

ELECTRONIC DOCUMENTS DISCLAIMER

1. Electronic copies of the solicitation documents are made available on this website solely for the convenience of prospective bidders (whether as a prime contractor or sub-contractor) on the Project, and are not considered part of the Contract Documents. No representation or warranty is made, either expressed or implied, with regard to the accuracy or suitability of these electronic copies for any purpose whatsoever. In the event of discrepancies or conflicts between the County's originally published document(s) and any other version distributed or submitted by other parties, the County's original hard copy version shall prevail.
2. Miami-Dade County Department of Transportation and Public Works (DTPW) does not track or monitor downloads of Project documents from this website. Therefore, prospective bidders who choose to use this method of distribution shall also be responsible for monitoring the site and downloading any applicable addenda or supplemental information. DTPW will distribute hard copy addenda or supplemental information only to those persons or firms who we have purchased a hard copy of the original solicitation documents.
3. Miami-Dade County shall not be responsible for errors and omissions occurring in the transmission or downloading of any documents or specifications from this website. In the event of any discrepancy between information obtained from this website and the DTPW hard copy solicitation documents and specifications, the terms of the hard copy documents will prevail.
4. Miami-Dade County does not guarantee continuous, uninterrupted or secure access to this or other related websites. Operation of this website may be affected from time to time by numerous factors outside of our control. In the event that we are notified of any problems in a timely manner we will do our best to assist with those problems that fall within our control. For assistance, contact us at 305-375-2930. Solicitation documents are removed from this website as soon as possible after the due date.
5. DTPW does not accept facsimile or electronic bid responses of any kind. All bids must be submitted in writing, on the forms provided by the County, to the address designated in the bid package. It is the bidder's responsibility to ensure that their submittals are received at the designated location, complete and on time. Bids received after the due date will be rejected, even if the solicitation is still appearing on this site.
6. These documents shall not be altered in any manner. Utilization or viewing of these electronic documents shall constitute implicit acknowledgement and acceptance of these provisions. Failure to comply with these provisions may result in rejection of your bid.

CONTRACT SPECIFICATIONS

DEPARTMENT OF TRANSPORTATION
& PUBLIC WORKS
DESIGN AND ENGINEERING DIVISION

BID DOCUMENTS

METRORAIL BATHROOM REHABILITATION

CONTRACT NO. CICC 7360 PLAN

RPQ NO.: TP-0000027284

PROJECT NO.: IRP215

VOLUME I OF II

SOLICITATION DOCUMENTS

NOVEMBER 2024



RPQ NO.: TP-0000027284

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

BID DOCUMENTS

METRORAIL BATHROOM REHABILITATION

PROJECT NO. IRP215

RPQ NO. TP-0000027284

BID DOCUMENTS - TABLE OF CONTENTS I OF II
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BID DOCUMENTS

INVITATION TO BID

MINIMUM QUALIFICATIONS & REQUIREMENTS

FORMS FOR BIDDING

- Bid Form
- Attachment 5A
- Surety Bid Bond Form
- Acknowledgment Addenda (if applicable/Signed by Contractor)
- Certificate of Assurance (CoA) (Not Applicable for this Project)
- Bidder's Statement of Qualifications and Business References
- Scrutinized Company Affidavit
- Non-Collusion Affidavit
- Firm's Responsibility Combined Affidavit
- Responsible Contractor Affidavit (Form RTFE 1)
- Contractor's Due Diligence Affidavit
- Fair Wage Affidavit
- E-Verify Affidavit
- DPM Requirement - Affirmation of Vendor Affidavits
- Financial Documentation
- Job Clearinghouse Form
- Fair Subcontracting Practices

CONTRACT FORMS

- Surety Performance and Payment Bond
- Residents First Training and Employment Program/Community Workforce Program/
Employ Miami-Dade Program Construction Workforce Plan - Form RFTE2
- OSHA Safety Training Affidavit - Form RFTE 3
- Residents First Training and Employment Program/Employ Miami-Dade Program
Workforce Performance Report - Form RFTE 4
- Bid Submittal Check List Questionnaire Appendix "D"
- Certificate(s) of Insurance

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

BID DOCUMENTS

METRORAIL BATHROOM REHABILITATION

PROJECT NO. IRP215

RPQ NO. TP-0000027284

BID DOCUMENTS - TABLE OF CONTENTS II OF II

BID DOCUMENTS

- LCP TRACKER

- SPECIAL PROVISIONS:

- Appendix A: Authorization Agreement for Automatic Deposit
- Appendix B: Sustainable Buildings Program

- STANDARD CONSTRUCTION: GENERAL CONTRACT CONDITIONS.

- TECHNICAL SPECIFICATIONS: SPECIAL TERMS & CONDITIONS.

- UHealth | Jackson Station
- Tri-Rail Station
- Palmetto Station
- Manuals

INVITATION TO BID



RPQ NO. TP-0000027284

**Department of Transportation and
Public Works**

**Capital Improvements Division
111 NW 1st Street, Suite 1410
Miami, FL 33128 33128**



**MIAMI-DADE COUNTY, FLORIDA
REQUEST FOR PRICE QUOTATION (RPQ)**

Contract No: MCC 7360 Plan

RPQ No: TP-0000027284

INVITATION TO BID

A RPQ has been issued for the work identified below. If you are interested in submitting a bid for this project, please submit your bid via Sealed Envelopes, attention to Office of the Clerk of the Board at 111 NW 1st ST. 17th Floor. Miami, FL. 33128 - Clerk of the Board Office no later than 1/8/2025 at 02:00 PM. If you have any questions, contact Marco Movilla at (305) 375-3267.

This RPQ is issued under the terms and conditions of the Miscellaneous Construction Contracts (MCC) Program MCC 7360 Plan.

RPQ DETAILED BREAKDOWN

Bid Due Date:	1/8/2025	Time Due:	02:00 PM	Submitted Via:	Sealed Envelopes		
Estimated Value:	\$556,713	(excluding Contingencies and Dedicated Allowances)					
Project Name:	Metrorail Bathroom Rehabilitation						
Project Location:	Various Locations						
License Requirements:	Primary:	General Engineering					
	Sub:	Electrical Contractor; Plumber, Master; Fire Alarm; Building Contractor; Structural					
Scope of Work:	<p>(Contractor must obtain and submit all permits prior to performing any work).</p> <p>A. Work under this Contract includes the remodeling of certain restrooms facilities within the UHealth Jackson, Palmetto and Tri-Rail Metrorail stations. Scope is identified in the construction documents and associated specifications for each of the facilities; however, it includes and is not limited to:</p> <p>1) The removal and installation of all fixtures and finishes complying with codes and ADA standards.</p> <p>2) Removal and replacement of all finishes and fixtures with new walls, floor, and ceiling coverings, fixtures, appurtenances, plumbing, electrical, mechanical, communications, P/A speaker and speaker grills, hand free telephones, building systems, equipment and components associated thereto for the complete repair of the Metrorail Bathroom projects.</p> <p>3) Remove and replace with new cast-iron and copper all existing sanitary drains, waste and vent systems.</p> <p>4) Remove and completely re-pipe with new L-type copper all existing water pipe, including trap primers, control valves, and supports for all plumbing fixtures.</p> <p>5) Provide new plumbing fixtures “institutional type” ADA and Watersense compliant. Contractors are to verify that the specified products, in the construction documents, are Watersense compliant. Contractors are to provide cut sheets for approval of all plumbing fixtures. In the event that some plumbing fixtures, as specified, are not watersense compliant, contractor is to submit to DTPW substitutions of equal or greater performance with the appropriate watersense certifications.</p> <p>6) Provide to all new plumbing fixtures acorn duran-ware 16-gauge, type 304 stainless steel rated for 1000 lbs. with all mounting screws concealed.</p> <p>7) Restrooms shall be equipped with as required per DTPW toilet accessory specifications.</p> <p>8) All bathroom's walls shall be tile from floor to ceiling with ceramic tile: Daletile, Marrazzi & American Olean, Ice White 0025, Glossy with Epoxy integral color grout, color: 44 Bright white.</p> <p>9) Bathroom floors shall be anti-slip ceramic tile. Daletile: Marrazzi & American Olean, Story Floor 0034, Matte Balance with epoxy integral grout: laticrete epoxy grouts, 78 sterling Silver.</p> <p>10) Provide new mechanical soffit and rigid ceiling with fire alarm and lighting.</p> <p>11) Install doors type 316 stainless steel with a min. of a 1.5-hour fire rating.</p>						

- 12) Provide light fixtures per specification in day brite LED with emergency battery back-up shall be 227V, 2 lamp recessed to match existing.
- 13) Furnish and install a new UL listed weather resistant wall mounted hand-free telephone to replace existing one.
- 14) Furnish and install a new exhaust ventilator with duct and wiring, in each restroom.
- 15) The smoke detectors inside the bathrooms must be removed at the beginning of the construction and reinstall before opening the bathroom to the public.
- 16) The P/A speaker, speaker enclosure and grill shall be replaced with a new atlas sound speakers to be compatible with existing P/A system.
- 17) Remove and replace lose / broken floor tiles in area adjacent to the area of work.
- 18) Remove and replace the existing Removal and replacement of existing O/A wall vent.
- 19) Remove and replace cracked lath and plaster ceiling and high hats above drinking fountain vestibule.
- 20) New concrete work as shown in the structural drawings.

Document Pickup:	Contact:	DTPW Capital Improvements Division	Phone No:	(305) 375-2930	Date:	11/21/2024
	Location:	111 NW 1st Street. Suite# 1410. Miami, Fl. 33128				

Pre-Bid Meeting::	YES	Mandatory:	No	Date:	12/11/2024	Time:	10:00 AM
	Location:	See Info. Below in Comments					

Site Meeting:	YES	Mandatory:	No	Date:	12/11/2024	Time:	10:00 AM
	Location:	See Info. Below in Comments					

Bid shall be submitted to:	Contact:	Office of the Clerk of the Board				
	Address:	111 NW 1st ST. 17th Floor. Miami, Fl. 33128 - Clerk of the Board Office				
	Email:	Clerkbbs@miamidade.gov	FAX # :	305-375-2931		

Type of Contract:	Single Trade	Method of Award:	Lowest Responsible Bidder		
Method of Payment:	Scheduled Monthly Payments	Insurance Required:	YES		

Additional Insurance Required:	NO	If Yes - Minimum Coverage:			
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Performance & Payment Bond Required:	YES	Bid Bond Required:	YES		
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Davis Bacon:	NO	Maintenance Wages:	NO	AIPP:	NO	Amount:	
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DBE Participation:	NO	Percentage:	0.00%	DBE Subcontractor Forms Required:	NO
SBE-S Requirements	NO	Percentage:	0.00%		
SBE-G Requirements	NO	Percentage:	0.00%		
Liquidated Damages:	YES	\$\$ Per Day:	\$2,437.00		

For RPQ's less than \$10,000, if no LD rate is specified, the County reserves the right to assess actual damages in lieu of LDs.

Design Drawing Included:	YES	Shop Drawing Included:	NO	Specifications Included:	YES
Anticipated Start Date:	10/20/2025			Calendar Days for Project Completion:	360

Comments: Pursuant to Section 2-8.10 of the Code of Miami-Dade County, this Contract is subject to a user access fee under the County's User Access Program (UAP) in the amount of two percent (2%). All construction services provided under this contract are subject to the 2% UAP. This fee applies to all Contract usage whether by County Departments or by any other governmental, quasi-governmental or not-for-profit entity. From every payment made to the Contractor under this contract (including the payment of retainage), the County will deduct the two percent (2%) UAP fee provided in the ordinance and the Contractor will accept such reduced amount as full compensation for any and all deliverables under the contract. The County shall retain the 2% UAP for use by the County to help defray the cost of its procurement program. Contractor participation in this pay request reduction portion of the UAP is mandatory.

Provided, however, UAP shall not be applicable for total contract values, inclusive of contingency and allowance accounts, of less than five hundred thousand dollars (\$500,000.00).

A. LICENSE REQUIREMENTS:

1. At the time of Bid and pursuant to the requirements of Section 10-3 of the Code of Miami-Dade County, Florida and these Solicitation and Contract Documents, the Bidder must hold a valid, current, and active:

a. Certificate of Competency from the County's Construction Trades Qualifying Board as General Engineering Contractor, or as a Specialty Engineering Contractor, commensurate to the requirements of the Scope of Work, in one of more engineering crafts. The specialty contractor shall subcontract with a qualified contractor any work which is incidental to the specialty but is specified in the aforementioned Code as being the work of other than that of the Engineering Specialty for which certified; or

b. Certification, as a General Contractor, provided by the State of Florida Construction Industry Licensing Board, pursuant to the provisions of Section 489.115 of the Florida Statutes.

2. Proof of such Certificate(s) must be submitted at the time of initial response and maintained current throughout the contract period. The County may request proof of continued certification at any time during the contract period. Failure to provide such proof within five (5) working days from notification by the County shall result in the removal from the contract and the rejection of any current or future RPQ bid submissions.

B. EXPERIENCE REQUIREMENTS:

In addition to the required licenses, bidders must be able to demonstrate, through prior experience, the ability to construct projects of similar size and scope, as described in the project's summary of Work and identified in the construction documents. Proposers shall provide documentation that demonstrates their ability to satisfy all the minimum qualification requirements. Bidders who do not meet the minimum qualification requirements or who fail to provide supporting documentation may not be considered for award.

The Contractor must be able to pull in a Master Permit. In addition, the Contractor is required to have a minimum of three years of experience with Architecture, Structural, HVAC, Electrical, Plumbing, Fire Alarm and, Building Technology.

C. INDEMNIFICATION AND INSURANCE REQUIREMENTS:

The Contractor shall furnish to Department of Transportation and Public Works, 111 NW 1 Street, Miami Florida 33128, Certificate(s) of Insurance which indicate that insurance coverage has been obtained which meets the requirements as outlined below:

A. Worker's Compensation Insurance for all employees of the Contractor as required by Florida Statute 440.

B. Commercial General Liability Insurance in an amount not less than \$1,000,000 per occurrence, and \$2,000,000 in the aggregate, not to exclude coverage for Products and Completed Operations. Miami-Dade County must be shown as an additional insured with respect to this coverage.

C. Automobile Liability Insurance covering all owned, non-owned and hired vehicles used in connection with the work, in an amount not less than \$1,000,000 combined single limit per occurrence for bodily injury and property damage.

All insurance policies required above shall be issued by companies authorized to do business under the laws of the State of Florida, with the following qualifications:

The company must be rated no less than "A-" as to management, and no less than "Class VII" as to financial strength, by Best's Insurance Guide, published by A.M. Best Company, Oldwick, New Jersey, or its equivalent, subject to the approval of the County Risk Management Division.

or

The company must hold a valid Florida Certificate of Authority as shown in the latest "List of All Insurance Companies Authorized or Approved to Do Business in Florida" issued by the State of Florida Department of Financial Services.

D. BID DOCUMENTS:

Bidding documents may be purchased from the Department of Transportation and Public Works, Capital Improvements Division, 111 NW 1st Street, 14th Floor, Miami, Florida 33128 for a non-refundable fee of One hundred twenty-five Dollars (\$ 125.00) per each complete set of documents. Payment shall be in the form of a company check, cashier's check, or money order payable to the "Department of Transportation and Public Works." Bid Documents can also be downloaded for free at the following link: <https://www8.miamidade.gov/Apps/ISD/DPMWW/SolicitationList.aspx>, and the project number TP-0000027284.

E. ADDENDUMS - RFI'S:

All RFI requests should be e-mailed to marco.movilla@miamidade.gov while copying the Clerk of the Board (clerkbcc@miamidade.gov).

Addendums and requests for information (RFI) will be sent to contractors who pick up documents at 111 NW 1st Street. Contractors who wish to download the solicitation and contract documents will be responsible for downloading the Addendums and RFI's. All Addendums, RFI's, and the document holders list (bidder's list) are available to view online at the following web address: <https://www8.miamidade.gov/Apps/ISD/DPMWW/SolicitationList.aspx>

The Department will only be sending addendums and RFI's by e-mail and posting online at the aforementioned link. The bidders list will be updated every Friday during the advertising phase of the contract. Please be aware that acknowledgment of receipt of all addendums and RFI's remain a requirement when submitting bids.

F. VENDOR REGISTRATION:

Due to the new Vendor Registration procedures of Miami-Dade County, updated definitions along with the "Affirmation of Vendor Affidavits" have been added to the Bid Submittal Package. The successful bidder must be registered under this new procedure prior to the award.

G. PRE-BID MEETING AND SITE VISIT MEETING:

Pre-Bid Meeting and Site Visit Meeting will be held on Wednesday, 10:00 A.M., December 11th, 2024, at the first meeting point, which it will be held at:

1st Meeting Point Location: UHealth | Jackson Metrorail Station, 1501 NW 12 Avenue, Miami, FL 33136

Then, for Site Visit's purposes, will proceed to second location at: Tri-Rail Metrorail Station, 2567 East 11th Avenue., Hialeah, FL 33013"

And will end at third location: Palmetto Metrorail Station, 7701 NW 79 Av, Miami, FL 33166

Site Visit will be held immediately after the Pre-Bid meeting.

Additional site visit meetings may be scheduled based on the number of RSVPs received. If additional site visit meetings are scheduled, DTPW will notify the prospective bidders in writing.

H. BID SUBMITTAL DUE DATE:

Bid Submittal Time and Location: Wednesday, 2:00 P.M., January 8th, 2025, at 111 NW 1 Street, 17th Floor, Clerk of the Board Office.

Bid Opening immediately after Bid Submittal in the 18 Floor.

DISCLOSURE:

- Contractor shall indemnify and hold harmless the County and its officers, employees, agents and instrumentalities from any and all liability, losses or damages, including attorneys' fees and costs of defense, which the County or its officers, employees, agents or instrumentalities may incur as a result of claims, demands, suits, causes of actions or proceedings of any kind or nature arising out of, relating to or resulting from the performance of this Agreement by the Contractor or its employees, agents, servants, partners principals or subcontractors. Contractor shall pay all claims and losses in connection therewith and shall investigate and defend all claims, suits or actions of any kind or nature in the name of the County, where applicable, including appellate proceedings, and shall pay all costs, judgments, and attorney's fees which may issue thereon. Contractor expressly understands and agrees that any insurance protection required by this Agreement or otherwise provided by the Contractor shall in no way limit the responsibility to indemnify, keep and save harmless and defend the County or its officers, employees, agents and instrumentalities as herein provided.

The Contractor shall furnish to **Department of Transportation and Public Works, Capital Improvements Division, 111 NW 1st Street, Suite 1410, Miami, FL 33128** 33128, Certificate(s) of Insurance which indicate that insurance coverage has been obtained which meets the requirements as outlined below:

- A.** Worker's Compensation Insurance for all employees of the Contractor as required by Florida Statute 440.
 - a. If applicable should include coverage required under the U.S. Longshoremen and Harbor Workers' Act (USL&H) and/or Jones Act for any activities on or about navigable water.
- B.** Commercial General Liability in an amount not less than \$300,000 per occurrence, and \$600,000 in the aggregate. Miami-Dade County must be shown as an additional insured with respect to this coverage.
- C.** Automobile Liability Insurance covering all owned, non-owned and hired vehicles used in connection with the work, in an amount not less than \$300,000 combined single limit per occurrence for bodily injury and property damage.

*Under no circumstances are Contractors permitted on the Aviation Department, Aircraft Operating Airside (A.O.A) at Miami International Airport without increasing automobile coverage to \$5 million. Only vehicles owned or leased by a company will be authorized. \$1 million limit applies at all other airports.

VERIFICATION OF EMPLOYMENT ELIGIBILITY (E-VERIFY):

By entering the Contract, the Awarded Bidder becomes obligated to comply with the provisions of Section 448.095, Florida Statute, titled "Verification of Employment Eligibility." This includes but is not limited to utilization of the U.S. Department of Homeland Security's E-Verify System to verify the employment eligibility of all newly hired employees by the Awarded Bidder effective, January 1, 2021, and requiring all Subcontractors to provide an affidavit attesting that the Subcontractor does not employ, contract with, or subcontract with, an unauthorized alien. Failure to comply may lead to termination of this Awarded Bidder, or if a Subcontractor knowingly violates the statute, the subcontract must be terminated immediately. Any challenge to termination under this provision must be filed in the Circuit Court no later than twenty (20) calendar days after the date of termination. If this Contract is terminated for a violation of the statute by the Awarded Bidder, the Awarded Bidder may not be awarded a public contract for a period of one year after the date of termination, and the Awarded Bidder may be liable for any additional costs incurred by the County resulting from the termination of the Contract. Public and private employers must enroll in the E-Verify System (<http://www.uscis.gov/e-verify>) and retain the I-9 Forms for inspection.

**MINIMUM QUALIFICATIONS &
REQUIREMENTS**



RPQ NO. TP-0000027284

LICENSE REQUIREMENTS:

1. At the time of Bid and pursuant to the requirements of Section 10-3 of the Code of Miami-Dade County, Florida and these Solicitation and Contract Documents, the Bidder must hold a valid, current, and active:
 - a. Certificate of Competency from the County's Construction Trades Qualifying Board as *General Engineering Contractor*, or as a *Specialty Engineering Contractor*, commensurate to the requirements of the Scope of Work, in one of more engineering crafts. The specialty contractor shall subcontract with a qualified contractor any work which is incidental to the specialty but is specified in the aforementioned Code as being the work of other than that of the Engineering Specialty for which certified; or
 - b. Certification, as a *General Contractor*, provided by the State of Florida Construction Industry Licensing Board, pursuant to the provisions of Section 489.115 of the Florida Statutes.
2. Proof of such Certificate(s) must be submitted at the time of initial response and maintained current throughout the contract period. The County may request proof of continued certification at any time during the contract period. Failure to provide such proof within five (5) working days from notification by the County shall result in the removal from the contract and the rejection of any current or future RPQ bid submissions.

CONTRACTOR MUST MEET THE BELOW REQUIREMENTS:

In addition to the required licenses, bidders must be able to demonstrate, through prior experience, the ability to construct projects of similar size and scope, as described in the project's summary of Work and identified in the construction documents. Proposers shall provide documentation that demonstrates their ability to satisfy all the minimum qualification requirements. Bidders who do not meet the minimum qualification requirements or who fail to provide supporting documentation may not be considered for award.

The Contractor must be able to pull in a Master Permit. In addition, the Contractor is required to have a *minimum of three years of experience* with Architecture, Structural, HVAC, Electrical, Plumbing, Fire Alarm and, Building Technology.

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

METRORAIL BATHROOM REHABILITATION

PROJECT NO. IRP215

RPQ NO. TP-0000027284

FORMS FOR BIDDING

- Bid Form
- Attachment 5A
- Surety Bid Bond Form
- Acknowledgment Addenda (if applicable/Signed by Contractor)
- Certificate of Assurance (CoA) (Not Applicable for this Project)
- Bidder's Statement of Qualifications and Business References
- Scrutinized Company Affidavit
- Non-Collusion Affidavit
- Firm's Responsibility Combined Affidavit
- Responsible Contractor Affidavit (Form RTFE 1)
- Contractor's Due Diligence Affidavit
- Fair Wage Affidavit
- E-Verify Affidavit
- DPM Requirement - Affirmation of Vendor Affidavits
- Financial Documentation
- Job Clearinghouse Form
- Fair Subcontracting Practices

All bids must be received by the due date and time. The County will not consider bids received after the due date and time.

Bids are to be submitted sealed with all necessary affidavits and supporting documentation attached. Bids are to be delivered to the Clerk of the Board at 111 NW 1st Street, 17th Floor, Miami, Florida, 33128. **All envelopes must be stamped at the reception desk with the date and time. Failure to submit with your bid the forms stipulated above may render the bid non-responsive.**

BID FORM



RPQ NO. TP-0000027284

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

BID DOCUMENTS

METRORAIL BATHROOM REHABILITATION

PROJECT NO. IRP215

RPQ NO. TP-0000027284

To: Miami-Dade County

Department of Transportation and Public Works

Miami, Florida

Bid Opening Date: _____

Bid Opening Time: _____

Local Time _____

Gentlemen:

We _____

Bidder's Name

have received, have examined and are familiar with the Contract Documents bearing the title **METRORAIL BATHROOM REHABILITATION- RPQ NO. TP-0000027284**, the forms for the Submittal of Bids and have included the cost of their provisions, in our Bid. We have examined, are familiar with, and do accept the conditions of the Work site and other conditions affecting the Work.

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Failure to acknowledge receipt of all addenda may cause the bid to be considered not responsive to the invitation, which would require rejection of the bid.

METRORAIL BATHROOM REHABILITATION

PROJECT No.: IRP215

BID FORM

IF THIS CONTRACT IS ACCEPTED, THE BIDDER AGREES TO COMPLETE ALL WORK UNDER THIS CONTRACT WITHIN 360 CALENDAR DAYS AFTER THE EFFECTIVE DATE OF NOTICE TO PROCEED. **PRICING SHALL BE INCLUSIVE OF ALL REQUIREMENTS TO COMPLETE THE SCOPE OF WORK AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.**

***** TO BE COMPLETED BY BIDDER AT BID SUBMISSION *****

PAY ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Division 0 work (General Requirements): GC O&P, Bond / Insurance, Reimbursables	LS	1		
2	Division 1 work: Mobilization, Protection, Waste removal, Temp. toilets, other division 1 work	LS	1		
3	Division 2 work: Demolition, fill / Compact	LS	1		
4	Division 3 work: Concrete, Vaport barrier, Reinforcing	LS	1		
5	Division 6 work: Casework	LS	1		
6	Division 7 work: Joint sealers	LS	1		
7	Division 8 work: Doors, Frames and Hardware	LS	1		
8	Division 9 work: Partitions, Hard ceilings, Floor and wall tile, Painting, Access panels	LS	1		
9	Division 10 work: Restroom stalls, Urinal partitions and lockers	LS	1		
10	Division 15A work: Plumbing Fixtures, Restroom accessories, Sanitary piping, Water supply, Water arrestors, EWC, HWH	LS	1		
11	Division 15B work: Air distribution ductwork & vents (supply and return)	LS	1		
12	Division 16 work: Lighting fixtures conduit and wiring, FA modifications, PA system modifications	LS	1		

TOTAL BASE BID \$ _____

(Instructions: The spaces provided in the Total Price Column(s) for the Bid Line Item(s) must be filled in and no spaces left blank. The sum of the Bid Line Items must represent your Base Bid Total. Failure to submit a complete and accurate Bid Form may result in your bid found non-responsive.)

A TEN PERCENT (10%) CONTINGENCY ALLOWANCE AND OTHER DEDICATED ALLOWANCES AS REQUIRED WILL BE ADDED TO THE BASE BID TOTAL AS STIPULATED IN THE SPECIAL PROVISIONS.

LICENSE NO. _____ BIDDER'S NAME _____

BIDDER'S TELEPHONE NUMBER _____ BIDDER'S ADDRESS _____

BIDDER'S FEIN NUMBER _____ BIDDER'S SIGNATURE _____

THE BIDDER UNDERSTANDS AND AGREES THAT THE BASE BID TOTAL AND ALL APPLICABLE ALLOWANCES ARE INCLUSIVE OF ALL WORK NECESSARY TO COMPLETE THE SCOPE OF WORK AS DESCRIBED IN THE CONTRACT DOCUMENTS, AND IF THIS PROPOSAL IS ACCEPTED, THE BIDDER AGREES TO ENTER INTO AND EXECUTE THE CONTRACT WITH THE NECESSARY BOND AND ACCEPT THE ABOVE BASE BID, INCLUSIVE OF ALL ALLOWANCES, AS FULL COMPENSATION FOR THE WORK PERFORMED UNDER THIS CONTRACT.

***YOU ARE REQUIRED TO TRANSFER TOTALS TO FORM APPENDIX 5A. FAILURE TO COMPLY WITH THIS REQUEST MAY RENDER THE PROPOSAL NON-RESPONSIVE.**

LOCAL PREFERENCE CERTIFICATION: For the purpose of this certification, a “local business” is a business located within the limits of Miami-Dade County that conforms with the provisions of Section 3.0 of the Special Provisions of this solicitation and contributes to the economic development of the community in a verifiable and measurable way. This may include, but not be limited to, the retention and expansion of employment opportunities and the support and increase to the County’s tax base.

☐ Place a check mark here only if affirming bidder meets requirements for Local Preference. Failure to complete this certification at this time (by checking the box above) may render the vendor ineligible for Local Preference.

LOCALLY-HEADQUARTERED BUSINESS CERTIFICATION: For the purpose of this certification, a “locally-headquartered business” is a Local business whose “principal place of business” is in Miami-Dade County as defined in Section 3.0 of the Special Provisions of this solicitation.

☐ Place a check mark here only if affirming bidder meets requirements for the Locally-Headquartered Preference (LHP). Failure to complete this certification at this time (by checking the box above) may render the vendor ineligible for the LHP. The address of the locally-headquartered office is _____

LOCAL CERTIFIED WARTIME VETERAN BUSINESS ENTERPRISE CERTIFICATION: A Local Certified Service-Warime Veteran Business Enterprise is a firm that is (a) a local business pursuant to Section 2-8.5 of the Code of Miami-Dade County and (b) prior to bid submission is certified by the State of Florida Department of Management Services as a service-warime veteran business enterprise pursuant to Section 295.187 of the Florida Statutes.

☐ Place a check mark here only if affirming bidder is a Local Certified Service-Warime Veteran Business Enterprise. A copy of the certification must be submitted with this proposal.

A. WAIVER OF CONFIDENTIALITY AND TRADE SECRET TREATMENT OF BID:

The Bidder acknowledges and agrees that the submittal of the Bid is governed by Florida's Government in the Sunshine Laws and Public Records Laws, as set forth in Florida Statutes Section 286.011 and Florida Statutes Chapter 119. As such, all material submitted as part of, or in support of, the Bid will be available for public inspection after opening of bids and may be considered by the County in public.

By submitting a bid pursuant to this solicitation, Bidder agrees that all such materials may be considered to be public records. The Bidder shall not submit any information in response to this solicitation which the Bidder considers to be a trade secret, proprietary or confidential. In the event that the Bid contains a claim that all or a portion of the Bid submitted contains confidential, proprietary or trade secret information, the Bidder, **by signing below**, knowingly and expressly **waives** all claims made that the Bid, or any part thereof no matter how indicated, is confidential, proprietary or a trade secret and authorizes the County to release such information to the public for any reason.

B. CONVICTION DISCLOSURE:

Pursuant to Section 2-8.6 of the Code of Miami-Dade County, any individual, corporation, partnership, joint venture or other legal entity having an officer, director, or executive who has been convicted of a felony during the past ten (10) years shall disclose this information at the time of bid submittal.

☐ Place a check mark here only if the Bidder has such conviction to disclose to comply with this requirement.

D. C. CERTIFICATE OF COMPETENCY NO _____ BIDDER'S NAME _____

BIDDER'S TELEPHONE NUMBER _____ BIDDER'S ADDRESS _____

BIDDER'S SIGNATURE: _____ DATE: _____

ATTACHMENT 5A



RPQ NO. TP-0000027284

Department of
Transportation and Public
Works
Capital Improvements Division
111 NW 1st Street, Suite 1410
Miami, FL 33128, 33128



MIAMI-DADE COUNTY, FLORIDA
REQUEST FOR PRICE QUOTATION (RPQ)
Contract No: MCC 7360 Plan
RPQ No: TP-0000027284

RPQ BID FORM – ATTACHMENT 5A

RPQ Project Name: Metrorail Bathroom Rehabilitation

Price Proposal (Cost to Perform the work **must** be stated here. State 'No Bid' if not submitting a price proposal)

\$

Bidder's Company Name: _____

Company Address: _____

City: _____ **State:** _____ **Zip:** _____

Telephone No: _____ **Fax No:** _____ **E-Mail:** _____

THE EXECUTION OF THIS FORM CONSTITUTES THE UNEQUIVOCAL OFFER OF PROPOSER TO BE BOUND BY THE TERMS OF ITS PROPOSAL. FAILURE TO SIGN THIS SOLICITATION WHERE INDICATED BELOW BY AN AUTHORIZED REPRESENTATIVE SHALL RENDER THE PROPOSAL NON-RESPONSIVE. THE COUNTY MAY, HOWEVER, IN ITS SOLE DISCRETION, ACCEPT ANY PROPOSAL THAT INCLUDES AN EXECUTED DOCUMENT WHICH UNEQUIVOCALLY BINDS THE PROPOSER TO THE TERMS OF ITS OFFER.

Name of Person Submitting Quote (Print): _____

Number of Addendums received: _____ (if none' write "None")

Signature: _____ **Date:** _____

Note: Quotes must be submitted on this form. Quote envelope must state RPQ Number, date and time due and the Bidder's Name. Use of any other form for submission of the price quotation shall result in the rejection of the price quotation. Late bids will not be opened. *Low bidder will be notified, in the Recommendation of Award, of the requirements to submit current copies of insurance certificates in accordance with the Contract Documents. By signature, the CONTRACTOR agrees to be bound by the terms set forth in the MCC 7360 Plan.*

SURETY BID BOND FORM



RPQ NO. TP-0000027284

SURETY BID BOND

STATE OF _____) ss.:
COUNTY OF _____)

KNOW ALL MEN BY THESE PRESENTS, that we, _____ as Principal, and _____ as Surety, are held and firmly bound unto Miami-Dade County in the penal sum of Dollars (\$ _____) lawful money of the United States, which sum represents five percent of the Base Bid Total, and for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying Bid, dated _____ 20____ for **RPQ NO. TP-0000027284** entitled, **METRORAIL BATHROOM REHABILITATION.**

NOW THEREFORE, if the Principal shall not withdraw said Bid within 180 days after the Bid opening date, shall submit complete information required, and shall within 10 days after the prescribed forms are presented to him for signature, enter into a written Contract with Miami-Dade County, in accordance with the Bid as accepted, and give a Surety Performance and Payment Bond with good and sufficient surety or sureties and provide the necessary Insurance Certificates, as may be required, for the faithful performance and proper fulfillment of such Contract and for the prompt payment of all persons furnishing labor or materials in connection therewith, or in the event of withdrawal of said Bid within the period specified, or in the event of the failure to enter into such Contract and give such Bond within the time specified, if the Principal shall pay Miami-Dade County the difference between the amounts specified in said Bid and the amount for which Miami-Dade County may procure the required work and supplies, provided the latter amount be in excess of the former, then the above obligations shall be void and of no effect; otherwise, to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounden parties have caused this Bond to be executed by their appropriate officials as of the _____ day of _____, 20__.

(CORPORATE SEAL)

(printed name of corporation)

(printed state of incorporation)

By: _____
(signature of president or vice-president & capacity)

(printed name of president or vice- president & capacity)

By: _____
(signature of secretary or assistant secretary & capacity)

(printed name of secretary or assistant secretary & capacity)

(Business address of corporation)

ACKNOWLEDGEMENT:

STATE OF _____) ss.:

COUNTY OF _____)

Before me personally appeared _____, as President to me well known or has presented _____ as identification and
(Type of identification)

_____ as Secretary, to me well known, or has presented _____ as identification and known to me to be individuals described
(Type of identification)

in and who executed the foregoing instrument as _____ President and _____ Secretary of the above named _____ a Corporation, and severally acknowledged that they executed such instrument as such _____ President and _____ Secretary, respectively, of said corporation, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that it was affixed to said instrument by due and regular corporate authority, and said instrument is the free act and deed of said corporation.

SUBSCRIBED AND SWORN TO (or affirmed) before me on _____
(Date)
by _____. He / She is personally known to me or has presented
(Affiant)
_____ as identification.
(Type of Identification)

(Signature of Notary) (Serial Number)

(Print or Stamp Name of Notary) (Expiration Date)

Notary Public _____
(State) Notary Seal:

=====

SURETY:

(CORPORATE SEAL)

(printed name of Surety)

(address of Surety)

By: _____
(Attorney-in-Fact)

By: _____
(resident Florida agent)

(printed name of Attorney-in-Fact)

(printed name of agent)

Note: Copy of Resident Agent's current license as issued by State of Florida Insurance Commissioner must be attached.

(Power of Attorney must be attached)

ACKNOWLEDGMENT ADDENDA
(IF APPLICABLE/ SIGNED BY CONTRACTOR)



RPQ NO. TP-0000027284

MIAMI-DADE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS (DTPW)

PROJECT: METRORAIL BATHROOM REHABILITATION

PROJECT NO.: IRP215

RPQ NO: TP-0000027284

ACKNOWLEDGEMENT OF ADDENDA

(Must be completed and submitted with required solicitation documents)

Instructions: Complete Part I or Part II, as applicable.

PART I: Listed below are the dates of issue for each Addendum received in connection with this solicitation.

Addendum #1, Dated _____, 202__

Addendum #2, Dated _____, 202__

Addendum #3, Dated _____, 202__

Addendum #4, Dated _____, 202__

Addendum #5, Dated _____, 202__

Addendum #6, Dated _____, 202__

Addendum #7, Dated _____, 202__

Addendum #8, Dated _____, 202__

Addendum #9, Dated _____, 202__

Addendum #10, Dated _____, 202__

PART II:

____ No Addendum was received in connection with this solicitation.

Authorized Signature: _____ Date: _____

Print Name: _____ Title: _____

Firm Name: _____

CERTIFICATE OF ASSURANCE (CoA)
(Not Applicable for this Project)



RPQ NO. TP-0000027284

BIDDER'S STATEMENT OF QUALIFICATIONS
AND BUSINESS REFERENCES



RPQ NO. TP-0000027284

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
TRANSIT ENGINEERING

BIDDER'S STATEMENT OF QUALIFICATIONS AND BUSINESS REFERENCES

This statement is an integral part of the Contractor's Bid, and must be completed as directed in the Instructions to Bidders. All references and information shall be current and traceable. If Bidder is a joint venture, a separate form must be prepared by each venturer (extra forms are available from the Engineer).

NAME OF BIDDER _____

PRINCIPAL OFFICE _____

(Street Address or P. O. Number)

(City)

(State)

(Zip Code)

(Area Code) (Telephone Number)

1. Are you registered to do business in Florida? _____ Registration No. _____ Classification _____
2. Do you hold a certificate of competency issued by Miami-Dade County, Florida? _____ Classification _____
3. Are you an individual _____, a partnership _____, a corporation _____ or a joint venture _____ (Check as applicable).

If a partnership, list names and addresses of partners; if a corporation, list names of officers and directors and State of incorporation; if a joint venture, list names and addresses of venturers and, if any venturer is a corporation, partnership or joint venture, list the same information for each such corporation, partnership and joint venturer.

4. How many years has your organization been in business as a contractor under your present business name? _____ years.

5. How many years of experience has your organization had in construction work similar to the work of this Contract?

(a) As a general contractor? _____

(b) As a subcontractor? _____

6. List all the projects which your organization has completed, which demonstrate qualifications to perform the work of this Contract. (For joint venture work show the sponsoring individual or company.)

YEAR	CONTRACT PRICE	KIND OF CONSTRUCTION	LOCATION OF WORK	NAME, ADDRESS, AND E-MAIL OF ENGINEER OR ARCHITECT

7. Have you or your organization, or any officer or partner thereof, failed to complete a Contract? _____

If so, give details _____

8. In what other lines of business are you financially interested?

9. Name the persons with whom you have been associated in business as partners or business associates during the last five years.

10. Give information about the construction experience of the principal individuals of your present organization.

11. List work, which you have currently underway.

Contract Price	Type of Construction	Location of Work	Percent Completed	Expected Completion Date	Name & Address of Engineer or Architect

12. List engineers, architects and owners, including public bodies, for whom you have done work:

NAME	ADDRESS	BUSINESS	TELEPHONE

13. Reference is hereby made to the following financial institutions as to the financial responsibility of the Bidder:

Name of Bank: _____

Street Address: _____

City and State: _____ Telephone: _____

Officer Familiar with Bidder's Account: _____

Name of Bank: _____

Street Address: _____

City and State: _____ Telephone: _____

Officer Familiar with Bidder's Account: _____

Name of Bank: _____

Street Address: _____

City and State: _____ Telephone: _____

Officer Familiar with Bidder's Account: _____

14. Reference is hereby made to the following surety company or companies as to the financial responsibility and general reliability of Bidder:

Name of Surety Company: _____

Name of Local Agent (if different): _____

Local Street Address: _____

City and State: _____ Telephone: _____

Person Familiar with Bidder's Account: _____

Name of Surety Company: _____

Name of Local Agent (if different): _____

Local Street Address: _____

City and State: _____ Telephone: _____

Person Familiar with Bidder's Account: _____

15. Is any litigation pending against your organization? _____

If so, give details _____

16. Is any litigation presently being prosecuted by your organization or on behalf of your organization? _____

If so, give details

The undersigned certifies that he is legally authorized by the Bidder to make the statements and representations contained in this document, and represents and warrants that the foregoing information is true and accurate to the best of his knowledge, and intends that the Miami-Dade County, DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS Agency, rely thereon in awarding the Contract.

BIDDER'S NAME: _____

DATE OF SIGNING: _____

SIGNATURE: _____ By: _____

TITLE: _____

SCRUTINIZED COMPANIES
AFFIDAVIT

By executing the Scrutinized Companies with Activities in Sudan or Iran Petroleum Energy Sector Lists Affidavit through a duly authorized representative, the bidder certifies that the bidder is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, as those terms are used and defined in sections 287.135 and 215.473 of the Florida Statutes. In the event that the bidder is unable to provide such certification, the bidder shall execute the Affidavit through a duly authorized representative. In such event, the bidder shall furnish together with its bid a duly executed written explanation of the facts supporting any exception to the requirement for certification that it claims under Section 287.135 of the Florida Statutes. The bidder agrees to cooperate fully with the County in any investigation undertaken by the County to determine whether the claimed exception would be applicable. The County shall have the right to terminate any Contract resulting from this solicitation for default if the bidder is found to have submitted a false certification or to have been, or is subsequently during the term of the Contract, placed on the Scrutinized Companies for Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List.



AFFIDAVIT
SCRUTINIZED COMPANIES WITH ACTIVITIES IN SUDAN
OR IRAN PETROLEUM ENERGY SECTOR LISTS
FLORIDA STATUTES 215.473

Pursuant to 287.135, F.S., the { _____ } (“Entity”) must disclose, if the Entity or any of its officers, directors, or executives are doing certain types of business in or with Sudan or Iran.

Indicate below if the above named Entity, as of the date of submission:

_____ has not engaged in commerce in any form in Sudan or Iran, including, but not limited to, acquiring, developing, maintaining, owning, selling, possessing, leasing, or operating equipment, facilities, personnel, products, services, personal property, real property, or any other apparatus of business or commerce.

_____ has engaged in commerce with Sudan or Iran, including, but not limited to, acquiring, developing, maintaining, owning, selling, possessing, leasing, or operating equipment, facilities, personnel, products, services, personal property, real property, or any other apparatus of business or commerce.

(CORPORATE SEAL)

CONTRACTOR

(Legal Name of Corporation)

ATTEST:

Secretary _____
(Signature and Seal)

By: _____
Contractor – Signature

(Type Name & Title)

Name: _____

(Type Name & Title)

NON-COLLUSION AFFIDAVIT



RPQ NO. TP-0000027284



NON-COLLUSION AFFIDAVIT

(In accordance with [Sections 2-8.1.1](#) and [10-33.02.1](#) of the Code of Miami-Dade County)

I, the undersigned, am over 18 years of age, have personal knowledge of the facts stated in the Non-Collusion Affidavit (*this Affidavit*) and I am an owner, officer, director, principal shareholder and/or otherwise authorized to bind the Bidder/Proposer of this solicitation.

- A. I have reviewed the list of respondents attached to this Affidavit. I state that the Bidder/Proposer of this competitive solicitation (check one):

☐ is **not related** to any of the other respondents submitting a Bid/Proposal in the competitive solicitation.

☐ is **related** to the following respondents who submitted a Bid/Proposal in the competitive solicitation, which are identified and listed below:

- B. I state that the Bidder/Proposer of this competitive solicitation:

1. has prepared this Bid/Proposal independently without consultation, communication, agreement or arrangement with any other Bidder/Proposer or competitor for the purpose of restricting competition;
2. has submitted the Bid/Proposal in its own behalf, and not in the interest or on behalf of any person not therein named;
3. has not, directly or indirectly, induced or solicited any other Bidder/Proposer to put in a sham proposal, or any other person, firm, or corporation to refrain from proposing;
4. has not in any manner sought by collusion to secure an advantage over any other Bidder/Proposer.

Note: Any person or entity that fails to submit this executed Affidavit shall be ineligible for contract award. In accordance with Section 2-8.1.1 of the Code of Miami-Dade County, where two or more related parties, as defined herein, each submit a Bid for any contract, such Bids shall be presumed to be collusive. The foregoing presumption may be rebutted by the presentation of evidence as to the extent of ownership, control and management of such related parties in preparation and submittal of such Bids. **Related parties** shall mean the Bidder/Proposer; the principals, corporate officers, and managers of a Bidder/Proposer; or the spouse, domestic partner, parents, stepparents, siblings, children or stepchildren of a Bidder/Proposer or the principals, corporate officers and managers thereof which have a direct or indirect ownership interest in another Bidder/Proposer for the same contract or in which a parent company or the principals thereof of one Bidder/Proposer have a direct or indirect ownership interest in another Bidder/Proposer for the same contract. Bid/Proposal found to be collusive shall be rejected. Bidder/Proposer who has been found to have engaged in collusion may be considered non-responsible, and may be suspended or debarred, and any contract resulting from collusive bidding may be terminated for default.

Written Declaration: Pursuant to §92.525, Florida Statutes, under penalties of perjury, I declare that I have read the foregoing Affidavit and that the facts stated in it are true, accurate, and complete.

Solicitation No.: _____ Solicitation Title: _____

By: _____
Signature of Affiant

Date: _____ 20 ____

Printed Name of Affiant and Title

____/____/____-____/____/____/____/____
Federal Employer Identification Number

Printed Name of Bidder/Proposer

Address of Bidder/Proposer

FIRM'S RESPONSIBILITY COMBINED AFFIDAVIT



RPQ NO. TP-0000027284

STATE OF FLORIDA)
) SS:
COUNTY OF MIAMI-DADE)

The undersigned, being first duly sworn, states as follows:

GENERAL

1. I am a duly authorized representative of the Firm submitting a bid, proposal or other document to Miami-Dade County with the intention of being awarded a contract (referred to in this affidavit as the "Respondent").
2. This Affidavit is made of my personal knowledge. I understand that Miami-Dade County will rely on the representations made in this affidavit in determining my eligibility and responsibility to enter into a contract with Miami-Dade County. By executing this affidavit, the Respondent agrees to provide to Miami-Dade County such documentation or other proof as Miami-Dade County may require verifying the accuracy and completeness of any of the representatives.
3. The Respondent is duly authorized to submit this bid or proposal, and if awarded the contract, to enter into the contract and perform the services or supply the goods contemplated in the contract.

OWNERSHIP DISCLOSURE

4. That in compliance with Section 2-8.1(d)(1) of the Miami Dade County Code, if the contract or business transaction is with a corporation, the full legal name and business address shall be provided for each officer and director and each stockholder who holds directly or indirectly five percent (5%) or more of the corporation's stock. If the contract or business transaction is with a trust, the full legal name and address shall be provided for each trustee and each beneficiary. All such names and addresses are (Post Office addresses are not acceptable). The full legal names and business address of any other individual (other than subcontractors, materialmen, suppliers, laborers, or lenders) that have, or will have, any interest (legal, equitable beneficial or otherwise) in the contract or business transaction with Miami-Dade County are (Post Office addresses are not acceptable). This information shall be supplied on the attached Ownership Disclosure form (Attachment "A") and signed by the Respondent.

Combined Affidavit Initial

EMPLOYMENT DISCLOSURE

5. The following information and attachments are provided and are in compliance with all items in County Ordinance No. 90-133, amending Section 2.8-1; Subsection (d) (2):

- a. Does your firm have a collective bargaining agreement with its employees?
☐ Yes ☐ No
- b. Does your firm provide paid health care benefits for its employees?
☐ Yes ☐ No
- c. Provide a current breakdown (number of persons) of your firm's work force and ownership as to race, national origin and gender:

White:	_____	Males:	_____	Females:	_____
Asian:	_____	Males:	_____	Females:	_____
Black:	_____	Males:	_____	Females:	_____
American					
Indian:	_____	Males:	_____	Females:	_____
Hispanics:	_____	Males:	_____	Females:	_____
Aleut					
(Eskimo):	_____	Males:	_____	Females:	_____
_____:	_____	Males:	_____	Females:	_____

EMPLOYMENT DRUG FREE WORKPLACE

6. The Respondent provides a drug-free workplace in full compliance with Section 2-8.1.2 of the Code of Miami-Dade County.

EMPLOYMENT FAMILY LEAVE

7. That in compliance with Ordinance No. 91-142 of the Code of Miami-Dade County, Florida, the following information is provided and is in compliance with all items in the aforementioned Ordinance:

An employee who has worked for the above firm for at least one (1) year shall be entitled to ninety (90) days of family leave during any twenty-four (24) month period, for medical reasons, for the birth or adoption of a child, or for the care of a child, spouse or other close relative who has a serious health condition without risk of termination of employment or employer retaliation.

Combined Affidavit Initial

ARREARS WITH THE COUNTY

8. That in compliance with Ordinance No. 95-178 and Section 2-8.1(c) of the Code of Miami-Dade County, the Proposer has paid all delinquent and currently due fees or taxes, including but not limited to real estate and personal property taxes, registered in the name of Proposer and which are collected in the normal course by the Miami-Dade County Tax Collector, and that County issued parking tickets for vehicles registered in the name of the above proposer, and which are collected in the normal course by the Miami-Dade Clerk of the Circuit and County Courts, have been paid.

That in compliance with Ordinance No. 99-162 and Section 2-8.1 of the Code of Miami-Dade County, the Proposer is not in arrears in any payment under contract, promissory note or other loan document with Miami-Dade County, or any of its agencies or instrumentalities, including the Public Health Trust, either directly or indirectly through a firm, corporation, partnership or joint venture in which the individual or entity has a controlling financial interest as that term is defined in Section 2-11.1(b)(8) of the Code of Miami-Dade County.

CODE OF BUSINESS ETHICS

9. I, being duly sworn, hereby state and certify that this firm has adopted a Code of Business Ethics that is fully compliant with the requirements of Section 2-8.1(i) of the Code of Miami-Dade County as amended. I further acknowledge that failure to comply with the adopted Code of Business Ethics shall render any contract with Miami-Dade County voidable, and subject this firm to debarment from County work pursuant to Section 10-38 (h)(2) of the Code of Miami-Dade County as amended. I further acknowledge that failure to submit this affidavit shall render this firm ineligible for contract award.

NO CRIMINAL RECORD

10. The Respondent has not been convicted of a felony during the past ten (10) years, nor does it, as of the date of the bid or proposal submission, have an officer, director or executive who has been convicted of a felony during the past ten (10) years as defined in Section 2-8.6 of the Code of Miami-Dade County.

PUBLIC ENTITY CRIME

11. The respondent has not been convicted of a Public Entity crime as defined in Paragraph 287.133(1)(g) of the Florida Statutes. Violation of any State or Federal law with respect to the transaction of business with any public entity or with an agency or political subdivision of any State.

Combined Affidavit Initial

DEBARMENT AND SUSPENSION DISCLOSURE

- 12 . The Respondent, and its officers, principals, stockholders, subcontractors or its affiliates are not debarred or suspended from contracting with Miami-Dade County as regulated by Section 10-38 of the Miami Dade County Code.

NON -DISCRIMINATION BASED ON DISABILITY

- 13 . The Respondent is in compliance with and agrees to continue to comply with and assure any subcontractor, or third party contractor under this project complies with all applicable laws forbidding discrimination based on disability including, but not limited to those provisions pertaining to employment, provision of programs and services, transportation, communications. Access to facility, renovations and new construction as set forth in the Americans with Disabilities Act of 1990 (ADA), the Rehabilitation Act of 1973, the Federal Transit Act and the Fair Housing Act.

FAIR SUBCONTRACTING

- 14 . Consistent with Section 2-8.8 of the Code of Miami-Dade County, the Respondent has adopted subcontracting policies and procedures which (a) notifies the broadest number of local subcontractors of the opportunity to be awarded a subcontract; (b) invites local subcontractors to submit bids in a practical, expedient way; (c) provides local subcontractors access to information necessary to prepare and formulate a subcontracting bid; (d) allows local subcontractors to meet with appropriate personnel of the Respondent to discuss the Respondent's requirements; and (e) awards subcontracts based on full and complete consideration of all submitted proposals and in accordance with the Respondent's stated objectives.

RESPONSIBLE WAGE AND BENEFITS (IF APPLICABLE)

- 15 . If applicable, the Respondent is in full compliance with Section 2-11.16 of the Code of Miami-Dade County, and should he or she be awarded the contract, understands his or her obligation to pay the project minimum wage rates set forth in that Section and the labor provisions of the contract documents.

Combined Affidavit Initial

CLEARINGHOUSE AFFIDAVIT

16. That in compliance with Miami-Dade County Resolution Number R-1145-99, the Respondent agrees to comply with all requirements of the Clearinghouse Resolution and Job Request form for posting job opportunities. Making it a mandatory requirement for Respondents to post notice of job opportunities resulting from the construction of improvements on County property through the County's Clearinghouse process.

I STATE NOTHING FURTHER IN THIS AFFIDAVIT.

Signature: _____

Position/Title: _____

Name of Firm: _____

The foregoing was sworn and subscribed before me this _____ day of _____, _____ by _____, who is personally known to me or who has produced _____ as identification who being duly sworn, deposes and says that the above is true to the best of his knowledge, information and belief.

My Commission expires:

NOTARY PUBLIC
STATE OF FLORIDA

Residents First Training and Employment Program
Responsible Contractor/Subcontractor Affidavit
Form (RFTE 1)



RPQ NO. TP-0000027284

Residents First Training and Employment Program
Responsible Contractor/Subcontractor Affidavit Form (RFTE 1)
(Miami-Dade County Code Section 2-11.17)

In accordance with Section 2-11.17 of the Miami-Dade County Code, all contractors and subcontractors of any tier performing on a contract for (i) the construction, demolition, alteration and/or repair of public buildings or public works projects valued in excess of \$1,000,000 funded completely or partially by Miami-Dade County, or (ii) privately funded projects or leases valued in excess of \$1,000,000 for the construction, demolition, alteration or repair of buildings or improvements on County owned land, and which are subject to Section 2-11.16 of the Code of Miami-Dade County shall comply with the requirements of the Residents First Training and Employment Program.

If applicable, the undersigned ☐ Contractor / ☐ Subcontractor verifies that should they be awarded the contract, the undersigned understands their obligation to comply with the following:

- i. Prior to working on the project, all persons employed by the contractor / subcontractor to perform construction shall have completed, the OSHA 10 Hour Safety Training course established by the Occupational Safety & Health Administration of the United States Department of Labor. Such training does not need to be completed at the time of bidding but shall be completed prior to the date persons are employed on the project.
- ii. The contractor / subcontractor will make its best reasonable efforts to promote employment opportunities for local residents and seek to achieve a project goal of having fifty-one percent (51%) of all Construction Labor hours performed by Miami-Dade County residents. To verify workers' residency, firms shall require each worker to produce a valid driver's license or other form of government-issued identification.

Printed Name of Affiant Printed Title of Affiant Signature of Affiant

Name of Firm Date

Address of Firm State Zip Code

Notary Public Information

Notary Public – State of _____ County of _____

Subscribed and sworn to (or affirmed) before me this _____ day of, _____ 20____.

by _____ He or she is personally known to me ☐ or has produced identification ☐

Type of identification produced _____

Signature of Notary Public Serial Number

Print or Stamp of Notary Public Expiration Date Notary Public Seal

CONTRACTOR DUE DILIGENCE AFFIDAVIT

“The attention of the Contractor is hereby directed to the requirements of Resolution R-63-14 in that the award of this contract is conditioned on the Contractor providing the County, when required, with a “CONTRACTOR DUE DILIGENCE AFFIDAVIT”.



RPQ NO. TP-0000027284

Miami-Dade County
Contractor Due Diligence Affidavit

Per Miami-Dade County Board of County Commissioners (Board) Resolution No. R-63-14, County Vendors and Contractors shall disclose the following as a condition of award for any contract that exceeds one million dollars (\$1,000,000) or that otherwise must be presented to the Board for approval:

- (1) Provide a list of all lawsuits in the five (5) years prior to bid or proposal submittal that have been filed against the firm, its directors, partners, principals and/or board members based on a breach of contract by the firm; include the case name, number and disposition;
- (2) Provide a list of any instances in the five (5) years prior to bid or proposal submittal where the firm has defaulted; include a brief description of the circumstances;
- (3) Provide a list of any instances in the five (5) years prior to bid or proposal submittal where the firm has been debarred or received a formal notice of non-compliance or non-performance, such as a notice to cure or a suspension from participating or bidding for contracts, whether related to Miami-Dade County or not.

All of the above information shall be attached to the executed affidavit and submitted to the Procurement Officer overseeing this solicitation/ contract/purchase order. The Vendor/Contractor attests to providing all of the above information, if applicable, to the County.

Written Declaration: Pursuant to Florida Statutes s. 92.525, under penalties of perjury, I declare that I have read the foregoing Contractor Due Diligence Affidavit and that the facts stated in it (attached to it) are true.

Contract No. : **Federal Employer Identification Number (FEIN):**

Contract Title:

<input type="text"/> Printed Name of Affiant	<input type="text"/> Printed Title of Affiant	<input type="text"/> Signature of Affiant
<input type="text"/> Name of Firm	<input type="text"/> Date	
<input type="text"/> Address of Firm	<input type="text"/> State	<input type="text"/> Zip Code

Notary Public Information

Notary Public – State of _____ County of _____

Subscribed and sworn to (or affirmed) before me this _____ day of _____ by _____
_____ He or she is personally known to me _____ or has produced identification

_____ Signature of Notary Public	_____ Serial Number	
_____ Print or Stamp of Notary Public	_____ Expiration Date	_____ Notary Public Seal

FAIR WAGE AFFIDAVIT



RPQ NO. TP-0000027284

FAIR WAGE AFFIDAVIT

Before me, the undersigned authority appeared _____ the
(PRINT NAME)

_____ of _____,
(PRINT TITLE) (PRINT NAME OF BIDDER OR PROPOSER)

who attests that _____ shall pay workers on
(PRINT NAME OF BIDDER OR PROPOSER)

the project minimum wage rates in accordance with Responsible Wages and Benefits, Section 2-11.16 of the Code of Miami-Dade County and the Labor Provisions of the contract documents.

State of FLORIDA

County of Miami-Dade

Sworn to (or affirmed) and subscribed before me this _____ day of _____, 202____.

_____ Personally, known or _____ produced identification.

(Signature of Notary Public - State of Florida)

(Print, Type, or Stamp Commissioned Name of Notary Public)

Type of identification produced: _____



E-VERIFY AFFIDAVIT



RPQ NO. TP-0000027284

Miami-Dade County

E-Verify Affidavit

Executive Order 11-02 requires all Florida State agencies under the direction of the Governor to use E-Verify to confirm the employment eligibility of all current and prospective employees (including subcontractors) assigned to perform work pursuant to a state agency contract. Executive Order 11-116 clarifies that the requirement for state contractors to use E-Verify applies to "all contracts for the provision of goods and services to the state in excess of nominal value."

In accordance with the State requirement, Miami-Dade County requires all vendors doing business with the County who are awarded state-funded contracts to verify employee eligibility using the E-verify system. It is the responsibility of the awarded vendor to insure compliance with E-verify requirements at all times.

To enroll in E-Verify, employers should visit the E-Verify website (<http://www.uscis.gov/e-verify>) and follow the instructions. The employer must, as usual, retain the I-9 Forms for inspection.

By affixing your signature below you hereby affirm that you have complied with E-Verify requirements.

Federal Employer Identification Number (FEIN): _____

_____	_____	_____
Printed Name of Affiant	Printed Title of Affiant	Signature of Affiant
_____		_____
Name of Firm		Date
_____	_____	_____
Address of Firm	State	Zip Code

Notary Public Information

Notary Public -- State of _____ County of _____

Subscribed and sworn to (or affirmed) before me this _____ day of, _____ 20____

by _____ He or she is personally known to me ☐ or has produced identification

Type of identification produced _____

Signature of Notary Public

Serial Number

Print or Stamp of Notary Public

Expiration Date

Notary Public Seal

DEPARTMENT OF PROCUREMENT MANAGEMENT
(DPM) AFFIRMATION OF VENDOR AFFIDAVITS

Bidders are required to affirm that all information submitted with the Vendor Registration Package is current, complete and accurate as a condition of award, by completing the provided Affirmation of Vendor Affidavit Form.



RPQ NO. TP-0000027284



New Vendor Registration and Bid/Proposal Contract Language

1.1. DEFINITIONS FOR VENDOR REGISTRATION

Bid – shall refer to any offer(s) submitted in response to this solicitation.

Bidder – shall refer to anyone submitting a Bid in response to this solicitation.

Bid Solicitation – shall mean this solicitation documentation, including any and all addenda.

Bid Submittal Form – defines the requirement of items to be purchased, and must be completed and submitted with Bid. The Bidder should indicate its name in the appropriate space on each page.

County – shall refer to Miami-Dade County, Florida

DPM – shall refer to Miami-Dade County's Department of Procurement Management.

Enrolled Vendor – shall refer to a firm that has completed the necessary documentation in order to receive Bid notifications from the County.

Registered Vendor – shall refer to a firm that has completed the Miami-Dade County Business Entity Registration Application and has satisfied all requirements to enter into business agreements with the County.

The Vendor Registration Package – shall refer to the Business Entity Registration Application.

For additional information about on-line vendor enrollment or vendor registration contact the Vendor Assistance Unit at 111 N.W. 1st Street, 13th Floor, Miami, FL 33128, Phone 305-375-5773. Vendors can enroll online and obtain forms to register by visiting our web site at www.miamidade.gov/dpm

1.2. INSTRUCTIONS TO BIDDERS

A. Bidder Qualification

It is the policy of the County to encourage full and open competition among all available qualified vendors. All vendors regularly engaged in the type of work specified in the Bid Solicitation are encouraged to submit Bids. Vendors may enroll with the County to be included on a notification list for selected categories of goods and services. To be eligible for award of a contract (including small purchase orders), Bidders must become a Registered Vendor. Only Registered Vendors can be awarded County contracts. Vendors are required to register with the County by contacting the Vendor Assistance Unit. The County endeavors to obtain the participation of all qualified small business enterprises. For information and to apply for certification, contact the Department of Small Business Development at 111 N.W. 1st Street, 19th Floor, Miami, FL 33128-1900, or telephone at 305-375-3111. County employees and board members wishing to do business with the County are referred to Section 2-11.1 of the Miami-Dade County Code relating to Conflict of Interest and Code of Ethics.

B. Vendor Registration

To be recommended for award the County requires that vendors complete a Miami-Dade County Vendor Registration Package. Effective June 1, 2008, a new Vendor Registration Package, including a Uniform Affidavit Packet (Affidavit form), must be completed by vendors and returned to the Department of Procurement Management (DPM), Vendor Assistance Unit, within fourteen (14) days of notification of the intent to recommend for award. In the event the Vendor Registration Package is not properly completed and returned within the specified time, the County may in its sole discretion, award to the next lowest responsive, responsible Bidder. The Bidder is responsible for obtaining the Vendor Registration Package, including all affidavits by downloading from the DPM website at www.miamidade.gov or from the Vendor Assistance Unit at 111 N.W. 1st Street, 13th Floor, Miami, FL 33128.

Bidders are required to affirm that all information submitted with the Vendor Registration Package is current, complete and accurate, at the time they submit a response to a Bid Solicitation, by completing the provided Affirmation of Vendor Affidavit form.

In becoming a Registered Vendor with Miami-Dade County, the vendor confirms its knowledge of and commitment to comply with the following:

1. **Miami-Dade County Ownership Disclosure Affidavit**
(Sec. 2-8.1 of the County Code)
2. **Miami-Dade County Employment Disclosure Affidavit**
(County Ordinance No. 90-133, amending Section 2-8.1(d)(2) of the County Code)
3. **Miami-Dade County Employment Drug-free Workplace Certification**
(Section 2-8.1.2(b) of the County Code)
4. **Miami-Dade Disability and Nondiscrimination Affidavit**
(Article 1, Section 2-8.1.5 Resolution R182-00 Amending R-385-95)
5. **Miami-Dade County Debarment Disclosure Affidavit**
(Section 10.38 of the County Code)
6. **Miami-Dade County Vendor Obligation to County Affidavit**
(Section 2-8.1 of the County Code)
7. **Miami-Dade County Code of Business Ethics Affidavit**
(Article 1, Section 2-8.1(i) and 2-11(b)(1) of the County Code through (6) and (9) of the County Code and County Ordinance No 00-1 amending Section 2-11.1(c) of the County Code)
8. **Miami-Dade County Family Leave Affidavit**
(Article V of Chapter 11 of the County Code)

9. **Miami-Dade County Living Wage Affidavit**
(Section 2-8.9 of the County Code)

10. **Miami-Dade County Domestic Leave and Reporting Affidavit**
(Article 8, Section 11A-60 11A-67 of the County Code)

11. **Subcontracting Practices**
(Ordinance 97-35)

12. **Subcontractor /Supplier Listing**
(Ordinance 97-104)

13. **Environmentally Acceptable Packaging**
Resolution (R-738-92)

14. **W-9 and 8109 Forms**
The vendor must furnish these forms as required by the Internal Revenue Service.

15. **Social Security Number**
In order to establish a file for your firm, you must provide your firm's Federal Employer Identification Number (FEIN). If no FEIN exists, the Social Security Number of the owner or individual must be provided. This number becomes your "County Vendor Number". To comply with Section 119.071(5) of the Florida Statutes relating to the collection of an individual's Social Security Number, be aware that DPM requests the Social Security Number for the following purposes:

- Identification of individual account records
- To make payments to individual/vendor for goods and services provided to Miami-Dade County
- Tax reporting purposes
- To provide a unique identifier in the vendor database that may be used for searching and sorting departmental records

16. **Office of the Inspector General**
Pursuant to Section 2-1076 of the County Code.

17. **Small Business Enterprises**
The County endeavors to obtain the participation of all small business enterprises pursuant to Sections 2-8.2, 2-8.2.3 and 2-8.2.4 of the County Code and Title 49 of the Code of Federal Regulations.

18. **Antitrust Laws**
By acceptance of any contract, the vendor agrees to comply with all antitrust laws of the United States and the State of Florida.

C. PUBLIC ENTITY CRIMES

To be eligible for award of a contract, firms wishing to do business with the County must comply with the following:

Pursuant to Section 287.133(2)(a) of the Florida Statutes, a person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a Bid on a contract to provide any goods or services to a public entity, may not submit a Bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit Bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017 of the Florida Statutes, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.



Contract No. : _____ Federal Employer Identification Number (FEIN): _____

Contract Title: _____

1.	Miami-Dade County Ownership Disclosure Sec. 2-8.1 of the County Code	6.	Miami-Dade County Vendor Obligation to County Section 2-8.1 of the County Code
2.	Miami-Dade County Employment Disclosure County Ordinance No. 90-133, amending Section 2-8-1(d)(2) of the County Code	7.	Miami-Dade County Code of Business Ethics Article 1, Section 2-8.1(i) and 2-11(b)(1) of the County Code through (6) and (9) of the County Code and County Ordinance No 00-1 amending Section 2-11.1(c) of the County Code
3.	Miami-Dade County Employment Drug-free Workplace Certification Section 2-8.1.2(b) f the County Code	8.	Miami-Dade County Family Leave Article V of Chapter 11, Resolution No. R-183-00 amending Resolution No. R – 1499-91 of the County Code
4.	Miami-Dade County Disability Non-Discrimination Article 1, Section 2-8.1.5 Resolution R182-00 amending R-385-95	9.	Miami-Dade County Living Wage Section 2-8.9 of the County Code
5.	Miami-Dade County Debarment Disclosure Section 10.38 of the County Code	10.	Miami-Dade County Domestic Leave and Reporting Article 8, Section 11A-60 11A-67 of the County Code

5/09/2008

FINANCIAL DOCUMENTATION

As a condition of award, the Contractor may be required to provide documentation that affirm its financial capacity to perform the work (i.e., Tax Returns, Financial Statements, Profit-and-Loss Statements, Cash Flow Statements, etc.).



JOB CLEARINGHOUSE
FORM



RPQ NO. TP-0000027284



Delivering Excellence Every Day

JOB CLEARINGHOUSE AFFIDAVIT
Notice of Construction Job Opportunities

Project / Contract Number: _____

Pursuant to Miami-Dade County Resolution No. R-1395-05, there are ____ open position(s) to submit to the Job Clearinghouse for this project at this time. All open positions will be submitted to South Florida Workforce at <https://iapps.careersourcesfl.com/jchcwp/>.

(Signature of Affiant)

(Date)

(Printed Name of Affiant, Title, and Firm Name)

(Witness)

Sworn to and subscribed before me this

_____ day of _____ 20 ____

By: _____

Signature of Notary Public



Personally Known



Produced ID

Type of ID produced _____

FAIR SUBCONTRACTING
PRACTICES



RPQ NO. TP-0000027284

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

METRORAIL BATHROOM REHABILITATION

PROJECT NO. IRP215

RPQ NO. TP-0000027284

CONTRACT FORMS

- Surety Performance and Payment Bond
- Residents First Training and Employment Program/Community Workforce Program/
Employ Miami-Dade Program Construction Workforce Plan - Form RFTE2
- OSHA Safety Training Affidavit - Form RFTE 3
- Residents First Training and Employment Program/Employ Miami-Dade Program
Workforce Performance Report - Form RFTE 4
- Bid Submittal Check List Questionnaire Appendix "D"
- Certificate(s) of Insurance

SURETY PERFORMANCE AND PAYMENT BOND

(This is a sample. P&P Bond to be submitted by successful bidder)



RPQ NO. TP-0000027284

SURETY PERFORMANCE AND PAYMENT BOND

By this Bond, we _____, as Principal, whose principal business address is _____, as Contractor under the contract dated _____, 20_____, between Principal Miami-Dade County for the construction of **METRORAIL BATHROOM REHABILITATION**, with RPQ/Project No. **RPQ NO. TP-0000027284** (herein after referred to as "Contract") the terms of which Contract are incorporated by reference in its entirety into this Bond and, _____, a corporation, whose principal business address is _____ as Surety, are bound to Miami-Dade County (hereinafter referred to as "County") in the sum of _____ (U.S. dollars) \$ _____, for payment of which we bind Ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs all the work under the Contract, including but not limited to guarantees, warranties and the curing of latent defects, said Contract being made a part of this bond by reference, and in the times and in the manner prescribed in the Contract, including any and all damages for delay; and
2. Promptly makes payments to all claimants, as defined in Section [255.05](#)(1), Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the contract; and
3. Pays County all losses, damages, including damages for delay, expenses, costs and attorney's fees, including appellate proceedings, that County sustains because of a default by Principal under the Contract, including but not limited to a failure to honor all guarantees and warranties or to cure latent defects in its work or materials within 5 years after completion of the work under the Contract; and
4. Performs the guarantee of all work and materials furnished under the contract for the time specified in the Contract, including all warranties and curing all latent defects within 5 years after completion of the work under the Contract;

then this bond is void; otherwise, it remains in full force.

If no specific periods of warranty are stated in the Contract for any particular item or work, material or equipment, the warranty shall be deemed to be a period of one (1) year from the date of final acceptance by the County. This Bond does not limit the County's ability to pursue suits directly with the Principal seeking damages for latent defects in materials or workmanship, such actions being subject to the limitations found in Section 95.11(3)(c), Florida Statutes.

Any changes in or under the Contract Documents and compliance or noncompliance with any formalities connected with the Contract or the changes does not affect Surety's obligation under this Bond.

SURETY PERFORMANCE AND PAYMENT BOND (Cont'd)

IN WITNESS WHEREOF, the above bounden parties have caused this Bond to be executed by their appropriate officials as of the _____ day of _____ 20 ____.

CONTRACTOR

(Contractor Name)

BY:

(President) (Managing Partner or Joint Venture)

(SEAL)

COUNTERSIGNED BY RESIDENT
FLORIDA AGENT OF SURETY:

SURETY:

(Copy of Agent's current
Identification Card as issued by
State of Florida Insurance Commissioner must be attached) By: _____

Attorney-in-Fact

(CORPORATE SEAL)

(Power of Attorney must be attached)

**RESIDENTS FIRST TRAINING AND EMPLOYMENT PROGRAM/
COMMUNITY WORKFORCE PROGRAM/EMPLOY MIAMI-DADE
PROGRAM CONSTRUCTION WORKFORCE PLAN - FORM RFTE 2**



RPQ NO. TP-0000027284

**Residents First Training and Employment Program/Community Workforce Program/Employ Miami-Dade Program
Construction Workforce Plan (Miami-Dade County Code Sections 2-11.17, 2-1701 & A.O. 3-63) - Form RFTE 2**

Contract No. _____

Prime Contractor: _____

☐ §2-1701 Community Workforce Program ☐ §2-11.17 Resident First Training and Employment Program ☐ A.O. 3-63 Employ Miami-Dade Program

In accordance with Sections 2-11.17 & 2-1701 of the Miami Dade County-Code, this form must be submitted by the Prime Contractor within 15 business days of award notification and prior to issuance of a Notice to Proceed. The Prime Contractor should enter the word "NONE" where appropriate below and sign the form below. Please duplicate this form if additional space is needed.

- i. Specify the total number of persons that will be used by the Prime Contractor and all subcontractors to perform all of the construction trades and labor work of the contract, broken down by trade and labor category, minimum qualifications for each category, the number of persons to be utilized in each category, the number of positions to be hired by the contractor in each category which are not currently staffed, the number of positions to be filled from the Employ Miami-Dade Register and the number of employees which live within the project DTA. If the current workforce will not achieve the project goal of 51% construction labor hours performed by Miami-Dade County residents, include a Job Clearinghouse Affidavit or a statement on how Miami-Dade County residents will be recruited to fill the needed positions and meet the goal.

Contractor/Subcontractor Name	Trade/Category	Minimum Qualifications	# of Persons to be Utilized	# of Positions to be filled by Employ Miami Dade	# of Persons to be Hired	# of Persons who Reside in the DTA (if applicable)
Total:						

- ii. Identify by name, address and trade category of all persons proposed to perform work under the contract currently on the contractor's (or on any proposed subcontractor's) payroll who reside in Miami-Dade County only and marking the correct box for DTA residents. Two forms of identification must be provided for each DTA resident demonstrating one year of residency.

Employee Name	Address	Trade/Category Performing	DTA Resident (if applicable)

- iii. Attach a list of subcontractors that will be used on the project and executed Responsible Subcontractor Affidavits (Form RFTE 1) for each.
iv. Attach a list of all employees currently employed by the contractor and each subcontractor at the time of award that includes the last four digits of their social security.

I certify that the representations contained in this Construction Workforce Plan are to the best of my knowledge true and accurate.

Signature of Affiant

Print Name

Print Title

Date

OSHA SAFETY TRAINING AFFIDAVIT
(FORM RFTE 3)



RPQ NO. TP-0000027284

**Residents First Training and Employment Program
Occupational Safety & Health Administration (OSHA)
10 Hour Safety Training Affidavit - Form RFTE 3**

In accordance with Section 2-11.17 of the Miami-Dade County Code, all contractors and subcontractors of any tier performing on a County Construction Contract, shall satisfy the requirements of the Miami-Dade County Residents First Training and Employment Program which requires: for (i) all persons employed by the contractor to perform construction shall have completed the Occupational Safety & Health Administration (OSHA) 10 Hour safety training course established by the Occupational Safety & Health Administration of the United States Department of Labor

The undersigned verifies that every employee reported on the payroll has completed the OSHA 10 Hour or OSHA 30 Hour Safety Training Course prior to working on the project.

Project Number, Title

Printed Name of Affiant

Printed Title of Affiant

Signature of Affiant

Name of Firm

Date

Address of Firm

State

Zip Code

Notary Public Information

Notary Public – State of _____ County of _____

Subscribed and sworn to (or affirmed) before me this _____ day of, _____ 20____.

by _____ He or she is personally known to me ☐ or has produced identification ☐

Type of identification produced _____

Signature of Notary Public

Serial Number

Print or Stamp of Notary Public

Expiration Date

Notary Public Seal

RESIDENTS FIRST TRAINING AND EMPLOYMENT
PROGRAM/EMPLOY MIAMI-DADE PROGRAM
WORKFORCE PERFORMANCE REPORT - FORM RFTE 4



RPQ NO. TP-0000027284

Workforce Performance Report - Form RFTE 4
(Miami-Dade County Code Section 2-11.17 & A.O. 3-63)

Contract No. _____ Prime Contractor: _____

In accordance with Section 2-11.17 of the Miami-Dade County Code & A.O. 3-63, this report must be submitted by the Prime Contractor within thirty (30) days of completion of a County Capital Construction Contract to Small Business Development through the Contracting Officer. The Contracting Officer shall not authorize issuance of final payment for completion of a County Capital Construction Contract until the County receives a completed Workforce Performance Report.

Please provide the following information on the workforce employed in the execution of the contract:

_____ Total number of Construction Labor positions utilized on the project

_____ Total number of Construction Labor work hours performed on the project

Total number Construction Labor work hours performed by Miami-Dade County residents

Total number Construction Labor positions performed by Employ Miami-Dade participants

Percentage of Construction Labor work hours performed by Miami-Dade County residents

Attach supporting documentation verifying construction labor work hours performed by Miami-Dade County residents & Employ Miami-Dade participants.

\$ _____ Total amount of funds expended during the course of the project on other related skill and safety training programs

Were any positions on this project filled with new hires? _____ Yes _____ No

If you answered “yes” to the above question, please identify the new hires by name, address and trade category, and indicate whether they were Miami-Dade County residents or an Employ Miami-Dade participant. (Please attach additional sheets if necessary.)

Employee Name	Address	Trade/Category Performed	Miami-Dade County Resident (√)	Employ Miami-Dade County Participant (√)

Were all new hires Miami-Dade County residents?	No	Yes

Was the 20% labor workforce threshold met from the Employ Miami-Dade Register?	No	Yes

If you answered “no” to either of the above questions, please attach supporting documentation that verifies reasonable efforts to promote employment opportunities for local residents including participation in the Employ Miami-Dade Program, which shall include applicable advertisements in local newspapers, posting of job opportunities with CareerSource South Florida’s Job Clearinghouse, referrals received from CareerSource South Florida, job applications received, candidates interviewed, and number of new hires.

I certify that the representations contained in this Construction Workforce Plan are to the best of my knowledge true and accurate.

Signature of Affiant

Print Name, Title

Date _____

BID SUBMITTAL CHECK LIST QUESTIONNAIRE
APPENDIX “D”



RPQ NO. TP-0000027284

QUESTIONNAIRE

Appendix D



IN ORDER TO PROVIDE INFORMATION NECESSARY IN DETERMINING THE QUALIFICATIONS OF THE PROPOSER, PLEASE PROVIDE THE INFORMATION LISTED BELOW

#	QUESTION	ANSWER
1	Have you carefully read the Instruction To Prospective Contractors?	<input type="checkbox"/> YES <input type="checkbox"/> NO
2	Have you carefully reviewed the entire Contract Documents as identified within the Instruction To Prospective Contractors?	<input type="checkbox"/> YES <input type="checkbox"/> NO
3	If identified in the Contract Documents, have you carefully inspected the site of the work?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A
4	Have you requested, in writing, of the contact person identified in the Advertisement, any clarifications necessary to submit a responsive proposal? Have you received a written response of clarification?	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A
5	Are you licensed and certified to perform the work for which you are submitting this proposal? License No.: Competency No.: FEIN No.: Qualifier's Name:	<input type="checkbox"/> YES <input type="checkbox"/> NO _____ _____ _____ _____
6	Are you registered with the Miami-Dade County Department of Procurement Management (DPM)?	<input type="checkbox"/> YES <input type="checkbox"/> NO
7	Have you made any changes or written any codicils to the Contract Proposal?	<input type="checkbox"/> YES <input type="checkbox"/> NO
8	How many previous Contracts with Miami-Dade County in the past five (5) years?	_____
9	Total dollar value of Contracts with Miami-Dade County in the past five (5) years?	_____
10	How many years has your Company been in business with the same Principals?	_____
11	Applicable Federal Requirement Certifications	<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A

CERTIFICATE(S) OF INSURANCE
(TO BE PROVIDED BY CONTRACTOR)



RPQ NO. TP-0000027284

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

METRORAIL BATHROOM REHABILITATION

PROJECT NO. IRP215

RPQ NO. TP-0000027284

BID DOCUMENTS - TABLE OF CONTENTS II OF II

BID DOCUMENTS

- LCP TRACKER

- SPECIAL PROVISIONS:

- Appendix A: Authorization Agreement for Automatic Deposit.
- Appendix B: Sustainable Buildings Program

- STANDARD CONSTRUCTION: GENERAL CONTRACT CONDITIONS.

- TECHNICAL SPECIFICATIONS: SPECIAL TERMS & CONDITIONS.

- UHealth | Jackson Station
- Tri-Rail Station
- Palmetto Station
- Manuals

LCP TRACKER



RPQ NO. TP-0000027284

Memorandum



Date: April 25, 2019

To: Department Directors

From: Gary T. Hartfield, Director
Small Business Development (SBD) Division

Subject: Implementation of LCPtracker

A handwritten signature in blue ink, appearing to be "G. Hartfield", written over a light blue grid background.

On April 10, 2018, the Board of County Commissioners adopted Ordinance No. 18-33, which amended several Miami-Dade County Code sections to mandate use of the County's web-based system, the Business Management Workforce System (BMWS), to comply with Small Business Enterprise (SBE), Wage, and Workforce program requirements. The implementation of BMWS will soon be complete with the "go live" of LCPtracker on May 1, 2019.

LCPtracker is a new web-based system for firms to submit certified payroll and workforce program documentation, replacing our current paper-based reporting requirements at no cost to the firms. As part of the implementation of LCPtracker, Small Business Development (SBD), a division of the Internal Services Department, reviewed all active Miami-Dade County contracts in BMWS subject to Responsible Wages and Benefits, Living Wages and federally-funded contracts at Miami Dade County International Airport with Davis Bacon Wages. Based on the contract status, over three hundred existing contracts have been selected to go into LCPtracker. Attached is the latest report listing the projects by department. In addition to these identified projects, all County contracts subject to the above-mentioned wage requirements and awarded on or after April 1, 2019 will be synced to LCPtracker for the electronic submission of certified payrolls and workforce documentation.

Beginning with the May 2019 reporting period, all prime contractors/vendors and their subcontractors at every tier level participating on a contract that was added to LCPtracker must submit certified payrolls via the system by the 10th day of the month for work performed in the previous month. Therefore, all certified payrolls for work performed in the month of May 2019 must be submitted electronically by **June 10, 2019**. At which point, the department should no longer collect or accept paper certified payrolls for these projects.

SBD will provide department staff with access to LCPtracker to view certified payrolls by project, firm, and reporting period. Prior to approving a firm's pay application/invoice, departments must log into LCPtracker to verify certified payrolls have been submitted for all firms on the project, regardless of tier, for the period of the pay application.

Attached are the steps to generate the LCPtracker report titled "Certified Payroll Report (CPR) Status Report" for a project and period of a pay application/invoice under review. This report will list all received, rejected, pending and delinquent certified payrolls for a project for the period requested. For any delinquent certified payrolls listed on the report, the departments should:

- 1) Provide written notice to the prime contractor/vendor (and SBD, if the prime contractor/vendor is a certified SBE or any of the subcontractors are certified) that the review and approval of its pay application/invoice is on hold until all firms that worked during the period of the pay application/invoice have submitted their certified payrolls via LCPtracker.

- 2) Provide the prime contractor/vendor with a copy of the CPR Status Report, or provide the report to the firm(s) listed under the delinquent section of the report, the week ending date for the missing payroll(s), and a deadline to submit the missing certified payroll(s) via LCPtracker.

LCPtracker user accounts for department staff on existing applicable contracts will be automatically created. For any additional staff requiring access, the department's SBD Liaison should provide their name and email address to Alecia Anderson, SBD Section Manager, at Alecia.Anderson@miamidade.gov or Shawn Gannon, Special Projects Administrator, at Shawn.Gannon@miamidade.gov.

As always, SBD will continue to work closely with departments to ensure compliance with the legislated changes and offer monthly hands-on training opportunities for department staff and firms. Should you have any questions, please do not hesitate to contact Alice Hidalgo-Gato, SBD Section Chief, at (305) 375-3153.

Attachments

- c. Office of the Mayor Senior Staff
Tara C. Smith, ISD Director
SBD Liaisons
Procurement Liaisons

SAFETY DIRECTIVE 182536 / RESOLUTION NO.

1181-18

Memorandum



Date: February 26, 2019

Agenda Item No. 2(B)2
March 19, 2019

To: Honorable Chairwoman Audrey M. Edmonson
and Members, Board of County Commissioners

From: Carlos A. Gimenez
Mayor

A handwritten signature in blue ink, appearing to read "Carlos A. Gimenez", written over a horizontal line.

Subject: Report Regarding Consideration of Contractor Safety Information as a Part of the
Contractor Responsibility Review for Contract Award – Directive No. 182536

This report is in response to Resolution No. R-1181-18, approved at the November 8, 2018 meeting of the Board of County Commissioners (Board), directing the County Mayor or the County Mayor's designee to provide a status report describing the processes, procedures and actions taken to consider safety records of prospective contractors and first-tier subcontractors for public construction projects.

The County reviews contractor responsibility prior to award for all construction contracts. Pursuant to Resolution No. R-187-12, and in accordance with procurement guidelines, staff currently performs due diligence reviews as a part of the process to determine a contractor's responsibility. This review includes checking the contractor's corporate status, lists for convicted, debarred and suspended vendors, excluded parties, and internal County reports for small business compliance, evaluations and delinquent contractors.

County staff will require contractors and proposed first-tier subcontractors to submit the following items for the previous three years from the United States Department of Labor Occupational and Safety Health Administration (OSHA):

1. The OSHA Form 300 containing a list of the company's work-related injury and illness data; and
2. OSHA inspection data.

A copy of this memorandum and Resolution No. R-1181-18 will be forwarded to each of the department directors who manage capital programs across the County. Confirmation that safety due diligence was performed and any instance when a safety record affects the contractor responsibility will be included in any memorandum to the Board recommending an award or ratification of award of a construction project.

Pursuant to Ordinance No. 14-65, this memorandum will be placed on the next available Board Meeting agenda. Should you require additional information, please contact Tara C. Smith, Director, Internal Services Department, at 305-375-1135.

- c: Abigail Price-Williams, County Attorney
Geri Bonzon-Keenan, First Assistant County Attorney
Office of the Mayor Senior Staff
Tara C. Smith, Director, Internal Services Department
Department Directors
Linda L. Cave, Acting Director, Clerk of the Board
Eugene Love, Agenda Coordinator
Yinka Majekodunmi, Commission Auditor

MEMORANDUM

Agenda Item No. 11(A)(1)

TO: Honorable Chairman Esteban L. Bovo, Jr.
and Members, Board of County Commissioners

DATE: November 8, 2018

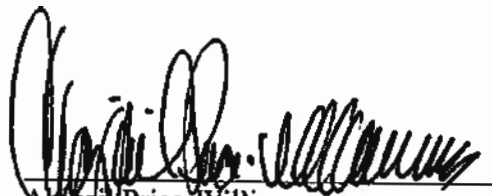
FROM: Abigail Price-Williams
County Attorney

SUBJECT: Resolution directing the County Mayor to: (1) consider safety records of prospective contractors and first-tier subcontractors for public construction projects; (2) confirm the safety records of recommended contractors and first-tier subcontractors were considered and report any instance where the safety record may adversely affect a finding of contractor responsibility in award memorandum to the Board; and (3) provide a report to the Board within 60 days

Resolution No. R-1181-18

This item was amended at the 10-17-18 Government Operations Committee to add language in Section 1 specifying that the OSHA related safety information required to be considered in the resolution shall be initially provided by the prospective contractors and first-tier subcontractors bidding on County construction projects.

The accompanying resolution was prepared and placed on the agenda at the request of Prime Sponsor Commissioner Daniella Levine Cava.



Abigail Price-Williams
County Attorney

APW/lmp



MEMORANDUM

(Revised)

TO: Honorable Chairman Esteban L. Bovo, Jr.
and Members, Board of County Commissioners

DATE: November 8, 2018

FROM: 
Abigail Price-Williams
County Attorney

SUBJECT: Agenda Item No. 11(A)(1)

Please note any items checked.

- ☐ **"3-Day Rule" for committees applicable if raised**
- ☐ **6 weeks required between first reading and public hearing**
- ☐ **4 weeks notification to municipal officials required prior to public hearing**
- ☐ **Decreases revenues or increases expenditures without balancing budget**
- ☐ **Budget required**
- ☐ **Statement of fiscal impact required**
- ☐ **Statement of social equity required**
- ☐ **Ordinance creating a new board requires detailed County Mayor's report for public hearing**
- ☐ **No committee review**
- ☐ **Applicable legislation requires more than a majority vote (i.e., 2/3's ____, 3/5's ____, unanimous ____) to approve**
- ☐ **Current information regarding funding source, index code and available balance, and available capacity (if debt is contemplated) required**

Approved _____ Mayor
Veto _____
Override _____

Agenda Item No. 11(A)(1)
11-8-18

RESOLUTION NO. R-1181-18

RESOLUTION DIRECTING THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE TO: (1) CONSIDER SAFETY RECORDS OF PROSPECTIVE CONTRACTORS AND FIRST-TIER SUBCONTRACTORS FOR PUBLIC CONSTRUCTION PROJECTS; (2) CONFIRM THE SAFETY RECORDS OF RECOMMENDED CONTRACTORS AND FIRST-TIER SUBCONTRACTORS WERE CONSIDERED AND REPORT ANY INSTANCE WHERE THE SAFETY RECORD MAY ADVERSELY AFFECT A FINDING OF CONTRACTOR RESPONSIBILITY IN AWARD MEMORANDUM TO THE BOARD; AND (3) PROVIDE A REPORT TO THE BOARD WITHIN 60 DAYS

WHEREAS, we live in a large, heavily-populated and diverse metropolitan area with constantly expanding public infrastructure needs and demands; and

WHEREAS, Miami-Dade County's infrastructure, including its public buildings, roads and bridges, mass transit facilities, airports and seaport, fuel supply facilities, medical and nursing care facilities, recreational facilities, sporting facilities and water and wastewater facilities, constantly require significant new construction and on-going improvements and upgrades; and

WHEREAS, consequently, to meet these infrastructure demands, Miami-Dade County (the "County") enters into significant construction contracts for public buildings, structures and other public works; and

WHEREAS, a substantial number of the County's public construction projects are large complex projects requiring a large of number of workers to complete the project; and

WHEREAS, many of these County projects occur in densely populated areas where members of the public may be directly exposed to the dangers of a construction site; and

WHEREAS, the tragic loss of life caused by the collapse of the Florida International University pedestrian bridge reminds this community that the safety of members of the public and workers relating to public construction projects is of paramount importance; and

WHEREAS, this Board wants to ensure that a contractor's safety record be fully considered in the selection and contracting of construction companies for public infrastructure projects,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that this Board:

Section 1. Directs the County Mayor or County Mayor's designee to consider the safety records of prospective contractors and their first-tier subcontractors as part of the due diligence investigation performed to determine contractor responsibility for the construction or improvement of a public building, structure or other public construction project that will be presented to this Board for contract award or ratification of an award. Such investigation shall include reviewing available relevant information from the United States Department of Labor Occupational Safety and Health Administration (OSHA) such as OSHA logs of work-related injuries and illnesses (Form 300) and OSHA inspection data >>which shall be initially provided by the prospective contractors and first-tier subcontractors<<¹. The OSHA information shall be reviewed for at least the previous three (3) years to the extent that such information is available for that period. In addition, County staff may use other sources to investigate the safety records

¹ Committee amendments are indicated as follows: Words stricken through and/or [[double bracketed]] are deleted, words underscored and/or >>double arrowed<< are added.

of prospective contractors and their first-tier subcontractors for public construction projects in determining contractor responsibility.

Section 2. Directs the County Mayor or County Mayor's designee to include in his or her memorandum to this Board recommending an award or ratification of an award of a County public construction project confirmation that the safety record was considered by the County as part of the due diligence required pursuant to Resolution R-187-12, including reporting to this Board any instance where the safety record may adversely affect a finding of contractor responsibility.

Section 3. Directs the County Mayor or County Mayor's designee to submit a report to this Board within 60 days of the effective date of this resolution describing the processes, procedures and actions taken to comply with Sections 1 and 2 of this resolution and place the completed report on an agenda of the Board pursuant to Ordinance No. 14-65.

The Prime Sponsor of the foregoing resolution is Commissioner Daniella Levine Cava. It was offered by Commissioner **Dennis C. Moss**, who moved its adoption. The motion was seconded by Commissioner **Sally A. Heyman** and upon being put to a vote, the vote was as follows:

Esteban L. Bovo, Jr., Chairman	aye
Audrey M. Edmonson, Vice Chairwoman	aye
Daniella Levine Cava	aye
Sally A. Heyman	aye
Barbara J. Jordan	aye
Jean Monestime	aye
Rebeca Sosa	aye
Xavier L. Suarez	aye
Jose "Pepe" Diaz	aye
Eileen Higgins	aye
Joe A. Martinez	aye
Dennis C. Moss	aye
Sen. Javier D. Souto	aye

The Chairperson thereupon declared this resolution duly passed and adopted this 8th day of November, 2018. This resolution shall become effective upon the earlier of (1) 10 days after the date of its adoption unless vetoed by the County Mayor, and if vetoed, shall become effective only upon an override by this Board, or (2) approval by the County Mayor of this resolution and the filing of this approval with the Clerk of the Board.



MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

HARVEY RUVIN, CLERK

Linda L. Cave

By: _____
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency.

A handwritten signature in black ink, appearing to be "EWG", written over a horizontal line.

Eduardo W. Gonzalez

A handwritten mark or signature at the bottom center of the page, consisting of a stylized, cursive letter 'L' or '4'.

Contractor Quick Start Guide

Version: 2

Date: 8/3/2022

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Contractor Quick Start Guide

At LCPtracker (Labor Compliance Program Tracker), we are aware that using a Prevailing Wage Software may be a new undertaking for many Contractors. We have designed this guide to explain what LCPtracker is used for and how to start using the software.

The LCPtracker service is a paperless, online system of entering Certified Payroll Reports (CPRs). Payroll data may be entered directly into the system or uploaded from major construction accounting systems or payroll programs. This service eliminates the need for Contractors to submit paper documents and forms while providing an online database that stores all CPRs.

All contract-specific wage rates, fringe rates and worker crafts/classifications are online within the system, and Contractors may then select craft/classifications from a drop-down menu. Potential errors in wage rates or work classification entries can be flagged to Contractors preemptively, allowing them to submit data with corrections implemented. (This is contingent on how the Administrator set up their Project validations). Once you have submitted your CPR, an electronic version will be available, and you will have access to all Contractor reports within LCPtracker.

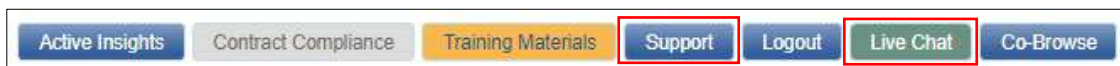
It is important to understand that the LCPtracker validation rules operate to assist you in your compliance process only insofar as the correct classifications are chosen by the user, and the correct data is entered by the user.

Contacting LCPtracker Support

There is no cost to Contractors for this service or for online training. We have a dedicated Support staff available Monday through Friday from 5:00am until 5:30pm PST.

Contractors may access the various options for training after receiving a User ID and password, which will be sent by a “no reply” email address from LCPtracker (i.e., NOREPLY@LCPtracker.com). This email, with login instructions, will be sent to Contractors once they’re assigned to an account in LCPtracker by your Agency or Prime Contractor. Every Contractor account is created by the Agency or their Prime Contractor. Complete and full support is offered directly to Contractors by LCPtracker for any technical questions on the use of the software.

Contact LCPtracker Support:



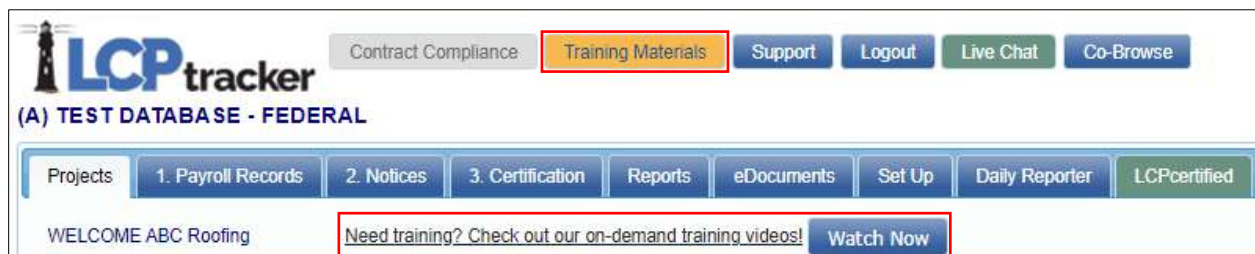
- 714-669-0052 option 4; or
- Support@LCPtracker.com; or
- Live Chat

If you send the Support Team an email or prefer to leave a voice message, LCPtracker asks that you include the information listed below (because of the high number of users stored within LCPtracker, we cannot look up your account with only your company name or project you are working on).

- Your Company Name
- Your User ID
- Your Name and Phone Number
- What the Issue is – please be as specific as possible so we can re-create the issue

LCPtracker Training Options

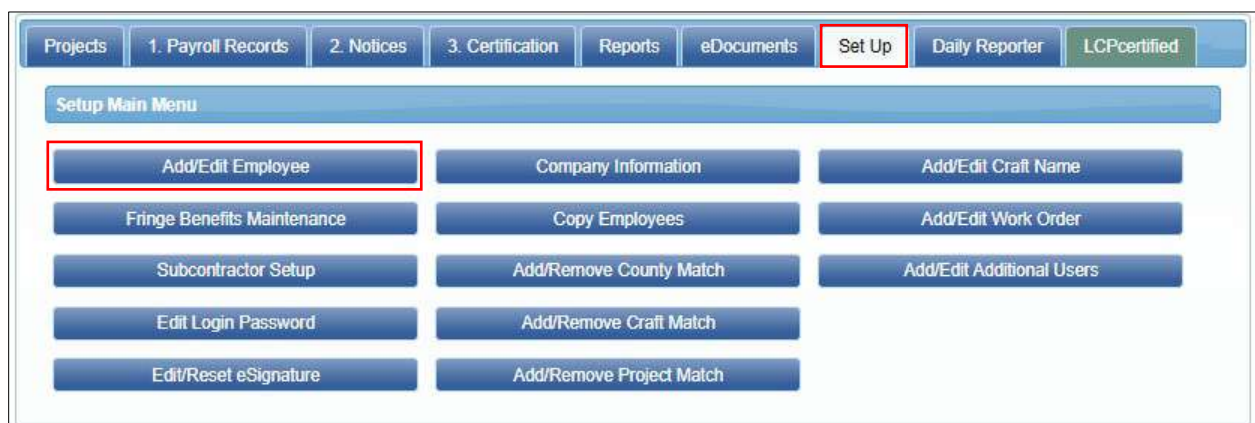
Contractors can access the various options for training after receiving a User ID and password. An email with login instructions will be sent to Contractors once they are assigned to an account in LCPtracker. Every Contractor account is created by the Agency or their Prime Contractor.



Add/Edit Employee

This section is used to enter Contractor employee's personal information.

To add an employee into system or edit someone already in system, click 'Set Up' and then 'Add/Edit Employee'.



Add/Edit Employee Information

Enter the appropriate employee information in the data fields. Tab key or mouse click to move between fields. Any **RED** asterisk field(*) is required by the Agency, and the system will not save unless the information is entered in the required fields.

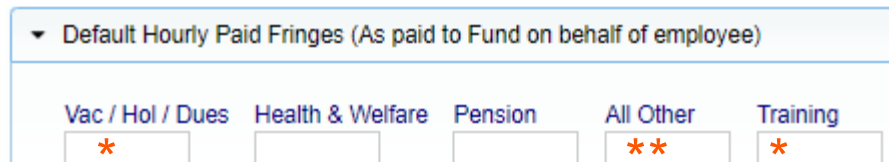
Default Hourly Paid Fringes (As paid to Fund on behalf of employee)

This section is known as a 'time saver'. It is optional to fill in the hourly fringe rates in this section. This will allow for ease of use when entering payroll records manually, as you will be able to click the 'Calculate Fringes' button on the Payroll Entry screen, and the system will perform the mathematical calculation of the hourly fringes multiplied by the hours worked.

*If there are any predetermined increases, or your Union updates once a year, you will need to come back to this section and update your fringes accordingly.

**If you have multiple projects with different fringe rates, built in increases, or everyone has the same fringes and you only want to enter those dollar values once, skip this section and use the 'Fringe Benefit Maintenance' table to enter your hourly fringe rates into system.

Note: Any fringe amount entered in this section will supersede the fringe amount entered in that time saver section of the employee setup.



The screenshot shows a form titled "Default Hourly Paid Fringes (As paid to Fund on behalf of employee)". It contains five input fields with the following labels: "Vac / Hol / Dues", "Health & Welfare", "Pension", "All Other", and "Training". The "Vac / Hol / Dues" field contains an asterisk (*), the "All Other" field contains two asterisks (**), and the "Training" field contains one asterisk (*). The other fields are empty.

*** DO NOT USE - Not allowed by Responsible Wages & Benefits** **** Use to enter vision, dental, life, and Accidental Death & Dismemberment insurance Only**

Default Other Deductions Notes

Any deduction that is permissible according to the USDOL or your Agency (such as IRS garnishments, child support, a company loan, etc.) would fall under the 'other' deduction section. Any amount listed in 'other' will then dictate that 'other deduction notes' are required.

1. Payroll Records Tab

There are five methods of payroll entry available to all Contractors:

1. Copy Payroll feature in LCPtracker
2. Upload from a payroll system export file
3. Upload from the Excel spreadsheet
4. Direct Payroll Subscription / Interface (DPI)
5. Manual entry

1. Copy Payroll

This option is only available if a week of payroll has been previously completed. In the Payroll Records tab, click the 'Copy Previous Payroll' button, select the project, then select the CPR to be copied.

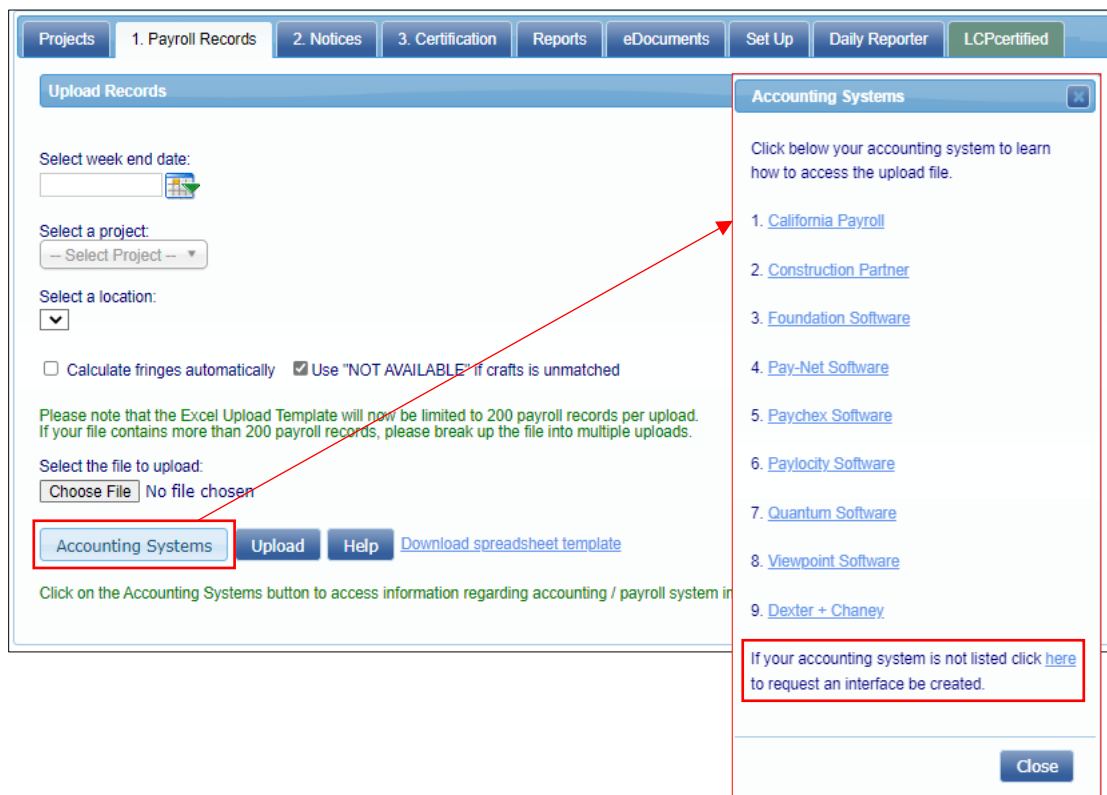


The screenshot shows the 'Payroll Records' tab in the LCPtracker interface. It contains several buttons for managing payroll records. The 'Copy Previous Payroll' button is highlighted with a red rectangular box.

2. Upload from a Payroll System Export File

In the Payroll Records tab, click the 'Upload Records' button, then click the 'Accounting Systems' button, you will see a partial list of the payroll companies that we have partnered with to create a payroll interface, or export file.

To see a complete list of payroll interfaces available, please visit www.lcptracker.com, and click the 'Resources' tab, then select 'Partners'. If you do not find your payroll company and would like to see if there is an opportunity to partner, please fill out the informational form listed under the "Upload Records" section and someone from LCPtracker will contact you.



The screenshot shows the 'Upload Records' tab in the LCPtracker interface. The 'Accounting Systems' button is highlighted with a red box. A red arrow points from this button to a modal window titled 'Accounting Systems'. The modal contains a list of payroll companies and a 'Close' button.

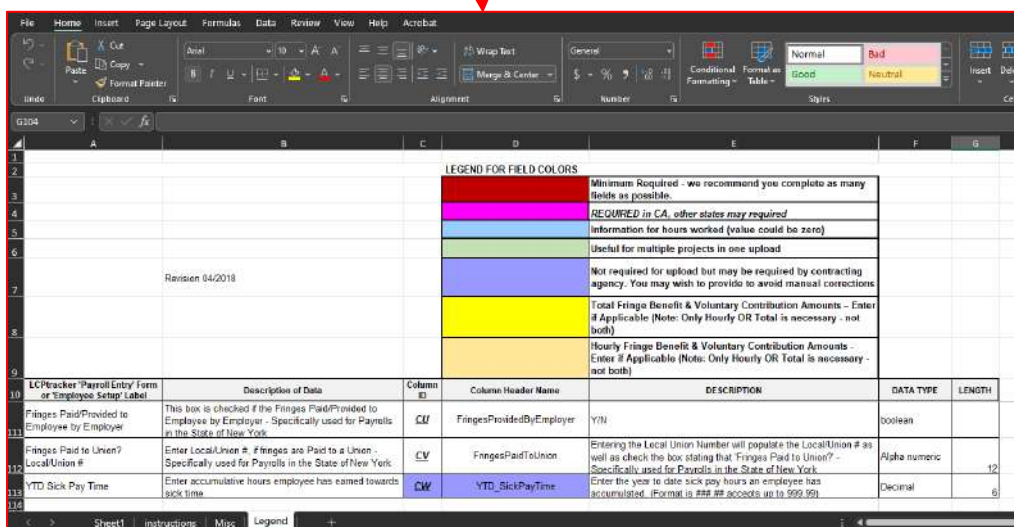
Click on the name of your payroll company, and a list of directions on how to obtain your export file will be available, or you will see a request that you contact your payroll company directly for instructions on how to obtain that export file.

Once you have the export file, you can use it to upload your CPR using the “Upload Records” button.

3. Upload from the Excel Spreadsheet

There is an Excel spreadsheet template available for you to download in the same ‘Upload Records’ section mentioned above. There is a legend as well as instructions available on the Excel template.

Information can be manually entered into this Excel spreadsheet, or you can confer with your IT department to see if they can utilize this spreadsheet to create a report out of your existing payroll system.

LCPtracker Payroll Entry Form or Employee Setup Label	Description of Data	Column ID	Column Header Name	DESCRIPTION	DATA TYPE	LENGTH
Fringes Paid/Provided to Employee by Employer	This box is checked if the Fringes Paid/Provided to Employee by Employer - Specifically used for Payrolls in the State of New York	CV	FringesProvidedByEmployer	Y/N	boolean	
Fringes Paid to Union? Local/Union #	Enter Local/Union # - fringes are Paid to a Union - Specifically used for Payrolls in the State of New York	CV	FringesPaidToUnion	Entering the Local Union Number will populate the LocalUnion # as well as check the box stating that Fringes Paid to Union? - Specifically used for Payrolls in the State of New York	Alpha numeric	12
YTD Sick Pay Time	Enter accumulative hours employee has earned towards sick time	DW	YTD_SickPayTime	Enter the year to date sick pay hours an employee has accumulated. If format is ###.## seconds up to 999.99	Decimal	6

Entering Fringe Benefits on LCPTracker

Wages Paid in Lieu of Fringes (Total cash fringes) = hourly rate of fringe x hours worked on county job

Projects | 1. Payroll Records | 2. Notices | 3. Certification | Reports | eDocuments | Set Up | Daily Reporter | LCPcertified

Notices

Week End Date: 6/21/2019 Contractor: CMC PRIME CONTRACTOR
 Project: CMC RWB TEST CONTRACT-HIGHWAY Sub To:
 Employee: ANDERSON, ALECIA Contract ID: test

☐ Is Foreman ☐ Is Owner/Operator

Gross Employee Pay This Project (Usually No Fringes) 1600.000
 Wages Paid in Lieu of Fringes (Total Cash Fringes) 0.000

These fields are Hourly rate fields (Usually No Fringes)

Base Hourly	Overtime Hourly	Doubletime Hourly
40.000	0.000	0.000

Rate in Lieu of Fringes (Cash Fringes) 0.000

▼ Classifications

Jurisdiction	Location	Craft	Classification	Construction Type	
Miami-Dade County Responsible Wages	Miami-Dade County	ELECTRICAL WORKER	Electrician - Wireman	Building	Edit

▼ Hours Worked Each Day for This Project Only

	Saturday 6/15/2019	Sunday 6/16/2019	Monday 6/17/2019	Tuesday 6/18/2019	Wednesday 6/19/2019	Thursday 6/20/2019	Friday 6/21/2019	Total Hours
Regular Time	0.00	0.00	8.00	8.00	8.00	8.00	8.00	40.00
Overtime at 1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Double-Time	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	8.00	8.00	8.00	8.00	8.00	40.00
Total Hours All Projects Worked	40.00							

▼ Fringes / Contributions paid to others (not employee) for This Project Only (Rate Times the # of Hours Worked)

Vac / Hol / Dues	Health & Welf.	Pension	All Other	Training
0.000	0.000	0.000	0.000	0.000
More...		More...		

Voluntary Contributions for all Projects

Pension	Medical
0.000	0.000

☐ Vac/Hol/Dues Included in Gross Emp. Pay/Base Hourly Rate
☐ Some or All Fringes Paid to Employee
☐ Voluntary Contributions Included in Gross Emp. Pay
 Calculate Fringes

This is an hourly rate of funds paid instead of Fringes Benefits. Funds paid directly to the employee and not paid into an approved plan.

Paid into approved Plan.

- Health Insurance
- Dental Insurance
- Vision Insurance
- Life Insurance
- Accident Death & Dismemberment

Paid into approved Plan

- Pension Plan
- 401K

Payroll record entry form (2 of 2)

Week End Date: 6/3/2018 Contractor: Darren's Demo
 Project: M59 Realignment Sub To:
 Employee: DUCK, DONALD Contract ID: 5

☐ Is Foreman ☐ Is Owner/Operator

Gross Employee Pay This Project
(Usually No Fringes)

0.000

Wages Paid in Lieu of Fringes (Total Cash Fringes)

0.000

These fields are Hourly rate fields (Usually No Fringes)

Base Hourly

50.000

Overtime Hourly

0.000

Doubletime Hourly

0.000

Rate in Lieu of Fringes (Cash Fringes)

0.000

Gross Employee Pay This Project – The amount of basic wages paid for this project only. This is typically the hourly rate of pay multiplied by the hours worked (it could be more complex with overtime figured in).

Wages Paid-in-Lieu of Fringes – The amount paid to the employee instead of fringe benefits paid to a plan, fund or program. This amount is sometimes included in the Gross Employee Pay this Project depending on the accounting system and the agency reporting requirements. (Whether you are a Union Shop or Open Shop typically determines whether you pay these required fringes to an approved plan, fund or program, or pay them directly to the employee in cash.) This amount would be the rate-in-lieu of Fringes multiplied by the number of hours worked.

Rate-in-lieu of fringes – The hourly rate paid-in-lieu of fringes. If you pay your employees directly for the required fringe benefit instead of paying into an approved plan, fund or program, please list the hourly rate paid here.

Base Hourly – The hourly rate of pay not including fringes. Some accounting systems include taxable fringes and fringes paid-in-lieu in this amount, do not include those in this field.

Overtime Hourly – The hourly rate of pay multiplied by a factor of 1.5. Do not include fringe benefits in this equation, unless specifically called for by your Awarding Body.

Doubletime Hourly – The hourly rate of pay multiplied by a factor of 2. Do not include fringe benefits in this equation, unless specifically called for by your Awarding Body.

Lump Sum Payments

Rates

4. Direct Payroll Subscription/Interface (DPI)

This option allows you to choose to have LCPtracker map your existing payroll so that you may use it (as a PDF or .CSV file) as an upload file. Once you have it, you can use it to upload your CPR from that 'Upload Records' button.



The screenshot shows the 'Payroll Records' section of the LCPtracker interface. At the top, there is a navigation bar with tabs: Projects, 1. Payroll Records, 2. Notices, 3. Certification, Reports, eDocuments, Set Up, Daily Reporter, and LCPcertified. Below the navigation bar, there is a section titled 'Payroll Records' with a blue header. Under this header, there are several buttons arranged in a grid: 'Enter Records', 'Direct Payroll Subscription', 'Edit Certified Payroll Records', 'Copy Previous Payroll', 'Recovery Act Additional Data Entry', 'Edit Uncertified Payroll Records', 'FHWA 1391 Additional Data Entry', 'Upload Records' (highlighted with a red rectangle), and 'HUD Additional Data Entry'.

5. Manual Entry

For Manual Entry, in the 'Enter Records' tab, you will enter a record each week for every employee that performs work covered by prevailing wages on their project.



The screenshot shows the 'Payroll Records' section of the LCPtracker interface. At the top, there is a navigation bar with tabs: Projects, 1. Payroll Records, 2. Notices, 3. Certification, Reports, eDocuments, Set Up, Daily Reporter, and LCPcertified. Below the navigation bar, there is a section titled 'Payroll Records' with a blue header. Under this header, there are several buttons arranged in a grid: 'Enter Records' (highlighted with a red rectangle), 'Direct Payroll Subscription', 'Edit Certified Payroll Records', 'Copy Previous Payroll', 'Recovery Act Additional Data Entry', 'Edit Uncertified Payroll Records', 'FHWA 1391 Additional Data Entry', 'Upload Records', and 'HUD Additional Data Entry'.

If your employee works in more than one classification (i.e., they've worked 20 hours as a Carpenter and 20 hours as a Power Equipment Operator) enter two separate pay records to show that they are being paid according to the work performed.

Amounts Paid (top section of the Payroll Record Entry Form)

Enter the appropriate amounts in the appropriate sections. Keep in mind this is just a transfer of historical data from your already existing payroll records.

1. Gross Employee Pay This Project – The amount of basic wages paid for this project only. This is typically the hourly rate of pay multiplied by the hours worked (it could be more complex with overtime figured in).
2. Wages Paid-in-Lieu of Fringes – The amount paid to the employee instead of fringe benefits paid to a plan, fund or program. This amount is sometimes included in the Gross Employee Pay this Project depending on the accounting system and the agency reporting requirements. (Whether you are a Union Shop or Open Shop typically

determines whether you pay these required fringes to an approved plan, fund or program, or pay them directly to the employee in cash.) This amount would be the rate-in-lieu of Fringes multiplied by the number of hours worked.

3. Rate-in-lieu of fringes – The hourly rate paid-in-lieu of fringes. If you pay your employees directly for the required fringe benefit instead of paying into an approved plan, fund, or program, please list the hourly rate paid here.
4. Base Hourly – The hourly rate of pay not including fringes. Some accounting systems include taxable fringes and fringes paid-in-lieu in this amount, do not include those in this field.
5. Overtime Hourly – The hourly rate of pay multiplied by a factor of 1.5. Do not include fringe benefits in this equation, unless specifically called for by your Agency.
6. Doubletime Hourly – The hourly rate of pay multiplied by a factor of 2. Do not include fringe benefits in this equation, unless specifically called for by your Agency.

Payroll record entry form (2 of 2)

Week End Date: 6/3/2018

Project: M59 Realignment

Employee: DUCK, DONALD

Contractor: Darren's Demo

Sub To:

Contract ID: 5

☐ Is Foreman ☐ Is Owner/Operator

1

Gross Employee Pay This Project
(Usually No Fringes)

0.000

2

Wages Paid in Lieu of Fringes (Total Cash Fringes)

0.000

These fields are Hourly rate fields (Usually No Fringes)

4

Base Hourly

50.000

5

Overtime Hourly

0.000

6

Doubletime Hourly

0.000

3

Rate in Lieu of Fringes (Cash Fringes)

0.000

Classifications

This section lists the craft and classification that your employee worked on your project and will be paid for. If you mistakenly choose the wrong classification on the original entry page, you may change it here by clicking on the Edit button. (Remember that if your employee worked in more than one classification within this work week, you would need to enter a separate payroll record for that classification).

▼ Classifications						
Jurisdiction	Location	Craft	Classification	Construction Type		
Federal Wages	Huron County, MI	Carpenter	Carpenter - Pending USDOL 02/01/2017	Highway	Edit	

Hours Worked Each Day for This Project Only

Enter the hours worked each day.



The first row is for regular time worked(1), the second row is for overtime worked(2) and the third row for is for double time worked(3).

ONLY enter hours worked on this prevailing wage job for this week. The system will total each type of hours worked, the days worked and the week under the totals hours column(4).

▼ Hours Worked Each Day for This Project Only								
	Monday 5/28/2018	Tuesday 5/29/2018	Wednesday 5/30/2018	Thursday 5/31/2018	Friday 6/1/2018	Saturday 6/2/2018	Sunday 6/3/2018	4 Total Hours
1 Regular Time	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2 Overtime at 1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 Double-Time	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: If turned on by the Administrator, you may see an additional field 'Total Hours All Projects Worked' listed in the hours section. If so, this field will require a manual entry for your employee's full hours worked that week.

▼ Hours Worked Each Day for This Project Only								
	Monday 4/8/2019	Tuesday 4/9/2019	Wednesday 4/10/2019	Thursday 4/11/2019	Friday 4/12/2019	Saturday 4/13/2019	Sunday 4/14/2019	Total Hours
Regular Time	2.00	2.00	2.00	2.00	2.00	0.00	0.00	10.00
Overtime at 1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Double-Time	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.00	2.00	2.00	2.00	2.00	0.00	0.00	10.00
Total Hours All Projects Worked	40.00							

Fringes/Contributions Paid to Other (Not Employee) for This Project Only

You may utilize this section in two different ways:

1. Auto calculate
2. Manual entry

▼ Fringes / Contributions paid to others (not employee) for This Project Only (Rate Times the # of Hours Worked)					
* Vac / Hol / Dues 0.000 More...	Health & Welf. 0.000	2 Pension 0.000 More...	** All Other 0.000	* Training 0.000	<input type="checkbox"/> Vac/Hol/Dues Included in Gross Emp. Pay <input type="checkbox"/> Some or All Fringes Paid to Employee <input type="checkbox"/> Voluntary Contributions Included in Gross Emp. Pay <input type="button" value="Calculate Fringes"/>
				Voluntary Contributions for all Projects Pension: 0 Medical: 0	1

*** DO NOT USE - Not allowed by Responsible Wages & Benefits**

**** Use to enter vision, dental, life, and Accidental Death & Dismemberment insurance Only**

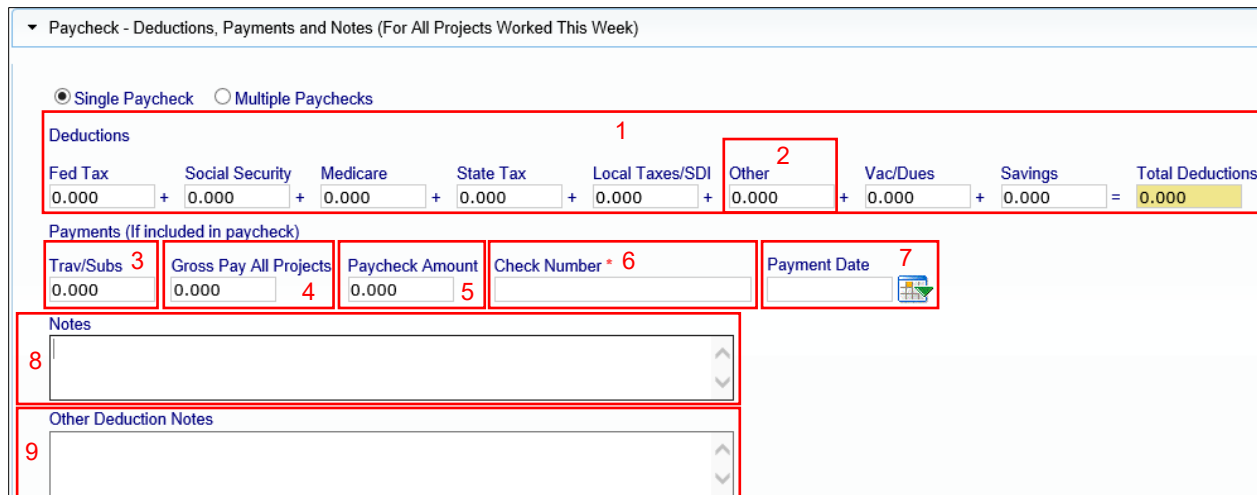
Auto Calculate: The first is by simply clicking the 'Calculate Fringes' button so that the system automatically calculates the fringe benefit rates paid.

Manual Entry: This only works if you filled out the hourly fringe benefit rates in the Add/Edit Employee screen (or the Fringe Benefit Maintenance section, also available in the Set Up tab). This function multiplies the hours worked times the fringe benefit rate to get the values.

The second way is to manually enter the total amounts paid per section (Vac/Hol/Dues, Health & Welfare, Pension, etc.) from your payroll register or paystubs. Mark the appropriate check boxes as required. If they are checked in the Add/Edit Employee setup, then that value carries over.

Paycheck – Deductions, Payments, and Notes

Values entered in this section apply to all hours worked on all projects during the week.



1. Deductions - the 'Total Deductions' box will add as you enter values in the taxes, other deductions, Vac/Dues and Savings fields.
2. Other Deduction - this field is for permissible deductions that do not fall into the other available fields. If you put an amount in the 'Other' deductions field, an 'Other Deduction Note' will become required.
3. Trav/Subs - this field is for travel or subsistence paid to your employee. This amount does figure into the mathematical calculation that the system to ensure that Gross and Net pays are correct.
4. Gross Pay All Projects – the gross amount on the paycheck for the week including all projects worked.
5. Paycheck Amount – this is also referred to as Net pay. This is the actual amount of pay the employee received.
6. Check Number – you have the option of putting different information in this field. If you hand out actual checks to your employees, please enter the check number in this field. If

you utilize direct deposit and no check numbers exists, enter 'DD'.

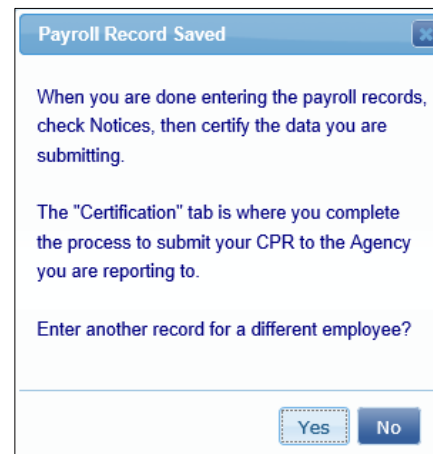
7. Payment Date – this is the actual date of the paycheck. Not all Agencies require this field.
8. Notes – this is a section that allows you to communicate anything out of the ordinary that you would like your Agency to know.
9. Other Deduction Notes – if you entered a permissible deduction in the above-mentioned field, then you will be required to leave a note describing that deduction. Please remember to be transparent in your notes entered. We recommend that you list what the actual deduction is, and not write "other deduction" or "N/A".

Saving the Payroll Record

When you have completed all the above-mentioned fields, Click Save.

SAVE WITH NO NOTICES

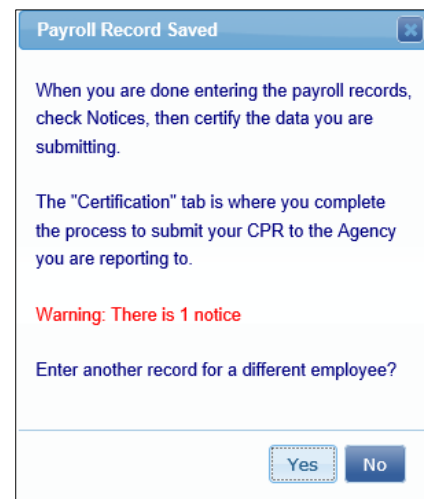
With a successful save you will get this message:



A screenshot of a web-based dialog box titled "Payroll Record Saved". The dialog box has a blue header bar with the title and a close button (X). The main content area is white and contains the following text: "When you are done entering the payroll records, check Notices, then certify the data you are submitting." followed by "The 'Certification' tab is where you complete the process to submit your CPR to the Agency you are reporting to." Below this is a question: "Enter another record for a different employee?". At the bottom right, there are two buttons: "Yes" (outlined) and "No" (solid blue).

SAVE WITH NOTICES

If you do not get this message, look for the **RED** message on the screen. You may have to scroll through the payroll record to see what you have missed that may be a required field.



A screenshot of a web-based dialog box titled "Payroll Record Saved". The dialog box has a blue header bar with the title and a close button (X). The main content area is white and contains the following text: "When you are done entering the payroll records, check Notices, then certify the data you are submitting." followed by "The 'Certification' tab is where you complete the process to submit your CPR to the Agency you are reporting to." Below this is a warning message in red text: "Warning: There is 1 notice". Below the warning is a question: "Enter another record for a different employee?". At the bottom right, there are two buttons: "Yes" (outlined) and "No" (solid blue).

2. Notices Tab

Once you have entered all payroll records for the week, go to the '2. Notices' tab to check and see if you have any payroll Notices.

After your records have been saved: there could be issues ranging from forgetting to add an employee ID or phone number to forgetting to enter the Gross Employee Pay This Project field at the top of the Payroll Record Entry screen, this will display in the Notices tab.

If an employee is displayed on the notices screen (see below), the notice will need to be cleared.



The screenshot shows the 'Contractor Notices' interface. At the top, there's a 'Project' dropdown menu set to 'All Projects'. Below it are 'From Date' and 'To Date' fields with calendar icons, and a checkbox for 'Include Closed Admin Notices'. There are 'Load Data' and 'Help' buttons. Below these are two tabs: 'Payroll Notices (7)' and 'Administrator Notices (20)'. The 'Payroll Notices' tab is active, showing a table with the following data:

Employee	Project	Sub ID	Contract ID	Week End Date	Jurisdiction	Craft	Classification	
CHARNTEL ALEXANDER	Herbert Hoover Dam			6/3/2018	Florida	Laborer	Laborer: Pipelayer	Edit

To clear the notice, click on the Edit button to the right of the employee's name. This will take you back into the Payroll Record Entry screen. Scroll down the bottom and you will see detailed notes on exactly what your notice is.

If you do not understand the notice, there are options on how to get help. You can click on the Video Assistance 'Play Now' button and you will see a video that explains what the notice is and how to address it, or you can contact our [Support](#) department and they will assist you.

All Notices must be cleared to certify the payroll.

3. Certification Tab

It's time to certify your payroll! You will do this for each week beginning when you first start work on your project until the last week on the project.

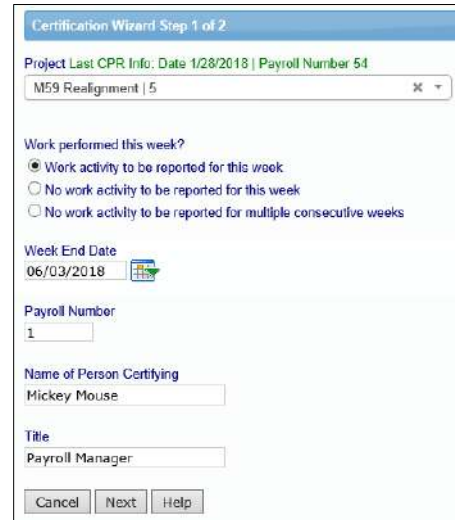
There are three options available to you when you certify your payroll:

1. Certify a payroll for a week during which work was performed
2. Certify a payroll for a week during which no work was performed (non-work week payroll)
3. Certify a payroll for multiple consecutive weeks during which no work was performed

Certification Wizard - Step 1 of 2

To certify your payroll:

- Choose your project
- Choose the type of payroll you are certifying
- Choose your week ending date (if you choose multiple consecutive weeks, you will enter the start date and the last date)
- Enter your name as the person certifying your payroll
- Enter your title
- Click next



The screenshot shows the 'Certification Wizard Step 1 of 2' form. It includes a header bar with the title. Below it, there's a section for 'Project Last CPR Info: Date 1/28/2018 | Payroll Number 54'. A dropdown menu shows 'M59 Realignment | 5'. The 'Work performed this week?' section has three radio buttons: 'Work activity to be reported for this week' (selected), 'No work activity to be reported for this week', and 'No work activity to be reported for multiple consecutive weeks'. The 'Week End Date' is set to '06/03/2018'. The 'Payroll Number' is '1'. The 'Name of Person Certifying' is 'Mickey Mouse'. The 'Title' is 'Payroll Manager'. At the bottom are 'Cancel', 'Next', and 'Help' buttons.

Certification Wizard - Step 2 of 2

The Statement of Compliance (SOC) portion of your certified payroll report will display.

You now need to denote how you pay your fringe benefits (if you do both, you may choose both):

- 4a – paid into an approved plan, fund, or program
- 4b – paid in cash to the employee
- 4c – section to note any exceptions you might have, per craft/classification.

If you have any final remarks that you'd like to leave for your Agency, there is a section available to you to do so. Note: this field is mandatory if you are *recertifying* a CPR.

You may also click on a checkbox to note if your CPR is a final.

Enter your eSignature and click Save. This completes your CPR, and it will pop up in another window so long as you have your pop-up blocker turned off. (If you forget your e- Signature, go back to the Set Up tab, edit your eSignature, and then go back to the Certification Tab and follow the above procedures again.)



The image shows a text input field with the label 'eSignature Password:' to its left.

You have now completed certifying your payroll.

Your CPRs are electronically sent to your Administrator, and unless otherwise specified, there is no need to send or print out a hardcopy unless you would like to do so for your own records.

Remember that your CPR's will always be stored in your account to access at any time, so you may decide not to print out hardcopies.

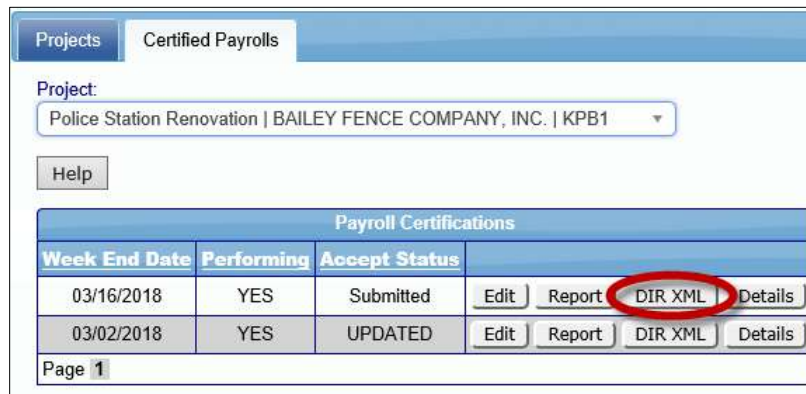
State Specific Uploads

California DIR XML Upload

If you perform work on a California Public Works project, you also need to upload your payroll to the Department of Industrial Relations (DIR) eCPR system. Once you've certified your payroll, you can download the DIR XML file to upload.

Instructions to find and upload this file:

- Click on the Projects tab
- Click on the Certified Payrolls tab
- Locate the week ending payroll file you need
- Click on the DIR XML button (make sure your pop-up blockers are off)
- Save this file to your desktop
- Upload into the DIR eCPR system



Payroll Certifications						
Week End Date	Performing	Accept Status				
03/16/2018	YES	Submitted	Edit	Report	DIR XML	Details
03/02/2018	YES	UPDATED	Edit	Report	DIR XML	Details

Page 1

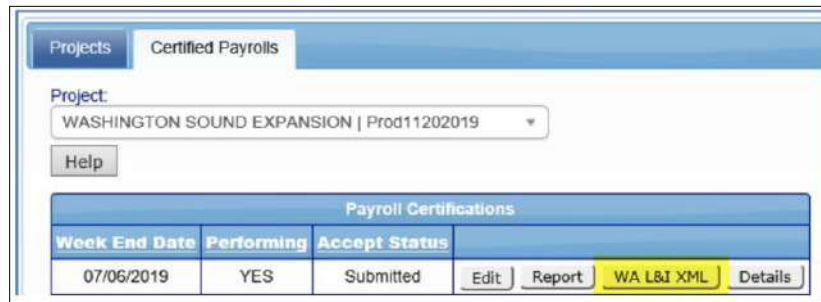
Washington L&I XML Upload

Beginning in January 2020, weekly certified payroll reports are required to be filed online with Washington State Department of Labor and Industries, or WA L&I, at least once a month for all public works projects. Once you've certified your payroll, you can download the WA L&I XML file to upload.

Instructions to find and upload this file:

- Click on the Projects tab
- Click on the Certified Payrolls tab
- Locate the week ending payroll file you need
- Click on the WA L&I XML button (make sure your pop-up blockers are off)
- Save this file to your desktop

- Upload into the WA State PWIA portal



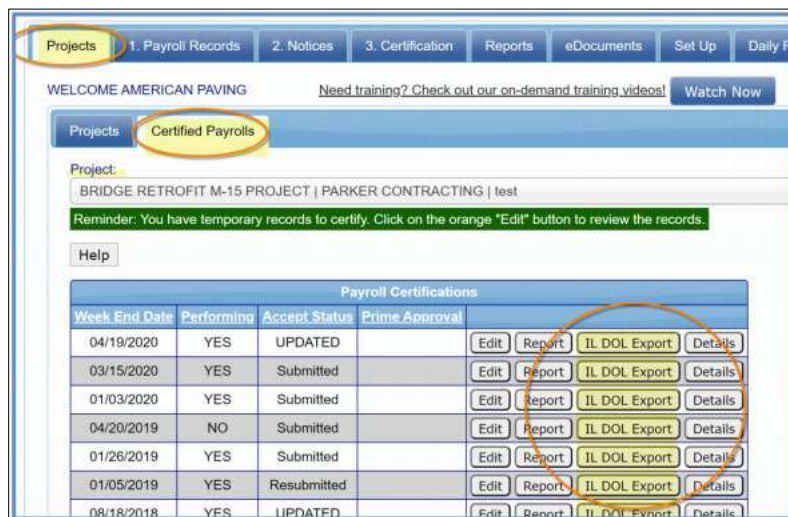
Week End Date	Performing	Accept Status	
07/06/2019	YES	Submitted	Edit Report WA L&J XML Details

Illinois DOL Export Upload

Beginning in September 2020, weekly certified payroll reports are required to be filed online with the Illinois Department of Labor, or IDOL, by the 15th of each month for all state-funded public works projects. Once you've certified your payroll, you can download the IL DOL XML file to upload.

Instructions to find and upload this file:

- Click on the Projects tab
- Click on the Certified Payrolls tab
- Locate the week ending payroll file you need
- Click on the IL DOL Export button (make sure your pop-up blockers are off)
- Save this file to your desktop
- Make any manual additions/adjustments to the CSV file
- Upload into the IDOL portal



Week End Date	Performing	Accept Status	Prime Approval	
04/19/2020	YES	UPDATED		Edit Report IL DOL Export Details
03/15/2020	YES	Submitted		Edit Report IL DOL Export Details
01/03/2020	YES	Submitted		Edit Report IL DOL Export Details
04/20/2019	NO	Submitted		Edit Report IL DOL Export Details
01/26/2019	YES	Submitted		Edit Report IL DOL Export Details
01/05/2019	YES	Resubmitted		Edit Report IL DOL Export Details
08/18/2018	YES	UPDATED		Edit Report IL DOL Export Details

Should you find that you have any further questions, please consult either the Contractor User Manual or call our [Support](#) department.

SPECIAL PROVISIONS



RPQ NO. TP-0000027284

SPECIAL PROVISIONS

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APPENDIX “A” TO SPECIAL PROVISIONS
Authorization Agreement for Automatic Deposit

APPENDIX “B” TO SPECIAL PROVISIONS
Sustainable Buildings Program

1. SCOPE OF WORK:

A. Work under this Contract includes the remodeling of certain restrooms facilities within the UHealth | Jackson, Palmetto and Tri-Rail Metrorail stations. Scope is identified in the construction documents and associated specifications for each of the facilities; however, it includes and is not limited to:

- 1) *The removal and installation of all fixtures and finishes complying with codes and ADA standards.*
- 2) *Removal and replacement of all finishes and fixtures with new walls, floor, and ceiling coverings, fixtures, appurtenances, plumbing, electrical, mechanical, communications, P/A speaker and speaker grills, hand free telephones, building systems, equipment and components associated thereto for the complete repair of the Metrorail Bathroom projects.*
- 3) *Remove and replace with new cast-iron and copper all existing sanitary drains, waste and vent systems.*
- 4) *Remove and completely re-pipe with new L-type copper all existing water pipe, including trap primers, control valves, and supports for all plumbing fixtures.*
- 5) *Provide new plumbing fixtures "institutional type" ADA and Watersense compliant. Contractors are to verify that the specified products, in the construction documents, are Watersense compliant. Contractors are to provide cut sheets for approval of all plumbing fixtures. In the event that some plumbing fixtures, as specified, are not watersense compliant, contractor is to submit to DTPW substitutions of equal or greater performance with the appropriate watersense certifications.*
- 6) *Provide to all new plumbing fixtures acorn duran-ware 16-gauge, type 304 stainless steel rated for 1000 lbs. with all mounting screws concealed.*
- 7) *Restrooms shall be equipped with as required per DTPW toilet accessory specifications.*
- 8) *All bathroom's walls shall be tile from floor to ceiling with ceramic tile: Daletile, Marrazzi & American Olean, Ice White 0025, Glossy with Epoxy integral color grout, color: 44 Bright white.*
- 9) *Bathroom floors shall be anti-slip ceramic tile. Daletile: Marrazzi & American Olean, Story Floor 0034, Matte Balance with epoxy integral grout: laticrete epoxy grouts, 78 sterling Silver.*
- 10) *Provide new mechanical soffit and rigid ceiling with fire alarm and lighting.*
- 11) *Install doors type 316 stainless steel with a min. of a 1.5-hour fire rating.*
- 12) *Provide light fixtures per specification in day brite LED with emergency battery back-up shall be 227V, 2 lamp recessed to match existing.*
- 13) *Furnish and install a new UL listed weather resistant wall mounted hand-free telephone to replace existing one.*
- 14) *Furnish and install a new exhaust ventilator with duct and wiring, in each restroom.*
- 15) *The smoke detectors inside the bathrooms must be removed at the beginning of the construction and reinstall before opening the bathroom to the public.*
- 16) *The P/A speaker, speaker enclosure and grill shall be replaced with a new atlas sound speakers to be compatible with existing P/A system.*
- 17) *Remove and replace lose / broken floor tiles in area adjacent to the area of work.*
- 18) *Remove and replace the existing Removal and replacement of existing O/A wall vent.*
- 19) *Remove and replace cracked lath and plaster ceiling and high hats above drinking fountain vestibule.*
- 20) *New concrete work as shown in the structural drawings.*

2. ALLOWANCE ACCOUNTS:

- A. Contingency Allowance** - A Contingency Allowance Account has been established for the exclusive use of the Department of Transportation and Public Works as a reserve account to cover unforeseeable and unavoidable costs associated with the Work. This Contingency Allowance account shall be calculated at ten percent (10%) of the base bid total for the Work. It is understood that any unspent portion of the contingency allowance account is to remain with the COUNTY.

3. INSURANCE REQUIREMENTS:

Contractor shall indemnify and hold harmless the County and its officers, employees, agents and instrumentalities from any and all liability, losses or damages, including attorneys' fees and costs of defense, which the County or its officers, employees, agents or instrumentalities may incur as a result of claims, demands, suits, causes of actions or proceedings of any kind or nature arising out of, relating to or resulting from the performance of this Agreement by the Contractor or its employees, agents, servants, partners principals or subcontractors. Contractor shall pay all claims and losses in connection therewith and shall investigate and defend all claims, suits or actions of any kind or nature in the name of the County, where applicable, including appellate proceedings, and shall pay all costs, judgments, and attorney's fees which may issue thereon. Contractor expressly understands and agrees that any insurance protection required by this Agreement or otherwise provided by Contractor shall in no way limit the responsibility to indemnify, keep and save harmless and defend the County or its officers, employees, agents and instrumentalities as herein provided.

Contractor shall furnish to Miami-Dade County, Department of Transportation & Public Works, 111 NW 1st Street, Miami FL 33128-1987, Certificate(s) of Insurance which indicate that insurance coverage has been obtained which meets the requirements as outlined below:

- A. Worker's Compensation Insurance for all employees of the Contractor as required by Florida Statute 440.*
- B. Commercial General Liability Insurance in an amount not less than \$1,000,000 per occurrence, and \$2,000,000 in the aggregate, not to exclude coverage for Products and Completed Operations. **Miami-Dade County must be shown as an additional insured with respect to this coverage.***
- C. Automobile Liability Insurance covering all owned, non-owned and hired vehicles used in connection with the work, in an amount not less than \$1,000,000 combined single limit per occurrence for bodily injury and property damage.*

All insurance policies required above shall be issued by companies authorized to do business under the laws of the State of Florida, with the following qualifications:

The company must be rated no less than "A-" as to management, and no less than "Class VII" as to financial strength, by Best's Insurance Guide, published by A.M. Best Company, Oldwick, New Jersey, or its equivalent, subject to the approval of the County Risk Management Division.

or

The company must hold a valid Florida Certificate of Authority as shown in the latest "List of All Insurance Companies Authorized or Approved to Do Business in Florida" issued by the State of Florida Department of Financial Services.

**NOTE: CERTIFICATE HOLDER MUST READ: MIAMI-DADE COUNTY
111 NW 1st STREET
SUITE 2340
MIAMI, FL 33128**

- A. Compliance with the foregoing requirements shall not relieve the vendor of his liability and obligation under this section or under any other section of the Contract.
- B. Contractor's qualification for inclusion in the Contract is contingent upon the receipt of the insurance documents within fifteen (15) calendar days after notification. If the insurance certificate is received within the specified time frame but not in the manner prescribed in this solicitation, the Contractor shall be verbally notified of such deficiency and shall not be placed in an active status until such time as a corrected certificate is submitted to the County. Contractors who are not or do not remain in compliance will be listed as inactive and will not remain inactive until all such defects are corrected. Any Contractor placed in an inactive status shall lose their current position in the established rotation and will be placed at the back of the current rotation upon correction of the deficiency and return to active status.
- C. The CONTRACTOR shall be responsible for assuring that the insurance certificates required in conjunction with this Section remain in force for the duration of the contractual period including any and all option years that may be granted to the CONTRACTOR in accordance with Section 2.5 of the Special Conditions.
- D. If insurance certificates are scheduled to expire during the contractual period, the CONTRACTOR shall be responsible for submitting new or renewed insurance certificates to the County at a minimum of thirty (30) calendar days in advance of such expiration. In the event that expired certificates are not replaced with new or renewed certificates which cover the contractual period, the County shall place the contractor in an inactive status until such time as the new or renewed certificates are received by the County in the manner prescribed in the solicitation. Any Contractor placed in an inactive status shall lose their current position in the established rotation and will be placed at the back of the current rotation upon correction of the deficiency and return to active status. If the contractor has an open work order or project when the insurance expires, the contractor will be issued a stop work order and be required to correct the deficiency immediately. No additional time will be allowed as a result of the stop work order and liquidated damages will be assessed. If a Payment and Performance Bond is available on the work, the Bondholder will be notified and given the opportunity to complete the work assignment.
- E. The County may, at its sole discretion require additional or supplemental insurance. Such requirements will be stated in any RPQ issued requiring insurance in addition to the requirements stated above.

4. PRE-BID MEETING:

A Pre-Bid Meeting will be held as indicated in the *Invitation to Bid (ITB)/Request for Price Quotation (RPQ)*. Please refer to the ITB/RPQ for instructions and additional information.

5. CONTRACTOR USE OF PREMISES:

- A. The Contractor's use of the premises is limited to the limits of construction. The Contractor will coordinate all work with the Project Manager and perform work in a manner which allows continuous use of adjoining facilities by DTPW. The Contractor shall maintain safe access to all project areas at all times.
- B. The Contractor shall remain flexible with respect to his work schedule and if the Contractor is delayed due to the non-availability of the project site, his sole remedy for delay shall be limited to a contract time extension only, with no consideration for additional compensation for lost productivity. This remedy for delay (time extension only, no additional compensation) shall also apply to inclement weather conditions.
- C. The Contractor and his subcontractors shall obtain all necessary Permits and provide copies to the Project Manager prior to commencement of work. At the completion of the project, the Contractor shall provide to the Project Manager as-built drawings, all equipment owner's manuals and related documentation provided by the Manufacturers and a copy of the permit(s) with all required inspections signed off.
- D. The Contractor shall clean the area after each workday. In addition, the contractor shall clean the area, remove materials and equipment that would create a potential hazard to pedestrians and DTPW operations personnel.

6. EQUIPMENT:

The contractor will provide equipment of sufficient size and capacity to meet project needs.

7. INSPECTION/MATERIAL TESTING:

- A. **Inspections:** Daily inspections will be performed by the DTPW Representative. Inspections by the DTPW Representative shall not relieve the Contractor of his duties and obligations related to performance and/or quality of the Work.

The Contractor shall coordinate with the DTPW Representative the inspection of all pertinent work activities that may be deemed crucial to the completion of the Project. The pertinent work activities shall be defined by the DTPW Representative prior to installation. The Contractor will be responsible to schedule a meeting with the DTPW Representative to identify the pertinent work activities. Refer to technical specifications/notes provided in the project drawings. Installation Procedures recommended by manufacturer shall be submitted by the Contractor to the DTPW Representative. Contractor to comply with Technical Specifications/Notes provided on the Contract Drawings.

B. **Materials:** As specified in the Scope of Work and Project Schedule of Values.

8. MEASUREMENT AND PAYMENT:

The Schedule of Values includes all costs required for the complete construction of the specified unit of work including cost of material, delivery; installation, testing, and labor including social security, insurance, and other required fringe benefits, workmen's compensation insurance, bond premiums, cost of the Inspector General random audits, rental of equipment and machinery, taxes, incidental expenses, and supervision.

The Contractor shall be compensated based on percentage of work completed if a lump sum contract or by unit price quantities as agreed upon by the DTPW Representative. The Schedule of Values will be used for payment and negotiation of additions/deletions to scope. DTPW reserves the right to modify/adjust any of the unit item quantities at the same unit rate as specified on the Schedule of Values with no additional adjustment (compensation) for the reduction of work scope.

The Contractor shall comply with Resolution No. R-138-10, which mandates that SBE firms work be identified in the Schedule of Values, if applicable. In accordance with Resolution R-138-10, the Contractor is required as a condition subsequent to award and prior to the issuance of notice to proceed, that the scope of work to be performed by any SBE utilized to satisfy any SBE goal in the contract be separately identified in such schedule of values.

Payment requisitions for the scope of work of such SBE shall be accomplished by statements of completion of the work of the SBE and shall be accompanied by appropriate documentation including invoicing and checks reflecting payment of the SBE for the previous construction draw.

9. TIME OF WORK:

Refer to Technical Specification.

10. PRE-CONSTRUCTION MEETING:

A Pre-Construction Meeting will be scheduled prior to the NTP date. The DTPW Representative may require the Contractor to submit at the time of the Pre-Construction meeting a Project Schedule, Detailed Schedule of Values, Maintenance of Traffic (MOT) Plan, Shop Drawing Submittal Log, Emergency Contact List, and List of Subcontractors.

11. CONSTRUCTION COORDINATION MEETINGS:

The Contractor shall attend Construction Coordination meetings at the site, if required by the DTPW Representative. The DTPW Representative will advise the Contractor of the frequency of the meetings. The meetings shall be attended by the Contractors representative and the DTPW Representative at a time and location to be determined by the DTPW Representative.

12. COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK:

TIME IS OF THE ESSENCE. The work to be performed under this Contract shall commence on the effective date of the Notice-to-Proceed and be completed and released to MDC upon completion of all punch list items within the time specified.

Completion of All Work: The Work must be Substantially Completed within **360 calendar days** after the date when the Contract Time commences to run, and all requirements of the Contract Documents completed to the Engineer's satisfaction, including the completion of all punch list items, delivery to the Engineer of all required deliverable, and completion of any remaining Site restoration.

13. LIQUIDATED DAMAGES:

TIME IS OF THE ESSENCE and completing the work within the specified time is of the utmost importance to MDC. The following liquidated damages rate(s) have been determined based on the best information available at the time of bidding and represent a good faith effort by MDC to quantify the damages that MDC will incur if the contract duration is not achieved. Therefore, for failure to complete the work within the number of days stipulated in the Invitation to Bid, the Contractor and his/ her sureties will be assessed Liquidated Damages as follows:

Final Completion

Liquidated Damages shall be assessed in the amount of **\$2,437.00**, per day for each day of delay, not as a penalty, but as Liquidated Damages for each day or fraction thereof of delay until the Final Completion Date is met, which will be paid to Miami-Dade County by the Contractor.

14. METHOD OF AWARD:

The award shall be made to the lowest responsive and responsible bidder. DTPW reserves the right to negotiate additional or deductive services related to this project with the low bidder. DTPW reserves the right to reject all bids if deemed in the best interest of Miami Dade County.

15. PERFORMANCE & PAYMENT BOND:

The Contractor shall provide a Surety Performance and Payment Bond for 100% of the contract amount. NTP shall not be issued, and no work shall commence until a fully executed performance bond and required insurance are submitted and approved by Miami-Dade County's Risk Management Division. Failure to provide a Performance & Payment Bond within the time required inclusive of any time extensions granted by DTPW may be considered withdrawal of the bid and forfeiture of the Bid Bond. The Contractor will be reimbursed for the direct (actual) Surety Performance and Payment costs upon presentation of an invoice and paid receipt/cancelled check.

16. COLLUSION AFFIDAVIT:

In accordance with Sections 2-8.1.1 and 10-33.1 of the Miami-Dade County Code as amended by Ordinance No. 08-113, bidders/proposers on County contracts are requested to submit the Collusion Affidavit within five (5) days from notification of intent to award.

Failure to provide a Collusion Affidavit within 5 business days after the recommendation to award has been filed with the Clerk of the Board shall be cause for the contractor to forfeit their bid/proposal bond. NTP shall not be issued, and no work shall commence until a fully executed Collusion Affidavit is submitted and approved by DTPW.

17. JOB CLEARINGHOUSE:

The Contractor is required to comply with the requirements of Job Clearinghouse Code §2-1701 and Resolution No. R-1395-05 amending Resolution Nos. 1145-99 & 937-98, by making it a mandatory requirement for contractors to post notice through the County's Clearinghouse process of job opportunities made available by construction improvements on County property.

The procedures direct the Contractor to forward a notice of job vacancy(s) created as a result of this construction work to the Director of the Division of Small Business Development (SBD), located at Stephen P. Clark Center, 111 N.W. 1st. Street, Contract Review and Compliance Section, 19th Floor, Miami, Florida, 33128. The job vacancy notice(s) should be delivered within ten (10) working days following award of contract. The SBD Director will in turn distribute said job announcements to all Miami-Dade County facilities participating in the notification requirements of Resolution No. 1395-05. For information regarding the Miami-Dade County's Clearinghouse program, please contact the SBD at (305) 375-3157.

18. SCRUTINIZED COMPANIES:

By executing this proposal through a duly authorized representative, the bidder certifies that the bidder is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, as those terms are used and defined in sections 287.135 and 215.473 of the Florida Statutes. In the event that the bidder is unable to provide such certification but still seeks to be considered for award of this solicitation, the bidder shall execute the proposal through a duly authorized representative and shall also initial this space: _____. In such event, the bidder shall furnish together with its proposal a duly executed written explanation of the facts supporting any exception to the requirement for certification that it claims under Section 287.135 of the Florida Statutes. The bidder agrees to cooperate fully with the County in any investigation undertaken by the County to determine whether the claimed exception would be applicable. The County shall have the right to terminate any contract resulting from this solicitation for default if the bidder is found to have submitted a false certification or to have been, or is subsequently during the term of the contract, placed on the Scrutinized Companies for Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List.

19. USER ACCESS PROGRAM (UAP):

Pursuant to Miami-Dade County Budget Ordinance No. 03-192, this Contract is subject to a user access fee under the County's User Access Program (UAP) in the amount of two percent (2%). All construction services provided under this contract are subject to the 2% UAP. This fee applies to all Contract usage whether by County Departments or by any other governmental, quasi-governmental or not-for-profit entity. From every payment made to the Contractor under this contract (including the payment of retainage), the County will deduct the two percent (2%) UAP fee provided in the ordinance and the Contractor will accept such reduced amount as full compensation for any and all deliverables under the contract. The County shall retain the 2% UAP for use by the County to help defray the cost of its procurement program. Contractor participation in this pay request reduction portion of the UAP is mandatory.

20. CONTRACTOR DUE DILIGENCE AFFIDAVIT:

The attention of the Contractor is hereby directed to the requirements of Resolution R6314 in that the award of this contract is conditioned on the Contractor providing the County, when required, with a "CONTRACTOR DUE DILIGENCE AFFIDAVIT."

21. SUBCONTRACTOR / SUPPLIER LISTING:

Pursuant to Section 2-8.1 and 10.34 of the Miami-Dade County Code, for contracts valued at \$100,000 or more when subcontractor(s) and/or supplier(s) are utilized, the Prime contractor/vendor/consultant shall report to Miami-Dade County the race, gender, and ethnic origin of all such first-tier subcontractor(s) and supplier(s). The paper-based Subcontractor/Supplier Listing that was previously submitted at time of bid submission is no longer being used. The Prime contractor/vendor/consultant shall be required to identify its first-tier subcontractor(s)/supplier(s) and provide demographic information for both their firm and each subcontractor/supplier on the contract as soon as reasonably available and in any event prior to final payment under the contract via Miami-Dade County's online Business Management Workforce System (BMWS).

22. RESIDENTS FIRST TRAINING AND EMPLOYMENT PROGRAM:

In accordance with Section 2-11.17 of the Code of Miami-Dade County and Implementing Order No. 3-61 (copies attached or online at <http://www.miamidade.gov/smallbusiness/business-development-legislation.asp>), all contractors and subcontractors of any tier on (i) construction contracts valued in excess of \$1,000,000 for the construction, demolition, alteration and/or repair of public buildings or public works, or (ii) contracts or leases valued in excess of \$1,000,000 for privately funded construction, demolition, alteration or repair of buildings or improvements on County-owned land, shall comply with the following:

1. Bidders must:

- a) Submit a completed Responsible Contractor Affidavit (Form RTFE 1) along with the Bid Submittal Package. The Responsible Contractor Affidavit shall verify

that (i) prior to working on the project, all persons employed by the contractor on the project to perform construction have completed the OSHA 10-hour safety training course, and (ii) the contractor will make its best reasonable efforts to have fifty-one percent (51%) of all construction labor hours performed by Miami-Dade County residents.

- b) The Contracting Officer shall provide to any contractor who fails to submit a Responsible Contractor Affidavit with its bid or proposal, a written notice that said contractor has forty-eight (48) hours from the time of notification to submit a Responsible Contractor Affidavit or its bid or proposal will be deemed nonresponsive and disqualified.
2. Prior to the issuance of a Notice to Proceed, contractors must also submit: (i) a Construction Workforce Plan (Form RFTE 2) and supporting documentation; (ii) a list of all subcontractors to be used on the project; (iii) a Responsible Subcontractor Affidavit (Form RFTE 1) for each subcontractor; and (iv) a list of all employees currently employed by the contractor.
 3. All certified payrolls submitted to the Contracting Officer shall include an OSHA Safety Training Affidavit (Form RFTE 3).
 4. Within thirty (30) business days of completion of a project, the contractor must submit a Workforce Performance Report (Form RFTE 4).
 5. Any lessee shall include requirements of Section 2-11.7 of the Code of Miami-Dade County and Implementing Order No. 3-61, including the right of the County to access the contractor's and subcontractors' records to verify compliance, in any contract, subcontract, or sublease. Lessee shall be responsible to the County for payment of compliance monitoring costs and any penalties found due.

23. MONTHLY UTILIZATION REPORTS:

Paper-based Monthly Utilization Reports (MURs) are no longer being accepted for construction, architecture, and engineering projects with measures. Also, for architecture and engineering firms, pursuant to Implementing Order 3-39, primes and subconsultants are required to report payments monthly via Miami-Dade County's online Business Management Workforce System (BMWS). "Compliance Audits" will be created in Miami-Dade County's online Business Management Workforce System (BMWS) after Miami-Dade County pays the Prime contractor/vendor/consultant (approximately one month after). Miami-Dade County Departments will check the compliance audit status for each payment application to ensure that no audits are open for more than two (2) months. For construction contracts without measures, which only require reporting of cumulative subcontractor payments, a "Compliance Audit" shall only be verified prior to the final payment.

24. PUBLIC RECORDS AND CONTRACTS FOR SERVICES PERFORMED ON BEHALF OF MIAMI-DADE COUNTY (HB 1309):

HB 1309 re: governmental accountability has been signed into law by the Governor and was effective July 1. It generally applies only to state agencies, but there is one provision of HB 1309

that also applies to counties. This provision requires public agency contracts for services performed on behalf of the public agency to contain contract provisions clarifying the public record responsibilities of the contractor.

The Contractor shall comply with the Public Records Laws of the State of Florida, including but not limited to,; (1) keeping and maintaining all public records that ordinarily and necessarily would be required by Miami-Dade County (County) in order to perform the service; (2) providing the public with access to public records on the same terms and conditions that the County would provide the records and at a cost that does not exceed the cost provided in Chapter 119, F.S., or as otherwise provided by law; (3) ensuring that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law; and (4) meeting all requirements for retaining public records and transferring, at no cost, to the County all public records in possession of the Contractor upon termination of the contract and destroying any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements upon such transfer. In addition, all records stored electronically must be provided to the County in a format that is compatible with the information technology systems of the County. Failure to meet any of these provisions or to comply with Florida's Public Records Laws as applicable shall be a material breach of the agreement and shall be enforced in accordance with the terms of the agreement.

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT (305) 375-5773; ISDVSS@MIAMIDADE.GOV; 111 NW 1 STREET, SUITE 1300, MIAMI, FLORIDA 33128.

25. CONE OF SILENCE

The attention of the Contractor is hereby directed to the requirements of Miami-Dade County Administrative Order No. 3-27 – Cone of Silence.

26. BID PROTEST

The attention of the Contractor is hereby directed to the requirements of Miami-Dade County Implementing Order No. 3-21 – Bid Protest and Resolution R-1080-19 which updated the Bid Protest filing fees for contracts set-aside for bidding solely by certified Small Business Enterprises, and other relevant sections.

27. PROMPT PAYMENT

The attention of the Contractor is hereby directed to the requirements of Miami-Dade County Administrative Order No. 3-19 – Prompt Payment.

28. ASSIGNABILITY/ASSIGNMENT

- A. **ASSIGNABILITY** - Department of Transportation and Public Works (DTPW) may assign its rights and obligations under the Contract to any successor to the rights and functions of DTW or to any governmental agency to the extent required by applicable laws or governmental regulations or to the extent that DTPW deems necessary or advisable under the circumstances.
- B. **ASSIGNMENT** - The Contractor shall not assign, transfer, or otherwise dispose of this Contract, including any rights, title or interest therein, or their power to execute such Contract to any person, company or corporation without the prior written consent to DTPW. DTPW's consent for any assignment will not be unreasonably withheld.

29. SECTION 20.055 (5)

The contractor/consultant/vendor agrees to comply with s.20.055 (5), Florida Statutes, and to incorporate in all subcontracts the obligation to comply with s.20.055 (5), Florida Statutes.

Section 20.055 (5):

(5) It is the duty of every state officer, employee, agency, special district, board, commission, contractor, and subcontractor to cooperate with the inspector general in any investigation, audit, inspection, review, or hearing pursuant to this section. Beginning July 1, 2015, each contract, bid, proposal, and application or solicitation for a contract shall contain a statement that the corporation, partnership, or person understands and will comply with this subsection.

30. ESTIMATED TIME CONTINGENCY

This Contract contains a Contingency Allowance time extension not to exceed ten percent (10%) of the original Contract Duration. Pursuant to a written request by the Contractor for a time extension, that affects the critical path schedule of the Contract or any previously approved changes; written documentation that supports the justification of a time extension, review and concurrence by the COUNTY A/E, a Contract Contingency Allowance Expenditure Authorization will be created for execution by all parties. Once executed the time extension will adjust the scheduled completion date. The cumulative total of all Contingency Allowance time extensions shall not exceed ten percent (10 %) of the original Contract Duration rounded off to the next whole number.

31. LCP TRACKER

Refer to the memo dated April 25, 2019 from the Director of Small Business Development Division for Implementation of LCPtracker.

32. RESOLUTION NO. 1181-18 / DIRECTIVE NO. 182536

The Contractor is directed to the attached report regarding consideration of Contractor Safety Information as a Part of the Contractor Responsibility Review for Contract Award – Directive No. 182536 and the requirements of Resolution No. 1181-18, applicable to this Project.

Bidders may request a copy of any ordinance, resolution and/or administrative order cited in this bid solicitation, by contacting the Clerk of the Board at 305.375.5126.

33. DISCLOSURE OF ALLEGED DISCRIMINATION LAWSUITS

In accord with Resolution No. R-828-19, the County reserves the right to request from any Bidder the disclosure of any lawsuits which include allegations of discrimination in the last ten years prior to date of solicitation, the disposition of such lawsuits, or statement that there are NO such lawsuits.”

34. E-VERIFY

By entering the Contract, the Awarded Bidder becomes obligated to comply with the provisions of Section 448.095, Florida Statute, titled "Verification of Employment Eligibility." This includes but is not limited to utilization of the U.S. Department of Homeland Security's E-Verify System to verify the employment eligibility of all newly hired employees by the Awarded Bidder effective, January 1, 2021, and requiring all Subcontractors to provide an affidavit attesting that the Subcontractor does not employ, contract with, or subcontract with, an unauthorized alien. Failure to comply may lead to termination of this Awarded Bidder, or if a Subcontractor knowingly violates the statute, the subcontract must be terminated immediately. Any challenge to termination under this provision must be filed in the Circuit Court no later than twenty (20) calendar days after the date of termination. If this Contract is terminated for a violation of the statute by the Awarded Bidder, the Awarded Bidder may not be awarded a public contract for a period of one year after the date of termination, and the Awarded Bidder may be liable for any additional costs incurred by the County resulting from the termination of the Contract. Public and private employers must enroll in the E-Verify System (<http://www.uscis.gov/e-verify>) and retain the I-9 Forms for inspection.

35. APPLICABLE LEGISLATION

The selected Contractor will be required to abide by all applicable federal, state and local laws and ordinances, as amended. the applicable local laws and ordinances include, but are not limited to:

Florida Statute(s)

- [Section 119.07-](#) Inspection and Copying of Records; Photographing Public Records; Fees; Exemptions.
- [Section 119.0701](#) - Contracts; Public Records
- [Section 287.133](#) - Public Entity Crimes
- [Section 287.135](#) - Prohibition against contracting with scrutinized companies
- [Section 295.187](#) - Florida Veteran Business Enterprise Opportunity Act
- [Section 448.095](#) – Employment Eligibility

Ordinance(s)

- [77-13](#) -Financial Disclosures Requirements
- [90-133](#) - Disclosure of Ownership, Collective Bargaining Agreement, and Employee Wages,
- Health Care Benefits, Race, National Origin and Gender
- [97-35](#) - Policy of Fair Subcontracting Practices
- [97-67](#) - Amending Chapter 11A Prohibiting Discrimination in Contracting, Procurement, Bonding and Financial Services
- [99-152](#) - False Claim Ordinance
- [03-107](#) - Ordinance Amending Section 2-11.1 (s) of the Conflict of Interest and Code of Ethics
- [07-65](#) - Sustainable Buildings Program (when applicable)
- [08-113](#) - Ordinance Amending Sections 2-8.1.1 and 10-33.1 of the Miami-Dade County Code relating to bids from related parties to include a prohibition on collusive bidding
- [11-90](#) - Ordinance Relating to the Collection of Data for a Disparity Study
- [14-79](#) - Sea-Level Rise Ordinance (when applicable)
- [21-22](#) - Buy American Iron and Steel Products Procurement Program

Resolution(s)

- R-1049-93 - Affirmative Action Plan Furtherance and Compliance
- R-385-95 - Policy prohibiting contracts with firms violating the American with Disabilities-Act. (ADA) and other laws prohibiting discrimination on the basis of disability ADA requirements, are a condition of award, as amended by Resolution R-182-00.
- [R-531-00](#) - Prohibition of contracting with individuals and entities while in arrears with the County
- [R-183-00](#) - Family Leave Requirements
- [R-185-00](#) - Domestic Violence Leave
- [R-273-05](#) - Public Involvement Planning

- [R-63-14](#) - Contractor Due Diligence
- [R-828-19](#) – Disclosure of Alleged Discrimination Lawsuits
- [R-1106-15](#) - Aspirational Policy of Miami-Dade County
- [R-1011-15](#): Requiring Vendors to Provide Addresses of Local Offices Administrative Order(s)

Administrative Order(s)

- [03-27](#) - Cone of Silence
- [3-53](#) – Miscellaneous Construction Contracts Program
- [10-10](#) - Duties and Responsibilities of County Departments for Compliance with the Americans with Disabilities Act (ADA) Implementing Order(s)
- [3-19](#) – Prompt Payment

Implementing Order(s)

- [3-21](#) - Bid Protest Procedure
- [3-24](#) – Responsible Wages and Benefits for County Construction Contracts
- [3-37](#) – Community Workforce Program
- [3-61](#) – Residents First Training and Employment Program
- [3-63](#) – Employ Miami-Dade Program
- [7-7](#) – Policies and Procedures Establishing a Public Service Honor Code for Elected and Appointed County Officials and County Employees
- [8-8](#) – Sustainable Buildings Program IO

Miami-Dade County Code(s)

- [Section 2-8.1](#) - Contracts and Purchases
- [Section 2-8.1.5](#) – Nondiscrimination
- [Section 2-8.4](#) - Protest Procedures
- [Section 2-8.5](#) – Procedure to provide preference to local business in county contracts
- [Section 2-8.5.1](#) - Procedure to Provide Preference to Local Certified Veteran Business Enterprises in County Contracts
- [Section 2-8.8](#) - Fair Subcontracting Practices
- [Section 2.11.1](#) - Conflict of Interest and Code of Ethics
- [Section 10-34](#) - Listing of Subcontractors Required
- [Section 2-8.2.6.1](#) - Buy American Iron and Steel Products Procurement Program

36. BUY -AMERICAN IRON AND STEEL PRODUCTS PROCUREMENT PROGRAM

The attention of the Contractor is hereby directed to the requirements of Miami-Dade County Ordinance No. 21-22 and Miami-Dade County Code 2-8.2.6.1 – Buy American Iron and Steel Products Procurement Program, applicable to this project.

APPENDIX "A"
**AUTHORIZATION AGREEMENT FOR AUTOMATIC
DEPOSIT**



RPQ NO. TP-0000027284



ACH AUTHORIZATION AGREEMENT FOR AUTOMATIC DIRECT DEPOSIT OF MIAMI-DADE COUNTY WARRANTS

We hereby authorize the Finance Department to initiate credit entries and, if necessary, a debit entry in order to reverse a credit entry made in error in accordance with NACHA rules.

Original form must be received before we can process your request for ACH deposits. Please refer to page 2 for instructions. Processing of the form is approximately 15 days from receipt of completed original form. This authority is to remain in effect until revoked in writing and received by the Finance Department. Account changes must be reported at a minimum **fifteen (15) days prior to actual change**.

Section 1 (TO BE COMPLETED BY VENDOR) - ALL FIELDS ARE REQUIRED

TRANSACTION TYPE:	New <input type="checkbox"/>	Change <input type="checkbox"/>	Terminate <input type="checkbox"/>											
FEDERAL IDENTIFICATION NUMBER	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> (AS PER CURRENT W-9)											<table border="1"><tr><td></td><td></td></tr></table> (FOR INTERNAL USE ONLY)		
VENDOR NAME :														
DBA (DOING BUSINESS AS) :														
TELEPHONE NUMBER :														
FISCAL OFFICER NAME AND TITLE :														
FISCAL OFFICER'S EMAIL :														
ACH NOTIFICATION EMAIL:														
<i>(This is the email where payment information will be sent)</i>														
ROUTING NUMBER	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>											<table border="1"><tr><td></td><td></td></tr></table> (FOR INTERNAL USE ONLY)		
VENDOR'S BANK ACCOUNT NUMBER	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>													
TYPE OF ACCOUNT	Checking <input type="checkbox"/>	Savings <input type="checkbox"/>												
AUTHORIZED SIGNATURE _____	DATE : _____													
PRINTED NAME _____														

A VOIDED CHECK OR REDACTED COPY OF A BANK STATEMENT FOR THE ACCOUNT LISTED ABOVE MUST BE PROVIDED. PLEASE REFER TO INSTRUCTIONS FOR OUR MAILING ADDRESS. SUBMISSION OF YOUR E-MAIL ADDRESS IS MANDATORY IN ORDER TO PARTICIPATE IN THIS PAYMENT OPTION.

Section 2 (TO BE COMPLETED BY FINANCIAL INSTITUTION)

FINANCIAL INSTITUTION NAME:		
ADDRESS:		
BANK OFFICIAL NAME (PRINTED) AND TITLE :		
TELEPHONE NUMBER :	EMPLOYEE ID NO. :	
EMAIL :		
<input type="checkbox"/>	I have verified that the account and routing number provided above is correct and corresponds to vendor noted above.	
<input type="checkbox"/>	I have also verified that the person signing is an authorized signer on the account specified.	
SIGNATURE _____	DATE : _____	

Section 3 (TO BE COMPLETED BY MIAMI-DADE FINANCE DEPARTMENT)

Accounts Payable Verifications	Cash Management	Input/Output
Corp. Officer Name : _____	Routing # verified by : _____	ACH Indicator updated by : _____
Verified by: _____		
A/P Staff: _____		
Corp. Officer Title : _____	Date: _____	Date of Update : _____
Date: _____	Verified by : _____	Verified by : _____
Bank Officer: _____	Verification Date: _____	Verification Date: _____
Date: _____		



ACH AUTHORIZATION AGREEMENT FOR AUTOMATIC DIRECT DEPOSIT OF MIAMI-DADE COUNTY WARRANTS

INSTRUCTIONS

Please contact us at (305) 375-5111 or email at FIN-ACHN@miamidade.gov if you have any questions or need assistance with this form.

You may obtain blank copies of this form at : http://www.miamidade.gov/finance/library/ach_form.pdf

At our Vendor Payment Inquiry (VPI) website you can obtain payment information as well as status of invoices, payment due date and other important information. You can reach the VPI site at :

<https://w85exp.miamidade.gov/VInvoice/login.do>

Section 1

Transaction Type

- New : If vendor is currently not on ACH deposits with Miami-Dade County.
- Change : If vendor is currently on ACH deposits with Miami-Dade County and would like to make changes to their information (example : change of financial institution, account number, etc.)
- Terminate : If vendor is currently on ACH deposits with Miami-Dade County and would like to switch to either Check or AP Control disbursement type)

Federal Identification Number : Enter your Federal Employer Identification Number (FEIN) or Social Security Number (SSN) used to register you as a vendor with Miami-Dade County. Name and FEIN/SS must be exactly as provided on IRS Form W-9.

Vendor Name : Enter the name of your business or individual name used to register you as a vendor with Miami-Dade County.

DBA (Doing Business As) : If you have registered a DBA for your business or for you as an individual, please enter it here.

Fiscal Officer Name, Title and E-Mail : Name of Authorized Corporate officer, Title and E-Mail address to be contacted to. Corporate officer signing this form must be an authorized signatory in the corporate bank account listed on this form.

ACH Notification E-Mail : This is the E-Mail address where payment information will be sent to.

Section 2

This section must be completed in full and legible manner by your banking institution in order to prevent delays in processing change to ACH. Both acknowledgment statements must be checked off by Bank Official signing and dating the form.

Section 3

This section will be completed by Miami-Dade County Finance Department.

ORIGINAL FORM AND VOIDED CHECK OR REDACTED STATEMENT MUST BE MAILED TO :

Accounts Payable Manager

Miami-Dade County Finance Department
111 NW First Street, Suite 2620
Miami, Florida 33128

Terms and Conditions

Completed form should not contain any changes (scratched off /white out) or altered information; otherwise, form will not be accepted.

Processing time is approximately fifteen (15) days from receipt of complete form and voided check or redacted Bank statement.

Providing account information does not authorize Miami-Dade County to access bank account activity.

ACH deposits can be made into **only** one (1) bank account. Payments can not be split between multiple accounts.

Notification E-mail providing payment information can be sent to one (1) single E-mail address **only**.

Proper verification will be conducted by Miami-Dade County Finance Department Staff, via a telephone call to confirm the information being provided is accurate.

This authorization shall remain in effect until terminated in writing with sufficient notice to Miami-Dade County Finance Department.

Miami-Dade County will not be responsible for any loss that may arise solely by reason of error, mistake or fraud regarding information provided on this ACH Authorization Agreement Form.

APPENDIX "B"
SUSTAINABLE BUILDINGS PROGRAM



RPQ NO. TP-0000027284

SUSTAINABLE BUILDINGS

PROGRAM

1.0. INFRASTRUCTURE – BUILDINGS:

The Sustainable Buildings Program applies countywide, applies to Public Projects, and shall govern all phases of capital construction projects regardless how they are classified (new construction, repair and maintenance) including, but not limited to, planning, budgeting, design, construction, replacement, and Operations and Maintenance (O&M).

Implementing Order 8-8 applies to projects implemented through contracts or solicitations such as Professional Services Agreements and solicitations for architecture or engineering services, design criteria packages developed for design-build or P3 projects, design-build contracts and solicitations, construction contracts and solicitations including through the County's Miscellaneous Construction Contracts program, Equitable Distribution Pool contracts, P3 projects, redesign contracts and solicitations, lease agreements that allow construction on County-owned land or Buildings, lease agreements wherein the County is constructing on non-County owned land or Buildings, grant agreements for County-funded Buildings or Infrastructure, Infrastructure projects, and certain replacement and repair projects.

Resolutions Nos. R-617-17 and R-811-22; Sections 2-1 (Board of County Commissioners Rule 5.10) and 9-71 through 9-75 of the Code; and Implementing Order ("IO") No. 8-8.

The vendor shall ensure that infrastructure and building public projects comply with the Sustainable Buildings Program with the Miami Dade County Office of Resilience. The Consultant shall comply with: (i) Resolutions No. R-617-17 and R-811-22; (ii) Sections 2-1 (Board of County Commissioners Rule 5.10) and 9-71 through 9-75 of the Code; and (iii) Implementing Order ("IO") No. 8-8; , which established a County policy to incorporate, wherever practical, Green Building Practices into the planning, budgeting, design, construction, operations, management, renovation, maintenance and decommissioning of Public Projects. These sections of the Code together with the IO, are referred to as the **"Sustainable Buildings Program"**.

2.0. INFRASTRUCTURE, BUILDINGS, CONSTRUCTION, AND ARCHITECTURAL & ENGINEERING SERVICES:

Resolution R-451-14 (Sea Level Rise

Infrastructure); Comprehensive Development Master Plan (CDMP) Land Use Element Objective LU-13 and Policies LU-13A-LU13I; Miami-Dade County Sea Level Rise Strategy; and Section 21 of the Code (Board of County Commissioners Rule 5.09, consideration of sea level rise).

CDMP Objective LU-13 requires the County to implement strategies to reduce the impacts of climate change on the built environment and address the impacts of the built environment on the natural systems that provide protections against the impacts of climate change. The underlying policies in LU-13A through LU-13I delineate strategies for the County to meet this objective. Resolution R-451-14 requires the consideration of sea level rise in all County infrastructure projects. It is incumbent upon the user department to ensure that procurements are consistent with these County policies.

Pursuant to Section 2-1 of the Code (Board of County Commissioners Rule 5.09), all agenda items brought to the Board that relate to planning, design and/or construction of County infrastructure projects, including but not limited to, County building elevation projects, County installation of mechanical and electrical system, County infrastructure modifications and County infrastructure renovations, the Mayor or Mayor's designee shall include a statement in the item that the impact of sea level rise has been considered in the project.

Pursuant to Resolution R-451-14, all County infrastructure projects, including but not limited to County building elevation projects, County installation of mechanical and electrical systems, County infrastructure modifications, and County infrastructure renovations shall consider sea level rise projections and potential impacts as best estimated at the time of the project. These projects shall consider regionally consistent unified sea level rise projections during all phases, including but not limited to planning, design, and construction, in order to ensure that infrastructure projects will function properly for fifty (50) years or the design life of the project, whichever is greater.

3.0. TOILETS, FAUCETS, PLUMBING, or IRRIGATION PRODUCTS:

- A. **Applicability**: Residential and commercial toilets, showerheads, bathroom faucets, urinals, irrigation controllers, spray sprinkler bodies, and pre-rinse spray valves.
- B. The user department shall ensure that toilets, faucets, plumbing, and irrigation products solicited comply with the **Green Purchasing Guidelines pursuant to Resolution R-1053-09**. It is incumbent upon the user to ensure that the product selected meets the criteria as specified in the recommended clauses below.
- C. Water-intensive products shall be purchased with the most up-to-date water saving features.
- D. In accordance with the County's Green Procurement Preferences, the products solicited through this solicitation shall bear the U.S. **Environmental Protection Agency's (EPA's) WaterSense label***.

**All plumbing fixtures should be EPA Watersense certified.*

Memorandum



Date: NOV 02 2010
To: Department Directors
From: George M. Burge
County Manager
Subject: Green Purchasing – Commodity Priorities

As you are aware, the Board of County Commissioners has enacted several pieces of legislation directing environmentally-friendly purchases and programs. Below is a brief summary of legislation that guides the purchase of environmentally preferred products and services.

- Green Procurement Program (Resolution R-1053-09) - Directs the County Mayor to prepare a "green" procurement preference program for the purchase of environmentally responsible products and services.
- Life Cycle Costing Procedure (AO 11-3) - Requires life cycle analysis that considers maintenance, repair, energy costs and other expenditures associated with day-to-day operations for certain commodities.
- Sustainable Buildings Program (Ordinance 07-65 and Implementing Order 8-8) - Established as the policy of Miami-Dade County the institution of sustainable development practices and measures into buildings owned, financed, and/or operated by the County. The Implementing Order guides the design, construction, renovation and maintenance of County buildings and requires the Department of Procurement Management to include language into procurement contracts to ensure compliance with the Ordinance.
- Gasoline Reduction (Resolution R-969-03) – Mandates the development and implementation of a plan to reduce the County's purchase of gasoline by three to five percent annually, with a goal of reducing the County's total gasoline consumption by 20% over the next five years. This includes modifying specifications for County fleet vehicles and equipment to achieve fuel efficiencies.
- Electrical Energy Reduction (Resolution R-228-09) – Directs the Mayor to reduce electrical energy consumption in County Operations by 20% by 2014. A component of this legislation includes the establishment of a mandate to procure Energy Star qualified products for all purchases for which the Energy Star has established standards.

In line with this legislation and the County's commitment to purchasing environmentally preferred products and services, earlier this year the Department of Procurement Management (DPM) implemented the Countywide "Buy Green" Purchasing Guide (attached). The Guide requires an analysis during the purchasing process to include available green options in solicitations for goods and services, including construction.

Additionally, DPM and the Office of Sustainability have worked with key department stakeholders to identify priorities to achieve the most significant impact in green purchasing. Through this effort, several commodity priorities have been identified that are targeted to be purchased solely with 100% sustainable or green components. The attached list of priorities

applies to purchases made through DPM-established contracts, and purchases made at the department level, including construction contracts, service-based contracts and small purchase orders.

These efforts will reduce waste and will increase demand for environmentally preferred products. The County will benefit from improved employee and public health, reduction in energy consumption and emissions, improved air and water quality, and conservation of natural resources.

Your commitment to this effort is vital. Purchasing the listed commodities solely with 100% sustainable or green components is essential to achieving the County's sustainability goals.

Should you need additional information, please do not hesitate to call Miriam Singer, Director, Department of Procurement Management at 305-375-5502, or Susanne Torriente, Director, Office of Sustainability at 305-375-5593.

Attachments

- c County Executive Office Senior Staff
Miriam Singer, Director, Department of Procurement Management
Charles Anderson, Commission Auditor

Commodity Priorities		
Product/Service Category	Requirement	Key Environment & Health Issues
Paper and Paper Products	Office Paper minimum recycled content of 30%. All other paper: the highest recycled content practical. Unbleached or Processed Chlorine Free (PCF) certification for recycled paper and Totally Chlorine Free (TCF) for virgin paper are preferred.	Source and Waste Reduction
Janitorial Services	Require contractors to use Green Seal or EcoLogo certified products.	Reduce toxics and pollution. Improved health of employees and service providers.
Bags	Biodegradable plastic bags are a priority. Compostable products are also acceptable. If neither is available, recycled content bags are preferred.	Reduce waste, toxics and pollution
Carpet	Carpet shall contain the highest level of recycled content practical. Installers shall be required to recycle removed carpet.	Reduce waste, toxics and pollution
Computers & Electronic Equipment	Require Energy Star and EPEAT certifications as applicable. Implement program to recycle and reuse electronics.	Energy savings, preserves resources, reduces toxics, reduces waste
Vehicles	Fuel efficient vehicles and vehicles powered by bio-fuels, hybrid, electric batteries, fuel cells	Preserves resources, energy savings, reduces toxics
Food Containers/Trays/Cups/Plasticware	Reusable items are preferred (made of recycled content). Disposables shall be compostable. No Styrofoam.	Reduce toxics, waste and pollution
Office Supplies	Recycled content, compostable, plant based. Refillable pens and pencils. No PVC in office supplies.	Reduce toxics, waste and pollution
Toner and Ink Cartridges	Remanufactured cartridges are preferred. Used cartridges are to be recycled through contract IB8091-0/13. Plant-based inks are preferred.	Source and waste reduction
Pest Control	Integrated Pest Management (IPM)	Reduce toxics and pollution

Commodity Priorities		
Product/Service Category	Requirement	Key Environment & Health Issues
Paint	VOC and Lead Free	Reduce toxics and pollution
Fuel	Bio Fuels	Preserves resources, reduces toxics
Energy Star Products	All products purchased from product categories for which the Energy Star certification is available shall have a Energy Star certification. When Energy Star labels are not available, the County shall choose energy-efficient products that are in the upper 25% of energy efficiency as designated by the Federal Energy Management Program.	Energy savings, preserves resources, reduces toxics
Copiers and Related Devices	Managed Print programs shall be implemented and desktop printers are discouraged. Energy Star certified multifunctional devices shall replace older devices.	Energy savings, preserves resources, reduces toxics
Furniture	Low VOCs	Reduce toxics and pollution
Lighting	Energy Efficient and lower-mercury lighting applications are to replace older applications. Also, see Energy Star category above.	Energy savings, preserves resources, reduces toxics, reduces waste
Landscaping	Native species are preferred. Xeriscape (low water) landscaping is encouraged.	Water conservation, preserve natural resources

Memorandum



Date: January 21, 2010

To: Honorable Chairman Dennis C. Moss
and Members, Board of County Commissioners

Agenda Item No.
12(B)2

From: George M. Burgess
County Manager

A handwritten signature in dark ink, appearing to read "Burgess", written over the printed name of George M. Burgess.

Subject: Report Regarding Miami-Dade County's "Buy Green" Purchasing Guide

At the Budget, Planning and Sustainability meeting of November 9, 2009, Chairwoman Sorenson requested that the Buy Green Purchasing Guide be updated to reference legislation the Board of County Commissioners has passed to enable and strengthen the Guide. The attached Buy Green Purchasing Guide has been updated to reflect enabling legislation on pages one and two.

Sustainability is meeting the needs of current generations without compromising the ability of future generations to meet their own needs. As the County population grows, it becomes increasingly important to maintain a high quality of life for residents and to protect natural resources. To ensure a healthy environment for residents and visitors alike, the County has launched many programs and projects to improve sustainability.

The County has been a leader in field of sustainability since the 1990s. These efforts include a commitment to purchasing environmentally preferred products and services. Environmentally preferred procurement means purchasing materials, products, and services in a manner that integrates fiscal responsibility, social equity, and environmental stewardship. The State of Florida enacted legislation in 1988 requiring "Any State agency or agency of a political subdivision of the State which is using State funds... to procure products or materials with recycled content when those products or materials are available at reasonable prices" (Section 403.7065 of the Florida Statutes). The objective of the state legislation was to develop a guide that encourages waste minimization.

In April 2003, the Board adopted Resolution R-374-03, establishing a County policy favoring waste-reduction, environmentally based promotional activities and purchasing of commodities containing recycled or recyclable content. The resolution also reestablished the Recycling Management Committee as the Miami-Dade Resource Conservation Committee. Implementation of a Buy Green purchasing guide will build on the work of these programs, helping the County meet and exceed the goals of sustainability.

Green purchasing programs are not only environmentally friendly, but are often cost effective and improve productivity. Numerous municipalities, counties, states, and the federal government have developed environmentally preferred purchasing policies. Private sector organizations are also leading the way in green sourcing initiatives throughout the supply chain. These entities made a strong commitment to the environment and have realized related savings. The benefits are visible in both direct and indirect savings/benefits:

- King County in Washington State realized a savings of over \$837,000 in 2008 by purchasing over \$54 million dollars in "green" products and services.
- Lee County, Florida, eliminated hazardous waste production in its fleet maintenance facilities and is saving \$17,000 annually.
- Santa Monica, California, switched to "green" cleaning products, eliminating 3,200 pounds of hazardous materials and reducing cleaning costs by five percent.
- Green purchases saved the Commonwealth of Massachusetts at least \$544,362 in Fiscal Year 2001; representing more than three times the cost of managing the program.
- Northrop Grumman, a private sector provider of security and military equipment, noticed a 1-2% drop in employee absenteeism and a higher employee retention rate after changing to third party certified, non-toxic janitorial chemicals for their cleaning services contracts. This effort was cost-neutral.

These short-, mid-, and long-term economic, health, and environmental benefits or savings are positive and are highly desirable benefits of a concerted Green purchasing enterprise initiative.

The establishment of a "Buy Green" purchasing guide will provide guidelines and procedures to facilitate environmentally friendly purchasing. This guide is also consistent with Board Resolution R-1053-09, favoring the purchase of green products and services for the County.

The key goals for the Buy Green guide are to:

- ⇒ reduce greenhouse gas (GHG) emissions to combat climate change,
- ⇒ decrease the use of hazardous materials to improve community and environmental health, and
- ⇒ decrease waste and inefficiencies in electricity, fuel, paper, water, and other consumption to relieve pressure on natural resources.

The County will advance in achieving these goals by implementing the "Buy Green" purchasing guide. The guide's purpose shall be to:

- purchase products and services that reduce greenhouse gas emissions, are durable and long-lasting, include recycled content and plant-based, organic material, use unbleached or chlorine free manufacturing processes, and are lead-free, asbestos-free, and mercury-free
- purchase products and services that reduce hazards to worker and community safety and minimize environmental impacts, toxics, and pollution
- procure products and services that help the County reduce waste and increase the efficiency and effectiveness of the County's consumption of water, fuel, paper, electricity, and other resources
- implement procurement evaluation practices that consider full life-cycle impacts of the commodities and services purchased

Adopting a "Buy Green" procurement guide and an affirmative procurement program will reduce the amount of waste generated and will increase the overall demand for environmentally preferred products. The County will also benefit from improved employee and public health, reduction in

energy consumption and GHG emissions, improved air and water quality, and conservation of natural resources. The development and implementation of a comprehensive Buy Green purchasing guide will serve as a model for other public entities and private sector companies.

Buy Green Guide Details

Most significantly, the guide requires environmental screening during solicitation development and prior to exercising any renewal to determine the availability of environmentally preferable alternatives. If environmentally preferable alternatives are available, the specifications may include both the traditional and green options.

Additionally, the guide identifies and defines commonly accepted environmental certifications for use in clearly identifying environmentally preferred products. The guide also emphasizes the importance of considering additional environmental attributes in making purchases.

The DPM Director shall develop and implement this guide for countywide purchasing. DPM will incorporate education into existing procurement training for County staff involved in the procurement process regarding the value of green purchases and environmentally preferable purchasing methods. Additionally, DPM will conduct vendor outreach to encourage contractors to provide green products and services.

Fiscal Impact

"Green" or environmentally-preferred products and services have less negative impacts on human health and the environment in comparison with competing products or services that serve the same purpose. In the long-term, many green products and services are more cost-effective than their conventional counterparts. Total cost of ownership analysis shows that environmentally preferred products and services can provide savings at different stages in the lifecycle:

- At time of purchase – remanufactured cartridges cost approximately 10% less
- During operation – Energy Star technology can save up to 75% in energy costs
- Over a product's lifetime – refillable pens, rechargeable batteries and bulk-packaged products end up costing much less than single-use disposables

Attachment


Assistant County Manager

MIAMI-DADE COUNTY BUY GREEN PURCHASING GUIDE

PURPOSE

This guide is established to provide environmentally preferable purchasing guidelines that support the County's progress towards comprehensive sustainability. The key goals of this guide are to:

- Reduce greenhouse (GHG) emissions to combat climate change
- Decrease the use of hazardous materials to improve community and environmental health
- Decrease waste and inefficiencies in resource use such as electricity, fuel, and water consumption in order to relieve pressure on natural resources.

To meet these goals, the County shall:

- purchase products and services that reduce greenhouse gas emissions, are durable and long-lasting, include recycled content and plant-based, organic material, and use unbleached or chlorine free manufacturing processes
- purchase products and services that reduce hazards to employee and community safety and minimize environmental impacts, toxics, and pollution
- procure products and services that reduce waste and increase the efficiency and effectiveness of the County's consumption of water, fuel, paper, electricity, and other resources

ENABLING LEGISLATION

The Miami-Dade County Board of County Commissioners has enacted several pieces of legislation directing environmentally-friendly purchases and programs. This Buy Green Guide facilitates implementation of this legislation. Below is a brief summary of legislation that has led to the development of this guide.

Green Procurement Program (Resolution R-1053-09)- Directs the County to prepare a "green" procurement preference program for the purchase of environmentally responsible products and services.

Life Cycle Costing Procedure (AO 11-3) - Requires life cycle analysis that considers maintenance, repair, energy costs and other expenditures associated with day-to-day operations for certain commodities.

Sustainable Buildings Program (Ordinance 07-65 and Implementing Order 8-8) - Established as the policy of Miami-Dade County the institution of sustainable development practices and measures into buildings owned, financed, and/or operated by the County. The Implementing Order guides the design, construction, renovation and maintenance of County buildings and requires the County's Department of Procurement Management to include appropriate language into procurement contracts to ensure compliance with the Sustainable Buildings Ordinance.

Gasoline Reduction (Resolution R-969-03) – Mandates the development and implementation of a plan to reduce the County's purchase of gasoline by three to five percent annually, with a goal of reducing the County's total gasoline consumption by 20% over the next five years. This includes modifying specifications for County fleet vehicles and equipment to achieve fuel efficiencies.

Electrical Energy Reduction (Resolution R-228-09) – Directs the Mayor to reduce electrical energy consumption in County Operations by 20% by 2014. A component of this legislation includes the establishment of a mandate to procure Energy Star qualified products for all purchases for which the Energy Star has established standards.

Resource Conservation Committee (Resolution R-702-05) – Establishes the following Countywide goals and requirements:

- Increase the percentage of County purchases of office goods containing recycled materials and/or identified as an environmentally preferred product.
- Increase the rate of participation in recycling by County agencies.
- Increase the overall percentage of the County's operational waste stream that is eliminated or diverted through recycling and conservation efforts.
- Reduce operational costs through environmentally-preferable products, services and practices.
- Requires the Department of Procurement Management to actively seek environmentally preferred products and services and develop expertise in the field of environmentally preferred purchasing.

Additional legislation related to the County's commitment to sustainability is available at <http://green.miamidade.gov>.

IMPLEMENTATION AND RESPONSIBILITIES

Department of Procurement Management (DPM)

- The DPM Director shall implement this guide in coordination with other DPM and client department personnel.
- DPM shall implement this guide in concert with the requirements of AO 11-3, Life Cycle Costing Procedure.
- DPM shall implement this guide in concert with the requirements of IO 8-8, Sustainable Buildings Program. DPM internal procedures shall reference this guide and incorporate best practices for soliciting products and services that meet the specifications of this guide.
- DPM shall conduct market research and include environmentally preferred options, when available, in all solicitation specifications and review with client departments
- Prior to exercising any Option to Renew (OTR), DPM shall conduct market research to ascertain the availability of environmentally preferred products or services. Should green products or services be identified, DPM shall evaluate the possibility of re-soliciting the contract to allow for inclusion of environmentally preferable product options.
- DPM shall develop and integrate standardized environmentally preferable procurement language into solicitation document templates and provide the standardized language to client departments so that they can be included in department-issued solicitations.
- DPM shall incorporate total life-cycle analysis into procurement evaluation practices.
- DPM shall incorporate training, education, and outreach programs regarding the Buy Green guide, including:
 - Education on the specifics of green products and services into existing procurement training for DPM staff, procurement liaisons and other relevant County staff.
 - Coordinate vendor outreach programs to encourage vendors to provide environmentally preferred products and services.

VENDORS

- Vendors shall certify that the sustainable attributes claimed in bids and proposals are accurate. Third party certification of products and services through reputable and

nationally or internationally accepted certification programs is preferred when such certification programs are available for specific commodities or services.

- As applicable, vendors shall quantify and provide proof that LEED and/or alternative green building criteria could be met with their services and products.

EVALUATION

The DPM Director and the Office of Sustainability Director (or their designees) shall periodically evaluate the guide's effectiveness and recommend amendments to this guide as necessary.

GUIDE SPECIFICATIONS

DPM staff shall include available sustainable products or services as options in solicitation specifications and review with client department(s). Pursuant to the key goals of this guide, the following are guidelines to work toward achieving those goals:

1. Energy and Water Savings

- A. Where applicable, energy-intensive products shall be purchased with the most up-to-date energy efficiency functions
 - I. All products purchased from product categories for which the Energy Star certification is available shall have a Energy Star certification. When Energy Star labels are not available, the County shall choose energy-efficient products that are in the upper 25% of energy efficiency as designated by the Federal Energy Management Program.
 - II. This includes, but is not limited to, lighting, commercial and industrial equipment, food service equipment, office equipment, electronics, appliances, and residential equipment.
 - III. Energy/fuel from renewable sources is preferable.
- B. Water-intensive products shall be purchased with the most up-to-date water-saving features.
 - I. All products purchased from product categories for which the EPA WaterSense certification is available shall meet WaterSense certification standards, whenever practical.
 - II. This includes, but is not limited to, high-performance fixtures like toilets, low-flow faucets and aerators, and upgraded irrigation systems.
- C. Electricity and fuel utilized during product or service delivery shall be minimized to reduce related emissions.
- D. Bulk ordering is encouraged instead of smaller, more frequent deliveries.
- E. Consider how the purchase of a product or service can help the County reduce fuel, electricity, and water consumption or GHG emissions.

2. Toxics and Pollution

- A. The County shall purchase or require janitorial contractors to supply industrial and institutional cleaning products that meet Green Seal or EcoLogo certification standards for environmental preference and performance.
- B. Compostable plant-based products, such as bags, film, food and beverage containers, and cutlery, which are broken down by bacterial decomposition and leave no toxic residue, e.g. methane gas, are encouraged.
- C. All surfactants and detergents shall be readily compostable or biodegradable and, when possible, shall not contain phosphates.
- D. The County shall reduce or eliminate the use of products that contribute to the formation of dioxins and furans. This includes, but is not limited to:

- I. Purchasing paper, paper products, and janitorial paper products that are unbleached or that are certified to be processed without chlorine or chlorine derivatives, whenever possible. The County will accept the Processed Chlorine Free (PCF) certification for recycled paper and Totally Chlorine Free (TCF) certification for virgin paper.
 - II. Prohibiting purchase of products that use polyvinyl chloride (PVC) such as, but not limited to, office binders, furniture, flooring, and medical supplies whenever practical.
 - E. The County shall purchase products and equipment with no lead, mercury or other heavy metals whenever possible. For products that contain lead or mercury, DPM shall give preference to those products with lower quantities of these metals and to vendors with established lead and mercury recovery programs. When evaluating the costs of purchasing items that contain lead or mercury, the costs of disposing them at the end of their useful life shall be included in comparison with alternate products that do not contain heavy metals.
 - F. The County shall purchase products and equipment without asbestos whenever possible.
 - G. The use of chlorofluorocarbon and halon-containing refrigerants, solvents and other products shall be phased out and new purchases of heating/ventilating/air conditioning, refrigeration, insulation and fire suppression systems shall not contain them.
 - H. When maintaining buildings, the County shall use products with low amounts of volatile organic compounds (VOCs), high recycled content, and low or no formaldehyde when purchasing materials such as paint, carpeting, adhesives, furniture and casework.
 - I. When purchasing vehicles, the County shall consider highest efficiency vehicles and those fueled by less-polluting alternatives such as, sustainably-sourced bio fuels, hybrids, electric batteries, and fuel cells, as available.
3. Source and Waste Reduction
- A. Refers to products and services that result in a net reduction in the use of initial resources or generation of waste compared to their previous or alternate version and includes durable, reusable and remanufactured products; products with low GHG emissions; products with no, or reduced, toxic constituents; and products marketed with no, or reduced, packaging.
 - B. Buyer Considerations
 - I. County Departments shall institute practices that reduce waste and result in the purchase of fewer products and cost-effectiveness, but without reducing safety or workplace quality.
 - II. All buyers shall consider short-term and long-term costs in comparing product alternatives. This includes an evaluation of total cost of ownership, including, but not limited to, acquisition, extended warranties, operation, supplies, maintenance, disposal costs and expected lifetime compared to other alternatives.
 - III. All buyers shall consider short-term and long-term environmental impact in comparing product alternatives. This includes a total life cycle analysis, including, but not limited to, environmental impact of raw material extraction, GHG emissions of transportation of raw materials to production, manufacturing processes, packaging, disposal of packaging materials, the distribution channel's GHG emissions, operation, maintenance, and ultimate disposal.
 - IV. Products that are durable, long lasting, reusable or refillable are preferred.

- V. Products that are remanufactured such as toner cartridges, tires, furniture, equipment and automotive parts are preferred, but without reducing safety, quality or effectiveness.
- C. Vendor considerations
 - I. Packaging that is reusable, recyclable or compostable is preferred.
 - II. Vendors shall be encouraged to take back and reuse pallets and other shipping and packaging materials and products that have reached the end of their useful life.
 - III. DPM shall encourage vendors to provide environmentally safe recycling and reuse options.
- 4. Recycled Content Products
 - A. All products for which the EPA has established minimum recycled content standard guidelines in the Agency's Comprehensive Procurement Guidelines, such as those for printing paper, office paper, janitorial paper, construction, landscaping, parks and recreation, transportation, vehicles, miscellaneous, and non-paper office products, shall contain the highest recycled content practical.
 - B. The County shall procure wood products such as lumber and paper for printing, office, or janitorial purposes that meet the standards of the Forest Stewardship Council (FSC) certification, or an equivalent/stricter third-party certification system.
 - I. The County encourages purchasing FSC-certified products that contain 100% post-consumer recycled material. This is known as the "FSC 100% Recycled" label.
 - II. If "FSC 100% Recycled" products are unavailable or do not meet cost differential guideline, the County shall purchase FSC-certified products that contain the maximum possible percentage of post-consumer recycled material and material from FSC-certified sustainably managed forests. This is known as the "FSC Mixed Sources with Recycled Content" label.
 - III. If "FSC Mixed Sources with Recycled Content" products are unavailable, the County encourages purchasing products that contain 100% material from FSC-certified sustainably managed forests. This is known as the "FSC 100%" label.
 - C. Paper, paper products and construction products made from non-wood, plant-based materials such as plant-based material or other recycled/recovered material are also encouraged.
 - D. Recycled content shall be included in products that also meet other specifications, such as chlorine free or certified sustainable.
 - E. Copiers and printers purchased shall have duplexing capabilities and shall be compatible with the use of recycled content and remanufactured products.
 - F. When specifying asphalt concrete, aggregate base, or Portland cement concrete for road construction projects, the County shall use recycled, reusable or reground materials.
 - G. The County shall specify and purchase recycled content transportation products, including signs, cones, parking stops, delineators, channelizers and barricades, which shall contain the highest recycled content practical, but no less than the minimum recycled content standards established by the U.S. EPA Comprehensive Procurement Guidelines.
 - H. All informational, marketing, and educational materials distributed by the County that contain recycled content shall include a statement that the paper has recycled content. The statement should indicate the percentage of pre and post-consumer recycled content it contains and the certifications it has been awarded.

- I. DPM shall identify all applicable sustainable products and services on its award sheets.

GUIDE EXCEPTIONS

Conventional products or services may be purchased if it is determined that:

- The environmentally-preferred product or service does not meet the client department's requirements; or
- The Price Premium Differential is over ten percent 10% for the life cycle of the good or service; and it is determined that the good or product is essential to the operation of the Department. Written justification from the Department director shall be required; or
- DPM finds that the purchase of the environmentally preferred product or service would create a financial burden; or
- The environmentally preferred product or service is unavailable; or
- The environmentally preferred product or service is not safe; or
- For emergency purchases fully justified as such.
- Nothing contained in this guide shall be construed as requiring a department to procure products that do not perform adequately for their intended use or are not available at a reasonable price in a reasonable period of time.

Appendix 1

DEFINITIONS

Biodegradable: Organic material that is broken down by living organisms. Material can be degraded aerobically, with oxygen, or anaerobically, without oxygen.

Buyer: Anyone authorized to purchase or contract for purchases on behalf of Miami-Dade County.

Compostable: Organic material that is broken down by bacterial decomposition, in the presence of oxygen, at a reasonable rate of decomposition (usually 90 days or less), leaving no toxic residue.

Dioxins and furans: A group of chemical compounds that are classified as persistent, bioaccumulative, and toxic by the United States Environmental Protection Agency (EPA).

Chlorine-Free (or Processed Chlorine Free): Products processed without chlorine or chlorine derivatives.

Energy-intensive Products: Products, where its use or its manufacturing process, utilize an extensive amount of energy.

Environmentally Preferable Products/Services: A product or service that has a reduced negative effect or increased positive effect on human health and the environment.

Postconsumer Recycled Material: A material or finished product that has served its intended end-use (completed its life as a consumer item) and then diverted or recovered from the waste stream to be utilized for another end-use (i.e. recycled). Postconsumer recycled materials are part of the broader category of recovered materials.

Preconsumer Recycled Material: Material or by-products generated after manufacture of a product is completed but before the product reaches the end-use consumer. Preconsumer recycled material does not include mill and manufacturing trim, scrap, or broke which is generated at a manufacturing site and commonly reused on-site in the same or another manufacturing process. Preconsumer recycled material includes items such as print overruns, over issue publications, and obsolete inventories.

Practical (includes terms "available," "feasible," or "possible"): Without reducing safety, quality, or product effectiveness; available in a timely manner at a reasonable price and sufficient in performance.

Price Premium Differential: The price difference between a comparable sustainable product or service and a conventional product or service.

Recovered Material: Waste materials and byproducts that have been recovered or diverted from solid waste, but do not include materials and byproducts generated from, and commonly reused within, an original manufacturing process.

Recycled Content Product: A product that contains recovered materials or either preconsumer or postconsumer recycled materials.

Remanufactured Product: Any product diverted from the waste stream by refurbishing and marketing said product without substantial change to its original form.

Sustainable or Sustainability: Meeting the needs of current generations without compromising the ability of future generations to meet their own needs

Total Life Cycle Analysis: The comprehensive examination of a product or service's total life cycle impact on the environment. This examination includes all environmental and economic factors of a product or service throughout its lifetime, from the acquisition of raw materials, packaging, transport, use and final disposal.

Water-intensive Products or Services: Products or services where the use of the product or the manufacturing process of the product utilizes a taxing amount of water or is wasteful in its use of water.

Appendix 2

STANDARDS AND CERTIFICATIONS

Comprehensive Procurement Guidelines: The EPA provides Comprehensive Procurement Guidelines (CPG) that are updated every two years. Through the CPG, the EPA designates items that must contain recycled materials when purchased with appropriated federal funds by federal, state, and local agencies. www.epa.gov/cpg

Energy Star: Sponsored by the US Department of Energy and the EPA, Energy Star labels products such as computer components, electronic devices and many other products that exceed energy efficiency standards. www.energystar.gov

Federal Energy Management Program: A program of the US Department of Energy that issues a series of *Product Energy Efficiency Recommendations* that identify recommended efficiency levels for energy-using products. The Federal Energy Management Program (FEMP) facilitates the federal government's implementation of sound, cost-effective energy management and investment practices to enhance the nation's energy security and environmental stewardship. www.eere.energy.gov/femp/

Forest Stewardship Council (FSC): A globally recognized non-profit organization devoted to encouraging the responsible management of the world's forests. The FSC certification system endorses sustainably managed forests and the products that those forests produce according to rigorous standards developed by a broad variety of stakeholder groups. <http://www.fscus.org/>

Green Seal: Green Seal is a nationally recognized nonprofit organization that certifies a variety of environmental products that pass stringent testing standards. Approved products carry a Green Seal logo that is well recognized throughout industry and government as a leading environmental standard. Green Seal bases its work on thorough, state-of-the-art scientific evaluations using internationally accepted methodologies. Product evaluations are conducted using a life-cycle approach to ensure that all significant environmental impacts of a product are considered, from raw materials extraction through manufacturing to use and disposal. www.greenseal.org

Leadership in Energy and Environmental Design (LEED): Developed by the U.S. Green Building Council (USGBC), LEED is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. <http://www.usgbc.org>

Processed Chlorine Free (PCF): A certification for recycled content paper. PCF papers have not been bleached with chlorine containing compounds. PCF certified paper must have a minimum of 30% post-consumer content. <http://www.chlorinefreeproducts.org/marks.htm>

Totally Chlorine Free (TCF): A certification for virgin fiber papers. TCF papers do not use pulp produced with chlorine or chlorine containing compounds as bleaching agents. <http://www.chlorinefreeproducts.org/marks.htm>

United States Environmental Protection Agency (EPA): The EPA develops and enforces regulations that implement environmental laws enacted by the United States (US) Congress. The EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and tribes the responsibility for issuing permits and for monitoring and enforcing compliance. www.epa.gov

The U.S. Green Building Council (USGBC)- A non-profit community of leaders working to make green buildings available to everyone within a generation. <http://www.usgbc.org>

WaterSense: A partnership program sponsored by the EPA that seeks to protect the nation's water supply by promoting water efficiency and enhancing the market for water-efficient products, programs, and practices. The WaterSense label indicates that the products meets water efficiency and performance criteria. WaterSense labeled products will perform well, help save money, and encourage innovation in manufacturing. <http://www.epa.gov/watersense/index.htm>

STANDARD CONSTRUCTION
GENERAL CONTRACT CONDITIONS



RPQ NO. TP-0000027284

STANDARD CONSTRUCTION
GENERAL CONTRACT CONDITIONS
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[NOTE: THIS STANDARD CONSTRUCTION GENERAL CONTRACT CONDITIONS HAVE BEEN PREPARED FOR USE IN ALL CONSTRUCTION (DESIGN-BID-BUILD) CONTRACTS AND OTHERWISE IN ACCORDANCE WITH IMPLEMENTING ORDER 3-57.

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1. DEFINITIONS

Addendum/Addenda: A modification or clarification of the Contract Documents distributed to prospective Bidders prior to the opening of Bids.

Administrative Orders/Implementing Orders (AO/IO): a list of Miami-Dade County Administrative Orders and Implementing Orders is available online at:

<http://www.miamidade.gov/ao/home.asp?Process=completelista> Advertisement for Bids: The public notice inviting the submission of Bids for the Work.

Allowance Account (Contingency Account): Account in which a stated maximum dollar amount is included in the Contract for the purpose of funding, at the sole discretion of the Owner, unforeseen and/or changed conditions or extra work arising during the prosecution of the Work or any other changes issued by the Owner. The scope and limitations regarding use of the Allowance Account are contained in the Contract Documents. The performance of any work under this Allowance Account, shall be authorized by a written Work Order issued by the Owner.

Allowance Account(s) (Dedicated): Account(s) in which stated maximum dollar amount(s) are included in the Contract for the purpose of funding specific pre-identified items of work at the sole discretion of the Owner. The scope and limitations regarding use of the Dedicated Allowance Account(s) are contained in the Contract Documents.

Architect/Engineer: Owner or its authorized representatives identified in the Notice-to-Proceed letter, which may include but is not limited to the Owner's Resident Architect/Engineer, the Construction Manager, the Owner's representatives, and the Architect/Engineer of Record. In the event an Architect/Engineer is not employed on the project, or an Architect/Engineer is not otherwise specified in the Notice-to-Proceed, the term shall be read as coterminous with the term "Owner."

Art in Public Places: Miami-Dade County program established in Miami-Dade County Code Section 2-11.15 providing a one and a half percent (1.5%) of each County project's construction and engineering design cost to fund a public art component within the Project. Coordination and installation of the Artist's work is included as part of the scope of the Contractor's services to the extent that it is defined in the Bid Documents. The cost of this program is budgetary, funded by the Department, and shall not be included in the Contractor's bid.

Artist: Person(s) chosen through the Art in Public Places program to design and fabricate or specify an integrated work of art for the Project. The term Artist as may be referred to in the Contract Documents means the Artist and/or their authorized representative.

As-Built Documents: Documents signed and sealed by an appropriately licensed professional and submitted by the Contractor during and/or upon completion of the Contract reflecting actual installed/built conditions and all changes made in the Contract Documents during the construction process and showing the exact dimensions, geometry, location, identification and such other information as required by the Contract Documents and/or Architect/Engineer for all elements of the work completed under the contract (also referred to as "As-Built Drawings" or "As-Builts"). Final payment is conditional upon the receipt of As-Built Documents.

Award: Action taken by the Owner to accept the Bid submitted by the Contractor to perform the Work described in the Contract Documents.

Baseline Construction Schedule: A schedule submitted by the Contractor in accordance with the Contract Documents, reviewed and approved by the Owner that is used by the Contractor to plan the performance of the Work. The Contract Documents may require interim Baseline Construction Schedules be submitted for only a portion of the initial Work to be followed by a Baseline Construction Schedule covering all the Work. The Baseline Construction Schedule shall also be used to quantify delays in accordance with the Contract Documents. While the Baseline Construction Schedule remains unchanged, updates to the Baseline Construction Schedule are prepared and submitted by the Contractor per the Contract Documents. The Baseline Construction Schedule shall only be revised and submitted again for review and approval by the Owner as required by the Contract Documents.

BCC: Board of County Commissioners, the governing board of Miami-Dade County.

Beneficial Occupancy: The point at which the Owner or Architect/Engineer determines that the Work or any portion thereof can be occupied from a regulatory and work function standpoint prior to Substantial Completion of the Work. Beneficial Occupancy will not relieve the Contractor of any of its obligations relative to Substantial Completion, or of its responsibility to fully complete the Work in accordance with the Contract Documents.

Bid: The written offer of a Bidder to perform the Work.

Bid Documents: The Advertisement for Bids, Instructions to Bidders, Bid Form, Bid Security, Construction Contract, all contractual forms, General Conditions, Special Provisions, Technical Specifications and Contract Drawings, together with all Addenda and any other applicable standards, regulations, laws and permits as described within these other documents which may be incorporated by reference.

Bid Item: A specific item of work represented by a line item in the Bid Form.

Bid Form: The form on which Bids are submitted.

Bid Security: (Also known as Bid Bond) The cashier's check, certified check or bid bond, accompanying the Bid and submitted by the prospective bidder, as a guarantee that the prospective bidder will enter into a contract with the Owner for the performance of the Work and furnish acceptable bonds and insurance if the Contract is awarded to him.

Bidder: An individual, firm, partnership, corporation, or combination thereof, submitting a Bid for the Work.

Certificate of Substantial Completion: Certificate issued to the Contractor by the Owner certifying that Substantial Completion has been achieved.

Certificate of Completion: Certificate issued by the local building official providing proof that a structure or system is complete and, for certain types of permits, is released for use and may be connected to a utility system. This certificate does not grant authority to occupy a building, such as a shell building, prior to the issuance of a Certificate of Occupancy by the local building official.

Certificate of Final Acceptance: Certificate issued to the Contractor by the Owner certifying that Final Acceptance has been achieved in accordance with the definition reflected herein (see Final Acceptance definition).

Certificate of Occupancy: Certificate issued by the local building official after the building official inspects the building or structure and finds no violations of the provisions of applicable codes or other laws that are enforced by the local building department.

Change Notice: A document issued by the Architect/Engineer or Owner to the Contractor specifying a proposed change to the Contract Documents and requesting a price proposal from the Contractor, if applicable, within a specified time period.

Change Order: A written agreement executed by the Owner, the Contractor and the Contractor's Surety, covering modifications to the Contract Documents.

Claim: A Claim should include any request for additional compensation, time, or other relief arising out of or relating to the Contract Documents, including without limitation, requests for equitable adjustments and breach of contract.

Commissioning: A quality-focused process for enhancing the delivery of a project. The process focuses upon verifying and documenting that all of the commissioned systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements.

Construction Staging Area: Property which may be available for use by the Contractor during the construction period for the purpose of storing products and construction equipment and for the purpose of staging the Work. The construction staging area(s), if applicable, are defined in the Contract Documents.

Construction Contract: The agreement executed by the Contractor and the Owner covering the performance of the Work including the furnishing of labor, superintendence, materials, tools, and equipment as indicated in the Contract Documents. The term "Contract" shall have the same meaning.

Construction Inspection Services: Services performed by the Owner or a consultant to the Owner to verify that the Work is being performed in accordance with the Contract Documents. The use of these services shall not relieve the Design/Builder of their responsibilities under the Contract Documents.

Consultant: See Architect/Engineer.

Contract Documents: Bid Documents, Contract Summary, General Conditions, Special Conditions, Technical Specifications, Change Orders, Payment and Performance Bonds, Work Orders, Approved Schedules, Approved Shop Drawings and Approved Working Drawings.

Contract Drawings: The plans, profiles, cross-sections, elevations, schedules, and details which show locations, character, dimensions, and details of the Work. Contract Drawings are confidential under the Florida Public Records Act and the Contractor is responsible for maintaining confidentiality during and after the progress of the Work.

Contractor: The individual, firm, partnership, or corporation, or combination thereof, private, municipal, or public, including joint ventures, duly licensed under Florida Statutes, which, as an independent Contractor, has entered a Contract with Miami-Dade County, who is referred to throughout the Contract Documents by singular in number and masculine in gender.

Contract Summary: The written agreement between the County and the Contractor for performance of the Work in accordance with the requirements of the Contract Documents and for the payment of the agreed consideration.

Contract Time: The number of days allowed for completion of the Work commencing with the effective date of Notice to Proceed and ending with the date of Substantial Completion or Final Completion, including completion of punch list items, as determined by the Owner or the Owner's designee. The Contract Time will be stipulated in the Contract Documents unless extended by a Change Order or by a Work Order.

County: See Owner.

County Mayor: The Mayor of Miami-Dade County, Florida, or the County Mayor's designee.

Critical Path: Longest sequence of activities in a project's schedule which defines the project completion date and which must be completed on time in order for the project to be completed on schedule.

Delays: May be Excusable or Non-Excusable. Excusable Delays may be Compensable or Non-Compensable, as further defined within the text of these General Conditions.

Days: Unless otherwise designated, days mean calendar days.

Department Director: The Director of the Miami-Dade County Department implementing the work or the Director's designee.

Department Director's Representative: The person or persons designated by the Department Director to act on his behalf in the administration of the contract within the limits of their respective authorization.

Direct Costs: Direct Costs recoverable by the Contractor as a result of changes in the Work shall be limited to the actual additional costs of labor and materials installed as part of the Work and for the reasonable additional cost of rental of any Special Equipment or Machinery. Labor shall be limited to site labor costs, including Employer's Payroll Burden. Specifically excluded from labor are the costs of general foremen and site office personnel. Materials are limited to permanent materials required by the Contract Documents and materials approved by the Architect/Engineer as necessary to install the permanent materials in an efficient and workmanlike manner. For special equipment or machinery not listed in said document, the Contractor shall be paid a rental rate corresponding to the average prevailing rental rate for such equipment or machinery in Miami-Dade County, Florida, subject to approval by the Architect/Engineer. No additional payment shall be made to the Contractor for fuel, lubricants, for wear and tear, transportation, insurance, or depreciation. Any equipment or machinery not designated by the Architect/Engineer as special equipment and machinery shall be considered Overhead.

Extra Work: Work not provided for in the Contract Documents as awarded or as previously modified by Change Order or Work Order but found to be essential to the satisfactory completion of the Contract within its intended scope.

Facility: The structure or items being constructed under the Contract, inclusive of all subsurface work, landscaping work, and other ancillary work. Field Representative/Construction Manager: An authorized representative of the Owner that may provide administrative and construction inspection services during the pre-construction, construction, and closeout phases of the Contract and through which the orders of the Owner shall be given. The Field Representative has no authority to modify or waive any provision of the Contract Documents.

Fast Track: A design/build method where separate and often, intermediate phases of the Project are designed, permitted and constructed earlier in the schedule while the remainder and often, more complex portions of the Project are designed, permitted and constructed later in the schedule. For example, foundation design, permitting and construction earlier while the remainder of the structure takes longer to design, permit and construct. Fast-track construction is subject to the approval of the Owner and the permitting agencies.

Final Acceptance: The formal written acceptance by the Owner of the completed work.

Final Completion: Point in time when the Owner determines that all physical Work has been completed in accordance with the Contract Documents and all deficiencies listed within the Certificate of Substantial Completion and/or Punch List elements have been corrected to the satisfaction of the Owner and Architect/Engineer. Where the contract requires that Contractor provide the Owner with spares or surplus

material, provision of same in accordance with the Contract Documents shall be an additional requirement for Final Completion (See Article 8 Contract Time Paragraph D. Substantial Completion, Final Completion and Final Acceptance).

Force Account: A method of payment measured by actual cost of the labor, materials, and equipment plus the contractual approved mark-up for Indirect Costs, as distinct from other payment methods such as lump sum or unit price, for Extra Work ordered by Change Order and/or Work Order (See Article 10 Changes Paragraph G. Force Account).

Force Majeure: Force Majeure as used herein shall mean Acts of God, strikes, lockouts, any late delivery of the Owner's supplied material and equipment due to transportation delays beyond Department's control, or other industrial disturbances; acts of public enemy, blockades, wars, insurrections, or riots; epidemics, landslides, earthquakes, fire, storms, floods, or washouts; arrests, title disputes, or other litigation; governmental restraints, either Federal or County, civil or military; civil disturbances; explosions; nationwide inability to obtain necessary materials or equipment, supplies, labor, or permits whether due to existing or future rules, regulations, orders, laws, or proclamations, either Federal, State or County, civil or military, or otherwise; and other causes beyond the control of the Department or County, whether or not specifically enumerated herein. Changes in the market price of goods, materials, equipment, labor, or supplies shall not be considered an instance of Force Majeure, and Contractor's bid shall include all risks of market changes the price of such things. COVID-19 or any other catastrophic event shall not be considered a Force Majeure event. Changes in the County's Responsible Wage Ordinance wage rates shall not be considered as Force Majeure events.

Furnishing: Manufacturing, fabricating, or purchasing and delivering to the site of the Work materials, plant, power, tools, patterns, supplies, appliances, vehicles, and conveyances necessary or required for the completion of Work.

General Conditions: This section of the Contract Documents which specifies, in general, the contractual conditions.

Green Building Practices: Environmentally and socially-conscious practices that emphasize processes and methods of design and construction that reduce exposure to noxious materials, conserve non-renewable energy and scarce materials, minimize life-cycle ecological impact of energy and materials, employ renewable energy or materials that are sustainably harvested, protect and restore local air, water, soils, flora and fauna, and support pedestrians, bicycles, mass transit and other alternatives to fossil-fueled vehicles.

Indirect Costs: Overhead.

Installation, Install or Installing: Completely assembling, erecting, and connecting material, parts, components, supplies and related equipment specified or required for the completion of the Work including the successful passing of all tests so that they are fully functional.

LEED (Leadership in Energy and Environmental Design): An ecology-oriented building certification program run under the auspices of the U.S. Green Building Council (USGBC) which concentrates its efforts on improving performance across five key areas of environmental and human health: energy efficiency, indoor environmental quality, materials selection, sustainable site development, and water savings.

Limit of Work: Boundary within which the Work is to be performed.

Liquidated Damages: The amount that the Contractor accepts, as stipulated in the Contract Documents, which will be deducted from the Contract Sum for each day of delay due to a Non-Excusable Delay. The Liquidated Damages set forth herein are compensation for the County's inability to timely put the project

into service, the continued disruption of County functions, for impacts to the County's reputation, and other indirect damages which the parties agree are difficult to measure. (See Article 8 Contract Time Paragraph F. Liquidated Damages and Liquidated Indirect Costs).

Liquidated Indirect Costs Rate: The amount, stipulated in the Contract Documents, which will be added to the Contract Sum for each day of delay due to a Compensable Delay. The Contractor accepts this sum as full compensation for the Contractor's and all its subcontractors', of any tier, for indirect costs, for each day of Compensable Delays. This amount is agreed to include any costs other than Direct Costs incurred by the Contractor and all its subcontractors of any tier in the performance of this Contract. (See Article 8 Contract Time, Paragraph F. Liquidated Damages and Liquidated Indirect Costs)

Lump Sum Bid Item: A bid item in which quantity is not separately measured for payment in units but rather is based on the amount bid by the Contractor as indicated in the Bid Form and made a part of the Contract. Partial payments of Lump Sum Bid Items will be conditionally made, based upon an approved schedule of values, and will be subject to reconciliation in the event that the work of a Lump Sum Bid Item is not fully completed in accordance with the requirements of the Contract Documents.

Miami-Dade County (MDC): A political subdivision of the State of Florida, the Owner.

Miami-Dade County Code of Ordinances: Central repository for Governing Legislation where Ordinances are codified and kept current with subsequent amendments. The Miami-Dade County Code of Ordinances can be viewed at the following hyperlink:

<https://library.municode.com/fl/miami-dade-county/codes/code-of-ordinances>

Milestone: A completion date as defined in the Contract Documents.

Notice to Proceed: Written notice from the Owner to the Contractor specifying the date on which the Contractor is to proceed with the Work and on which the Contract Time commences to run.

Notice of Termination: Written notice from the Architect/Engineer or the Owner to the Contractor to permanently stop work under the Contract on the date and to the extent specified in the notice. The Notice of Termination includes Notices of Termination for Convenience, Default and National Emergencies as set forth in the Contract Documents. Upon receipt of such notice, the Contractor shall comply with the termination provisions of this Contract.

Overhead (Indirect Costs): Overhead, also defined as "Indirect Costs," includes any and all costs other than Direct Costs. The term "Overhead" as indicated in this definition shall apply to both Contractors and subcontractors of any tier. Overhead includes, but is not limited to, all profit and costs associated with: project bond premiums, project insurance premiums, costs of supervision, coordination, superintendents, general foremen, consultants, schedulers, cost controllers, accountants, office administrative personnel, time keepers, clerks, secretaries, watch persons, small tools, equipment or machinery, utilities, rent, telephones, facsimile machines, computers, word processors, printers, plotters, computer software, all expendable items, job site and general office expenses, extended jobsite general conditions, interest on monies retained by the Owner, escalated costs of materials and labor, impact cost on unchanged work, inefficiency, decreased productivity, home office expenses or any cost incurred that may be allocated from the headquarters of the Contractor or any of its subcontractors, loss of any anticipated profits, loss of bonding capacity or capability losses, loss of business opportunities, loss of productivity on this or any other Project, loss of interest income on funds not paid, costs to prepare a bid, cost to prepare a quote for a Change in the Work, costs to prepare, negotiate or prosecute claims, costs of legal and accounting work,

costs spent to achieve compliance with applicable laws and ordinances, loss of Projects not bid upon, loss of productivity or inefficiencies in the Work from any cause.

Owner: Miami-Dade County, whose governing body is the BCC acting in its proprietary capacity through its duly authorized agents. When these Contract Documents require the action of individual persons, the documents contain specific references to these persons. In particular, the documents shall refer to the BCC when approval of the BCC is specifically required and to the Architect/Engineer when the Architect/Engineer's approval is specifically required.

Payment and Performance Bond: Bond executed by the Contractor and its Surety assuring that the Contractor will, in good faith, perform and guarantee the work in full conformity with the terms of the Contract Documents and will promptly pay all persons supplying the Contractor with labor, materials, or supplies, used directly or indirectly by the Contractor in the prosecution of the Work. This bond shall be a single instrument bond for twice the penal sum (to cover 100 percent of the total maximum contract amount for payment-related issues and 100 percent of the total maximum contract amount for performance-related issues).

Project: See definition for Work.

Punch List: A list issued by the Owner to the Contractor of work elements requiring remedial action or completion by the Contractor before Final Completion is issued to the Contractor.

Resolution: An action taken by a vote of the Miami Dade County Board of County Commissioners setting policy and providing guidance to County Departments. Resolutions issued after 1995 can be viewed at the following hyperlink: <http://www.miamidade.gov/govaction/searchleg.asp>. Earlier Resolution can be obtained through request to the Clerk of the Board Division, Stephen P. Clark Center, 111 NW 1st Street, Suite 17-202 Miami, Florida 33128.

Right-of-Way: A term denoting land and property, and interests therein, owned or acquired by the Owner.

Schedules: All schedules delivered under the Contract including time schedules and schedule of values.

Schedule of Values: A detailed cost breakdown of each lump sum bid item in the bid form, submitted by the Contractor at the beginning of the Work and to be used as a basis to determine monthly progress payments and quantity adjustments within the constraints specified in the Contract Documents.

Shop Drawings: Documents furnished by the Contractor for approval by the Architect/Engineer to illustrate specific portions of the Work. Shop Drawings include drawings, diagrams, illustrations, calculations, schedules, tables, charts, brochures and other data describing design, fabrication and installation of specific portions of the Work. Shop Drawings are understood to be submitted for information purposes only, and the County's receipt of or acceptance of shop drawings shall not be deemed as the County agreeing that the selected materials will meet contract requirements or that the selected means and methods are appropriate; the Contractor shall at all times remain responsible for completion of the work in accordance with the contract documents, notwithstanding any approved shop drawings. .

Site, Project Site, Work Site, Construction Site, Job Site: The location(s) at which the work under this Contract is to be accomplished, as shown in the Contract Documents.

Special Provisions: Section of the Contract which includes specific contractual requirements not covered in the General Conditions that are specific to the Project.

Small Business Enterprise – Architect/Engineer (SBE -A&E) Program: Architect/Engineering firms that are certified with Miami-Dade County Small Business Enterprise program

Small Business Enterprise – Construction (SBE -CON) Program: Construction firms that are certified with Miami-Dade County Small Business Enterprise program

Small Business Enterprise – GOODS (SBE -GOODS) Program: Goods, Manufactures, and Wholesalers firms that are certified with Miami-Dade County Small Business Enterprise program

Small Business Enterprise – SERVICES (SBE -SERVIES) Program: Services firms that are certified with Miami-Dade County Small Business Enterprise program

Special Provisions: Section of the Contract Documents which includes specific contractual requirements not covered in the General Conditions that are specific to the Project.

Subcontractor: Any person or entity, other than the employees of the Contractor, supplying the Contractor with labor, materials, supplies and/or equipment used directly or indirectly by the Contractor in the prosecution of the Work.

Substantial Completion: Substantial Completion of a Project is the date on which the Owner certifies that the construction is sufficiently completed, in accordance with the Contract Documents, as modified by any Change Orders, so that the Owner can occupy the Project for the use for which it was intended. A certificate shall be issued to the Contractor by the Owner upon achievement of Substantial Completion. (See Article 8 Contract Time Paragraph D. Substantial Completion, Final Completion and Final Acceptance)

Surety: The bonding company or companies furnishing the bonds required of a Bidder and of the Contractor.

Technical Specifications: The general term comprising all the written directions, provisions and requirements contained herein, entitled "Technical Specifications," those portions of standard specifications to which reference is specifically made in the Technical Specifications, and any Addenda, Work Orders and Change Orders that may be issued for the Contract, all describing the work required to be performed, including detailed technical requirements as to labor, materials, supplies and equipment and standards to which such work is to be performed as well as any reports specifically issued with the Bid Documents and specifically identified in the Instructions to Bidders which may include geotechnical or other technical reports.

Temporary Construction Easement Line: A boundary which describes additional areas which may be made temporarily available for construction operations.

Time Contingency: The maximum time specifically identified in the Contract Documents by which the Owner may extend the contract time to accomplish the work without a change order. Limitations on the use of the time contingency are set forth in the Contract Documents.

Unit Prices: Unit prices shall include all labor, materials, tools, and equipment; all other direct and indirect costs necessary to complete the item of Work and to coordinate the unit price Work with adjacent work; and shall include all overhead and profit. Contractor shall accept compensation computed in accordance with the unit prices as full compensation for furnishing such Work.

Work: The construction and services required by the Contract Documents, which includes all labor, materials, equipment, and services to be provided by the Contractor to fulfill the Contractor's duties and obligations imposed by the Contract Documents or, if not specifically imposed by the Contract Documents, which can be reasonably assumed as necessary to fulfill the intent of the Contract Documents to provide a complete, fully functional, and satisfactory project.

Work Order: A written order, authorized by the Architect/Engineer or Owner, directing the Contractor to perform work under a specific Allowance Account or directing the Contractor to perform a change in the Work that does not have a monetary impact, including but not limited to, extending the Contract Time or subject to the payment of Liquidated Indirect Costs if entitlement is established as required by these Contract Documents. No Work Order may increase the Contract Sum.

END OF ARTICLE

2. INTERPRETATION

- A. The intent of the Contract is to include all necessary items for the proper completion of the Work by the Contractor so the Owner may have a fully functioning facility and fully receive the benefits intended under the Contract. The Contractor shall perform, without additional compensation, such incidental, implied, or appurtenant work as necessary to complete the Work and fulfill the design intent, in accordance with the requirements set forth in the Contract Documents, so that it will meet the requirements for which the Project was intended, in a satisfactory and workmanlike manner.
- B. The Contract Documents and all referenced standards cited are essential parts of the Contract requirements. A requirement occurring in one is as binding as though occurring in all. The documents comprising the Contract Documents are complementary and indicate the construction and completion of the Work. Anything mentioned in the Contract Documents and not shown on the Contract Drawings or shown on the Contract Drawings and not mentioned in the Contract Documents, shall be of like effect as if shown or mentioned in both. The more stringent shall apply in the case of a conflict. The Owner's determination of the more stringent standard shall control and be binding on the contractor, without limitation, and the Contractor's compliance with this determination shall not be considered as Extra Work.
- C. Site Inspections and Verification of Governing Dimensions: In executing the contract, the Contractor represents that he has, prior to bid, visited the site, become familiar with the conditions under which the work is to be performed and correlated his personal observations with the requirements of the Contract Documents or that he has chosen not to do so, in the event that a mandatory site visit is not specified in the Contract Documents. The Contractor accepts the responsibility for all errors in construction which could have been avoided by such examination and the opportunity to seek timely clarifications during the bidding process. The Contractor, before commencing work, shall verify all governing dimensions at the site, all conditions under which the work is to occur, including but not limited to site access, lay down and staging areas, the presence of known utilities and utility connections, and shall examine all adjoining work on which his work is in any way dependent for its conformance with the intent of the Contract Documents and no disclaimer of responsibility for defective or non-conforming adjoining work will be considered unless notice of same has been filed by the Contractor, and agreed to in writing by the Owner through the Architect/Engineer before the Contractor begins any part of the Work. No disclaimer for defective or non-conforming adjoining work that was clearly foreseeable to the Contractor during a site visit (mandatory or non-mandatory) will be considered by the Owner. The County does not warrant or guarantee the presence or absence of any particular site conditions, or the accuracy of any as-built information related to existing work in-place on the site. To the extent provided by or in the possession of the County, subsurface reports, soil borings, and as-builts are solely for the Contractors consideration and use, and the County does not represent that such materials accurately reflect the conditions of the Site.
- D. Errors, Inconsistencies and Omissions: The Contractor shall carefully study and compare all drawings, Contract Documents, and other instructions; shall verify all figures on the Contract Drawings before laying out the Work; shall notify the Owner or Architect/Engineer of all errors, inconsistencies, or omissions which he may discover; and obtain specific instructions in writing during the bidding process and prior to submitting his Bid. The Contractor shall not take advantage of any apparent error or omission which may be found in the Contract Drawings or Contract Documents, and the Architect/Engineer shall be entitled to make such corrections therein and interpretations thereof as he may deem necessary for the fulfillment of their intent. The Contractor shall be responsible for all

errors in construction which could have been avoided by such examination and notification, and shall correct, at his own expense, all work improperly priced, scheduled or constructed through failure to notify the Owner or Architect/Engineer and to request specific instructions.

- E. Where "as indicated," "as detailed," or words of similar import are used, it shall be understood that the reference is made to the Contract Documents unless stated otherwise.
- F. References to Articles or Sections include sub-articles or subsections under the Article referenced.
- G. Referenced Standards: Material and workmanship specified by the number, symbol, or title of a referenced standard shall comply with the latest edition or revision thereof and amendments and supplements thereto in effect on the date of the Invitation to Bid except where otherwise expressly indicated. In case of a conflict between the Contract Documents and the referenced standard, the Contract Documents shall govern.
- H. Order of Precedence of Contract Documents: Unless otherwise provided for in the Special Provisions or required by law, the order of precedence of the Contract Documents will be as follows:
 - 1) Change Orders to the Contract
 - 2) Notice to Proceed
 - 3) Contract
 - 4) Addenda
 - 5) Special Provisions
 - 6) General Conditions
 - 7) Referenced Codes and Standards
 - 8) Technical Specifications
 - 9) Contract Drawings
 - 10) Guarantees
 - 11) Instructions to Bidders
 - 12) Invitation to Bid
 - 13) Other documents
- I. In case of differences between small- and large-scale drawings, the drawings showing greater detail shall govern. The Owner's determination of the more detailed shall control and be binding on the contractor, without limitation, and the Contractor's compliance with this determination shall not be considered as Extra Work. Schedules on drawings shall take precedence over conflicting notations on drawings. In the event of discrepancy between any scaled dimensions on drawings and the figures written thereon, the figures shall govern over the scaled dimensions unless otherwise indicated.
- J. Explanations: Should it appear that the Work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Contract Documents, the Contractor shall apply to the Owner or Architect/Engineer in a timely manner to allow sufficient time for such further written explanations as may be necessary and shall conform to the explanation provided as part of the Contract. The Owner or Architect/Engineer's decision shall be final.

- K. Effect of Headings: The headings and titles to provisions in the Contract Documents are descriptive only and shall be deemed not to modify or affect the rights and duties of parties to this Contract.
- L. No acceptance, order, measurement, payment, or certificate of or by the Architect/Engineer and/or the Owner or its employees or agents shall either stop the Owner from asserting any rights or operate as a waiver of any provision hereof or of any power or right herein reserved to the Owner or of any rights to damages herein provided.
- M. Wherever the terms, "as directed," "ordered," "permitted," "designated," "as approved," "approved equal," "or equal," "acceptable," and other words of similar meaning which authorize an exercise of judgment are used in the Contract Documents, such judgment shall be vested only in the Owner and shall be final.
- N. The Contractor shall make available at the job site one copy of each referenced standard and/or Contract Documents for the Contractor's and the Field Representative's use during the time that work covered by the standards and/or Contract Documents is underway.
- O. The Contract Documents provide for a complete work and may have been prepared in divisions of various crafts, trades, and other categories of work. The Contractor is responsible for the performance of all work under the Contract regardless of any such divisions and shall ensure that all work is performed and completed. The organization of the Contract Documents into divisions, sections and articles and the arrangement of the drawings do not restrict or limit the Contractor into dividing the Work among subcontractors or in establishing the extent of the Work to be performed by any trade.
- P. No deviation from the approved Contract Documents shall be permitted without the prior written approval of the Owner, which approved deviation shall be documented either by Change order, except that deviations with respect to line items may be paid for via Work Order, to the extent funds are available in the Allowance Account or applicable dedicated Allowance Account.
- Q. All Requests for Information by the Contractor shall be submitted to the Architect or Engineer, with a copy to the Owner, shall be in writing, shall specify, to the maximum extent possible, the particular sheet, page, or section for which the Contractor is requesting information, and shall identify with the maximum specificity possible the ambiguity or uncertainty which the Contractor claims exists.

END OF ARTICLE

3. ARCHITECT/ENGINEER/FIELD REPRESENTATIVE

- A. The Architect/Engineer shall respond to questions which may arise as to the quality and acceptability of materials furnished, work performed, and as to the manner of performance and rate of progress of the work in accordance with the time frames prescribed in the Contract Documents. The Architect/Engineer shall decide all questions which may arise as to the interpretation of the Contract Documents relating to the Work, and the fulfillment of the Contract on the part of the Contractor, and those decisions shall be binding on the Contractor.
- B. The Architect/Engineer is not authorized to revoke, alter, or waive any requirement of the Contract.
- C. The Architect/Engineer, Owner and Field Representative shall have free access to the Work and materials at all times to facilitate the performance of his duties.
- D. Subject to concurrence by the Owner, the Architect/Engineer shall have the right to observe and reject any material or work performed which does not meet the requirements of the Contract Documents. When the Architect/Engineer discovers any work in progress or completed that does not meet the requirements of the Contract Documents, the Architect/Engineer shall reject that portion of the Work affected and shall confirm such rejection in writing, as soon as practical, detailing the reasons for the rejection. Work rejected by the Architect/Engineer will not be paid for, nor shall any work associated to remove, remediate, or correct such non-conforming work be considered Extra Work. Any such observation and/or rejection shall not be construed as undertaking supervisory control of the Work or of means and methods employed by the Contractor or his subcontractors and shall not relieve the Contractor of any of his responsibilities or obligations under the Contract. The Contractor shall not request or attempt to require the Architect/Engineer to undertake such supervisory control or to administer, supervise, inspect, assist, or act in any manner so as to relieve the Contractor from such responsibilities or obligations.
- E. The fact that the Architect/Engineer has not made early discovery of materials furnished or work performed which does not meet the requirements of the Contract Documents, shall not bar the Architect/Engineer from subsequently rejecting said materials or work.
- F. If either the Architect/Engineer or the Field Representative requests it, the Contractor, at any time before acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the Contract Documents. Should the work thus exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as Extra Work. Should the work so exposed or examined prove unacceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be at no additional cost to the Owner.
- G. Any work done or materials used which are not in compliance with the Contract Documents may be ordered removed and replaced at the Contractor's expense.
- H. The Owner and other agencies having jurisdiction over the work hereunder shall be afforded free access to the site to perform such inspections and tests as may be required to determine conformance of the Work with the Contract Documents.
- I. Neither the Architect/Engineer nor the Field Representative shall be responsible for any safety obligations imposed on the Contractor by applicable industry standards, licensing requirements, laws, or regulatory requirements.

- J. Inspectors may additionally be employed by the Owner or the Architect/Engineer. Inspectors will be authorized to inspect all work and materials which are to become a part of the completed Project. Inspectors will have no authority to revoke, alter or waive any requirements of the Specifications or to make any changes in the Plans. Each Inspector will be authorized to call the attention of the Contractor to any failure of the work to conform to the Plans or the Specifications and will have authority to suspend the work affected until any question at issue can be referred to and decided by the Engineer. The Inspector will have no authority to delay the Contractor by failure to inspect the work and materials with reasonable promptness.
- K. If authorized in writing by the Owner, the Field Representative and/or Architect/Engineer will administer the Contract and the orders of the Owner are to be given through the Field Representative and/or Architect/Engineer. The Field Representative and/or Architect/Engineer shall make initial determinations as to the amount and quality of the several kinds of work performed and materials furnished which are to be paid for under the Contract, subject to review and approval by the Owner.
- L. The Field Representative may observe the Contractor's work for compliance with the Contract Documents. Such observation shall extend to all, or any part of the work done and to the preparation, fabrication, or manufacture of the material to be used. Owner reserves the right to observe the work via its own employees, Field Representatives, Inspector's, or the Architect/Engineer.
- M. Upon discovery, the Field Representative shall call the Contractor's attention to faulty workmanship or defective materials and shall reject work and materials not conforming to the requirements of the Contract Documents.
- N. When any work in progress or completed does not meet the requirements of the Contract Documents, the Field Representative shall have the authority to order the Contractor to shut down that portion of the work affected until the affected work is corrected to the satisfaction of the Field Representative. The Field Representative shall confirm this order in writing as soon as practicable, detailing the reasons for the shutdown. Work performed in violation of the Field Representative's order to shutdown will not be accepted or paid for.
- O. The Field Representative is not authorized to revoke, alter, or waive any requirements of the Contract. If authorized in writing by the Owner, the Field Representative will negotiate and act on behalf of the Owner to the authorized limits of his authority as specified in the Contract Documents.
- P. Whenever the Contractor intends to build, assemble, or perform any portions of the Work away from the site, the Contractor shall promptly notify the Field Representative of such intentions, including where and when such work is to be performed before such work starts. The Contractor shall also make arrangements for access thereto by the Owner, Field Representative and/or the Architect/Engineer so that the aforementioned portions of the Work may be inspected as needed.
- Q. The fact that the Field Representative has not made early discovery of materials furnished or work performed which does not meet the requirements of the Contract Documents, shall not bar the Field Representative from subsequently rejecting said materials or work and does not relieve the Contractor of his responsibility to meet the requirements of the Contract Documents.
- R. The Field Representative shall not act as a foreman or perform other duties for the Contractor, nor interfere with the management of the work by the Contractor.
- S. The administration, observation of the work, and actions by the Field Representative, as herein provided, shall not be construed as undertaking supervisory control of the construction work or of

means and methods employed by the Contractor or his subcontractors and shall not relieve the Contractor from any of his responsibilities or obligations under the Contract; the Contractor shall not request or attempt to require the Field Representative to undertake such supervisory control or to administer, to supervise, to inspect, to assist, or to act in any manner so as to relieve the Contractor from such responsibilities or obligations.

- T. If authorized in writing by the Owner, the Field Representative shall decide all questions relating to the rights of different prime contractors on the Project or site.
- U. All materials and each part or detail of the work shall be subject to observation by the Field Representative and/or the Architect/Engineer. The Architect/Engineer and the Field Representative shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required.

END OF ARTICLE

4. OWNER

- A. Unless otherwise specified or excluded elsewhere in the Contract Documents, the records of borings, test excavations and other subsurface investigations, if any, are offered as information only and solely for the convenience of the Contractor. The Owner does not warrant or guarantee either that said records are complete or that the said records will disclose the actual subsurface conditions. The interpretation of the records and the conclusions drawn therefrom as to the actual existing subsurface conditions are the sole responsibility of the Contractor.
- B. Any estimates of quantities of work or materials, based on said borings, test excavations and other subsurface investigations are not warranted by the Owner to indicate the true quantities or distribution of quantities unless the Contractor is expressly directed to rely on such information to prepare and submit his Bid.
- C. If the Contractor is notified by the Owner to correct defective or nonconforming work, and the Contractor fails to promptly proceed with corrective action in a reasonable time, the Owner may, upon written notice, accomplish the redesign, repair, rework, or replacement of nonconforming work by the most expeditious means available and back charge the Contractor for the cost incurred. The cost of back charge work shall include all reasonable costs associated with the corrective action.
- D. The Owner shall separately invoice or deduct from payments, otherwise due to the Contractor, back charges as provided herein. The Owner's right to back charge is in addition to any or all other rights and remedies provided in this Contract, or by law. The performance of back-charge work, on behalf of the Owner, shall not relieve the Contractor of any of its responsibilities under this Contract including but not limited to express or implied warranties, specified standards for quality, contractual liabilities and indemnifications, and the Contract Time.
- E. Miami-Dade County enters into this Contract solely in its proprietary capacity. Nothing in this Contract is intended to bind or otherwise restrict the discretion of Miami-Dade County acting in its regulatory capacity, including but not limited to the regulatory acts of the departments of Regulatory and Economic Resources (RER), Transportation and Public Works (DT&PW), Miami-Dade Fire-Rescue (MDFR) and Mia-Dade Water and Sewer Department (WASD), or their successors.

END OF ARTICLE

5. CONTRACTOR

- A. If the Contractor hereunder is comprised of more than one legal entity, each such entity shall be jointly and severally liable hereunder.
- B. The Contractor shall hold valid current certificate(s) of competency for the type of work to be performed, in accordance with the qualifications requirements as set forth in Chapter 489 of the Florida Statutes and Chapter 10 of the Code of Miami- Dade County.
- C. The Contractor shall maintain within Miami-Dade County, Florida, a duly authorized agent to accept service of legal process on its behalf and shall keep the Owner advised of such agent's name and address, during the duration of the Contract, and for three years after final payment or as long as Contractor has warranty obligations under these Contract Documents, whichever period terminates later. The Contractor shall complete the form titled "Contractor Agent to Accept Service" included in the Contract Documents and submit it to the Architect/Engineer prior to NTP.
- D. The Contractor shall be responsible for the complete performance for all of the work under the Contract, and for the methods, means, and equipment used in performing the Contract and for all materials, tools, apparatus, and property of every description used in connection therewith.
- E. If requested by the Owner, the Contractor will obtain written confirmation from impacted subcontractors agreeing to work within the timeframes specified in the Contractor's schedule as a condition of acceptance.
- F. Contractor's Superintendent: The Contractor shall provide a superintendent at the site at all times who is competent in the type of work being performed to act as the Contractor's agent, and shall give that superintendent the full authority to receive instruction from the Field Representative or Architect/Engineer and to execute the order or directions of the Field Representative or Architect/Engineer, including the prompt supply of all materials, tools, equipment, labor, and incidentals that may be required. The Contractor shall furnish such superintendence regardless of the amount of work that is subcontracted, and the superintendent shall read, speak, write, and understand English. The Contractor shall also maintain at least one other employee on the work site during Project working hours who speaks and understands English. The superintendent shall be responsible for keeping written daily logs of the work on the project.
- G. The competency of the superintendent shall be demonstrated through licensure or certification in contracting, engineering, trade, or experience as applicable to the work being performed. Proof of licensure, certification or qualification of the superintendent must be provided to the Owner at the pre-construction conference and is subject to the approval of the Architect/Engineer or Field Representative after Contractor receipt of said requirements. The Contractor shall replace the Superintendent only with written notice to the County five (5) days in advance of the proposed substitution, and only with a superintendent qualified to perform the work as reasonably determined by the Field Representative.
- H. In the event that the Field Representative or Architect/Engineer determines, through the course of the actual work progress, that the superintendent lacks the knowledge or expertise necessary to execute the work in an efficient and competent manner, in keeping with all current codes and best practices, the Field Representative or Architect/Engineer shall notify the Contractor in writing and the

superintendent shall be replaced by the Contractor with a person acceptable to the Field Representative or Architect/Engineer within five (5) working days.

- I. The Contractor's failure to replace the superintendent in the time allotted shall be cause for the Owner to suspend work with such delays chargeable to the Contractor as Liquidated Damages as specified elsewhere in this contract.
- J. The Contractor shall maintain a daily accounting of his daily manpower, by trade and position, and provide this information to the Field Representative on a weekly basis.
- K. The Contractor shall notify the Owner of any changes of key personnel and all replacement personnel prior to assigning them to the jobsite.

END OF ARTICLE

6. SUBCONTRACTORS

- A. The Contractor will be permitted to subcontract portions of the Work to competent subcontractors. Such subcontractors shall hold valid current certificate(s) of competency for the type of work to be performed, in accordance with the qualifications requirements as set forth in the Florida Statutes and the Code of Miami-Dade County. Use of Subcontractors who were not listed on the Subcontracting Form, or equivalent, at the time of award may occur only with the express consent of the Owner.
- B. Nothing contained herein shall create any contractual relationship between the Owner and any level of subcontractor, materialman, or supplier.
- C. All work performed for the Contractor by a subcontractor shall be pursuant to an appropriate agreement between the Contractor and the subcontractor which shall contain provisions that:
 - 1) Preserve and protect the rights of the Owner and any of its authorized representatives under the Contract, including but not limited to, the Architect/Engineer and Field Representative, with respect to the Work to be performed under the subcontract so that the subcontracting thereof will not prejudice such rights;
 - 2) Require that such Work be performed in accordance with the requirements of the Contract Documents including the Contractor's accepted schedule;
 - 3) Require submission to the Contractor of applications for payment under each subcontract to which the Contractor is a part, in reasonable time to enable the Contractor to apply for payment in accordance with any and all payment provisions of the Contract Documents;
 - 4) Require that all claims for additional costs, extensions of time, damages for delays or otherwise with respect to subcontracted portions of the Work shall be submitted to the Contractor (via any subcontractor or Sub-subcontractor or Supplier where appropriate) in sufficient time so that the Contractor may comply in the manner provided in the Contract Documents for like claims by the Contractor upon the Owner;
 - 5) Require specific consent to all relevant provisions of the Contract Documents; and
 - 6) Incorporate all flow-down clauses specifically called for in the Contract, as directed.
- D. Contractor Participation: The Contractor shall perform not less than 10 percent of the Work, not inclusive of materials purchased, with his own organization. If the Contractor is a joint venture, the requirement shall be satisfied by any one, or a combination of any of the joint venture partners. Where a percentage of a Bid Item is subcontracted, the dollar value of that percentage subcontracted will be based on the estimated cost of such Bid Item, determined from information submitted by the Contractor, subject to approval by the Owner. If, during the progress of the Work, the Contractor requests a reduction in such participation percentage, and the Owner determines that, due to the special nature of the conditions of the Work at the time, it would be to the Owner's advantage, the percentage of the Work required to be performed by the Contractor may be reduced, provided written approval of such reduction is obtained by the Contractor from the Owner. The Contractor shall not proceed with any such reductions until his request is approved in writing by the Owner or his authorized designee. Under no circumstances shall less than 10 percent of the Work be performed with the Contractor's own forces.

E. Work Performed by Equipment-Rental Agreement:

- 1) The amount of work performed under equipment rental agreements shall not be considered subcontractor work. However, for work to be performed by equipment-rental agreement, the Contractor shall notify the Architect/Engineer in writing of such intention before using the rented equipment and shall indicate whether the equipment is being rented on an operated or non-operated basis. The Contractor's written notice shall contain a listing and description of the equipment and a description of the particular work to be performed with such equipment. As an exception to the above requirements for a written notice to the Architect/Engineer, such notice will not be required for equipment to be rented (without operators) from an equipment dealer or from a firm whose principal business is the renting or leasing of equipment.
- 2) The operators of rented equipment, whether rented on an operated or a non-operated basis, will be subject to wage rate requirements applicable to the Project. If equipment is being rented without operators, the Contractor shall be required to carry the operators on his own payroll. When equipment is rented on an operated basis, the Contractor, when required by the Contract or requested by the Architect/Engineer, shall submit payrolls from the lessor with the names of the operators shown thereon.

F. No work is to be performed at the Work site until the Contractor is in compliance with the Insurance Specifications, has furnished satisfactory evidence of required insurance to the Owner and obtained all required permits.

G. Approval of Subcontractor:

- 1) Prior to entering into any subcontract for Work to be performed on the Project, the Contractor shall secure the approval of the Owner regarding the prospective subcontractor's qualifications, employment data and compliance with Small Business Enterprise – Construction (SBE-CON) program requirements, if applicable. The forms or web-based system used to provide the required information shall be the same as those included in the Forms or web-based system for Bidding. The Owner will review the submittal from each subcontractor and will furnish written notification to the Contractor concerning approval of the award of the subcontract. If the Owner objects to the proposed award or fails to respond to the Contractor within five (5) business days of the complete submittal of the required information, the Contractor may furnish written notice of another subcontractor for consideration. The Owner may, at its discretion, waive or reduce subcontractor information submittal requirements as it deems appropriate.
- 2) In accordance with Miami-Dade County Code Sections 2-8.1 and 10-33.01, the Contractor shall not, without written consent of the Owner, either replace any subcontractor or permit any such subcontract to be assigned or transferred, or allow that portion of the Work to be performed by anyone other than the approved subcontractor, except he may perform the work himself with qualified personnel upon written notice to the Owner in accordance with applicable law.

END OF ARTICLE

7. PROSECUTION OF THE WORK

A. Workmanship and Unauthorized Work

- 1) Work under this Contract shall be performed in a skillful and workmanlike manner. Unless otherwise indicated in the Contract Documents, the Contractor shall be solely responsible for means and methods and for the coordination of all trades through completion of the Work and without damage to the existing or newly installed components and surfaces. The Architect/Engineer or Field Representative may, in writing, require the Contractor to remove from the work any employee the Architect/Engineer or Field Representative determines incompetent, careless, or otherwise objectionable. Such request shall be at no cost to the Owner.
- 2) Unauthorized Work: Work performed beyond the lines and grades shown on the Contract Drawings and approved Shop Drawings or established by the Owner, and Extra Work done without a Work Order or Change Order, will be unauthorized work and the Contractor will receive no compensation therefor. If required by the Owner, unauthorized work shall be remedied, removed, or replaced by the Contractor at the Contractor's expense. Upon failure of the Contractor to remedy, remove or replace unauthorized work, the Owner may at its discretion, remedy, remove or replace the unauthorized work and the Contractor shall bear the responsibility for any and all costs and for delays resulting from such work.
- 3) The entire work and each part thereof, unless otherwise specified in the Contract Documents, shall be placed at the location, elevation, grade and gradient specified, and in proper alignment and adjustment. The Contractor shall provide all frames, forms, falsework, shoring, guides, anchors, and temporary structures required to ensure these results.
- 4) No deviation from the approved Plans/Specifications shall be permitted unless (1) the Contractor has submitted an RFI requesting the deviation, and (2) the Contractor has prior written approval of the Architect/Engineer and/or Owner. Written approval shall be by Work Order or Change Order, shall be documented to the extent required by, and shall otherwise comply with the requirements of, the Contract Documents.
- 5) The Contractor shall, at all times, employ sufficient labor and equipment for prosecuting the work to full completion in the manner and time required by the Contract Documents. All workers shall have sufficient skill and experience to properly perform the work assigned to them. Workers engaged in special work or skilled work shall have sufficient experience in such work and in the operation of the equipment required to perform the work satisfactorily.
- 6) All proposed equipment shall be of sufficient size and in such mechanical condition as to meet requirements of the work, producing a satisfactory quality of work. Equipment used on any portion of the work shall be such that no damage to previously completed work, adjacent property, or existing facilities will result from its use.
- 7) When the Contract Documents expressly specify the use of certain methods and equipment, such methods and equipment shall be used unless other methods are authorized in writing by the Architect/Engineer by Work Order or Change Order. If the Contractor desires to use a method or type of equipment other than specified in the Contract, he may request permission from the Architect/Engineer to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed and of the reasons for desiring to make the change. If approval

is given, it will be on the condition that the Contractor will be fully responsible for producing work in conformity with Contract requirements. If, after trial use of the substituted methods or equipment, the Architect/Engineer determines that the work produced does not meet Contract requirements, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The Contractor shall remove any deficient work and replace it with work of specified quality or take such other corrective action as the Architect/Engineer may direct at no additional cost to the Owner. No change will be made to the Contract price or the Contract Time as a result of authorizing a change in methods or equipment under this article.

- 8) The Contractor shall give constant attention to the work to facilitate the progress thereof such that the work will be completed during the contract time and shall cooperate with the Architect/Engineer and its Field Representatives and with other Contractors in every way possible.
- 9) The Contractor warrants to the Owner that all materials and equipment furnished under this Contract will be new unless otherwise expressly allowed in the Plans and Specifications, or otherwise expressly approved in writing by the Owner and that the work will be of good quality, free from faults and defects in materials and workmanship for a period of one year from the date of Substantial Completion, unless otherwise required under this Contract. Work not conforming to these standards may be considered defective. If required by the Architect/Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.
- 10) Contractors working in the Public Rights-of-Way shall be cognizant of and comply with Miami-Dade County Code Section 2-103.1 relating to restoration after construction of utilities or works in the public right of way; and Miami-Dade County Code Sections 21-221 through 228 relating to excavation and protection of underground utilities and requiring various Contractor activities; The Contractor shall make every effort to minimize construction impact to business in the area of the Project and as appropriate, the Department will recover any costs caused the County by Contract delays or other business impacting activities attributable to the Contractor. To this end the Contractor shall conduct its construction activities in a manner that will minimize these detrimental effects.
- 11) The Contractor shall at all times ensure that the work site is maintained in a clean and orderly fashion. As soon as the work in any one locality is completed, the accumulated rubbish or surplus materials thereat shall be promptly removed. The Contractor shall also restore all public and private property in a manner acceptable to the Engineer, to a condition equal to or better than pre-construction conditions. This shall apply to public and private property which has been displaced or damaged during the prosecution of the work, and the Contractor shall leave the site and vicinity unobstructed and in a neat and presentable condition. In the event of delay exceeding two days after written notice is given to the Contractor by the Engineer to remove such rubbish or materials, or to restore displaced or damaged property, the Engineer may employ such labor and equipment as he may deem necessary for the purpose, and the cost of such work, together with the cost of supervision, shall be charged to the Contractor and shall be deducted from any money due the Contractor on the monthly or final estimate. No Contract shall be considered as having been completed until all rubbish and surplus materials have been removed and disposed of properly.
- 12) The Architect/Engineer shall furnish the Contractor with horizontal and vertical controls which shall be utilized as specified elsewhere herein to layout the work. The Florida Registered Land Surveyor hired by the Contractor shall verify all controls provided by the Engineer of Record and it shall be the responsibility of the Contractor to preserve same.

- a. The Contractor shall retain the services of a Florida Registered Land Surveyor who, shall furnish and set stakes, establishing line and grade and shall solely be responsible for the layout of the work as well as the recording of all as-built dimensions and elevations. The Contractor shall furnish all additional stakes, templates, and other materials for marking and maintaining survey points and lines given and shall be responsible for their preservation. Should any of the horizontal and vertical control points furnished by the Engineer of Record be destroyed or disturbed, they shall be reset by the Contractor's Florida Registered Land Surveyor, at the Contractor's expense. All control points previously furnished by the Engineer of Record shall be verified by the Contractor's surveyor.
 - b. For pipeline Projects the Engineer of Record shall furnish the Contractor with horizontal and vertical control every 1,320 feet which shall be utilized as specified elsewhere herein to layout the work. If a pipeline Project is less than 1,320 feet, the Engineer of Record will provide the Contractor with two horizontal and vertical control points. At on-plant-site Projects, the Engineer of Record shall furnish the Contractor with three horizontal and vertical controls.
 - c. No direct payment shall be made for the cost to the Contractor of any of the work occasioned by delay in giving lines and grades, or making other necessary measurements, or by inspection.
- 13) Chapter 446 of the Florida Statutes, as amended, which is by reference incorporated herein, provides labor standards for ratios of apprentices or trainees to journeymen on State, County, or municipal contracts. It shall be the responsibility of the Contractor, prior to the opening of bids, to inform themselves of the provisions of Chapter 446, Florida Statutes, as amended, which are, or may become, applicable to the Contract, and he shall abide by these provisions at no cost to the County. The Contractor is advised to direct all inquiries concerning Chapter 446, Florida Statutes, as amended to the Florida State Apprenticeship Advisory Council.

B. Material

- 1) Unless otherwise indicated in the Contract Documents, equipment, material, and products incorporated in the Work covered by this Contract shall be new and of the grade specified for the purpose intended. Unless otherwise specifically indicated, reference to equipment, material, product, or patented process by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at his option and, subject to the approval of the Architect/Engineer, use any equipment, material, article, or process which is equivalent to that named, subject to the requirements of these Contract Documents or propose a substitute equipment, material, article, or process as indicated below. The Contractor shall at all times comply with Green Building or LEED standards, as established in the Contract Documents; unless otherwise specified, LEED Silver standards shall be the minimum standards acceptable to the County. Proposed alternative equipment, material, products, or patented processes shall be considered equivalent if the Architect/Engineer determines that the proposed alternative is functionally equal to and/or sufficiently similar to that specified in the Contract Documents. The Architect/Engineer and/or the Owner may consider the Department's current maintenance history, requirements for spare parts, training of personnel and conformity to existing systems when reviewing alternatives.
- 2) The Architect/Engineer shall be the sole judge of the quality, suitability and cost of the proposed alternative equipment, material, article, or process. A proposed alternative shall be considered

equivalent and/or functionally equal to that specified in the Contract Documents if, in the exercise of reasonable judgment, the Architect/Engineer determines that the proposed alternative is at least equal in materials of construction, quality, durability, appearance, strength and design characteristics, will reliably perform at least equally well the function and achieve the results imposed by the Design Professional's Basis of Design and has a proven record of performance and availability, and the procurement and installation of same will not impact project costs or schedule.

- 3) If the Architect/Engineer determines that a proposed alternative does not qualify as equivalent or functionally equal, the alternative may be proposed for consideration as a substitute subject to the Contractor submitting sufficient information as provided below to allow the Architect/Engineer to determine that the proposed alternative is essentially equivalent to or better than the specified item and is an acceptable substitute for that said specified item.
- 4) The burden and cost of proving the quality, suitability and cost of an alternative shall be borne by the Contractor. All information required by the Architect/Engineer in judging an alternative shall be supplied by the Contractor at the Contractor's expense. The Architect/Engineer's costs in evaluating a proposed alternative, irrespective of its acceptance, will be reimbursed by the Contractor to the Owner. In the case of approved alternatives, the Contractor shall also reimburse the Owner for the Architect/Engineer's costs to revise the Contract Documents.
- 5) The Contractor certifies that, if approved and incorporated into the Work, there will be no increase in cost to the Owner or in Contract Time and the proposed alternative shall conform substantially to the detailed requirements of the item specified in the Contract Documents.
 - a. Where use of an alternative material involves redesign of or changes to other parts of the Work, the cost and the time required to affect such redesign or change will be considered in evaluating the suitability of the alternative material. All costs pertaining to redesign and changes in other parts of the Work, including remedial work to completed work, shall be at the Contractor's expense,
 - b. No action relating to the approval of alternative materials will be taken until the request for approval of the alternative materials is made in writing by the Contractor accompanied by complete data as to the quality, suitability and cost of the materials proposed. Such request shall be made at least 60 days before the early start date of the activity. Any delays in receiving approval shall be the responsibility of the Contractor.
 - c. The Architect/Engineer will examine and review the proposed alternative with the Owner and return it, within twenty-one (21) calendar days from the date of its receipt at the Architect/Engineer's office, to the Contractor noted with the final decision. If the final decision approves either an equal or a substitution, the approval must also contain the Owner's written approval. When requested by the Architect/Engineer, the Contractor shall resubmit such Shop Drawings, descriptive data and samples as may be required. Contractor is solely responsible for submitting alternatives in a timely fashion so as not to impact project schedule; in the event that Owner's or Architect/Engineer's review of an alternative delays the project, or redesign of the project required to accommodate the alternative delays the project, such delay shall be considered non-compensable delay.

- d. Where classification, rating, or other certification by a body such as, but not limited to, Underwriters' Laboratories Inc. (UL), National Electrical Manufacturer's Association (NEMA), or American Railway Engineering Association (AREA) is a part of the specification for any material, proposals for use of alternative materials shall be accompanied by reports from the listed body, or equivalent independent testing laboratory, indicating compliance with Contract Documents requirements. Testing required proving equality of the material proposed shall be at the Contractors expense.
 - e. Approval of an alternative material will be only for the characteristics and use named in such approval, and shall not change or modify any Contract requirement, or establish approval for the material to be used on any other Project for the Owner.
- 6) Source of Supply and Quality of Materials: The Contractor shall furnish all materials and products required to complete the Work except those designated to be furnished by the Owner.
- a. Notwithstanding prior inspection and approval by the Architect/Engineer, only materials conforming to the requirements of the Contract Documents shall be incorporated in the Work.
 - b. The materials shall be manufactured, handled, and incorporated so as to ensure completed work in accordance with the Contract Documents.
- 7) Defective Materials: Contractor-furnished materials not conforming to the requirements of the Contract Documents will be rejected, whether in place or not. Rejected material shall be removed immediately from the Work site. No rejected material, the defects of which have been subsequently corrected, shall be used in the Work. The Owner may cause the removal and replacement of rejected material and the cost thereof will be deducted from any monies due or to become due to the Contractor.
- 8) Handling of Materials: Materials shall be transported, handled, and stored by the Contractor in a manner which will ensure the preservation of their quality, appearance, and fitness for the Work. Materials shall be stored in a manner to facilitate inspection.
- 9) The Owner will have no responsibility to the Contractor concerning local material sources.
- a. The Contractor shall make all necessary arrangements with the owners of material sources. The Contractor shall pay all costs in connection with making such arrangements, exploring, developing and using material sources, whether or not indicated, except such costs as the Owner expressly agrees in writing to assume.
- 10) Disposal of Material Outside the Work Site: Unless otherwise specified in the Contract Documents, the Contractor shall make his own arrangements for properly disposing of waste and excess materials outside the Work Site and he shall pay all costs, therefore. Contractor shall comply with all local, state, and federal requirements when disposing of waste and excess materials.
- a. Prior to disposing of material outside the Work Site, the Contractor shall obtain written permission from the owner on whose property the disposal is to be made. The Contractor shall file with the Architect/Engineer said permit, or a certified copy thereof, together with a written release from the property owner absolving the Owner from any and all responsibility in connection with the disposal of material on said property.

- 11) Property Rights in Materials: The Contractor shall have no property right in materials after they have been attached or affixed to the Work or the soil, or after payment has been made by the Owner to the Contractor for materials delivered to the site of the Work, or stored subject to or under the control of the Owner, as provided in these Contract Documents. However, the Contractor shall be responsible for the security of the material on-site until Final Acceptance by the Owner.

C. Methods of Sampling and Testing

- 1) Sampling and testing of all materials shall be as set forth in the Contract Documents. Except for quality control testing and any other testing that may be the direct responsibility of the Contractor as set forth in the Contract Documents, the testing of samples and materials will be made at the expense of the Owner by the project testing laboratory. The Contractor shall furnish the required samples without charge. Any and all fees for non-conforming materials or work shall be solely borne by the Contractor. The Contractor shall give sufficient notification to the Field Representative of the placing of orders for or receipt of materials to permit testing.
- 2) The Field Representative may inspect, at its source, any specified material or assembly to be used in the Work. Manufacturing plants may be inspected from time to time for the purpose of determining compliance with specified manufacturing methods or materials to be used in the Work and to obtain samples required for its acceptance of the material or assembly. Should the Field Representative conduct plant inspections, the following shall exist:
 - a. The Field Representative shall have the cooperation and assistance of the Contractor and the producer with whom he has contracted for materials.
 - b. The Field Representative shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of materials being furnished.
 - c. If required by the Field Representative, the Contractor shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Office or working space should be conveniently located with respect to the plant.
- 3) It is understood and agreed that the Owner shall have the right to retest any material which has been tested and approved at the source of supply after it has been delivered to the site. The Field Representative shall have the right to reject only material which, when retested, does not meet the requirements of the Contract Documents. In such an event, the cost of re-testing shall be borne by the Contractor if it results in a rejected material.
- 4) All inspections and testing of materials, assemblies and equipment will be performed in Miami-Dade County. If the Contractor's material or manufacturing sources are such that inspections or tests cannot be made in Miami-Dade County, all traveling and lodging expenses in connections with such inspections and testing shall be borne by the Contractor.

D. Meetings

- 1) A pre-construction conference will be held prior to the issuance of the Notice to Proceed to discuss the work to be performed under this contract. The Contractor and its major subcontractors shall be required to attend this meeting. The Contractor will be advised of the time, date, and location of the meeting.

- 2) The Contractor shall attend weekly construction coordination meetings at a time and place to be designated by the Architect/Engineer. These meetings are intended to determine job progress, identify job problems, assist in solving and preventing job problems, and promote coordination with all entities involved in the Contract and with other Contractors. The Contractor shall cause subcontractors and suppliers to attend as he deems advisable, or as requested by the Architect/Engineer. Unless otherwise provided for in these Contract Documents, the Contractor shall be responsible for generating and distributing meeting minutes for all such meetings. Notwithstanding, the Owner may generate and disseminate supplemental meeting minutes, as may be necessary in the owner's discretion.

E. Permits and Compliance with Laws

- 1) Unless otherwise provided for in these Contract Documents, the Contractor shall be responsible for obtaining necessary licenses and permits and for complying with applicable Federal, State, County and Municipal laws and latest codes and regulations in connection with the prosecution of the Work. (For payment of permit(s), see Special Provisions). No time extensions will be allowed for delays in obtaining the required permits unless revisions directly caused by the Owner, or its agents are required to the Contract Drawings due to changes in codes, regulations, and applicable contract standards during the contract term. See Special Provisions for additional permit requirements.
- 2) The Owner will not pay or reimburse the Contractor for any penalties relating to his permits or fees as a result of the Contractor's failure to timely obtain all his permits, inspections, and approvals.
- 3) The Contractor shall observe and comply with all applicable Federal, State, County and other laws, codes, ordinances, rules, and regulations of the Federal, State and County governments, all authorities having jurisdiction, and any and all programs developed in compliance therewith, in any manner affecting the conduct of the Work.
- 4) Dewatering of excavations shall be performed in accordance with the applicable provisions of the County's Department of Regulatory and Economic Resources (RER), Florida Department of Environmental Protection (DEP), U.S. Environmental Protection Agency (EPA) and the South Florida Water Management District (SFWMD) Dewatering Permits and/or any and all authorities having jurisdiction and any other requirements specified in the Contract Documents. The means and methods of dewatering shall be determined by the Contractor who shall bear the full cost of same as part of the contract price.
- 5) All construction activities shall be subject to the pollution prevention requirements established under the National Pollutant Discharge Elimination System (NPDES) program under the Clean Water Act regulating storm water discharge from construction sites.
- 6) Upon completion of all of the work contemplated under the Contract Documents, the Contractor shall obtain and deliver to the Field Representative such Certificate(s) of Occupancy or Certificate(s) of Completion as required by the Florida Building Code and/or authority having jurisdiction.
- 7) The Contractor shall be subject to and comply with all the provisions of Miami-Dade County Code Section 2-8.4.1, which provides that, whenever any individual or corporation or other entity attempts to meet its contractual obligations with the County through fraud, misrepresentation or material misstatement, the County shall, whenever practicable, terminate the Contract. The

Contractor is further directed to Section 10-38 of the Miami-Dade County Code, which provides for the debarment of County contractors.

- 8) The use of explosives will not be permitted under this Contract, except that powder and/or explosive fasteners may be allowed with the prior written consent of the Owner.

F. Coordination and Access

- 1) Other Contracts: The Owner may undertake or award other contracts for additional work, and the Contractor shall fully cooperate and coordinate with other Contractors and the Owner and carefully fit his own work to such additional work. The Contractor shall not perform any act which will interfere with the performance of work by any other contractor or by the Owner. The Contractor shall be responsible for obtaining all necessary scheduling details from other Contractors and these requests must be provided, in writing, to the Owner. The Owner, or, if authorized in writing by the Owner, the Architect/Engineer shall have the authority to resolve conflicts related to coordination between Contractors.
- 2) In the event of interference between the work of the Contractor and other contractors working concurrently at the Site, the Field Representative will instruct the Contractor as to which work has priority in performance and such instructions shall be binding upon the Contractor.
- 3) Utility companies, railroads, municipal agencies, and County tenants/lessees having facilities within the limits of the Work shall always have access to their facilities for operations, inspection, and repair.
- 4) Lands to be furnished by the County for construction operations, roads, or for other purposes, will be specifically shown on the drawings or provided for in the Specifications. Should the Contractor find it necessary to use any additional land for the construction operations or for other purposes during the construction of the work, they shall provide for the use and restoration of such lands at their own expense.
- 5) Rights-of-way for work to be done under the Contract will be provided by the County. Nothing herein contained, however, and nothing marked on the drawings, shall be interpreted as giving the Contractor exclusive occupancy of the territory provided. When two or more contracts are being executed at one time on the same or adjacent land in such a manner that work on one contract may interfere with that on another, the Owner, or, if directed in writing by the Owner, the Architect/Engineer will decide which Contractor shall cease work, and which shall continue, or whether the work of both contracts shall progress at the same time, and in what manner. When the territory of one contract is a necessary or convenient means of access for the execution of another contract, the Engineer may grant to the Contractor so desiring such privilege of access to the territory as the Engineer shall deem to be appropriate, and no such decision shall be made the basis of any claim for delay or damage, except as provided in Article 8 herein.

G. Rights in Land and Improvements

The Contractor shall make no arrangements with any person to permit occupancy or use of any land, structure or building within the Work Site for any purpose whatsoever, either with or without compensation, in conflict with any agreement between the Owner and any property owner, former property owner or tenant of such land, structure or building. The Contractor shall not occupy County-owned property outside the Work Site without obtaining prior written approval from the County.

H. Interference With Existing Utilities

- 1) Attention of the Contractor is specifically directed to the need for careful control of all aspects of his work to prevent damage to cables, ducts, water mains, sewers, fire mains, telephone cables, fuel lines, radar cables, and any other existing overhead or underground utilities and structures.
- 2) Before commencing work in any given area, the Contractor shall contact utility companies to identify any potential conflicts. Further, the Contractor shall also carefully review the plans, survey, and search the site for utility locations, and determine possible utility conflicts. All known above and underground utilities, including, but not limited to, electrical, telephone, communications, lighting cables, fuel lines, sewer, drainage and water pipes, and other existing structures are shown on the Plans for reference purposes only, but no guarantee is expressed or implied that the information is accurate. It shall be the sole responsibility of the Contractor to ascertain and/or verify the location of any and all such utilities or structures using magnetic and electronic detectors and by hand excavation or other appropriate measures before performing any work that could result in damage to such existing utilities or structures. The Contractor shall make a thorough search of the particular location for underground utilities or structures whether or not shown on the drawings before excavation work is commenced in any particular location. To this end the Contractor shall provide and maintain throughout the term of the Contract, electronic and magnetic detecting devices capable of locating underground or other non-observable utilities or structures. The Contractor shall, after locating primary and critical existing utilities, mark their location with indelible material or other means satisfactory to the Field Representative and maintain above ground physical identification during the work.
- 3) In the event of damage to, or accidental disruption of utilities or other facilities as a result of the Contractor's operations, the Contractor shall take immediate steps to repair or replace all damage and to restore all services. Further, the Contractor shall engage any additional outside services which may be necessary to prosecute repairs on a continuous "around the clock" basis until services are restored. The Contractor shall also provide and operate any supplemental temporary services to maintain uninterrupted use of the facilities. All costs involved in making repairs and restoring disrupted service resulting from the Contractor's work shall be borne by the Contractor and the Contractor shall be fully responsible for any and all claims resulting from the damage.

I. Protection of Existing Facilities, Vegetation, Structures, Utilities, and Improvements

- 1) The Contractor shall preserve and protect existing vegetation such as trees, shrubs, and grass on or adjacent to the work site which are not indicated to be removed and which do not unreasonably interfere with the construction work and he shall replace in kind the vegetation, shrubs, and grass damaged by him at his own expense.
- 2) The Contractor shall protect from damage all utilities, foundations, walls, or other parts of adjacent, abutting or overhead buildings, railroads, bridges, structures, surface and subsurface structures at or near the site of the Work and shall repair or restore any damage to such facilities, except utilities, resulting from failure to comply with the requirements of this Contract or the failure to exercise reasonable care in the performance of the Work. If, after receipt of notification from the Architect/Engineer, the Contractor fails to or refuses to repair any such damage promptly, the Owner may have the necessary Work performed and charge the cost thereof to the Contractor.

- 3) At points where the Contractor's operations are adjacent to utility facilities, damage to which might result in expense, loss, disruption of service or other undue inconvenience to the public or to the owners, Work shall not be commenced until all arrangements necessary for the protection thereof have been made by the Contractor. The Contractor shall be solely and directly responsible to the owners and operators of such utilities for any damage, injury, expense, loss, inconvenience, or delay, caused by the Contractor's operations.
- a. Where public utilities or their appurtenances interfere with permanent construction, unless otherwise specified, work involved in permanently relocating or otherwise altering such public utilities and their appurtenances will not be a part of this Contract but will be done by utility owners at no cost to the Contractor. If the Contractor wishes to have utilities temporarily relocated, he shall make necessary arrangements with utility owners and reimburse them at his own expense for cost of the Work. The Contractor shall keep the Architect/Engineer advised of temporary relocation arrangements.
 - b. The Contractor shall not repair or attempt to repair utility damage but shall immediately contact the utility owner. The Contractor shall obtain the name, address, and telephone number of each utility company that the work will affect and the person in such utility company to contact. He shall submit to the Architect/Engineer said names, addresses and telephone numbers.
- 4) The Contractor shall comply with the latest version of the Florida Building Code, Florida Fire Prevention Code or the Code under which the Contract Documents were approved, whichever is applicable at the time the Work is performed.
- 5) In order to safeguard the owners and tenants of abutting property and at the same time prevent unjust or fraudulent claims against the Contractor the Government, State, the Owner, and the Architect/Engineer in respect thereto, the Contractor shall cause a detailed examination of abutting property to be made before construction is begun. The owner or tenant of each parcel or structure or his or their duly authorized representative will be invited to be present during the examination by a notice in writing delivered by the Contractor to a person in charge of the premises or structure, or by the mailing of the notice to the owner at the premises. The Architect/Engineer will attend while the Contractor makes the detailed examination. A complete record including photographs of the existing conditions of each parcel or structure shall be made in triplicate, signed by the Contractor, Owner, and the Architect/Engineer and one copy will be delivered to the Owner, one to the Architect/Engineer and one will be retained by the Contractor. At such time as the Architect/Engineer may direct, or upon the filing of the verified statement by the owner, tenant, lessee, operator, or occupant of the building structure, and in any event, upon the completion of any work that in the opinion on the Architect/Engineer might affect the abutting property, the Contractor will make another detailed examination of such abutting property. A complete record of the then existing conditions of said property will be made in triplicate, signed by the Contractor and one copy will be delivered to the Owner, one to the Architect/Engineer and one will be retained by the Contractor. In any action, which may be brought by any owner, tenant, lessee, operator, or occupant of abutting property to recover under the provisions of this article or any paragraph hereof, the record of the existing conditions of each parcel will be prima facie evidence of the conditions thereof at the time of the making of the examination.

- 6) The Contractor shall maintain access to fire hydrants and fire alarm boxes throughout the prosecution of the Work. Hydrants, alarm boxes and standpipe connections shall be kept clear and visible at all times unless approved otherwise. If visibility cannot be maintained, the Contractor shall provide clearly visible signs showing the location of the fire hydrant, fire alarm box or standpipe connection. The Contractor shall promptly notify the authority having jurisdiction of any impairment to any fire systems.

J. Damage to the Work and Responsibility for Materials

- 1) The Contractor shall be responsible for materials delivered and work performed until completion and Final Acceptance of the entire construction thereof, except those materials and work which may have been accepted under the applicable sections of this article and shall take all necessary steps to protect the Work, from all causes, at his expense.
- 2) The Contractor shall bear the risk of injury, loss or damage to any and all parts of the Work for whatever cause, whether arising from the execution or from the non-execution of the Work, except as provided for in this article. The Contractor shall rebuild, repair or restore work and materials which have been damaged or destroyed from any cause before Completion and Acceptance of the Work and shall bear the expense thereof. The Contractor shall provide security including, but not limited to, security guards, temporary drainage systems and erection of temporary structures and temporary fencing as necessary to protect the Work and materials from damage.
- 3) The Contractor shall be responsible for materials not delivered to the site for which any progress payment has been made to the same extent as if the materials were so delivered.
- 4) The Contractor's responsibility for material shall be the same for Owner-furnished material, upon receipt of said material from the Owner, under this Contract as for Contractor-furnished material.
- 5) Relief from Maintenance and Responsibility: The Contractor may request, in writing, from the Owner, that the Owner relieve the Contractor of the duty of maintaining and protecting certain portions of the Work, as described in this paragraph, which have been completed in all respects in accordance with the requirements of the Contract. Such action by the Owner will relieve the Contractor of responsibility for injury or damage to said completed portions of the Work resulting from use by the Owner or the public for any cause, but not from injury or damage resulting from the Contractor's own operations or negligence. Portions of the Work for which the Contractor may be relieved of the duty of maintenance and protection, as provided in this paragraph, include the following:
 - A. Early possession by the Owner of any portion of the Work, in accordance with the Contract Documents.
 - B. This Paragraph 5 does not relieve the Contractor of responsibility for repairing or replacing defective work or materials in accordance with the Contract requirements
- 6) If it is specifically stated in the Specifications that the Department will furnish materials or equipment to the Contractor for incorporation into the work for which this Contract pertains, the County shall not be liable for any: expenses, losses, damages, claims or demands including but not limited to, all direct costs of Contractor such as labor, material, job overhead, and profit markup but also includes any costs for modifications or changes in sequence of work to be performed, delays, rescheduling, disruptions, extended direct overhead

or general overhead, acceleration, material or other escalation which includes wages, and other impact cost, or inflationary factors, arising out of any late delivery of such materials or equipment caused by any force Majeure. Compliance with delivery schedules by the Department shall be excused when delays are caused by force Majeure, and, if the delay causes the Contractor to exceed the Contract time stipulated for the final completion of the Project, a non-compensable time extension in the Contract time. An extension in this Contract time will be allowed equal to the length of the delay.

K. Emergencies

- 1) In an emergency affecting the safety of life, the Work, or adjacent property, the Contractor shall notify the Owner, the Field Representative, or the Architect/Engineer as early as possible that an emergency exists. In the meantime, without special instruction as to the manner of dealing with the emergency, the Contractor shall act at his own discretion to prevent such threatened loss or injury. As emergency work proceeds, the Owner, the Field Representative, or the Architect/Engineer may issue instructions, which the Contractor shall follow. Contractor shall present any claims for compensation for emergency work under this section as claims for Extra Work; however, the Contract shall not be entitled to claim Extra Work for if the Contractor did not cause or contribute to the occurrence of the emergency via its actions or omissions.
- 2) For purposes of this article, an emergency is defined as an act or event that has occurred or may imminently occur and which is not caused by actions or inactions of the Contractor, which, if no immediate action is taken may affect the safety of life, the work, or adjacent property. This article does not apply to steps taken by the Contractor to protect the Work, adjacent structures, utilities, existing vegetation, etc. under other sections of the Contract Documents. Furthermore, this article does not apply to preparations the Contractor may make prior to storms or hurricanes or other acts of God.

L. Accident Prevention

- 1) Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - a. All persons on the Site or who may be affected by the Work;
 - b. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and other property at the Site or adjacent thereto, including trees, shrubs lawns, walks, pavements, roadways, structures, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.
- 2) Contractor shall comply with all applicable laws and regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss and shall erect and maintain all necessary safeguards for such safety and protection.
- 3) Upon notification from the Owner or its representative(s), the Contractor shall promptly correct any deficiencies affecting the safety and wellbeing of the construction workers and the public that have been identified by the notice.

- 4) Should a situation of imminent danger be identified, work in the affected area must be suspended immediately until the condition has been corrected. Imminent danger is defined as the exposure or vulnerability to harm or risk that is impending or about to occur as defined by the Field Representative or the Architect/Engineer. The Contractor will not be entitled to future claims alleging impacts caused by the Owner stoppage of the Work due to safety reasons.
- 5) When the Contract involves work on a plant, pump station or other site or restricted area, the Contractor shall comply with the Owner's Process Safety Management Plan, or other safety management plan or Operation Directives as may be promulgated by Owner prior to the commencement of the work and shall instruct their personnel as required by that plan.

M. Warranty of Work

- 1) Except where longer periods of warranty are indicated for certain items, the Contractor warrants the Work under the Contract to be free from faulty materials and workmanship for a period of not less than one (1) year from the date of Substantial Completion. This one-year period shall be covered by the Surety Performance Bond as specified in this Contract, except that in the case of defects or failure in a part of the work which the Owner takes possession of prior to Substantial Completion, such a period shall commence on the date the Owner takes possession. Upon receiving notification from the Owner or any public body, to whom the ownership of the Work has been transferred or who has agreed to maintain the Work, the Contractor shall immediately remedy, repair, or replace, without cost to the Owner or other notifying party and to the entire satisfaction of the notifying party, defects, damages, or imperfections due to faulty materials or workmanship appearing in said Work within said period of not less than one year. Remedial work shall carry the same warranty as the original work starting with the date of acceptance of the replacement or repair. Payment to the Contractor will not relieve him of any obligation under the Contract. Notwithstanding, the correction of latent defects shall not be considered as warranty work.
- 2) The Contractor, at no additional expense to the Owner, shall also remedy damage to equipment, the site, or the buildings or the contents thereof, which is the result of any failure or defect in the Work, and restore any Work damaged in fulfilling the requirements of the Contract. Should the Contractor fail to remedy any such failure or defect within ten (10) days after receipt of notice thereof, the Owner will have the right to replace, repair, or otherwise remedy such failure or defect and deduct all costs from the Contractor's pay request or Payment and Performance Bond if final payment has been made.
- 3) The Contractor will correct all latent defects discovered within ten (10) years after Substantial Completion provided that the Owner shall notify the Contractor of each latent defect within the time specified by law and shall provide the Contractor with an opportunity to conduct test as contemplated in Chapter 558, Fla. Stat. The Contractor, without prejudice to the terms of the Contract, shall be liable to the Owner for all damages sustained by the Owner resulting from latent defects, fraud, or such gross mistakes as may amount to fraud, discovered after the stated guarantee and warranty periods have expired. If the Contractor fails to act within ten (10) days, the Owner reserves the right to have the work performed by others at the expense of the Contractor, and the Contractor agrees to pay the Owner the actual cost associated with procurement, implementation, and management thereof upon demand. The Owner shall also be entitled to reasonable attorney's fees, necessarily incurred upon the Contractor's refusal to pay the above costs.

- 4) Subcontractors', manufacturers' and suppliers' warranties and guaranties, expressed or implied, with respect to any part of the Work and any material used therein shall be deemed obtained and shall be enforced by the Contractor for the benefit of the Owner provided that, if directed by the Owner, the Contractor requires such subcontractors, manufacturers, and suppliers to execute such warranties and guaranties, in writing, directly to the Owner.
- 5) The rights and remedies of the Owner provided in this article are in addition to and do not limit any rights and remedies afforded by the Contract or by law.
- 6) Nothing in the above intends or implies that this warranty shall apply to work that has been abused or neglected by the Owner, its agents or other public body, utility or railroad to which ownership has been transferred.

END OF ARTICLE

8. CONTRACT TIME

A. Notice to Proceed

- 1) The Contract shall be effective 10 days after notice is provided to the Contractor of contract award (“the effective date”) The Contractor shall, immediately after the effective date of the contract: deliver the specified bonds and certificates of insurance to the Owner, if same were not delivered prior to the effective date; apply for all necessary permits; provide a schedule and a schedule of values in accordance with the requirements herein. Contract time shall not begin on the effective date, but instead shall begin upon issuance of a Notice to Proceed. Contractor shall use continuous diligent good faith efforts to provide bonds, insurance, schedules, schedule of values, and to cause the issuance of permits. The failure of Contractor to utilize such continuous diligent good faith efforts shall render the Contractor in default of this Agreement. Alternatively, if the Contractor is unable to obtain all necessary permits within 30 days, through no fault of the Contractor, the Owner has the option, but not the obligation, to terminate the Contract, without fault to the Contractor or the Owner, effective immediately upon written notice by the Owner or give the Contractor additional time to obtain the permits.
- 2) Upon receipt of all required bonds and insurance, issuance of all required permits, and approval by the Owner of the Schedule and the Schedule of values, the Owner may issue a Notice to Proceed. Except as specifically authorized in writing by the Owner, the Contractor is not authorized to perform work (other than obtaining permits) under the Contract until the effective date of the Notice to Proceed, upon which the Contractor shall commence work and shall diligently prosecute the Work to completion within the time limits specified. The Contract time commences on the start date shown on the Notice to Proceed. The Notice to Proceed shall be effective as of the day it is issued by Owner.
- 3) Any Work Performed by the Contractor (other than obtaining permits) prior to Notice-To-Proceed shall be at the Contractor’s own risk and shall not be considered as the basis for any claim.

B. Schedules

- 1) The Contractor shall provide, maintain, and submit monthly updated schedules in strict accordance with the Contract Documents. The Contractor shall at all times maintain an electronic schedule in the critical path methodology (“CPM”) format or in a format as designated in the technical specifications (e.g., Microsoft Project, Primavera, etc).The Special Provisions and Division 01 of the Technical Specifications may contain further specific requirements for the form, content and date of submission of the baseline schedule and all schedule updates. The County shall approve this schedule prior to issuance of Notice to Proceed. The approved schedule shall be the Baseline Construction Schedule.
- 2) The Contractor shall prosecute the Work in accordance with the approved Baseline Construction Schedule or most recently approved revision to the baseline schedule. In the event that progress along the critical path is delayed, the Contractor shall revise his planning to include additional forces, equipment, shifts or hours as necessary to meet the time or times of completion specified in this Contract at no additional cost to the Owner, unless the Contractor has demonstrated it is entitled a compensable time extension pursuant to the terms of this Contract. In addition, the Contractor shall revise his schedule to reflect these recovery actions

and submit it to the Owner for review and acceptance it being understood that such acceptance will be as to the format and composition of the schedule and not the Contractor's means and methods. Additional costs resulting therefrom will be borne by the Contractor. Delayed progress is defined as:

- a. A delay in the start or finish of any activity on the critical path of the approved baseline schedule or most recently approved revision to the baseline such that the last activity in the critical path occurs after the contract time; or
 - b. A delay in the start or finish of any non-critical activity which consumes more than the available float shown on the approved baseline schedule or most recently approved revision to the baseline, thereby making the activity critical and late; or
 - c. A projected completion date shown on a schedule update which is later than the contractual completion date; or
 - d. Any combination of the above.
- 3) Failure of the Contractor to comply with the requirements under this provision will be grounds for determination that the Contractor is not prosecuting the Work with such diligence as will ensure completion within the Contract Time. Upon such determination, the Owner may terminate the Contractor's right to proceed with the Work, or any separate part thereof, in accordance with the Contract Documents. If in the Contractor's estimation, the cause(s) of delay are beyond the Contractor's control, the Contractor shall adhere to the sections of the Contract Documents related to extensions of time, claims and others as appropriate.
- 4) The Contractor shall be responsible for scheduling and coordinating the work of all crafts and trades, subcontractors, and suppliers, required to perform the Work and to complete the Work within the prescribed time. Any inefficiency or loss of productivity in the labor, materials, or special equipment of the Contractor or its subcontractors of any tier, from any cause, shall be the responsibility of the Contractor. No reimbursement of these or any other costs can be requested by or granted to the Contractor or any of its subcontractors of any tier for inefficiency or loss of productivity in labor, materials, or special equipment, except as specified in the paragraph in this article dealing with Liquidated Indirect Costs, for delays in the performance and completion of the Work directly caused by the Owner or its authorized representatives. Other than the exception described above, additional costs may only be paid to the Contractor as a result of additional Work added to the Contract scope of work.

C. Extensions of Time and Classification of Types of Delays

- 1) Once a delay has been identified and it has been established through a Time Impact Analysis that a delay affects the Project's end date or contractually mandated milestone date, the delay must be classified to determine responsibility and to compute damages, if any. Before the Contractor can submit a request for time extension, claim or any request for additional compensation involving or related to time, the Contractor must classify the delay(s) in accordance with the following classifications. These delay classifications shall be used by the Owner and the Contractor in resolving any time-related disputes. Delays fall into three basic categories: non-excusable, excusable, and compensable.
 - a. Non-excusable delays are those delays to the critical path which were foreseeable at the time of contract award or delays caused by the Contractor due to the Contractor's

fault or negligence or his/her own inefficiencies or problems, due to his/her inability to coordinate subcontractors and/or other flaws in his/her planning. In these types of delays, the Contractor is not entitled to extra time or compensation and the Owner may be allowed to assess Liquidated Damages or actual damages, depending on the contract provisions.

- b. Excusable delays are those delays to the critical path beyond the Contractor's control and without the active interference of the Owner, such as extreme weather, force majeure, strikes, and delays caused by third parties (i.e. not the Contractor or the Owner). Contractors are granted a time extension but no additional compensation for the extended time of performance for excusable delays.
- c. Compensable delays are delays to the critical path caused by active interference or participation of the Owner or Owner's consultant. Examples of compensable delays are failure of the Owner to provide right-of-way, introducing late design changes, late review of shop drawings by the Owner or his Architect/Engineer and failure of the Owner to coordinate the work of various prime Contractors. In the case of a compensable delay, the compensation for the extended period of performance shall be the Liquidated Indirect Costs as specified in the Contract Documents. Where a delay is caused by Extra Work, the direct costs of the Extra Work shall be paid for in accordance with Section 9 herein.
- d. Concurrent delays involve two or more delays to the critical path occurring at the same time (irrespective of whether each delay would if analyzed alone, be compensable or non-compensable), either of which had it occurred alone, would have affected the end date of the Project.
- e. The compensability of concurrent delays depends on the types of delays involved. The following shall determine the effects of concurrent delays on time extensions and compensable costs:
 - i. EXCUSABLE DELAY CONCURRENT WITH A NON-EXCUSABLE DELAY. For excusable delays concurrent with non-excusable delays, the Contractor is entitled to a time extension only. For example, it rains the day footings are to be excavated (excusable delay) but the excavation equipment was down for repairs (non-excusable delays).
 - ii. NON-EXCUSABLE DELAY CONCURRENT WITH A COMPENSABLE DELAY. For non-excusable delays concurrent with compensable delays, the Contractor is entitled to a time extension only. For example, if the Owner introduces a design change for a beam but the Contractor has failed to submit the shop drawings for said beam in a timely manner. This would be an example of a non-excusable delay (late shop drawings) concurrent with a compensable delay (Owner introducing design change).
 - iii. EXCUSABLE DELAY CONCURRENT WITH A COMPENSABLE DELAY. For excusable delays concurrent with compensable delays, the Contractor is entitled to a time extension only. For example, the Owner does not provide the necessary right-of-way to begin construction (compensable delay) but the Contractor's forces are on strike (excusable delay).

- 2) Time Extensions: The Contractor may be granted an extension of time and will not be assessed Liquidated Damages for any portion of the delay in completion of the Work, arising from acts of God, acts of the public enemy, fires, floods, epidemics, quarantine restrictions, freight embargoes, strikes, labor disputes, or weather more severe than the norm, provided that the aforesaid causes were not foreseeable and did not result from the fault or negligence of the Contractor, and provided further that the Contractor has taken reasonable precautions to prevent further delays owing to such causes, and has given to the Architect/Engineer immediate verbal notification, with written confirmation within 48 hours, of the start of the delay of: (1) the cause or causes of delay, (2) the schedule activities impacted by the delay, (3) a rough order of magnitude estimate of the duration of the delay, and (4) potential measures to recover the schedule. Within thirty (30) days after the end of the delay, the Contractor shall furnish the Architect/Engineer with detailed information concerning the circumstances of the delay, the actual number of days actually delayed, the appropriate Contract Document references, and the measures taken to prevent or minimize the delay; notwithstanding, where monthly schedule updates are required prior to the end of the delay, that monthly updated schedule shall reflect all delay experienced through the date of the submittal. All requests for extension of time shall be submitted in accordance with the Contract Documents. Failure to submit such information will be sufficient cause for denying the delay claims, irrespective of the Contractors entitlement to a time extension or liquidated damages. The Owner will ascertain the facts and the extent of the delay, and its findings thereon will be final and conclusive subject to the dispute provisions in the Contract Documents. The extensions of time granted for these reasons shall be considered excusable and shall not be the basis for any additional compensation.
- a. Weather more severe than the norm shall apply only as it affects particular portions of the Work and operations of the Contractor, as determined by the Architect/Engineer. Weather more severe than the norm is defined as any situation exceeding the mean data as recorded by The National Climatic Data Center, Asheville, North Carolina, and published by the National Oceanic and Atmospheric Administration (this data is taken from the table of normal, means, and extremes in the latest version of the "Local Climatological Data, Annual Summary with Comparative Data, Miami, Florida"). For the calculation of delays due to rain, precipitation of 0.01 inches or more a day occurring during normal work hours shall be considered to be a rainy day, if the rain actually prevented the Contractor from performing work. The effects of weather less severe than the norm may be taken into account in granting time extensions at the Owner's sole discretion.
 - b. An extension of time will not be granted for a delay to the critical path caused by a shortage of materials, except Owner-furnished materials, unless the Contractor furnishes to the Architect/Engineer documentary proof that he has diligently made every effort to obtain such materials from every known source within reasonable reach of the Work. The Contractor shall also submit proof, in the form of a CPM network analysis data, that the inability to obtain such materials when originally planned, did in fact cause a delay in final completion of the Work which could not be compensated for by revising the sequence of his operations. Only the physical shortage of material will be considered under these provisions as a

cause for extension of time. No consideration will be given to any claim that material could not be obtained at a reasonable, practical, or economical cost, unless it is shown to the satisfaction of the Architect/Engineer that such material could have been obtained only at exorbitant prices, entirely inconsistent with current rates taking into account the quantities involved and the usual practices in obtaining such quantities.

- 3) Delays Caused by the Owner: If the Contractor's performance of the Work along the critical path is delayed by any condition or action directly caused by the Owner, and which was not foreseeable by the Contractor at the time the Contract was entered into, the Contractor shall, provide notification in accordance with the Contract Documents, of any such delay and of the anticipated results thereof. The Contractor shall cooperate with the Owner and use its best efforts to minimize the impact on the schedule of any such delay. In instances where the Owner causes a delay which is responsible for extending the Contract beyond the completion date, the Contractor may claim Liquidated Indirect Costs as specified in the paragraph in this article dealing with Liquidated Indirect Costs. These delays shall be considered compensable, except for the period in which these delays may be concurrent with Contractor-caused delays. If a delay on the part of the Owner is concurrent, that is, if it occurs at the same time as a Contractor-caused delay, the Owner-caused delay shall be considered an excusable delay for the portion of the Owner-caused delay which is concurrent with the Contractor-caused delay.
- 4) Delays Beyond Contractor's Control Not Caused by the Owner: If Contractor's performance of the Work along the critical path is delayed by any conditions beyond the control and without the fault or negligence of Contractor and not caused by the Owner, and if the Owner determines that the delay was beyond the control and without the fault or negligence of the Contractor and not foreseeable by the Contractor at the time this Contract was entered into, the Owner will determine the duration of the delay based on the documentation provided by Contractor, and may extend the time of performance of this Contract provided; however, that Contractor shall cooperate with the Owner and use its best efforts to minimize the impact on the schedule of any such delay. These delays shall be considered excusable, and the Contractor shall not be entitled to, and hereby expressly waives recovery of, any damages suffered by reason of the delays contemplated by this paragraph and extension of time shall constitute Contractor's sole remedy for such delays.
- 5) In addition to the delays in the Work specified in this section, delays in the Work directly caused by an act or omission by an owner of an adjoining property, or by tenants or permittees on County property, will not be considered an Owner-controlled delay. An owner of an adjoining property is a person, firm, corporation, partnership, or other organization who either owns or occupies, or both, structures, or parcels or both, immediately adjacent to the Work Site. Extension of time for those delays will be considered excusable and shall be treated as specified in this article, provided that:
 - a. The Contractor has, in accordance with this article, given to the Architect/Engineer immediate verbal justification, with written confirmation within 48 hours of the delay; and
 - b. The Contractor establishes, to the satisfaction of the Architect/Engineer, that:
 - i. The delay was caused directly by an act or omission by the owner of the adjoining property; and

- ii. The Contractor has taken reasonable precautions and has made substantial effort to minimize the delay.
- 6) A Change Order will be furnished to the Contractor within a reasonable period of time, after approval of a request for extension of time, specifying the number of days allowed, if any, and the new dates for completion of the Work or specified portions of the Work. All requests for time extension shall be in accordance with the Contract Documents. With the exception of time extensions covered under the time contingency allowance in the contract, pursuant to Section 9-3 of the Code of Miami-Dade County. All change orders shall be in full accord with the Contract Documents. The Board of County Commissioners shall not be bound by the recommendation of County Staff with respect to time extensions, and may accept, reject, or modify change orders in its sole discretion.
- 7) Additional requirements for the submittal of time extension requests may be included in the Technical Specifications,

D. Substantial Completion, Final Completion and Final Acceptance

- 1) The following items must be satisfied before Substantial Completion, as defined in the Contract Documents, will be approved:
 - a. All Work must be completed to the satisfaction of the appropriate permitting agencies having jurisdiction over the Work. The Contractor must furnish the Owner with a “Temporary Certificate of Occupancy” or a “Certificate of Completion,” as applicable, from the permitting agency unless circumstances arise outside the contract scope that prohibits such certificates from being issued (i.e. utility connections).
 - b. All operational systems which may include but not be limited to electrical systems, security systems, irrigation systems and fire systems, must be completed in accordance with the Contract Documents, tested and approved.
 - c. All plumbing, heating, ventilation, and air conditioning systems must be completed, tested, and approved. Whenever the scope of work includes a facility or building, an HVAC test and balance report must be submitted and approved as a condition precedent to Substantial Completion.
 - d. The punch list may not be so extensive or of a nature that the Contractor’s completion will significantly interfere with the Owner’s beneficial use of the facility.
- 2) When the Contractor believes that all the Work or designated portion thereof required by the contract is substantially completed, the Contractor shall submit to the Field Representative and the Architect/Engineer a request for Substantial Completion inspection. The Contractor, the Field Representative, the Architect/Engineer, sub-consultants, and the Owner shall meet at the Project site for the purpose of making a combined inspection of the Work. During this inspection, any item of work remaining to be done or Work to be corrected shall be noted on a Punch List. If the Field Representative and/or the Architect/Engineer and the Owner indicate on this inspection report that the Work is substantially complete, a Certificate of Substantial Completion will be issued to the Contractor. The Certificate of Substantial Completion shall establish the date of Substantial Completion and shall have attached the Punch List reflecting any items to be completed or corrected, but which do not prevent beneficial use and occupancy, and shall state the date by which the Punch List is to be completed. The completion time for

the Punch List shall not be greater than 60 days from the date of issuance of the Certificate of Substantial Completion.

- 3) If any of the conditions listed in this article are not met and the Work has not been completed, or the Owner determines that the final Punch List cannot be completed within sixty (60) days, a Certificate of Substantial Completion shall not be issued. The Contractor shall continue work, reducing the number of items on the Punch List that were not met. Additional inspections shall be scheduled as necessary until Substantial Completion is declared. However, costs incurred by the Owner for any inspections beyond a second inspection will be charged back to the Contractor.
- 4) In the event the Contractor fails to achieve Substantial Completion within the period specified in the Contract for completion, the Contractor shall be liable for Liquidated Damages and the Owner has, as its option, the right to, after 10 calendar day-notice to the Contractor, to remove such work from the Contract, in which case the value of the work, as measured by the Owners' cost to have such work performed by others, shall be deducted from Contractor's final payment, whether or not the Owner causes such work to be performed. In the event that the Owner chooses to remove such work, there shall not be any further non-excusable delays charged to the Contractor beyond the 10 days following notice to the Contractor. However, the Contractor shall not be relieved of any non-excusable delays incurred through the date of termination. The Punch List and the Contract shall remain open until all the Work is complete and accepted. The current retainage will be used to offset any Liquidated Damages and any back charges, after which, any surplus retainage will be released to the Contractor. If the retainage is insufficient to cover the Liquidated Damages and any back charge, the Owner will bill the Contractor for the balance and the Contractor shall promptly remit to the Owner an amount equal to the billing.
- 5) Final Completion: When the Owner or Architect/Engineer considers all Work indicated on the Punch List to be complete, the Contractor shall submit written certification that:
 - a. Work has been inspected for the compliance with the Contract Documents.
 - b. Work has been completed in accordance with the Contract Documents, and that deficiencies listed within the Certificate of Substantial Completion and its attachments have been corrected.
 - c. Work is completed and ready for Final Inspection.
- 6) Should the Owner and/or Architect/Engineer inspection find that Work is incomplete, he will promptly notify the Contractor in writing listing all observed deficiencies. The Contractor shall be responsible for all Direct and Indirect Costs to the County resulting from the Contractor's failure to complete the Punch List items within the time allowed for completion.
- 7) The Contractor shall remedy deficiencies and send a second certification. Another inspection will be made that shall constitute the final inspection. Provided that work has been satisfactorily completed, the Architect/Engineer will notify the Contractor in writing of Final Acceptance as of the date of this final inspection.
- 8) Prior to Final Acceptance, the Contractor shall deliver to the Field Representative complete As-Built drawings, all approved Shop Drawings, maintenance manuals, pamphlets, charts, parts lists and specified spare parts, operating instructions and other necessary documents required

for all installed materials, equipment, or machinery, all applicable warranties and guarantees, and the appropriate Certificate of Occupancy.

- 9) Upon notification of Final Acceptance to the Contractor, the Architect/Engineer will request and consider closeout submittals from the Contractor including but not limited to the final Contractor's Affidavit and Release of All Claims.
- 10) The Contractor, without prejudice to the terms of the Contract, shall be liable to the Owner for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Owner's rights under any warranty or guaranty.
- 11) Re-Inspection Fees: Should the status of completion of the Work require re-inspection of the Work by the Owner and the Architect/Engineer due to failure of the Work to comply with the Contractor's representations regarding the completion of the Work, the Owner will deduct from the final payment to the Contractor, fees and costs associated with re-inspection services in addition to scheduled Liquidated Damages.

E. Use and Possession

The Owner shall have the right to occupy, take possession of or use any completed or partially completed portions of the Work. Such possession or use will not be deemed an acceptance of work not completed in accordance with the Contract. While the Owner is in such possession, the Contractor, notwithstanding the provisions of the Contract Documents, will be relieved of the responsibility for loss or damage to those portions of the Work occupied by Owner, excepting those resulting from the Contractor's fault or negligence or breach of warranty. The Contractor shall be responsible for maintenance of all equipment in these areas until these responsibilities are turned over to the County in writing. If such prior possession or use by the Owner delays the progress of the Work or causes additional expense to the Contractor, a Contract change in the Contract price, or the time of completion will be made, and the Contract will be modified in writing accordingly.

F. Liquidated Damages and Liquidated Indirect Costs

- 1) The parties to the Contract agree that time, in the completion of the Work, is of the essence. The Owner and the Contractor recognize and agree that the precise amount of actual damages for delay in the performance and completion of the Work is impossible to determine as of the date of execution of the Contract and that proof of the precise amount will be difficult. Therefore, the Contractor shall be assessed Liquidated Damages on a daily basis for each Day that individual milestones, both interim and cumulative as specified in the Contract Documents, are not timely achieved or that Contract Time is exceeded due to a non-excusable delay. These Liquidated Damages shall be assessed, not as a penalty, but as compensation to the Owner for expenses which are difficult to quantify with any certainty and which were incurred by the Owner due to the delay. The amount of Liquidated Damages assessed shall be an amount, as stipulated in the Contract Documents, per day for each calendar day that individual milestones as specified in the Contract are not timely achieved or that the Project is delayed due to a non-excusable delay.
- 2) The Owner and the Contractor recognize and agree that the precise amount of the Contractor's Indirect Costs for delay in the performance and completion of the Work is impossible to determine as of the date of execution of the Contract, and that proof of the precise amount will be difficult. Therefore, Liquidated Indirect Costs recoverable by the Contractor, shall be assessed on a daily basis for each Day the Contract Time is delayed due to compensable delay.

These Liquidated Indirect Costs shall be paid to the Contractor in full satisfaction of all costs and damages caused by compensable excusable delays, except for Direct Costs. There shall be no Liquidated Indirect Costs payable for time directly related to Extra Work for which a Change Order has been issued.

- 3) The amount of Liquidated Indirect Costs recoverable shall be an amount, as stipulated in the Contract Documents per day for each day the Contract is delayed due to compensable excusable delay. Unless otherwise specified in the Contract, for lump sum contracts, the daily amount of Liquidated Indirect Costs will be calculated by dividing the total amount in the Contractor's approved Schedule of Values for General Requirements by the Contract duration (in days) after deducting any general conditions costs directly paid by the Owner during the execution of the Project. The amount of the Liquidated Indirect Costs calculated in accordance with this formula shall be stated in the Notice-to-Proceed. For unit price contracts, the daily amount of Liquidated Indirect Costs will be calculated as defined in the formula below:

$$\frac{(\text{Amount of Bid} \times 8\%) \text{ less any General Requirements items paid independently/individually}}{\text{Original Contract Duration (In Days)}}$$

- 4) In the event the Contractor fails to perform any other covenant or condition (other than time-related) of this Contract relating to the Work, the Contractor shall become liable to the Owner for any actual damages which the Owner may sustain as a result of such failure on the part of the Contractor. The Owner reserves the right to retain these amounts from monies due the Contractor.
- 5) Nothing in this article shall be construed as limiting the right of the Owner to terminate the Contract and/or to require the Surety to complete said Project and/or to claim damages for the failure of the Contractor to abide by each and every one of the terms of this Contract as set forth and provided for in the Contract Documents.
- 6) Consequential Damages: This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination. Nothing contained in this Section shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents. Notwithstanding anything whatsoever contained in this Agreement to the contrary, the Parties expressly agree that no Party to this Agreement shall be liable to any other Party or Parties to this Agreement for any special, consequential, or exemplary damages of any kind whatsoever, whether arising in contract, warranty, tort (including but not limited to negligence), strict liability, or otherwise, including without limitation losses of use, profits, business reputation and financing.

END OF ARTICLE

9. PROGRESS PAYMENTS

A. Payments

- 1) The Contractor shall receive and accept compensation provided for in the Contract as full payment for furnishing all materials, for performing all work under the Contract in a complete and acceptable manner, and for all risk, loss, damage, or expense of whatever character arising out of the nature of the work or the prosecution thereof.
- 2) The Owner will make progress payments monthly as the work proceeds. Prior to issuance of the Notice to Proceed, unless the Special Provisions provide for the payment to be determined by using a cost-loaded CPM, the Contractor shall, furnish a Schedule of Values for review and approval by the Owner consisting of a detailed cost breakdown of each lump sum bid item in the Bid Form in such detail as the Architect/Engineer shall request, showing the amount included therein for each principal category of the work, to provide the basis for determining the amount of progress payments. Unit price bid items shall be paid for in accordance with the Bid Form. The Schedule of Values shall clearly indicate the amount to be paid by the Contractor to each individual subcontractor. Notice to Proceed shall not be issued, and the Contractor cannot submit monthly invoices, without an approved Schedule of Values.
- 3) In making such progress payments, a maximum of 5 percent of the estimated amount shall be retained from each progress payment made to the Contractor until 50 percent Completion of the work has been established. 50 percent completion is defined as the point in time when at least 50 percent of the Work under contract has been physically and satisfactorily completed in accordance with the intent of the Contract Documents as determined by the Architect/Engineer. At this point, the retainage amount withheld from each subsequent progress payment may be reduced, at the discretion of the Owner, provided the Owner finds that satisfactory progress is being made. Also, whenever the Work is Substantially Complete, the Owner, if it considers the amount retained to be in excess of the amount adequate for its protection, may release to the Contractor all or a portion of such excess amount.
- 4) Material and work covered by progress payments shall become the sole property of the Owner. This provision shall not be construed as relieving the Contractor from the sole responsibility for material and work upon which payments have been made, the restoration of damaged work or as waiving the right of the Owner to require the fulfillment of the terms of the Contract.
- 5) Progress payments will be made in accordance with the Miami-Dade County Code, Florida Statute, s. 218.70 Florida Prompt Payment Act, and Florida Statute, s. 218.735.
 - a. The Contractor's attention is directed to Florida Statute, s. 218.735, revising provisions regarding timely payment, revising deadlines for the payment of contractors, subcontractors, sub-subcontractors, materialmen and suppliers. The contractor shall remit payment due to subcontractors within 10 days after the contractors' receipt of payment. The subcontractor shall remit payment due to sub-subcontractors and suppliers within seven (7) days after the subcontractors' receipt of payment. Dispute resolution is provided within the Statute.
 - b. The Contractor's attention is further directed to Miami Dade County Code Section 10-33.02, Section 2-8.1.4 , Section 2-8.1.1.1.1 and Section 2-8.1.1.1.2 , providing for prompt payments of fourteen (14) days upon receipt of an approved invoice are made

to prime contractor certified as Miami Dade County certified small businesses or prime contracts with Miami Dade County certified small businesses are participating as subcontractors by County agencies and the Public Health Trust; creating dispute resolution procedures for payment of County and Public Health Trust obligations; and requiring the prime Contractor to issue prompt payments within two (2) days upon receipt of payment from the owner, and have the same dispute resolution procedures as the County, for all small business subcontractors. Failure of the Contractor to issue prompt payment to small businesses, or to adhere to its dispute resolution procedures, may be cause for suspension, termination, and debarment, in accordance with the terms of the County contract or Public Health Trust contract and debarment procedures of the County.

- 6) No progress payments will knowingly be made for work not in accordance with this Contract, but payment of a requisition shall not constitute acceptance of non-conforming work or otherwise constitute a waiver of any of the Owner's rights under the Contract
- 7) Applications for progress payments shall be in the format as prescribed by the Owner. These applications shall be supported by evidence, which is required by this article. Each application for payment shall clearly indicate the amount to be paid to the Contractor as well as the amount to be paid to each of the Contractor's subcontractors and suppliers, based on work installed and approved at the time of the application. The Contractor shall certify, pursuant to the Miami-Dade County False Claims Ordinance, that the work for which payment is requested has been done and that the materials listed are stored where indicated. Those items on the progress payment application that, in accordance with the applicable sections of the Contract Documents, compensate for Force Account Work, for materials not yet incorporated in the work, or for work under change orders negotiated on a cost-reimbursable basis will, under procedures of the Owner, be subject to the Owner's audit review of the Contractor's records supporting the payment application. Audits will be performed so as not to interfere with timely processing of applications for payment. If audit indicates the Contractor has been overpaid under a previous payment application, that overpayment will be credited against current progress payment applications. For a period of five years from Final Acceptance of the Contract, the Contractor shall maintain and make available for audit inspection and copying by the Owner, State and the Government and their authorized representatives, all records subject to audit review.
- 8) The Owner, at its discretion, may authorize payment for materials not yet incorporated into the Work, whether or not delivered to the Work Site. The value of materials on hand but not incorporated into the Work will be determined by the Field Representative, based on actual invoice costs to the Contractor, and such value will be included in a monthly application for payment only if the materials have been properly stored on the Site, provided that such materials meet the requirements of the Contract Documents, and are delivered to acceptable locations on Site or in bonded warehouses that are acceptable to the Owner; materials paid for in this manner shall be kept segregated from other materials purchased by Contractor and shall not be used for other projects undertaken by Contractor. Such delivered costs of stored or stockpiled materials may be included in the next application for payment after the following conditions are met:
 - a. The material has been stored and stockpiled in a manner acceptable to the Field Representative at or on the Work site or in a secure storage facility within Miami-Dade County or other location as approved by the Architect/Engineer. If such

materials are stored outside Miami-Dade County, the Contractor shall accept responsibility for and pay all personal and property taxes that may be levied against the Owner by any state or subdivision thereof on account of such storage of such material. The Owner will permit the Contractor, at his own expense, to contest the validity of any such tax levied against the Owner and in the event of any judgment or decree of a court against the Owner, the Contractor agrees to pay same.

- b. The Contractor has furnished the Field Representative with acceptable evidence of the quantity and quality of such stored or stockpiled materials.
- c. The Contractor has furnished the Field Representative with satisfactory evidence that the materials and transportation costs have been paid including but not limited to certified bills of sale for such materials and insurance certificates or other instruments, in writing, and in a form as required by the Owner. The Architect/Engineer may allow only such portion of the amount represented by these bills as, in his opinion, is consistent with the reasonable cost of such materials.
- d. The Contractor has furnished the Owner legal title (free of debts, claims, liens, mortgages, taxes, or encumbrances of any kind) to the material so stored and stockpiled and subject only to the Owner's payment for the materials as reflected in the application for payment. All such materials so accepted shall become the property of the Owner. The Contractor at his own expense shall mark such material as the property of the Owner and shall take such other steps, if any, the Owner may require or regard as necessary to vest title in the Owner to such material.
- e. The Contractor has furnished the Owner evidence that the material so stored or stockpiled is insured against loss by damage to or disappearance of such materials at any time prior to use in the work. The cost of the material included in an application for payment which may subsequently become lost, damaged, or unsatisfactory shall be deducted from succeeding applications for payment irrespective of the cause and whether or not due to the negligence, carelessness or fault of the Owner.
- f. It is understood and agreed that the transfer of title and the Owner's payment for such stored or stockpiled materials shall in no way relieve the Contractor of its responsibility for furnishing and placing such materials in accordance with the requirements of the Contract Documents and does not waive Owner's right to reject defective material when it is delivered to the Site until such material is delivered to the Site and satisfactorily incorporated into the work.
- g. In no case will the amount in an application for payment for material on hand exceed the Contract price for such material, the Contract price for the Contract item in which the material is intended to be used or the value for such material established in the approved Schedule of Values. Payment for material furnished and delivered as indicated above will be based on 100 percent of the cost to the Contractor and retention will be withheld as specified in the Contract Documents. In any event, partial payments for materials on hand will not exceed 70 percent of the item's Bid Price, including taxes and shipping, or the agreed amount within the Schedule of Values.

- h. No partial payment will be made for stored or stockpiled living or perishable plant materials.
 - i. The Contractor shall bear all costs associated with the partial payment of stored or stockpiled materials in accordance with the provisions of this Article.
 - j. Materials may be subject to being purchased by the Owner directly under the County's "Direct Material Purchase Program" and installed by the Contractor, as applicable, in accordance with the Special Provisions.
- 9) Payment of the Contract lump sum price for General Requirements, if applicable, will be made in the following manner:
 - a. The General Requirements Lump Sum amount, including cost for bonds and insurance, shall be paid in proportion to the total percent of completion. The Owner will consider requests for payment for bonds and insurance under the General Requirements after receipt of certified invoices from the Contractor showing that the Contractor has paid them.
 - b. The Owner reserves its right to withhold payment for General Requirements, in whole or in part, at the Owner's sole discretion, in accordance with Paragraph 11 below.
- 10) If any claim is filed against the project for labor, materials, supplies or equipment which the Owner has determined to have been incorporated on the site and the Contractor has not paid for, the Owner will have the right to retain from payments otherwise due the Contractor, in addition to other amounts properly withheld under this article or under other provisions of the Contract, an amount equal to such amounts claimed.
- 11) In addition to the provisions of this article and other relevant sections of the Contract Documents, payment may also be withheld proportionately for the following reasons:
 - a. Reasonable doubt that the Work can be completed for the unpaid balance of the Contract Sum,
 - b. Reasonable indication that the Work will not be completed within the Contract Time,
 - c. Damage to another Contractor,
 - d. Unsatisfactory prosecution of the Work by the Contractor,
 - e. Failure of the Contractor, or his subcontractors, to pay wage rates, when applicable as required by the Contract.
 - f. In the event the Surety on the Performance and Payment Bond provided by the Contractor becomes insolvent, or is placed in the hands of a receiver, or has its right to do business in the State of Florida suspended or revoked as provided by law. In this case, payment will continue when the Contractor provides a good and sufficient Bond(s) as required by the Contract Documents, in lieu of the Bond(s) so executed by such Surety.
 - g. If any work or material is discovered which, in the opinion of either the Architect/Engineer or the Field Representative, is defective, or should a reasonable

doubt arise on the part of either the Architect/Engineer or the Field Representative as to the integrity of any part of the work completed previous to the final acceptance and payment. In this case, there will be deducted from the first application for payment subsequent to the discovery of such work, an amount equal in value to the defective or questioned work, and this work will not be included in any subsequent applications for payment until the defects have been remedied or the causes for doubt removed.

- 12) The Contactor shall submit with each monthly invoice, or as otherwise directed by the County, certified payroll forms for all the Contractor's employees on the job, as well as for all subcontractors regardless of tier in accordance with applicable Responsible Wages and Benefits in accordance with Miami-Dade County Code Section 2-11.16). Failure to provide this information will cause the Contracting Officer, Field Representative, and/or Architect/Engineer to return the invoice to the Contractor until such time as the Contractor properly submits the required information.
- 13) Failure to comply with the insurance requirements listed in the Contract Documents may result in the Owner's withholding or delaying payment to the Contractor.
- 14) In accordance with Miami-Dade County Implementing Order 3-9, Accounts Receivable Adjustments, if money is owed by the Contractor to the County, whether under this Contract or for any other purpose, the County reserves the right to retain such amount from payment due by County to the Contractor under this Contract. Such retained amount shall be applied to the amount owed by the Contractor to the County. The Contractor shall have no further claim to such retained amounts which shall be deemed full accord and satisfaction of the amount due by the County to the Contractor for the applicable payment due herein.

B. Taxes

- 1) Except as may be otherwise provided for in the Contract Documents, the price or prices bid for the Work shall include full compensation for all federal, state, local and foreign taxes, fees and duties that the Contractor is or may be required to pay and the Contractor shall be responsible for the payment thereof during the prosecution of the work.
- 2) The Contractor's attention is directed to the fact that materials and supplies necessary for the completion of this Contract are subject to the Florida Sales and Use Tax, in accordance with Section 212.08, Florida Statutes, as amended. The Contractor shall not collect taxes upon making delivery to the Owner.
- 3) The Owner, at its sole discretion, upon request of the Contractor and where appropriate, may furnish to the Contractor appropriate evidence to establish exemption from any taxes, fees or duties which may be applicable to the agreement and from which the Owner is exempt.

C. Tax Exempt Owner Purchase Materials

The owner may incorporate specifications for tax exempt owner purchase in all covered contracts. A tax-exempt owner purchase is one made directly by the County which is intended to be tax exempt in accordance with Section 212.08(6) of the Florida Statutes and Rule 12A-1.094 of the Florida Administrative Code, as the same may be amended. A covered contract is a contract for the construction, improvement or rehabilitation of property which is estimated to exceed ten million dollars (\$10,000,000.00) in cost.

The contractor must include Florida State Sales Tax and other applicable taxes in his bid for materials, supplies, and equipment. The owner, being exempt from sales tax, reserves the right to make direct purchases of various construction equipment, materials or supplies included in the Contractor's bid and/or contract, substantially in accordance with the contract.

OWNER DIRECT PURCHASE PROCEDURES

- A) Contractor shall provide Owner's Representative a list of all intended suppliers, vendors, and materialmen for consideration as Owner Direct Purchased materials. This list shall be submitted at the same time as the preliminary schedule of values and the Project schedule. The Contractor shall submit a description of the materials to be supplied, estimated quantities and prices.
- B) Upon request from Owner, and in a timely manner, Contractor shall submit the attached Purchase Order Requisition Form to the Owner's Representative, to specifically identify the materials which Owner has, at its sole option, elected to purchase directly. On the Purchase Order Requisition Form, the Contractor will provide the Owner the required quantities of material at the price established in the vendor's quote to the Contractor, less any sales tax associated with such price.
- C) Such Purchase Order Requisition Forms are to be submitted to Owner's designated representative no less than two (2) weeks prior to the need for ordering such Owner Direct Purchased Materials, in order to provide sufficient time for Owner review and approval and to assure that such Directly Purchased Materials may be directly purchased by Owner and delivered to the Project site so as to avoid any delay to the Project.
- D) After receipt of the Purchase Order Requisition Form, Owner shall prepare its Purchase Order for equipment, materials or supplies which the Owner chooses to purchase directly. Promptly, within two (2) business days of receipt of each Purchase Order, the Contractor shall verify the terms and conditions of the Purchase Order prior to its issuance to supplier and in a manner to assure proper and timely delivery of items. After such verification by the Contractor, The Owner shall issue the Purchase Order to the supplier or vendor. The Purchase Order shall require that the supplier provide the required shipping and handling insurance. The Purchase Order shall also require the delivery of the Owner Direct Purchased Materials on the delivery dated provided by the Contractor in the Purchase Order Requisition Form and shall indicate F.O.B. jobsite. The Owner's Purchase Order shall also provide that the supplier shall invoice the Owner directly for the items purchased and not the Contractor. Owner shall immediately provide Contractor with copies of such invoices it receives. The Owner's Purchase Orders shall contain or be accompanied by the Owner's exemption certificate and must include the Owner's name, address, and exemption number with issue and expiration date shown. The Owner shall issue each supplier or vendor a Certificate of Entitlement on the Certificate of Entitlement Form attached hereto with each Purchase Order.

- E) All shop drawings and submittals shall be made by the Contractor in accordance with the Project Specifications.
- F) Contractor shall be fully responsible for all matters relating to the receipt of materials in accordance with these Procedures, including, but not limited to, verifying correct quantities, verifying documentation of orders in a timely manner, coordinating purchases, providing and obtaining all warranties and guarantees in favor of and for the benefit of the Owner required by the Contract Documents, inspection and acceptance of the goods at the time of delivery. At the time of, and subsequent to, the delivery of such materials, the Owner shall be liable for all loss or damage to equipment and materials purchased pursuant to the Purchase Order. The Contractor shall coordinate delivery schedules, sequence of delivery, loading orientation, and other arrangements normally required by the Contractor for the particular materials furnished. The Contractor shall provide all services required for the unloading, handling and storage of materials through installation. The Contractor agrees to indemnify and hold harmless the Owner from any and all claims of whatever nature resulting from non-payment of goods to suppliers arising from the actions or directions of Contractor. Notwithstanding the foregoing, the Owner shall be responsible for payment of the invoices issued by the supplier or vendor pursuant to the procedures in Paragraph G below.
- G) As Owner Direct Purchased Materials are delivered to the jobsite, the Contractor and the Owner's Representative, shall visually inspect all shipments from the suppliers, and approve the vendor's invoice issued to the Owner for material delivered. The Contractor shall assure that each delivery of Owner Direct Purchased Material is accompanied by documentation adequate to identify the Purchase Order against which the purchase is made. This documentation may consist of a delivery ticket and an invoice from the supplier delivered to the Owner (and provided to Contractor) conforming to the Purchase Order, together with such additional information as the Owner or Contractor may require. The Contractor shall verify in writing to the Owner's Representative that the Materials were received in order for the Owner to agree to approve the invoice for payment of the invoice issued. The Owner shall have the right to assign Owner personnel to verify and audit the accuracy of all Direct Purchase documents.
- H) The Contractor shall insure that Owner Direct Purchase materials conform to the Specifications, and determine prior to incorporation into the Work if such materials are patently defective, and whether such materials are identical to the materials ordered and match the description on the bill of lading. If the Contractor discovers defective or nonconformity's in the Owner Direct Purchased Material upon such visual inspection, the Contractor shall not utilize such nonconforming or defective materials in the Work and instead shall promptly notify the Vendor of the defective or non-conforming condition in order to pursue repair or replacement of those materials without any undue delay or interruption to the Project. Additionally the Contractor shall notify the Owner of such occurrence. If the Contractor fails to perform such inspection and otherwise incorporates Owner Direct Purchased materials, the condition of which it either knew or should have known by performance of an inspection, Contractor shall be responsible for all damages to

Owner resulting from Contractor's incorporation of such materials into the Project, including liquidated or delay damages. In the event that materials furnished are found to be defective or nonconforming, the Contractor shall promptly take action to remedy the defect or nonconformance so as not to delay the work.

- I) The Contractor shall be responsible for obtaining and managing all warranties and guarantees in favor of and for the benefit of the Owner for all materials and products as required by the Contract Documents. All repairs, maintenance or damage repair calls shall be forwarded to the Contractor for resolution with the appropriate supplier or vendor.
- J) The transfer of possession of Owner Direct Purchased Materials from the Owner to the Contractor shall constitute a bailment for mutual benefit of the Owner and the Contractor. The Owner shall be considered the bailor and the Contractor the bailee of the Owner Direct Purchased materials. Owner Direct Purchased Materials shall be considered returned to the Owner for purposes of its bailment at such time as they are incorporated into the Project or consumed in the process of completing the Project. Bailee shall have the duty to safeguard, store and protect all Owner Direct Purchased Materials.
- K) The Contractor shall maintain insurance in favor of and for the benefit of the Owner pursuant to the requirements set forth in the Owner and Contractor Agreement which shall be sufficient to protect against any loss of or damage to Owner Direct Purchased equipment, materials or supplies. Such insurance shall cover the value of any Owner Direct Purchased Materials not yet incorporated into the Project from the time the Owner first takes title which shall be at the time of delivery and acceptance of the materials by the Contractor as provided in Paragraph F above.
- L) On a monthly basis, Contractor shall be required to review invoices submitted by all suppliers of Owner Direct Purchased Materials delivered to the Project site during that month and either concur or object to the Owner's issuance of payment to the supplier, based upon Contractor's records of materials delivered to the site and any defects in such materials.
- M) In order to arrange for the prompt payment to the supplier, the Contractor shall provide to the Owner, a list indicating the acceptance of the goods or materials in accordance with the established monthly Payment Request Schedule. The list shall include a copy of the applicable Purchase Order, invoices, delivery tickets, written acceptance of the delivered items, and such other documentation as may be reasonably required by the Owner. Upon receipt and verification of the appropriate documentation, the Owner shall prepare a payment to the supplier based upon the receipt of data provided. This payment will be released, delivered and remitted directly to the supplier by the Owner. The Contractor agrees to assist the Owner to immediately obtain partial or final release of lien waivers as appropriate.

- N) Salvage materials shall be the property of the Owner and stored or removed from the site by the Contractor at the Owner's discretion.
- O) From the time of delivery and acceptance, the Owner shall have and retain title to any and all Owner Direct Purchased materials.
- P) Upon completion of the project, the Contractor shall execute and deliver to the Owner, one or more deductive Change Orders, referencing the full value of all Owner Direct Purchased materials purchased directly, plus all sales tax savings associated with such materials in Contractor's bid to Owner's Representative.

D. Payments to Subcontractors and Suppliers

- 1) The Contractor shall pay all subcontractors for and on account of work performed by such subcontractors in accordance with the terms of their respective subcontracts and in accordance with Miami-Dade County Code Section 10-33.02 and Florida Statute s. 218.735.
- 2) Before the Contractor can receive any payment, except the first payment, for monies due him as a result of a percentage of the work completed, he must provide the Architect/Engineer with duly executed release of claim from all subcontractors and suppliers who have performed any work or supplied any material on the project as of the date, stating that said subcontractors or suppliers have been paid their proportionate share of all previous payments. In the event such affidavits cannot be furnished, the Contractor may, at the Owner's sole discretion after the Contractor demonstrates justifiable reasons, submit an executed Consent of Surety to Requisition using the form provided in the Contract Documents identifying the subcontractors and the amounts for which the Statement of Satisfaction cannot be furnished.
- 3) The Contractor's failure to provide a Consent of Surety to Requisition Payment will result in the amount in dispute being withheld until (1) the Statement of Satisfaction is furnished, or (2) Consent of Surety to Requisition Payment is furnished. The subcontractor(s) shall submit with each monthly invoice the Certified Payroll forms for all employees on the job in accordance with applicable Provisions. Failure to provide this information will cause the Architect/Engineer to return the invoice to the Contractor until such time as the Contractor properly submits the information.

E. Contract Prices - Bid Form

Payment for the various Bid Items listed in the Bid Form shall constitute full compensation for furnishing plant, labor, equipment, appliances, and materials and for performing operations required to complete the Work in conformity with the Contract Documents. All costs for work shown or indicated by the Contract Documents, although not specifically provided for by a Bid Item in the Bid Form, shall be included in the most appropriate Bid Item price for the items listed. Except for the relief provided by the applicable section of the Contract Documents governing Differing Site Conditions, the Contractor will not be entitled to additional compensation for providing an activity

or material necessary for the completion of the Work in accordance with the Contract even though the activity or material is not included in a specific Bid Item or indicated in the Contract Documents.

F. Final Payment

- 1) After the Work has been accepted by the Owner, subject to the provisions of the Contract Documents, a final payment will be made as follows:
 - a. Prior to Final Acceptance of the Work, the Contractor shall prepare and submit a proposed final application for payment to the Architect/Engineer showing the proposed total amount due the Contractor, segregated as to Bid Item quantities, force account work, and other bases for payments; deductions made or to be made for prior payment; amounts to be retained; any claims the Contractor intends to file at that time or a statement that no claims will be filed; and any unsettled claims, stating amounts. Prior applications and payments shall be subject to correction in the proposed final application for payment. Claims filed with the final application for payment must be otherwise timely under these General Conditions.
 - b. The Owner will review the Contractor's proposed final application for payment and necessary changes, or corrections will be forwarded to the Contractor. Within 10 days thereafter, the Contractor shall submit a final application for payment incorporating changes or corrections made by the Architect/Engineer together with additional claims resulting therefrom. Upon approval by the Owner, the corrected proposed final application for payment will become the approved final application for payment.
 - c. If the Contractor files no claims with the final application for payment and no claims remain unsettled within 30 days after final inspection of the Work by the Architect/Engineer and the Owner, and agreements are reached on all questions regarding the final application for payment, the Owner, in exchange for an executed release of all claims and properly executed close-out documents specified in Paragraph 3 below, will pay the entire sum found due on the approved final application for payment.
 - d. Upon final determination of any and all claims, the Owner, in exchange for properly executed close-out documents specified in Paragraph 3 below, will pay the entire sum found due on the approved final application for payment, including the amount, if any, allowed on claims.
 - e. The release from the Contractor will be from any claims arising from the Work under the Contract. If the Contractor's claim to amounts payable under the Contract has been authorized by the Owner for assignment pursuant to the relevant sections of the Contract Documents, a release may be required from the assignee.
 - f. Final payment will be made within 30 days after approval of the final notice and resolution of Contractor's claims, or 30 days after Final Acceptance of the Work by the Owner, whichever is later. If a final application for payment has not been approved within 30 days after final inspection of the Work, the Owner shall make payment of sums not in dispute without prejudice to the rights of either the Owner or the Contractor in connection with any disputed items.

- g. Prior to payment of a claim settlement, the claim may be audited by the Owner and may be subject to approval by the funding agencies.
 - h. Final payment made in accordance with this article will be conclusive and binding against both parties to the Contract on all questions relating to the amount of work done and the compensation paid.
- 2) With the final application for payment, the Contractor shall return and submit final releases of claim from himself, from each subcontractor of record and from other subcontractors or material suppliers who may have notified the Owner that they were furnishing labor or materials for this project. These releases from subcontractors and suppliers shall be final, originals, notarized and executed on the form provided by the Owner and included in the Contract Documents, all in accordance with all applicable Florida Statutes. In addition, the Contractor shall execute and return to the Owner all the enclosed close-out documents. In the event that all of the above releases cannot be furnished, the Contractor may, at the Owner's sole discretion after the Contractor demonstrates justifiable reasons, submit a Consent of Surety to Final Payment in a form acceptable to the Owner, recognizing lack of such releases of claim. Furthermore, the Contractor and the Surety shall agree in writing, in a form acceptable to the Owner, to indemnify, defend and hold harmless the Owner from any claims of subcontractors and suppliers who refuse to execute final releases.
- 3) The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:
 - a. Faulty or defective Work appearing after Final Completion;
 - b. Failure of the Work to comply with the requirements of the Contract Documents, discovered after Final Completion;
 - c. The performance of audits to seek reimbursement of any overpayments discovered as a result of an audit as provided in the Contract Documents;
 - d. The enforcement of those provisions of the Contract Documents which specifically provide that they survive the completion of the Work;
 - e. The enforcement of the terms of the Payment and Performance Bonds against the Surety;
 - f. Terms of all warranties/guarantees required by the Contract Documents.
- 4) The acceptance of final payment shall constitute a waiver of all claims by the Contractor.
- 5) Escalation of Bid Items
 - Q) A dedicated allowance account has been established in this contract for escalation of contractor Unit Prices. The funds in the dedicated allowance account may not be used for any purpose other than escalation of Unit Prices as provided for below. Funds in the dedicated allowance account are the property of the Owner, and any unused funds at the end of the Contract shall remain property of the Owner. The Contractor expressly agrees that it is solely responsible for all cost escalations which exceed the value of the dedicated allowance account. Payment shall be made in a lump sum, based on escalation occurring in the preceding 365 days, as outlined below.

- R) The Contractor shall be entitled to escalation of its Unit Prices 365 days after award of the contract, and every 365 days thereafter.
- S) The Contractor shall utilize the most recent statistical data available as published by the Bureau of Labor Statistics.
- T) The formula for the alteration of the Unit Prices shall be the percentage change for the previous 12 months with a not-to-exceed percentage change of five percent (5%) for each bid item. Should the Bureau of Labor Statistics make a major CPI revision, such as a change to the applicable CPI base period, it remains that the Unit Prices shall be altered utilizing the percentage change of the most recent 12 months as published within the changed CPI. The percentage change in Unit Prices shall be computed similar to the following example:

CPI for the most recent month 135.8
 Less CPI for the month 12 months previous 129.9
 Equals the index point change 5.9
 Divided by previous period CPI.. 129.9
 Equals 0.0454
 The result is multiplied by 100 0.0454 x 100
 Which equals the percentage change multiplier 4.54

The percentage multiplier shall be rounded to two decimal places using the 5/4 rounding method, e.g., if the 3rd digit to the right of the decimal is a 5 through 9, then the 2nd digit to the right of the decimal is rounded up one value; or if the 3rd digit to the right of the decimal is 0 through 4, then the 2nd digit to the right of the decimal remains as is.

- E) Following each escalation period, the Contractor shall submit a request for escalation during the prior 365 days. The Owner shall, upon receipt of a proper request submitted in accordance with the provisions of these General Conditions, issue a work order for a lump sum amount representing the cost of escalation for all Unit Price items accepted and paid by the Owner during the preceding 365 days (Unit Price work accepted and paid multiplied times the percentage change multiplier). The Contractor shall at all times throughout the contract submit monthly invoices based on the Unit Prices contained in the bid, and shall not submit monthly invoices based on escalated pricing. Escalation Unit Prices shall only be paid retroactively and in a lump sum. Where the Dedicated Allowance Account is insufficient to pay for Escalated Unit Prices, the Owner shall pay the Contractor to the remaining value in the Dedicated Allowance Account and Owner shall have no further liability for escalated costs.

In the event that base contract work is not broken out into Unit Prices (i.e., for projects which were bid on a lump sum basis) escalation shall apply to the costs of such project as broken out in the approved Schedule of Values as if such costs were Unit Prices.

END OF ARTICLE

10. CHANGES

A. Changes

NOTE: "OVERHEAD" AS USED IN THIS SECTION IS DEFINED IN SECTION 1 DEFINITIONS - PAGE 8

- 1) The Owner reserves the right to, at any time, without notice to the sureties and without invalidating the Contract, by written notice or order designated as a Change Notice or Change Order, make any change in the Work within the general scope of the Contract including but not limited to changes:
 - a. In the Contract Documents;
 - b. In the method or manner of performance of the Work;
 - c. In Owner-furnished facilities, equipment, materials, services, or site or;
 - d. Directing acceleration in performance of the Work.

The Owner may authorize, via Allowance Account Work Order, Extra Work which does not change any provision of the General Covenants and Conditions or the Contract Documents, if the value of such work is less than the value remaining in the applicable Allowance Account and/or Time Contingency Account.

- 2) In the event the Owner exercises its right to change, delete or add work under the Contract, such work will be ordered and paid for as provided for in the Contract Documents.
- 3) Changes in the work may be initiated by the issuance of a Change Notice by the Architect/Engineer. The Contractor shall submit a proposal to the Architect/Engineer and the Owner for their review, in accordance with the Contract Documents, within five days after receipt of a Change Notice. The Contractor shall maintain this proposal, for acceptance by the Owner, for a minimum of 90 calendar days after submittal. The cost or credit to the Owner for any change in the work shall be determined in accordance with the provisions of the Contract Documents. The Contractor shall not be compensated for effort expended in preparing and submitting price quotes.
- 4) In the event the Contractor fails to provide the full cost and time estimate for the change work or refuses to execute a full accord Change Order, the Owner will, at its sole discretion, 1) determine the total cost and time impacts of the change and compensate the Contractor and/or extend the Contract Time, if applicable, through a unilateral Change Order signed only by the Owner; or 2) direct the Contractor to proceed with the Work under the Force Account provisions of this article. Failure of the Contractor to submit his total and final estimated cost and time impact within the time period specified on the Change Notice form shall constitute a waiver by the Contractor to claim additional costs or time beyond that which has been determined by the Owner. Any disputes arising out of an Owner determination shall be resolved in accordance with the dispute provisions in the Contract Documents. Pending the Owner's final decision, the Contractor shall proceed diligently with the performance of the Work under the Contract.
- 5) Changes in the work covered by Unit Prices, as stated in the Contract Documents shall be all inclusive. These prices will include all Direct and Indirect Costs and means and methods of

execution. To be compensable, units must be measured daily by the Contractor and approved in writing by the Owner or his authorized representative.

- 6) The following mark-ups on Extra Work shall apply to all changes in the Work performed under this article:
 - a. For Extra Work performed by the Contractor's own forces, the Contractor agrees that proposed cost to perform said Extra Work will in no event include a rate for total overhead in excess of 20 percent of the actual costs of the Extra Work.
 - b. For Extra Work performed by a subcontractor's forces, the Contractor agrees that the overhead, for each sub-contractors, sub-subcontractors, and suppliers, shall not exceed 15% of the total of all sub-contractor's actual direct costs of the Extra Work. The Contractor may then add five percent (5%) times the subcontractor's or sub-tier subcontractor's actual Direct Cost as direct compensation for the Contractor's Overhead and all other costs associated with the subcontractors Extra Work at all tiers.
- 7) Increases to the Contract Amount shall be authorized by a Change Order executed by the Contractor, the Contractor's Surety and the Owner and approved by the Board of County Commissioners; where the Board of County Commissioners has delegated via Ordinance authority to County Staff to execute change orders, such change orders are subject to ratification by the Board of County Commissioners as described in such ordinance. BCC. Decreases to the Contract amount shall be by Change Order or Work Order as determined by the Owner and shall also be subject to BCC approval when the decrease results from a reduction in the scope of the work.
- 8) A cost of bonds for Change Orders that impact the Contract price shall be established by the Contractor's actual reimbursement costs, as approved by the Owner, based on the original Contract Amount and the original amount reimbursed to the Contractor for bonds at the commencement of the Work. This cost of bonds shall be added to all credit amounts allowed by the Owner. For Change Orders paid under the Allowance Account, no additional bond cost will be allowed unless the Allowance Account is not included in the original Contract Amount. In this case, additional bond costs for these Change Orders will be considered.
- 9) Any claim for payment of Extra Work that is not covered by a Change Order or Work Order will be rejected by the Owner.

B. Allowance Accounts

- 1) Certain portions of work which may be required to be performed by the Contractor under this Contract are either unforeseeable or have not yet been designed, and the value of such work, if any, is included in the Contract as a specific line item(s) entitled "Allowance Account(s)."
 - a. The Allowance Account (Contingency) can be used to reimburse the Contractor for 1) furnishing all labor, materials, equipment and services necessary for modifications or Extra Work required to complete the Project because of unforeseeable conditions and; 2) for performing construction changes required to resolve: Owner directed changes in the work, unforeseen conditions (if compensation for same is otherwise allowed under the contract), revised regulatory requirements, work required by any Authority Having Jurisdiction (if not required

due to errors or omissions of the Contractor), and for making final adjustment to estimated quantities shown on the Schedule of Values or amounts bid in the Bid Form to conform to actual quantities installed.

- b. Other Allowance Account(s) (Dedicated) may be used as specified in the Contract Documents to fund specific items of work at the sole discretion of the Owner. These dedicated allowance accounts shall be used only for the purposes approved pursuant to a written Work Order issued by the Owner or his authorized representative.
- 2) At such time as work is to be performed under the Allowance Account(s), if any, the work shall be incorporated into the Schedule and the Schedule of Values and shall in all respects be integrated into the construction as a part of the Contract as awarded.
- 3) The Work Order for the required work will be issued by the Owner or Architect/Engineer upon receipt from the Contractor of a satisfactory proposal for performance of the work, and the acceptance thereof by the Architect/Engineer and the Owner. If the Contractor and the Owner are unable to agree upon an amount of compensation or; if the nature of the work is such that a Unit Price or Lump Sum price is not economically practical or if the change work is deemed essential to the Project and actual conditions require work to be swiftly conducted to avoid or minimize delays, the Work Order may be issued to perform the work on a Force Account basis. In the event that an equitable adjustment for the said change work cannot be arrived at, either by mutual agreement or under the dispute provisions of the Contract Documents, the compensation hereunder will be the total compensation for this work.
- 4) No Work Orders shall be issued against an Allowance Account if such Work Orders in the aggregate exceed the authorized amount of that Allowance Account, provided however that such excess may be authorized by appropriate Change Order.
- 5) The unexpended amounts under the allowance accounts shall remain with the Owner and the Contractor shall have no claim to the same.

C. Deletion or Addition of Work

- 1) In the event the Owner exercises its right to delete any portion(s) of the work contemplated herein, such deletion will be ordered, and the Contract Total Amount and Time may be adjusted as provided for in these Contract Documents by Change Order or by Work Order, as appropriate. The Contractor shall be reimbursed for any actual reasonable expenses incurred prior to the notice of deletion of work as a result of preparing to perform the work deleted. In the event of a dispute between Owner and Contractor as to the adjustment to the amount of time, the dispute shall be handled in accordance with these General Conditions.
- 2) Deleted Work - Lump Sum Bid Item(s): The Contractor shall credit the Owner for the reasonable value of the deleted work determined from the approved Schedule of Values, subject to approval by the Architect/Engineer. If the reasonable value of the deleted work cannot be readily ascertained from the Schedule of Values submitted in accordance with these General Conditions, or if requested by the Architect/Engineer, the Contractor shall supply all data required by the Architect/Engineer, including the actual agreements executed by the Contractor with the subcontractors and suppliers affected by the deleted work, to substantiate the amount of the credit to be given the Owner. The Contractor shall also submit for the Owner's approval a revised schedule of values reflecting the work remaining under the Contract following the deletion.

- 3) No payment(s) shall be made to the Contractor by the Owner for loss of anticipated profit(s) from any deleted work.
- 4) In the event the Owner exercises its right to add to any portion of the work contemplated herein, such addition will be ordered, and the Contract Total Amount and Contract Time will be adjusted as provided for in these Contract Documents, by Change Order or by Work Order as appropriate. In the event of a dispute between Owner and Contractor as to the adjustment to the Amount or the Time, the dispute shall be handled in accordance with the Contract Documents.

D. Increased or Decreased Quantities (Unit Prices)

- 1) This section applies to Owner-initiated additions or deletions from the Work and to the unit prices contained within this contract and controls payments or credits for variations between estimated and actual quantities required to complete the Work, even though the additions or deletions may be distinct or separate structures or activities and regardless of the fact that the addition or deletion is a result of field adjustments, site conditions, a design change, or any other cause. Increases or decreases will be determined by comparing the actual quantity required to the Architect/Engineer's estimated quantity in the Bid Form.
- 2) If the actual quantity of Bid Item varies from the Architect/Engineer's quantity estimate by 25 percent or less, payment for the Bid Item will be made at the Contract unit price. If the actual quantity varies from the Bid quantity by more than 25 percent, the compensation payable to the Contractor will be the subject of review by the Contractor and the Architect/Engineer and a Contract adjustment will be made by means of a Change Order in accordance with the Contract Documents to credit the Owner with any reduction in unit prices or to compensate the Contractor for any increase in unit price resulting from variations between estimated and actual quantities. The unit price to be re-negotiated shall be only for that quantity above 125 percent or below 75 percent of the original bid quantities.
- 3) The Contractor shall submit to the Architect/Engineer all data required to substantiate the amount of compensation requested, therefore. In no event shall the Contractor be entitled to compensation greater than the aggregate amount of all the Unit Prices times the original bid quantities of Work reflected in the Bid Form.
- 4) No compensation will be made in any case for loss of anticipatory profits, loss of bonding capacity or consequential damages.

E. Extra Work

- 1) Except as otherwise expressly provided above, all additional work ordered, work changed or work deleted shall be authorized by Work Order(s) or Change Order(s). All changed or added work so authorized shall be performed by the Contractor at the time and in the manner specified. The Change Order shall include, as a minimum:
 - a. Scope of work to be added, deleted, or modified;
 - b. Cost of work to be added, deleted, or modified;
 - c. The Contract time extension or reduction in contract time in the case of deleted work required to perform the work to be added, deleted, or modified;
 - d. Full release of claims associated with the Contract through the date of the change order, or, if the Owner and Contractor cannot agree on entitlement to a claim, a

reservation of the specific claims at issue; such reservation must, to be effective: identify each specific claim reserved, the scope of the work, the maximum cost of the work associated with the claim, and the maximum number of days of Contract time requested.

The Work Order shall include, at a minimum:

- a. Scope of work to be added, deleted, or modified;
 - b. Cost of work to be added, deleted, or modified;
 - c. The Contract time extension required to perform the work to be added, deleted, or modified;
 - d. Full release of claims associated with the work order work, or a reservation of claims identified as to each claim reserved, the scope of the work, the maximum cost of the work, and the maximum number of days of Contract time requested, shall be specified.
- 2) If Work is ordered, changed, or deleted which is not covered by Unit Prices, then, the Owner and the Contractor shall negotiate an equitable adjustment to the Contract Price for the Direct Costs for the performance of such work in accordance with this article. Indirect Costs for Work ordered, changed, or deleted may be reimbursed for Excusable and Compensable Delay as defined in these Contract Documents.
- a. In order to reimburse the Contractor for additional Direct Costs, either by Work Order, Change Order or any other means, the Contractor must have additional work added to the Contract Scope of Work. The additional cost of idle or inefficient labor, from any cause, or the additional cost of labor made idle or inefficient from any cause will not be considered a reimbursable additional Direct Cost. Special equipment or machinery, which is made idle or inefficient by the Work ordered, changed, or deleted, may be reimbursable if approved by the Architect/Engineer as an unavoidable cost to the Contractor, caused by the Owner.
 - b. Costs of special equipment or machinery, not already mobilized on the site, approved by the Architect/Engineer, shall be calculated using the current issue of the Associated Equipment Distributors (AED) Manual plus any required mobilization. The selection of which of the AED rates (daily, weekly, monthly) to be used to calculate these costs shall be as follows:
 - i. Between one (1) day and seven (7) days, use the daily rate.
 - ii. Between seven (7) days and 30 days, use the weekly rate.
 - iii. Greater than 30 days, use the monthly rate.
 - c. For less than one (1) day hourly rates, use the daily rate divided by eight (8).
 - d. For overtime hourly rates use the daily rate divided by eight (8), the weekly rate divided by 40, or the monthly rate divided by 176 as appropriate.
 - e. Costs for Special Equipment and Machinery already mobilized on the site, shall not exceed the monthly rate stated in the AED Manual, divided by 176, per hour that the

Special Equipment and Machinery is in use on the work plus any required re-mobilization.

- f. The cost calculation shall not combine rates within the range of a time extension. It shall use decimals of the time extension rate that the extension falls under. For example, the cost calculation for a piece of Special Equipment with an approved delay of 45 days shall be one and one-half (1.5) months times the monthly rate, not one (1) month at the monthly rate, plus two (2) weeks at the weekly rate, plus one (1) day at the daily rate.
- g. Rental for special equipment and machinery, not already mobilized to the site, shall be an amount equal to the appropriate daily, weekly, or monthly rental rate for such equipment, in accordance with the current issue of Associated Equipment Distributors' (AED) "Compilation of Nationally Averaged Rental Rates and Model Specifications for Construction Equipment" (notwithstanding the caveats contained therein that such rental rates are not for use by government agencies) for each and every rental period (in weeks, days, or months as applicable) that the special equipment or machinery is in use on the work plus any required mobilization. Payment for special equipment and machinery already mobilized to the site shall not exceed the monthly rate stated in the AED standards divided by 176 to establish a per hour rate that the special equipment and machinery is in use on the Work, plus any required re-mobilization.
- h. For indirect costs, the Contractor shall be allowed a percentage mark-up as set forth in paragraph (6) above...

F. Differing Site Conditions

- 1) The Contractor shall immediately, upon discovery and before such conditions are further disturbed, notify the Architect/Engineer in writing of: 1) subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents, or 2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.
- 2) The Architect/Engineer will promptly investigate the conditions, and if such conditions materially differ from those warranted by the County, and if same cause an increase or decrease in the Contractor's cost of, or the time required for, performance of any part of the work under the Contract, a Contract change may be made, and the Contract modified in writing in accordance with the Contract Documents.
- 3) No claim of the Contractor under this article will be allowed unless the Contractor has given the notice required in the Contract Documents.
- 4) No claim by the Contractor for a Contract change hereunder will be allowed if asserted after final payment under this Contract.
- 5) If the Owner is not given written notice prior to the conditions being disturbed, the Contractor will be deemed to have waived his right to assert a claim for additional time and compensation arising out of such changed conditions.

G. Force Account

- 1) If the Owner and the Contractor cannot reach agreement on an equitable adjustment to the Contract Price for any work as prescribed above, then the Extra Work will be performed on a Force Account basis as directed by the Architect/Engineer and paid for subject to the maximum markups specified in this Contract for changes in the work.
- 2) In the event Extra Work is performed on a Force Account basis, then the Contractor and the subcontractor(s), as appropriate, shall maintain itemized daily records of costs, quantities, labor and the use of authorized Special Equipment or Machinery. Copies of such records, maintained as follows, shall be furnished to the Architect/Engineer daily for approval, subject to audit.
 - a. Comparison of Record: The Contractor, including its subcontractor(s) of any tier performing the work, and the Architect/Engineer shall compare records of the cost of force account work at the end of each day. Agreement shall be indicated by signature of the Contractor, the subcontractor performing the work, and the Architect/Engineer or their duly authorized representatives.
 - b. Statement: No payment will be made for work performed on a force account basis until the Contractor has furnished the Architect/Engineer with duplicate itemized statements of the cost of such force account work detailed as follows:
 - i. Name, classification, date, daily hours, total hours, rate and extension for each laborer, tradesman, and foreman.
 - ii. Designation, dates, daily hours, total hours, rental rate, and extension of each unit of special machinery and equipment.
 - iii. Quantities of materials, prices, and extensions.
 - iv. Transportation of materials.

The statements shall be accompanied and supported by a receipted invoice of all materials used and transportation charges. However, if materials used on the force account work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices the Contractor shall furnish an affidavit certifying that such materials were taken from its stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

- c. Authorization of Special Equipment and Machinery: No compensation for special equipment or machinery shall be made without written authorization from the Architect/Engineer. The Architect/Engineer shall review and evaluate any special equipment or machinery proposed by the Contractor for use on a force account basis. As part of its evaluation, the Architect/Engineer shall determine whether any of the special equipment or machinery being proposed by the Contractor will be concurrently used on the Project, including approved changes, or on other force account work on the Project. If the Architect/Engineer determines that such a concurrent use of special equipment or machinery is being proposed by the Contractor, prior to the authorization of such special equipment or machinery, the Architect/Engineer and thereto Contractor shall establish a straight-line prorated billing mechanism based on the actual percentage of time that the equipment or

machinery is required to be used on the force account work(s). Special equipment or machinery which is approved for use by the Architect/Engineer shall be reviewed and accounted for on a daily basis as provided in the Comparison of Record and Statement paragraphs of this section of the Contract.

- d. Inefficiency in the Prosecution of the Work: If in the Owner's or Architect/Engineer's opinion, the Contractor or any of its subcontractors, in performing Force Account Work, is not making efficient use of labor, materials or equipment or is proceeding in a manner which makes Force Account Work unnecessarily more expensive to the Owner, the Owner or Architect/Engineer may, in whole or part, direct the Contractor in the deployment of labor, material and equipment. By way of illustration, inefficiency may arise in the following ways, including but not limited to: 1) the timing of the Work, 2) the use of unnecessary labor or equipment, 3) the use of a higher percentage of journeymen than in non-force account Work, 4) the failure to procure materials at lowest price, or 5) using materials of quality higher than necessary.

H. Contractor Proposals - General

The Contractor may at any time submit to the Architect/Engineer for review proposed modifications to the Work, including but not limited to, changes in the Contract Time and/or Contract Amount, supported by a cost/price proposal. Upon acceptance of the proposed modifications by the Owner, a Work Order or Change Order will be issued. Denial of a proposed modification will neither provide the Contractor with any basis for claim for damages nor release the Contractor from contractual responsibilities. A Contract change in the form of a Contract price reduction will be made if the change results in a reduction of the cost of performance and the Contractor will not be entitled to share in said savings unless the proposal is made in accordance with Paragraph I of this article. Except as provided in Paragraph I below, the Contractor will not be compensated for any direct, incidental or collateral benefits or savings the Owner receives as a result of the proposal.

I. Value Engineering Change Proposals

The Contractor may submit to the Architect/Engineer one or more cost reduction proposals for changing the Contract requirements. The proposals shall be based upon a sound study made by the Contractor indicating that the proposal:

- 1) Will result in a net reduction in the total Contract amount;
- 2) Will not impair any essential function or characteristic of the Work such as safety, service life, reliability, economy of operation, ease of maintenance and necessary standardized features;
- 3) Will not require an unacceptable extension of the Contract completion time; and
- 4) Will require a change in the Contract Documents and such change is not already under consideration by the Owner.
 - a. The Owner may accept in whole or in part any proposal submitted pursuant to the previous paragraph on Value Engineering Change Proposals by issuing a Change Order which will identify the proposal on which it is based. The Change Order will provide for a Contract change in the Contract price and will revise any other affected provisions of the Contract

Documents. The equitable adjustment in the Contract price will be established by determining the net savings resulting from the accepted change. The net savings resulting from the change will be shared between the Contractor and the Owner on the basis of 50 percent for the Contractor and 50 percent for the Owner and will be limited to one Value Engineering Change Proposal per Change Order. Net savings will be determined by deducting from the proposal's estimated gross savings 1) the Contractor's costs of developing and implementing the proposal (including any amount attributable to a subcontractor) and 2) the estimated amount of increased costs to the Owner resulting from the change, such as evaluation, implementation, inspection, related items, and Owner -furnished material. Estimated gross savings will include Contractor's labor, material, equipment, overhead, profit and bond. The Contract price will be reduced by the sum of the Owner's costs and share of the net savings. For the purposes of this article, the applicable provisions of the Contract Documents shall be used to determine the equitable adjustment to the Contract price.

- b. The Owner will not be liable for delay in acting upon, or for failure to act upon, any proposal submitted pursuant to of this article. The decision of the Owner as to the acceptance or rejection of any such proposal under the Contract will be final. The submission of a proposal by the Contractor will not in itself affect the rights or obligations of either party under the Contract.
- c. The Contractor shall have the right to withdraw part or all of any proposal he may make under Paragraph 2 of this article at any time prior to acceptance by the Owner. Such withdrawal shall be made in writing to the Architect/Engineer. Each such proposal shall remain valid for a period of 60 days from the date submitted. If the Contractor wishes to withdraw the proposal prior to the expiration of the 60-day period, they will be liable for the cost incurred by the Owner in reviewing the proposal.
- d. The Contractor shall specifically identify any proposals under Paragraph 2 of this article with the heading "Value Engineering Change Proposal," or the proposal will be considered as made under Paragraph 1 of this article.

2) The Contractor, in connection with each proposal for a Contract Change Notice under this article, shall furnish the following information:

- a. A description of the difference between the existing Contract requirement and the proposed change, and the comparative advantages and disadvantages of each, justification when a function or characteristic of an item is being altered, and the effect of the change on the performance of the end item;
- b. An analysis and itemization of the requirements of the Contract which must be changed if the Value Engineering Change Proposal is accepted and a recommendation as to how to make each such change (e.g., a suggested specification revision);

- c. A separate detailed cost estimate for both the existing Contract requirement and the proposed change to provide an estimate of the reduction in costs, if any, that will result from acceptance of the Value Engineering Change Proposal taking into account the costs of development and implementation by the Contractor;
 - d. A prediction of any effects the proposed change would have on collateral costs to the Owner such as government-furnished property costs, costs of related items, and costs of maintenance and operation;
 - e. A statement of the time by which a Contract modification accepting the Value Engineering Change Proposal must be issued so as to obtain the maximum cost reduction, noting any effect on the Contract completion time or delivery schedule; and
 - f. Identification of any previous submission of the Value Engineering Change Proposal to the Owner, including the dates submitted, the numbers of the contracts involved, and the previous actions by the Owner.
- 3) The Contractor waives any and all claims relating to any delay that may arise out of a Value Engineering Change Proposal.

END OF ARTICLE

11. CLAIMS AND DISPUTES

A. Notice of Claims

- 1) The Contractor will not be entitled to additional time or compensation otherwise payable for any act or failure to act by the Owner, the happening of any event or occurrence, or any other cause, unless he shall have given the Architect/Engineer a written notice of claim therefore as specified in this article.
- 2) The Contractor shall provide immediate verbal notification with written confirmation within 48 hours of any potential claims and of the anticipated time and/or cost impacts resulting thereof. The written notice of claim shall set forth the reasons for which the Contractor believes additional compensation and/or time will or may be due, the nature of the costs involved and the approximate amount of the potential claim.
- 3) It is the intention of this article, that differences between the parties arising under and by virtue of the Contract shall be brought to the attention of the Architect/Engineer at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken.
- 4) The notice requirements of this article are in addition to those required in other articles of these Contract Documents.
- 5) The Contractor shall segregate all costs associated with each individual claim including but not limited to labor, equipment, material, subcontractor and supplier costs, and all other costs related to the claim. In the event that the Contractor has multiple claims, the Contractor will segregate each claim individually including the respective costs associated with each claim. Failure to segregate claims and their respective costs will be grounds for the Owner's rejection of the claim. No "total cost claims" shall be allowed under this Contract.
- 6) The Contractor must maintain a cost accounting system as a condition for making a claim against the Owner. The cost accounting system must segregate the costs of the work under the Contract (non-claims-related) from claims-related and other Contractor costs through the use of a job cost ledger and be otherwise in compliance with general accounting principles.
- 7) If the Owner decides to pay all or part of a claim for which notice was not timely made, the Owner does not waive the right to enforce the notice requirements in connection with any other claim.
- 8) Inasmuch as the notice of claim requirements of this article are intended to enable the Architect/Engineer to investigate while facts are fresh and to take action to minimize or avoid a claim which might be filed thereafter, the Contractor's failure to make the required notice on time is likely to disadvantage the Owner. Therefore, a claim that does not comply with the notice requirements above shall not be considered unless the Contractor submits with his claim proof showing that the Owner has not been prejudiced by the Contractor's failure to so comply and, in the event the Owner has been prejudiced by the Contractor's failure to submit a timely notice of claim, the Owner will reduce any equitable adjustment claimed by the Contractor to reflect the damage.

B. Claim Submittals

- 1) Claims or requests for equitable adjustments filed by the Contractor shall be filed in full accordance with this article no later than 30 calendar days after the act giving rise to the claim and in sufficient detail to enable the Owner to ascertain the basis and amount of said claims. In the case of continuing or on-going claim events, the Contractor shall be allowed to periodically amend his claim to more accurately reflect the impact of said claim, until the end of the claim event. No claims for additional compensation, time extension or for any other relief under the Contract shall be recognized, processed, or treated in any manner unless the same is presented in accordance with this Article. Failure to present and process any claim in accordance with this Article shall be conclusively deemed a waiver, abandonment, or relinquishment of any such claim, it being expressly understood and agreed that the timely presentation of claims, in sufficient detail to allow proper investigation and prompt resolution thereof, is essential to the administration of this Contract.
- 2) The Owner will review and evaluate the Contractor's claims. It will be the responsibility of the Contractor to furnish, when requested by the Architect/Engineer, such further information and details as may be required to determine the facts or contentions involved in his claims. The cost of claims preparation or Change Order negotiations shall not be reimbursable under this Contract.
- 3) Any work performed by the Contractor prior to Notice-to-Proceed (NTP) shall not be the basis for a claim from the Contractor of any kind.
- 4) Each claim must be certified by the Contractor as required by the Miami-Dade Code, False Claims Act (see Code Section 21-255, et seq.), and accompanied by all materials required by Miami-Dade County Code Section 21-257. A "certified claim" shall be made under oath by a person duly authorized by the claimant, and shall contain a statement that:
 - a. The claim is made in good faith;
 - b. The claim's supporting data is accurate and complete to the best of the person's knowledge and belief;
 - c. The amount of the claim accurately reflects the amount that the claimant believes is due from the Owner; and
 - d. The certifying person is duly authorized by the claimant to certify the claim.
- 5) In order to substantiate time-related claims (delays, disruptions, impacts, etc.), the Contractor shall, if applicable and as determined by the Owner, submit, in triplicate, the following information (schedule information shall be provided in electronic format with all logic visible):
 - a. Copy of Contractor's notice of claim in accordance with this article. Failure to submit the notice is sufficient grounds to deny the claim.
 - b. The approved, as-planned Schedule in accordance with the applicable section of the Contract Documents and computer storage media, if applicable.
 - c. The as-built Schedule reflecting changes to the approved schedule up to the time of the impact in question and computer storage media if applicable.
 - d. The basis for the duration of the start and finish dates of each impact activity and the reason for choosing the successor and predecessor events affected in the schedule

shall be explained. Also, the basis for the duration of any lead/lags inserted into the schedule and the duration in related activity duration shall be explained.

- e. A marked-up as-built Schedule indicating the causes responsible for changes between the as-planned and as-built schedule and establishing the required cause and effect relationships.
- f. After indicating specific time related changes on the as-built schedule, the documentation must be segregated into separate packages with each package documenting a specific duration change identified previously. This documentation package shall include Change Orders, Change Notices, Work Orders, written directions, meeting minutes, etc., related to the change in duration.
- g. The Contractor assumes all risk for the following items, none of which shall be the subject of any claim and none of which shall be compensated for except as they may have been included in the compensation described under Liquidated Indirect Costs: 1) home office expenses or any Direct Costs incurred allocated from the headquarters of the Contractor; 2) loss of anticipated profits on this or any other project, 3) loss of bonding capacity or capability; 4) losses due to other projects not bid upon; 5) loss of business opportunities; 6) loss of productivity on this or any other project; 7) loss of interest income on funds not paid; 8) costs to prepare, negotiate or prosecute claims and 9) costs spent to achieve compliance with applicable laws and ordinances (excepting only sales taxes paid shall be reimbursable expense subject to the provisions of the Contract Documents).
- h. All non-time-related claim items for additional compensation for Direct Costs shall be properly documented and supported with copies of invoices, time sheets, rental agreements, crew sheets and the like.
- i. Cost information shall be submitted in sufficient detail to allow for review. The basis for the budgeted or actual costs shall include man-hours by trade, labor rates, material, and equipment costs etc. These costs shall be broken down by pay item and Construction Specification Institute (CSI) Division.
- j. The documentation for budgeted cost shall, as a minimum, include:
 - i. Copies of all the Contractor's bid documents, bid quotes, faxed quotes, emailed quotes etc.
 - ii. Copies of all executed subcontracts.
 - iii. Other related budget documents as requested by the Architect/Engineer.
- k. The documentation for actual cost shall, as a minimum, include:
 - i. Time Sheets.
 - ii. Materials invoices
 - iii. Equipment invoices
 - iv. Subcontractors' payments
 - v. Other related documents as required by the Architect/Engineer.

1. The Contractor shall make all his books, employees, work sites and records available to the Owner or its representatives for inspection and audit.
- 6) No payment shall be made to the Contractor by the Owner for loss of anticipated profit(s) from any deleted work. Contractor shall not be entitled to any compensation for loss of efficiency, loss of productivity, disruption, loss of opportunity, or other similar indirect costs except via entitlement to Liquidated Indirect Damages as provided for herein. As indicated above, the Architect/Engineer and the Field Representative shall be allowed full and complete access to all personnel, documents, work sites or other information reasonably necessary to investigate any claim. Within 60 days after a claim has been received, the claim shall either be rejected with an explanation as to why it was rejected or acknowledged. Once the claim is acknowledged, the parties shall attempt to negotiate a satisfactory settlement of the claim, which settlement shall be included in a subsequent Work Order or Change Order. If the parties fail to reach an agreement on a recognized claim, the Owner shall pay to the Contractor the amount of money it deems reasonable, less any appropriate retention, to compensate the Contractor for the recognized claim.
- 7) Failure of the Contractor to make a specific reservation of rights in the form provided for above regarding any such disputed amounts in the body of the Change Order which contains the payment shall be construed as a waiver, abandonment, or relinquishment of all claims for additional monies resulting from the claims embodied in said Change Order. However, once the Contractor has properly reserved rights to any claim, no further reservations of rights shall be required, and the Contractor shall not be required to repeat the reservation in any subsequent change order. Prior reservation of rights may however be further limited or waived by express reference, in subsequent change orders. Notwithstanding the aforementioned, at the time of final payment under the Contract, the Contractor shall specify all claims which have been denied and all claims for which rights have been reserved in accordance with this section. Failure to so specify any particular claim shall be constructed as a waiver, abandonment, or relinquishment of such claim.

C. Disputes

- 1) The following provisions shall govern disputes under this Contract unless the Special Provisions to this Contract contain the requirement for the use of an alternate dispute resolution method. For example, for large projects of great complexity, a Dispute Review Board (DRB) may be employed by the Owner to settle disputes in lieu of the Department Director or Office of the Mayor (OOM) designee as specified below. In this case, the DRB alternative shall be specified by the individual department in the Special Provisions and, if utilized, shall supersede this dispute provision.
 - a. In the event the Contractor and Owner are unable to resolve their differences concerning any determination made by the Architect/Engineer or Owner on any dispute or claim arising under or relating to the Contract (referred to in this Section as a "Dispute"), either the Contractor or Owner may initiate a dispute in accordance with the procedure set forth in this article. Exhaustion of these procedures shall be a precondition to any lawsuit permitted hereunder.
 - b. For contracts with a value of \$5 million or less, all Disputes under this Contract shall be decided by the Department Director or his designee. For contracts valued at more than \$5 million, Disputes shall be decided by a designee appointed by the OOM.

Decisions rendered by the Department Director or OOM designee shall not be binding but shall be admissible in a court of competent jurisdiction.

- c. As soon as practicable, the Department Director or OOM designee shall adopt a schedule for the Contractor and Owner to file written submissions stating their respective positions and the basis, therefore. The written submissions shall include copies of all documents and sworn statements in affidavit form from all witnesses relied on by each party in support of its position. Within 20 working days of the date on which such written submissions are filed, the Department Director or OOM designee shall afford each party an opportunity to present a maximum of one hour of argument. The Department Director or OOM designee may decide the Dispute on the basis of the affidavits and other written submissions if, in his opinion, there is no issue of material fact, and the party is entitled to a favorable resolution pursuant to the terms of this Contract. As part of such decision, the Department Director or OOM designee shall determine the timeliness and sufficiency of each notice of claim and claim at issue as provided in this article. The Department Director or OOM designee shall have the authority to rule on questions of law, including disputes over contract interpretation, and to resolve claims, or portions of claims, via summary judgment where there are no disputed issues of material fact. Furthermore, the Department Director or OOM designee is authorized by both parties to strike elements of claims seeking relief or damages not available under the contract (such as, but not limited to, claims for lost profits, off-site overhead, loss of efficiency or productivity claims or claim's preparation costs) by summary disposition.
- d. In the event that the Department Director or OOM designee determines that the affidavits or other written submissions present issues of material fact, he shall allow the presentation of evidence in the form of lay or expert testimony directed solely to the issues which he may specifically identify to require factual resolution. The testimonial portion of the process shall not exceed one day in duration per side, including opening statements and closing arguments, if allowed by the Department Director or OOM designee at his reasonable discretion.
- e. No formal discovery shall be allowed in connection with any proceeding under this article. Notwithstanding the foregoing, both parties agree that all of the audit, document inspection, information and documentation requirements set forth elsewhere in this contract shall remain in force and effect throughout the proceeding. The Department Director or OOM designee shall not schedule the hearing until both parties have made all their respective records available for inspection and reproduction and the parties have been afforded reasonable time to analyze the records. The continued failure of a party to comply with the document inspection, examination, or submission requirements set forth in this contract shall constitute a waiver of that party's claims and/or defenses, as applicable. Hearsay evidence shall be admissible but shall not form the sole basis for any finding of fact. Failure of any party to participate on a timely basis, to cooperate in the proceedings, or to furnish evidence in support or defense of a claim all of which shall be a criterion in determining the sufficiency and validity of a claim.
- f. The Department Director or OOM designee shall issue a written decision within 15 working days after conclusion of any testimonial proceeding and, if no testimonial

proceeding is conducted, within 45 days of the filing of the last written submission. This written decision shall set forth the reasons for the disposition of the claim and a breakdown of any specific issues or subcontractor claims. As indicated previously, the decision of the Department Director or OOM designee is not binding on the parties but will be admissible in a court of competent jurisdiction.

- g. If either party wishes to protest the decision of the Department Director or OOM designee, such party may commence an action in a court of competent jurisdiction, within the periods prescribed by law, it being understood that the review of the court shall be limited to the question of whether or not the Department Director or OOM designee's determination was arbitrary and capricious, unsupported by any competent evidence, or so grossly erroneous to evidence bad faith.
- h. Pending final decision of a dispute hereunder, the Contractor shall proceed diligently with the performance of the Contract and in accordance with the Architect/Engineer's interpretation. Any presentation or request by the Contractor under this article will be subject to the same requirements for Submittal of Claims in this article.

D. Terminations

1) Termination for Convenience

- a. The Owner may at its option and discretion terminate the Contract, in whole or, from time to time in part, at any time without any default on the part of the Contractor by issuing a written Notice of Termination to the Contractor and its Surety, specifying the extent to which performance of work under the Contract is terminated and the date upon which such termination becomes effective, at least 10 days prior to the effective date of such termination.
- b. In the event of Termination for Convenience, the Owner shall pay the Contractor for all labor performed, all materials and equipment furnished by the Contractor and its subcontractors, materialmen and suppliers and manufacturers of equipment less all partial payments made on account prior to the date of cancellation as determined by the Field Representative and approved by the Architect/Engineer. The Contractor will be paid for:
 - i. The value of all work completed under the Contract, based upon the approved Schedule of Values and/or Unit Prices,
 - ii. The value of all materials and equipment delivered to but not incorporated into the work and properly stored on the site,
 - iii. The value of all bonafide irrevocable orders for materials and equipment not delivered to the construction site as of the date of cancellation. Such materials and equipment must be delivered to the Owner to a site or location designated by the Department prior to release of payment for such materials and equipment.
 - iv. The values calculated under i., ii., and iii. above shall be as determined by the Field Representative and approved by the Architect/Engineer.

- c. In the event of termination under this article, the Contractor shall not be entitled to any anticipated profits for any work not performed due to such termination.
- d. In the event of termination under this article, the Owner does not waive or void any credits otherwise due the Owner at the time of termination, including Liquidated Damages, and back charges for defective or deficient work.
- e. Upon termination as indicated above, the Field Representative shall prepare a certificate for Final Payment to the Contractor.

2) Termination for Default of Contractor

- a. The Contract may be terminated in whole or, from time to time in part, by the Owner for failure of the Contractor to comply with any requirements of the Contract Documents including but not limited to:
 - i. Failure to perform the work or failure to provide sufficient workers, equipment, or materials to assure completion of work in accordance with the terms of the Contract, and the approved Schedule, or
 - ii. Failure to provide the Schedule for the Project by the date due, or
 - iii. Failure to provide adequate shop drawings by the dates indicated in the approved Schedule for the Project, or
 - iv. Failure to replace the superintendent in the time allotted, if required, or
 - v. Performing the work unsuitably or neglecting or refusing to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, after written directions from the Field Representative, or
 - vi. Violating the terms of the Contract or performing work in bad faith, or
 - vii. Discontinuing the prosecution of the work, or
 - viii. Failure to resume work which has been discontinued within a reasonable time after notice to do so, or
 - ix. Abandonment of the Contract, or
 - x. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or failure to maintain a qualifier, or
 - xi. Allowing any final judgment to stand against him unsatisfied for a period of ten (10) days, or
 - xii. Making an assignment for the benefit of creditors, or
 - xiii. For any other cause whatsoever, fails to carry out the work in an acceptable manner or to comply with any other Contract requirement.
- b. Before the Contract is terminated, the Contractor and its Surety will be notified in writing by the Architect/Engineer or the Field Representative of the conditions which make termination of the Contract imminent (Notice to Cure). The Contract may be terminated by the Owner ten (10) days after said notice has been given to the Contractor and its Surety unless a satisfactory effort acceptable to the Owner has been made by the Contractor or its Surety to correct the conditions. If the Contractor

fails to satisfactorily correct the conditions giving rise to the termination, the Owner may declare the Contract breached and send a written Notice of Termination to the Contractor and its Surety.

- c. The Owner reserves the right, in lieu of termination as set forth in this article, to withhold any payments of money which may be due or become due to the Contractor until the said default(s) have been remedied. In the event of Termination for Default, the Owner also reserves the right, in cases where the damages calculated by the Owner are expected to exceed the amount the Owner anticipated recovering from the Surety, to withhold amounts for work already performed.
- d. In the event the Owner exercises its right to terminate the Contract for default of the Contractor as set forth herein, the Owner shall have the option of finishing the work, through any means available to the Owner, or having the Surety complete the Contract in accordance with its terms and conditions. In case that the Owner decides to have the Surety take over the remaining performance of the Work, the time or delay between Notice of Default and start of work by the Surety is a non-excusable delay. If the Surety fails to act promptly, but no longer than thirty (30) calendar days after the Owner notifies the Surety of the Owner's decision to have the Surety complete the work, or after such takeover fails to prosecute the Work in an expeditious manner, the Owner may exercise any of its other options including completing the Work by whatever means and method it deems advisable. No claims for loss of anticipated profits or for any other reason in connection with the termination of the Contract shall be considered.
- e. Payments for the various Bid Items listed in the Bid Form will constitute full compensation for all expenses incurred in consequence of discontinuance of all or any portion of the Work except as provided in this section of the Contract Documents. In no event will compensation be made for anticipatory profits or consequential damages as a result of a discontinuance of all or any portion of the Work.
- f. The Contractor shall immediately upon receipt communicate any Notice of Termination for Default issued by the Owner to the affected subcontractors and suppliers at any tier.
- g. If, after Notice of Termination of the Contractor's right to proceed under the provisions of this article, it is determined for any reason that the Contractor was not in default under the provisions of this article, or that the Contractor was entitled to an extension of time under the Contract Documents, the rights and obligations of the parties shall be the same as if the Notice of Termination had been issued pursuant to the section of this article dealing with Termination for Convenience.

3) Termination for National Emergencies

- a. The Owner shall terminate the Contract or portion thereof by written notice when the Contractor is prevented from proceeding with the construction Contract as a direct result of an Executive Order of the President of the United States with respect to the prosecution of war or in the interest of national defense.

- b. When the Contract, or any portion thereof, is terminated before completion of all items of work in the Contract, payment will be made for the actual number of units or items of work completed at the Contract price or as mutually agreed for items of work partially completed or not started. No claims or loss of anticipated profits or for any other reason in connection with the termination of the Contract shall be considered.

4) Implementation of Termination

- a. If the Owner cancels or terminates the Contract or any portion thereof, the Contractor shall stop all work on the date and to the extent specified in the Notice of Termination and shall:
 - i. Cancel all orders and Subcontracts, to the extent that they relate to the performance of the work terminated and which may be terminated without costs;
 - ii. Cancel and settle other orders and Subcontracts, except as may be necessary for completion of such portion of the Work not terminated, where the cost of settlement will be less than costs which would be incurred were such orders and subcontracts to be completed, subject to prior approval of the Field Representative;
 - iii. Settle outstanding liabilities and claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Owner, to the extent it may require, which approval or ratification shall be final for the purposes of this Article;
 - iv. Transfer title and deliver to the Owner, in the manner, at the time, and to the extent, if any, directed by it, in accordance with directions of the Field Representative, all fabricated or un-fabricated parts, all materials, supplies, work in progress, completed work, facilities, equipment, machinery or tools acquired by the Contractor in connection with the performance of the work and for which the Contractor has been or is to be paid;
 - v. Assign to the Owner in the manner, at the times and to the extent directed by it, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the Owner will have the right, at its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;
 - vi. Deliver to the Field Representative As-Built Documents, complete as of the date of cancellation or termination, plans, Shop Drawings, sketches, permits, certificates, warranties, guarantees, specifications, three (3) complete sets of maintenance manuals, pamphlets, charts, parts lists, spare parts (if any), operating instructions required for all installed or finished equipment or machinery, and all other data accumulated by the Contractor for use in the performance of the work;
 - vii. Perform all work as may be necessary to preserve the work then in progress and to protect materials, plant, and equipment on the site or in transit

thereto. The Contractor shall also take such action as may be necessary, or as the Architect/Engineer may direct, for the protection and preservation of the property related to this Contract which is in the possession of the Contractor and in which the Owner has or may acquire an interest;

- viii. Complete performance of each part of the work not terminated by the Notice of Termination;
- ix. Use his best efforts to sell, in the manner, at the time, to the extent, and at the price or prices directed or authorized by the Owner, property of the types referred to above; provided, however, that the Contractor a) shall not be required to extend credit to any purchaser, and b) may acquire any such property under the conditions prescribed by and at a price or prices approved by the Owner; provided, further, that the proceeds of any such transfer or disposition will be applied in reduction of any payments to be made by the Owner to the Contractor under this Contract or will otherwise be credited to the price or cost of the work covered by this Contract or paid in such other manner as the Owner may direct;
- x. Termination of the Contract or a portion thereof shall neither relieve the Contractor of its responsibilities for the completed work nor shall it relieve its Surety of its obligation for and concerning any just claim arising out of the work performed;
- xi. In arriving at the amount due the Contractor under this article, there will be deducted, (1) any claim which the Owner may have against the Contractor in connection with this Contract and (2) the agreed price for, or the proceeds of sale of materials, supplies or other items acquired by the Contractor or sold, pursuant to the provisions of this article, and not otherwise recovered by or credited to the Owner.

5) Suspension of Work

- a. The Owner reserves the right to temporarily suspend execution of the whole or any part of the Work without compensation to the Contractor.
- b. In case the Contractor is actually and necessarily delayed by any act or omission on the part of the Owner, as determined by the Owner in writing, the time for completion of the Work shall be extended by the amount of the time of such delay as determined by the Owner, and an allowance may be made for actual direct costs, if any, which may have been borne by the Contractor. Such requests for additional time and/or compensation must be made in accordance with the applicable sections of the Contract Documents.
- c. Only the actual delay necessarily resulting from the causes specified in this Article, shall be grounds for extension of time. In case the Contractor is delayed at any time or for any period by two or more of the causes specified in this Article, the Contractor shall not be entitled to a separate extension for each one of the causes but only one period of extension will be granted for the delay.

- d. In case the Contractor is actually and necessarily delayed in the performance of the Work from one or more of the causes specified in this Article, the extension of time to be granted to the Contractor shall be only for such portion of the Work so delayed. The Contractor shall not be entitled by reason of such delay to an extension of time for the completion of the remainder of the Work. If the Contractor shall be so delayed as to a portion of the Work they shall nevertheless proceed continuously and diligently with the prosecution of the remainder of the Work. No demand by the Contractor that the Owner determine and certify any matter of extension of time for the completion of the Work or any part thereof will be of any effect whatsoever unless the demand be made in writing at least 30 days before the completion date of the Work or any part thereof for which Liquidated Damages are established when meeting those dates is claimed to have been delayed by a suspension under this Article. Owner's determination as to any matter of extension of time for completion of the Work or any part thereof shall be binding and conclusive upon the Contractor.
- e. Permitting the Contractor to finish the Work or any part thereof after the time fixed for completion or after the date to which the time for completion may have been extended or the making of payments to the Contractor after any such periods shall not operate as a waiver on the part of the Owner of any rights under this contract.
- f. The Contractor shall insert in each subcontract a provision that the subcontractor shall comply immediately with a written order of the Owner to the Contractor to suspend the Work, and that they shall further insert the same provision in each subcontract of any tier.

END OF ARTICLE

12. MISCELLANEOUS PROVISIONS

A. Third-Party Beneficiary

No contractual relationship will be recognized under the Contract other than the contractual relationship between the Owner and the Contractor. There shall be no third-party beneficiary to this Contract.

B. Venue

Any litigation which may arise out of this Contract shall be commenced either in the Eleventh Judicial Circuit Court in and for Miami-Dade County, Florida, or in the United States District Court, Southern District of Florida.

C. Governing Laws

- 1) The Contractor shall, during the term of this Contract and in the prosecution of the work, be governed by the statutes, regulatory orders, ordinances and procedures of the United States of America, the State of Florida, and Miami-Dade County including, but not limited to, the Florida Building Code and Florida Fire Prevention Code.
- 2) The Contractor(s) shall comply with all applicable laws including, but not limited to, the Small Business Enterprise (SBE) programs (including, without limitation, SBE-Construction, SBE-Architectural and Engineering, and SBE-Goods, SBE-Services); Responsible Wages and Benefits program; Community Workforce Program; Residents First Training and Employment programs as set forth in Sections 10-33.02, 2-10.4.01, 2-8.1.1.1.2, 2-8.1.1.1.1, 2-11.16, 2-1701, and 2-11.17 of the Code; the Sustainable Buildings Program; Chapter 119 of the Florida Statutes regarding public records laws; the State of Florida and the County's Prompt Payment laws as set forth in Sections 2-8.1.4 and 10-33.02 of the County's ordinances; the County's Inspector General requirements as set forth herein; the County's Art in Public Places requirements as set forth herein; and provide the requisite bonding in accordance with Section 255.05 of the Florida Statutes, as well as the insurance requirements set forth in this Agreement

Specifically, the Contractor and his subcontractors shall comply with Miami-Dade County Resolution Nos. R-1386-09 and R-138-10 governing the treatment of SBE-CON firms.

- 3) In addition, the Contractor agrees to abide by all federal, state, and local procedures, as may be amended from time to time, regarding how documents that the Contractor has access to, are handled, copied, and distributed, particularly documents that contain sensitive security information.

D. Successors and Assigns

The Owner and the Contractor each bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contractor shall not assign the Contract or sublet it as a whole without the written consent of the Owner, nor shall the Contractor assign any moneys due or to become due the Contractor hereunder, without the previous written notice to the Owner. Consent will not be given to any proposed assignment, which would relieve the Contractor or his Surety of their responsibilities under the Contract.

E. Written Notice

- 1) Written notice to the Contractor shall be deemed to have been duly served if delivered in person to the individual or member of the firm or to any officer of the corporation for whom it was intended or if delivered at or sent by registered or certified mail to the last business address known to those who give the notice.
- 2) Written notice to the Owner shall be deemed to have been duly served if delivered in person, delivered at or sent by registered or certified mail to the individual identified in the Special Provisions.

F. Indemnification

- 1) In consideration of this Agreement, and to the maximum extent permitted by Chapter 725, Florida Statutes, as may be amended, the Contractor agrees to indemnify, protect, defend, and hold harmless the Government, State, County, their elected officials, officers, employees, consultants, and agents from claims, liabilities, damages, losses, and costs including, but not limited to reasonable attorney's fees at both the trial and appellate levels to the extent caused by the negligence, recklessness, or intentionally wrongful conduct of the Contractor and other persons employed or utilized by the Contractor in the performance of the Work.
- 2) The indemnification obligation under this clause shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor and/or any subcontractor under worker's compensation acts, disability benefit acts, or other employee benefit acts.
- 3) In the event that any claims are brought, or actions are filed against the Owner with respect to the indemnity contained herein, the Contractor agrees to defend against any such claims or actions regardless of whether such claims or actions are rightfully or wrongfully brought or filed. The Contractor agrees that the Owner may select the attorneys to appear and defend such claims or actions on behalf of the Owner. The Contractor further agrees to pay at the Contractor's expense the attorneys' fees and costs incurred by those attorneys selected by the Owner to appear and defend such claims or actions on behalf of the Owner. The Owner, at its sole option, shall have the sole authority for the direction of the defense, and shall be the sole judge of the acceptability of any compromise or settlement of any claims or actions against the Owner.
- 4) To the extent this indemnification clause or any other indemnification clause in this Agreement does not comply with Chapter 725, Florida Statutes, as may be amended, this provision and all aspects of the Contract Documents shall hereby be interpreted as the parties' intention for the indemnification clauses and Contract Documents to comply with Chapter 725, Florida Statutes, as may be amended.
- 5) This Section shall survive expiration or termination of this Agreement.

G. Audit Rights

- 1) Access to Records
 - a. The Contractor shall, during the term of this Contract and for a period of five years thereafter, allow the Owner and its duly authorized representatives to inspect all payroll records, invoices for materials, books of account, job cost ledgers, Project correspondence and Project-related files and all relevant records pertinent to the Contract.

- b. The Owner retains the right to audit accounts and access all files, correspondence and documents in reference to all work performed under this Contract. The Owner shall be provided full access upon request to all documents, including those in possession of subcontractors or suppliers during the work and for a period of five years after the completion of the Work. In case of any litigation regarding this Project, such rights shall extend until final settlement of such litigation. Failure to allow the Owner access shall be deemed a waiver of Contractor's claims.
- c. The Contractor shall maintain a banking account within Miami-Dade County for all payments to laborers, subcontractors and vendors furnishing labor and materials under this Contract. All records shall be maintained in Miami-Dade County for the term of this Contract.

2) Inspector General

- a. According to Section 2-1076 of the Code of Miami-Dade County, Miami-Dade County has established the Office of the Inspector General (IG) which may, on a random basis, perform audits, inspections, and reviews of all, on any County/Trust contracts, throughout the duration of said contracts. This random audit is separate and distinct from any other audit by the County. To pay for the functions of the Office of the Inspector General, any and all payments to be made to the Contractor under this contract will be assessed one quarter (1/4) of one (1) percent of the total amount of the payment, to be deducted from each progress payment as the same becomes due unless this Contract is federally or state funded where federal or state law or regulations preclude such a charge or where such a charge is otherwise precluded by Special Condition. The Contractor shall, in stating its agreed prices, be mindful of this assessment which will not be separately identified, calculated, or adjusted in the proposal or Bid Form.
- b. The Miami-Dade Office of the Inspector General is authorized to investigate County affairs and empowered to review past, present, and proposed County and Public Health Trust programs, accounts, records, contracts and transactions. In addition, the Inspector General has the power to subpoena witnesses, administer oaths, require the production of witnesses, and monitor existing Projects and programs. Monitoring of an existing Project or program may include a report concerning whether the Project is on time, within budget and in conformance with the Contract Documents and applicable law. The Inspector General shall have the power to audit, investigate, monitor, oversee, inspect and review operations, activities, performance and procurement process including but not limited to Project design, bid specifications, (bid/proposal) submittals, activities of the (Contractor/ Vendor/ Consultant), its officers, agents and employees, lobbyists, County and Public Health Trust staff and elected officials to ensure compliance with the Contract Documents and to detect fraud and corruption.
- c. Upon 10 days written notice to the Contractor, the Contractor shall make all requested records and documents available to the Inspector General for inspection and copying. The Inspector General is empowered to retain the services of independent private sector inspectors general to audit, investigate, monitor, oversee, inspect and review operations, activities, performance and procurement process

including but not limited to Project design, bid specifications, (bid/proposal) submittals, activities of the (Contractor/ Vendor/ Consultant), its officers, agents and employees, lobbyists, County staff and elected officials to ensure compliance with the Contract Documents and to detect fraud and corruption.

- d. The Inspector General shall have the right to inspect and copy all documents and records in the (Contractor/Vendor/Consultant's) possession, custody or control which in the Inspector General's sole judgment, pertain to performance of the contract, including, but not limited to original estimate files, change order estimate files, worksheets, proposals and agreements from and with successful subcontractors and suppliers, all Project-related correspondence, memoranda, instructions, financial documents, construction documents, (bid/proposal) and contract documents, back-change documents, all documents and records which involve cash, trade or volume discounts, insurance proceeds, rebates, or dividends received, payroll and personnel records and supporting documentation for the aforesaid documents and records.
- e. The Contractor shall make available at its office at all reasonable times the records, materials, and other evidence regarding the acquisition (bid preparation) and performance of this contract, for examination, audit, or reproduction, until three (3) years after final payment under this contract or for any longer period required by statute or by other clauses of this contract. In addition:
 - i. If this contract is completely or partially terminated, the Contractor shall make available records relating to the work terminated until three (3) years after any resulting final termination settlement; and
 - ii. The Contractor shall make available records relating to appeals or to litigation or the settlement of claims arising under or relating to this contract until such appeals, litigation, or claims are finally resolved.
- f. The provisions in this section shall apply to the (Contractor/Vendor/Consultant), its officers, agents, employees, subcontractors, and suppliers. The (Contractor/Vendor/Consultant) shall incorporate the provisions in this section in all subcontracts and all other agreements executed by the (Contractor/Vendor/Consultant) in connection with the performance of this contract.
- g. Nothing in this section shall impair any independent right to the Owner to conduct audits or investigative activities. The provisions of this section are neither intended nor shall they be construed to impose any liability on the Owner by the (Contractor/Vendor/Consultant) or third parties.

H. Severability

In the event any article, section, sub-article, paragraph, sentence, clause or phrase contained in the Contract Documents shall be determined, declared or adjudged invalid, illegal, unconstitutional or otherwise unenforceable, such determination, declaration or adjudication shall in no manner affect the other articles, sections, sub-articles, paragraphs, sentences, clauses or phrases of the Contract Documents, which shall remain in full force and effect as if the article, section, sub-article, paragraph, sentence, clause or phrase declared, determined or adjudged invalid, illegal, unconstitutional or otherwise unenforceable was not originally contained in the Contract Documents.

I. Payment and Performance Bond

- 1) A single instrument Payment and Performance Bond, satisfactory to the Owner, for twice the penal sum (no less than 100 percent of the total maximum contract amount for payment-related issues and 100 percent of the total maximum contract amount for performance-related issues), shall be required of the Contractor.
 - a. The bond shall be written through surety insurers authorized to do business in the State of Florida as Surety, with the following qualifications as to management and financial strength according to the latest edition of Best's Insurance Guide, published by A.M. Best Company, Oldwick, New Jersey:

Bond (Total Contract) Amount	Best's Rating
\$500,001 to \$1,500,000	B V
\$1,500,001 to \$2,500,000	A VI
\$2,500,001 to \$5,000,000	A VII
\$5,000,000 to \$10,000,000	A VIII
Over \$10,000,000	A IX

- 2) On Contract amounts of \$500,000 or less, the Bond provisions of Section 287.0935, Florida Statutes shall be in effect and surety companies not otherwise qualifying with this paragraph may optionally qualify by:
 - a. Providing evidence that the surety has twice the minimum surplus and capital required by the Florida Insurance Code at the time the Invitation to Bid is issued.
 - b. Certifying that the surety is otherwise in compliance with the Florida Insurance Code, and
 - c. Providing a copy of the currently valid Certificate of Authority issued by the United States Department of Treasury under 31 U.S.C. 9304-9308.

Surety insurers shall be listed in the latest Circular 570 of the U.S. Department of the Treasury entitled "Surety Companies Acceptable on Federal Bonds," published annually. The Bond amount shall not exceed the underwriting limitations as shown in this circular.

- 3) For Contracts in excess of \$500,000 the provisions of the Contract Documents will be adhered to, plus the surety insurer must have been listed on the U.S. Treasury list for at least three consecutive years, or currently hold a valid Certificate of Authority of at least 1.5 million dollars and listed on the Treasury list.
- 4) Payment and Performance Bonds guaranteed through U.S. Government Small Business Administration or Contractors Training and Development Inc. will also be acceptable.
- 5) The attorney-in-fact or other officer who signs a Payment and Performance Bond for a surety company must file with such Bond a certified copy of his/her power of attorney authorizing him/her to do so.
- 6) The cost of the Bonds shall be included in the Bid.

- 7) The required Bond shall be written by or through and shall be countersigned by, a licensed Florida agent of the surety insurer, pursuant to Section 624.425 of the Florida Statutes.
- 8) The Bond shall be delivered to the Contracting Officer in accordance with the instructions within the Notice of Award.
- 9) In the event the Surety on the Payment and Performance Bond given by the Contractor becomes insolvent, or is placed in the hands of a receiver, or has its right to do business in its State of domicile or the State of Florida suspended or revoked as provided by law, the Owner shall withhold all payments under the provisions of these Contract Documents until the Contractor has given a good and sufficient Bond in lieu of Bond executed by such Surety.
- 10) Cancellation of any bond, or non-payment by the Contractor of any premium for any Bond required by this Contract, shall constitute a breach of this Contract. In addition to any other legal remedies, the Owner at its sole option may terminate this Contract or pay such premiums and deduct the costs thereof from any amounts that are or may be due to the Contractor.

J. Insurance

The Contractor shall maintain the insurance set forth in the Special Provisions throughout the performance of this Contract until the Work has been completed by the Contractor and accepted by the Owner.

K. Conflict of Interest

- 1) The Contractor or his employees shall not enter into any Contract involving services or property with a person or business prohibited from transacting such business with Miami-Dade County pursuant to Section 2-11.1 of the Code of Miami-Dade County, Florida, known as the Miami-Dade County Conflict of Interest and Code of Ethics Ordinance.
- 2) In the event the Contractor, or any of its officers, partners, principals, or employees are convicted of a crime arising out of, or in connection with, the work to be done or payment to be made under this Contract, this Contract, in whole or any part thereof may, at the discretion of the Owner, be terminated without prejudice to any other rights and remedies of the Owner under the law.
- 3) In accordance with the Code of Miami-Dade County, no officer or employee of Miami-Dade County during his tenure or for two years thereafter shall have any interest, direct or indirect, in this Contract or the proceeds thereof.

L. Rights in Shop Drawings

- 1) Shop Drawings submitted to the Architect/Engineer by the Contractor, pursuant to the Work, may be duplicated by the Owner and the Owner may use and disclose, in any manner and for any purpose Shop Drawings delivered under this Contract.
- 2) This paragraph shall be included in all subcontracts hereunder at all tiers.

M. Patent and Copyright

- 1) If the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner. The Contractor and the surety shall indemnify and save harmless the Owner, the Field Representative, and the Architect/Engineer from any and all claims for

infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the Owner for any costs, expenses, and damages which it may be obliged to pay by reason of an infringement, at any time during the prosecution or after the completion of the work.

- 2) The Contractor shall warrant that the materials, equipment, or devices used on or incorporated in the Work shall be delivered free of any rightful claim of any third party for infringement of any United States patent or copyright. The Contractor shall defend, or may settle, at his expense, any suit or proceeding against the Owner or the Architect/Engineer so far as based on a claimed patent or copyright infringement which would result in a breach of this warranty, and the Contractor shall pay all damages and costs awarded therein against the Owner or the Architect/Engineer due to such breach. The Contractor shall report to the Architect/Engineer, promptly and in reasonable written detail, each notice or claim of patent or copyright infringement based on the performance of this Contract of which the Contractor has knowledge. In the event of any claim or suit against the Owner on account of any alleged patent or copyright infringement arising out of the performance of this Contract or out of the use of any supplies furnished or work or services performed hereunder, the Contractor shall furnish to the Owner when requested, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Contractor.
- 3) The Contractor shall bear all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the Work. In such case materials, equipment, devices, or processes are held to constitute an infringement and their use enjoined, the Contractor, at his expense shall:
 - a. Secure for the Owner the right to continue using said materials, equipment, devices, or processes by suspension of the injunction or by procuring a license or licenses; or
 - b. Replace such materials, equipment, devices or processes with non-infringing materials, equipment, devices, or processes; or
 - c. Modify them so that they become non-infringing or remove the enjoined materials, equipment, devices, or processes and refund the sum paid therefore without prejudice to any other rights of the Owner.
- 4) The preceding paragraph shall not apply to any materials, equipment or devices, specified by the Owner or the Architect/Engineer or manufactured to the design of the Owner or the Architect/Engineer or in accordance with the details contained in the Contract Documents; and as to any such materials, equipment or devices the Contractor assumes no liability whatsoever for patent or copyright infringement and the Owner will hold the Contractor harmless against any infringement claims arising therefrom.
- 5) Patent rights to patentable invention, item or ideas of every kind or nature arising out of the Work, as well as information, designs, specifications, know-how, data and findings shall be made available to the Government for public use, unless the Owner shall, in specific cases where it is legally permissible, determine that it is in the public interest that it not be so made available.
- 6) The sense of this article shall be included in all subcontracts. The foregoing states the entire liability of the Contractor for patent or copy infringement by use of said materials, equipment, or devices.

N. The Contractor shall be responsible for acknowledging the County's Recycling Programs when hauling materials that meets the requirement for a commercial business establishment. Please contact the Department of Solid Waste Management at dswm@miamidade.gov or visit www.earth911.com to search for recycling or disposal options and locations.

O. Historical, Scientific and Archaeological Discoveries

All articles of historical, scientific, or archaeological interest uncovered by the Contractor during progress of the Work shall be preserved and reported immediately to the Architect/Engineer. Further operations of the Contractor with respect to the find, including disposition of the articles, will be decided by the Owner.

P. Use of Owner's Name in Contractor Advertising or Public Relations

The Owner reserves the right to review and approve Owner-related copy prior to publication. The Contractor shall not allow Owner-related copy to be published in Contractor's advertisement or public relations programs until submitting the Owner-related copy and receiving prior approval from the Owner. The Contractor shall agree that published information on the Owner or the Owner's program shall be factual and in no way imply that the Owner endorses the Contractor's firm, service or product. The Contractor shall insert the substance of this provision, including this sentence, in each subcontract and supply Contract or purchase order.

Q. Accounts Receivable Adjustments

In accordance with Miami-Dade County Implementing Order 3-9, Accounts Receivable Adjustments, if money is owed by the Contractor to the County, whether under this Contract or for any other purpose, the County reserves the right to retain such amount from payment due by County to the Contractor under this Contract. Such retained amount shall be applied to the amount owed by the Contractor to the County. The Contractor shall have no further claim to such retained amounts which shall be deemed full accord and satisfaction of the amount due by the County to the Contractor for the applicable payment due herein.

R. User Access Program (UAP)

Pursuant to Miami-Dade County Code Section 2-8.10. User Access Program in County Purchases this Contract is subject to a user access fee under the County's User Access Program (UAP) in the amount of two percent (2%). All construction services provided under this contract are subject to the two percent (2%) UAP. This fee applies to all Contract usage whether by County Departments or by any other governmental, quasi-governmental or not-for-profit entity. From every payment made to the Contractor under this contract (including the payment of retainage), the County will deduct the two percent (2%) UAP fee provided in the ordinance and the Contractor will accept such reduced amount as full compensation for any and all deliverables under the contract. The County shall retain the two percent (2%) UAP for use by the County to help defray the cost of its procurement program. Contractor participation in this pay request reduction portion of the UAP is mandatory.

S. Residents First Training and Employment Program

Except where state or federal laws or regulations mandate to the contrary, all contractors and subcontractors of any tier performing on a County Construction Contract shall satisfy the requirements of this Article. In accordance with Section 2-11.17 of the Code of Miami-Dade County and Implementing Order No. 3-61, which are available online at

www.miamidade.gov/smallbusiness/business-development-legislation.asp, all contractors and subcontractors of any tier on (i) construction contracts valued in excess of \$1,000,000 for the construction, demolition, alteration and/or repair of public buildings, or public works; or (ii) contracts or leases valued in excess of \$1,000,000 for privately funded construction, demolition, alteration or repair of buildings, or improvements on County-owned land, shall comply, if applicable, with the following:

1) Bidders must:

- a. Submit a completed Responsible Contractor Affidavit (Form RFTE 1), along with the Bid Submittal Package. RFTE 1 shall verify the following:
 - i Prior to working on the project, all persons employed by the contractor on the project to perform construction have completed the OSHA 10-hour safety training course; and
 - ii Contractor will make its best reasonable efforts to have 51 percent of all construction labor hours performed by Miami-Dade County residents. County residents employed in furtherance of the goal set forth in the County's Community Workforce Program (CWP) shall be counted towards the 51 percent goal.
- b. In the event that form RFTE 1 is not submitted along with the bid package, the County will provide a notice that the bidder has 48 hours from the time of notification to submit the form or their bid or proposal will be deemed nonresponsive and disqualified.

2) Prior to the issuance of a Notice to Proceed, contractors must also submit the following:

- a. A Construction Workforce Plan (Form RFTE 2) and supporting documentation;
- b. A list of all subcontractors to be used on the project;
- c. A Responsible Subcontractor Affidavit (Form RFTE 1) for each subcontractor; and;
- d. A list of all employees currently employed by the contractor.

3) Submit OSHA Safety Training Affidavit (Form RFTE 3) with all certified payrolls.

4) Submit a Workforce Performance Report (Form RFTE 4) within 30 business days of completion of the Project.

5) Any lessee shall include requirements of Section 2-11.7 of the Code of Miami-Dade County and Implementing Order No. 3-61, including the right of the County to access the contractor's and subcontractors' records to verify compliance, in any contract, subcontract, or sublease. Lessee shall be responsible to the County for payment of compliance monitoring costs and any penalties found due.

T. Employ Miami-Dade Program

In order to promote Employ Miami-Dade Program, pursuant to Administrative Order 3-63, and except where federal or state laws or regulations mandate to the contrary, all County construction contracts shall include notification to the Contractor regarding the use of the Employ Miami-Dade Register, the minimum number of participants on the contract, and details regarding the County's evaluation of the Contractor's efforts to promote this legislation by using participants on the contract,

which will be used as part of the responsibility review for consideration on new County contract awards. The provision of this legislation shall apply to Country contracts valued in excess of \$1,000,000 for the construction, demolition, or alteration/repair of public buildings or public works projects, funded completely or partially by Miami-Dade County.

U. Public Records and Contracts for Services Performed on Behalf of Miami-Dade County

The Contractor shall comply with the Public Records Laws of the State of Florida, including but not limited to: (1) keeping and maintaining all public records that ordinarily and necessarily would be required by Miami-Dade County (County) in order to perform the service; (2) providing the public with access to public records on the same terms and conditions that the County would provide the records and at a cost that does not exceed the cost provided in Chapter 119, F.S., or as otherwise provided by law; (3) ensuring that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law; and (4) meeting all requirements for retaining public records and transferring, at no cost, to the County all public records in possession of the Contractor upon termination of the contract and destroying any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements upon such transfer. In addition, all records stored electronically must be provided to the County in a format that is compatible with the information technology systems of the County. Failure to meet any of these provisions or to comply with Florida's Public Records Laws as applicable shall be a material breach of the agreement and shall be enforced in accordance with the terms of the agreement. **If the contractor has questions regarding the application of Chapter 119, F.S. to the contractor's duty to provide public records relating to this contract, contact the custodian of public records via phone at (305) 375-5773, or via email at isd-vss@miamidade.gov. Offices are located at 111 NW 1st Street, Suite 1300, Miami, FL 33128.**

END OF ARTICLE

13. APPLICABLE LEGISLATION

Contractors and subcontractors are required to abide by all applicable federal, state, and local laws and ordinances, as they may be amended from time to time. Applicable local laws and ordinances include, but are not limited to, the following:

A. Resolutions

<http://www.miamidade.gov/govaction/searchleg.asp>

- R-1049-93 - Affirmative Action Plan Furtherance and Compliance
- R-385-95 - Policy prohibiting contracts with firms violating the American with Disabilities Act (ADA) and other laws prohibiting discrimination on the basis of disability ADA requirements, are a condition of award, as amended by Resolution R-182-00
- R-531-00 - Prohibition of contracting with individuals and entities while in arrears with the County
- R-894-05 - Independent Private Sector Inspector General (IPSIG) Services
- R-183-00 - Family Leave Requirements
- R-185-00 - Domestic Violence Leave
- R-1386-09 - Community Small Business Development Program; directing County Mayor to include additional subcontractor provisions in all future contracts, where applicable unless waived by the Board of County Commissioners
- R-138-10 - Resolution requiring that construction contracts include language mandating that the scope of work of SBEs be separately stated and accounted for in schedule of values.
- R-63-14 - Contractor Due Diligence

B. Administrative Orders

<http://www.miamidade.gov/ao/home.asp?Process=completelist>

- 3-20 - Independent Private Sector Inspector General (IPSIG) Services
- 3-37 - Community Workforce Program (CWP)
- 3-39 - Standard Process for Construction of Capital Improvements, Acquisition of Professional Services, Construction Contracting, Change Orders and Reporting
- 10-10 - Duties and Responsibilities of County Departments for Compliance with the Americans with Disabilities Act (ADA)

C. Implementing Orders

<http://www.miamidade.gov/ao/home.asp?Process=completelist>

- 3-9 - Accounts Receivables Adjustments
- 3-21 - Bid Protest Procedure
- 3-22 - Small Business Enterprise (SBE) Program for the Purchase of Construction Services
- 3-41 - Small Business Enterprise (SBE) Program for the Purchase of Goods and Services
- 3-61 - Residents First Training and Employment Program

D. Code of Miami-Dade County:

- https://library.municode.com/fl/miami_-_dade_county/codes/code_of_ordinancesSection 2-1 Rule 5.09 Statement of consideration of impact of sea level rise.
- Section 2-1076 - Office of the Inspector General
- Section 2-2113 First Source Hiring Referral Program
- Section 2-8.1 - Contracts and Purchases
- Sections 2-8.1.1 Bids from related parties and bid collusion for the purchase of goods and services, leases, permits, concessions, and management agreements.
- Section 2-8.1(d) Disclosure required of contractors and entities transacting business with Miami-Dade County.
- Section 2-8.1(f) Listing of subcontractors required
- Section 2-8.2.6.1 Buy American Iron and Steel Products
- Section 2-8.2.6.2 Cybersecurity and Information Technology
- Section 2-8.2.7 Economic Stimulus Ordinance
- Section 2-8.4 - Protest Procedures
- Section 2-8.5 - Local Preference
- Section 2-8.5.1 - Local Certified Veteran Business Enterprise
- Section 2-8.8 - Fair Subcontracting PracticesSection 2-8.8(4) Reporting of subcontracting policies procedures and payments
- Section 2-8.10. - User Access Program in County Purchases.
- Section 2-10.4.01 Small Business Enterprise – Architecture & Engineering Program
- Section 2-10.33.02 Small Business Enterprise – Construction Program
- Section 2-10.7 Sales Tax Exemption Program
- Section 2.11.1 - Conflict of Interest and Code of Ethics
- Section 2-11.1 (i)-(r) Financial Disclosure
- Section 2-11.16.1 Construction Contract Fee for Affordable Housing
- Section 2-11.16. Responsible Wages and Benefit Program
- Section 2-11.17 Residents First Training and Employment Program
- Section 2-1076 Office of the Inspector General
- Section 2-1701 Community Workforce Program
- Section 9-71 through 9-75 Sustainable Building Program
- Section 10-34 - Listing of Subcontractors Required
- Section 11A-38 through 11A-52 Discrimination
- Section 21-255 through 21-266 False Claims Ordinance

**TECHNICAL SPECIFICATIONS:
SPECIAL TERMS & CONDITIONS**

[UHEALTH | JACKSON STATION](#)



RPQ NO. TP-0000027284



**MIAMI DADE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS**

**METRORAIL BATHROOM
RENOVATION TO:**

**UHEALTH |
JACKSON**

DTPW PROJECT NO. IRP215R2

**BID DOCUMENTS
TECHNICAL SPECIFICATIONS**

MARCH 30, 2023

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SECTION 01030 ALTERNATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for alternates.

1.03 DEFINITIONS

- A. Additive Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to the Base Bid amount if DTPW decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost for each alternate is the net addition to the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.04 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether indicated as part of alternate or not.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section. The requirements for materials necessary to achieve the work described under each alternate are included in these Technical Specifications. Refer to the appropriate section based on the work involved in each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES: See Section 01110 for complimentary information.

END OF SECTION

SECTION 01110 SUMMARY OF WORK

1.0 BASIC DESCRIPTION OF FACILITY AND OTHER INFORMATION

- A. The facility is located at 1501 NW 12th Avenue, Miami, Florida, 33136. The Scope of Work is identified in the drawings and summarized above.
 - 1. Intended use of the area of work—bathroom and janitor closet repairs
 - 2. Type of construction—Level I interior alteration only
 - 3. General Systems contained in work—Architecture, Structural, HVAC, Electrical, Plumbing, Fire Alarm, and Building Technology.
- B. References used herein:
 - 1. Owner—Miami-Dade County Department of Transportation and Public Works (DTPW)
 - 2. User—Miami-Dade County Dept. of Transportation and Public Works – Transit Dept. (Transit)
 - 3. Engineer—The designated representative of DTPW in charge of the construction, a/k/a the DTPW Project Manager.
 - 4. General Contractor: The Company under contract with the Owner to do the construction work.
 - 5. A/E / Project Consultant / EOR—The Design Team composed of Architects and Engineers and other sub-consultants under contract with the Owner to design the Work and who signed / sealed the permit set drawings.

1.1 GENERAL SCOPE OF WORK: BASE BID

- A. Contractor shall remove and reset existing restroom fixtures and finishes. Repair existing restroom to comply with FBC 7th edition FBC 2020 accessibility.
- B. Remove and replace all finishes and fixtures with new walls, floor, and ceiling coverings, fixtures, appurtenances, plumbing, electrical, mechanical, communications, P/A speaker and speaker grill, hand free telephone, building systems, and all hardware, equipment and components associated thereto for the complete repairs of Metrorail station bathrooms.
- C. Remove and replace with new cast-iron and copper all existing sanitary drains, waste and vent systems.
- D. Remove and completely re-pipe with new L-type copper all existing water pipe, including trap primers, control valves, and supports for all plumbing fixtures.
- E. Provide new plumbing fixtures "institutional type" ADA compliant.
- F. Provide to all plumbing fixtures acorn duran-ware 16-gauge, type 304 stainless steel rated steel rated for 1000 lbs. with all mounting screws concealed.
- G. Restrooms shall be equipped with as required per DTPW toilet accessories specifications.
- H. All bathroom walls shall be tile from floor to ceiling with ceramic tile of a 6"X6" dimensions.
- I. Bathroom floors shall be anti-slip ceramic tile of a 12"X12".
- J. Provide new mechanical soffit and rigid ceiling with fire alarm and lighting.
- K. Install doors type 316 stainless steel with a min. of a 1.5 hour fire rating.
- L. Provide light fixtures per specification in day brite LED with emergency battery back-up shall be 227V, 2 lamp recessed to match existing.
- M. Furnish and install a new UL listed weather resistance wall mounted hand-free telephone to replace existing one.
- N. Furnish and install one exhaust ventilator with duct and wiring in each restroom.
- O. The smoke detector inside the bathroom must be removed at the beginning of the construction and reinstall before opening the bathroom to the public.
- P. The P/A speaker, speaker enclosure, and grill shall be replace with a new atlas sound speakers to be compatible with existing P/A system.
- Q. Remove and replace loose /broken floor tiles in area adjacent to the area of impact.

1.5 SCHEDULING AND CONCURRENT WORK

- A. Phasing of the Work: There is no phasing of work in this project.
- B. Staging Area: See drawings.
- C. Demolition: All fixtures, components and wall finishes. Entire ground floor slab as required for the installation of the underground sanitary lines. All existing utility connections in Area
 - 1. The allowed schedule for carrying out any demolition work and debris removal is as follows:
 - a. Weekdays (M-Th): Starting at 6:00pm and ending at 6:00am the following day.
 - b. Weekends: Anytime starting at 6:00pm on Friday and ending at 6:00am on Monday

Safety of Occupants and Public: Provide a "safety plan" which delineates areas of construction and construction traffic during the project, maintains required exits, and provides for barriers to separate construction areas from staff. The plan must provide for maintaining fire detection and warning systems in use while the building is occupied. Provide and maintain safety signage barriers, and construction aids. Maintain the safety of the facility and its occupants.

D DELIVERY AND STORAGE

The times of delivery and storage of construction products and equipment shall be coordinated with, the DTPW Site Supervisor and Engineer.

The storage of construction products and equipment fit within the confines of the property and the area is indicated in the drawings.

1.6

- A Parking of workers' vehicles shall be as designated by the DTPW in the pre-construction meeting.

1.7 SITE CONDITIONS

- A. Contractor's Use of Premises:
 - 1. The project site will be made available for general construction activities during normal business hours, Monday through Friday between the hours of 7:00am and 4:30pm. Availability of site for after-hours and / or weekend and Holiday work, for general construction work will have to be coordinated through the Engineer. The project site will be made available for demolition activities only during those periods when the general building operation functions in areas outside the limits of construction on the first floor and on the entire second floor of the building are inactive as indicated in Article 1.5.C above. Coordinate the demolition work schedule with the Engineer.
 - 2. The drawings designate a staging area on-site or for Contractor's use. Keep the area clean, secure, and organized. Do not block the buildings means of egress on the north wall. Work force parking and all access to the site, building and project location within the building to be coordinated with the Engineer.
 - 3. It is important that that the Contractor or any of the sub-contractors / vendors, or any deliveries do not interfere with the DTPW or User operations.
 - 4. Where construction impacts existing parking entrances / exits, areas, exits, staff and public circulation, submit plans showing temporary (for the duration of the work) pedestrian and vehicular traffic circulation for the

impacted areas. Include barricades and signing necessary during the entire construction period, to direct the public and the vehicles through the construction zone in the submittal.

5. Handle waste and clean areas affected by the work.
6. Remove debris such as construction material, debris, and spills from site each day. Dispose of lawfully using covered rubbish containers, recycling where possible.
7. Provide security for products and equipment stored on-site. Maintain the safety of persons in and surrounding the project site.
8. Provide devices and methods to maintain proper Indoor Air Quality (IAQ), protect other parts of the building outside the limits of construction, from damage including the migration of dust, fumes, smell or other debris. This applies to both horizontal and vertical space adjacencies.
9. Refer to the latest edition of DTPW Adjacent Construction Safety Manual, made a part of the construction contract, for work restrictions and safety standards, guidelines and requirements.
10. Before date of Substantial Completion, repair and return all area(s) affected by the construction to the original condition or as needed for the new use, to the satisfaction of DTPW. When work is performed subsequent to Substantial Completion, immediately at the completion of such work, repair and return the affected areas to the original condition or as needed for the new use, to the satisfaction of DTPW.

1.8 UNIT PRICES: Not Applicable in this contract.

1.9 BUY AMERICAN:

This project is designated as a "BUY AMERICAN" job. Do not provide any products, assemblies, or other components not designated as "AMERICAN MADE OR MANUFACTURED" for installation as a part of the work. Should an installed product be found to not be "AMERICAN MADE OR MANUFACTURED" it shall be promptly removed and replaced along with any other component damaged during the process and all at no cost to the Owner. Insure, before submitting for approval or delivering to the project, that the product or system or component complies with the "BUY AMERICAN" requirements of this project.

1.10 CONSTRUCTION DOCUMENT DRAWINGS

A. The Drawings listed in the following Index of Drawings are a part of the Construction Documents:

<u>Sheet #</u>	<u>Drawing #</u>	<u>Drawing Sheet Title</u>
1 of 18	A000	Cover sheet, project team, index
2 of 18	A100	Site Plan, scope of work & selective demolition plan
3 of 18	A101	Floor plans and elevations
4 of 18	A102	Equipment cut sheets
5 of 18	A103	Equipment cut sheets
6 of 18	A104	Equipment cut sheets
7 of 18	S001	General structural notes
8 of 18	S100	Floor plan
9 of 18	S500	Typical details
10 of 18	M001	General notes and legend
11 of 18	M100	Floor plans
12 of 18	M500	Details and schedules
13 of 18	E000	General notes and legend
14 of 18	E100	Floor plan
15 of 18	P001	General notes and legend
16 of 18	P100	Floor plans
17 of 18	P500	Details and schedules
18 of 18	FP100	Fire protection plan

END OF SECTION

SECTION 01297
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Specification establishes the requirements for breakdown of Payment Items.

1.02 SUBMITTAL REQUIREMENTS

- A. Submit to the DTPW a Preliminary Schedule of Values to include all portions of the work within 15 days after NTP.
- B. Submit to the DTPW a Baseline Schedule of Values within 15 days after receipt of DTPW comments on the Preliminary Schedule of Values. The Baseline Schedule of Values shall incorporate all comments associated with Contractor's Preliminary Schedule of Values submittals.
- C. Submit Documentation to support the values with data which will substantiate their accuracy.
- D. Upon acceptance by the DTPW, the Schedule of Values shall be used as the only basis for the Contractor's Applications for Payment. Acceptance of the Contractor's Preliminary/Baseline Schedule of Values is a condition precedent to processing all applications for payment other than payment for start-up costs during the first two months.
- E. The Schedule of Values shall correspond to each of the Payment Items. The breakdown of the progress payment for each Item shall be in accordance with the approved Work Breakdown Structure and each line item shall correspond with an activity in the Construction Schedule.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. The Schedule of Values shall be labeled with identifying information such as: title of contract and location, contract number, name and contact information of Contractor, and date of submission.
- B. The Schedule of Values shall list the installed value of the component parts of the WORK in sufficient detail to serve as the basis for computing values for progress payments during construction.
- C. Identify and list the title and number of the Specifications Section that is associated with the work.
- D. Deviations from the Schedule of Values form and content must be submitted and approved by the DTPW.
- E. Progress payment Items:
 - 1. Payments for progress payment activities will be based upon physical progress (percent complete) for each related activity in the Progress Schedule.
 - 2. The dollar value allocated to progress payment activities shall be representative of the Contractor's actual costs for performing the work including overhead and profit

and shall be balanced to ensure that sufficient funds are allocated for each portion of the work and shall be subject to acceptance by the DTPW.

3. In the case of a disagreement between DTPW and Contractor's, the DTPW shall have the right to make final determination of activity dollar amounts contained in the Schedule of Values.
- F. Each Payment Item shall include a directly proportional amount of the Contractor's overhead and profit.
- G. A new Payment Item will be added to the Schedule of Values for approved Change Order Work. For payment for Time & Materials Change Order Work, the Contractor shall hold a Pre-Work Change Order Meeting with the DTPW, prior to executing the Work.
- H. The sum of all Payment Items listed in the Schedule of Values shall equal the total Contract Price.

1.04 SUB-ACCOUNTS

- A. Include a breakdown of major Payment Items into sub-accounts on which progress payments will be requested. The sub-account breakdown shall include elements for Payment Items as appropriate and show the weight of the sub-accounts equal to 100 percent of major account (Payment Item).
- B. Contractor's Schedule of Values shall list the delivered value of the products, manuals, and services provided under the various Specification Sections. The lists shall be sufficiently detailed to serve as a basis for computing values for progress payments during the construction period.
- C. Copies of paid invoices for component material shall be included with the payment request in which the material first appears.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract Lump Sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01311

PROJECT MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes specifications for project meetings. The Contractor, along with Contractor's superintendent, project manager, superintendents of major subcontractors, as a minimum, shall attend meetings scheduled by the Engineer (DTPW) and shall:
1. Collect and disseminate information related to the Contract.
 2. Advise about Contract-related Safety information, Safety meetings, and Safety-related issues.

- 1.02 **SPECIAL MEETINGS:** Special meetings between the Engineer and the Contractor will be scheduled and conducted by the Engineer throughout the course of construction as the Engineer deems necessary.

1.03 PRECONSTRUCTION MEETING

- A. A pre-construction meeting will be scheduled and conducted by DTPW not more than 15 working days after the effective date of the Notice of Contract Award. Contractor's project manager and superintendent shall attend along with the superintendent of the major subcontractors. DTPW will provide Contractor written notice of this meeting not less than five working days or one calendar week prior to the date of the meeting.
- B. DTPW will discuss the following at this meeting:
1. Introduce representatives of DTPW, the User, and the Project Design Team.
 2. Explain and discuss the responsibilities and authorities of the Engineer (DTPW).
 3. Discuss Equal Employment Opportunity (EEO), Disadvantaged Business Enterprise (DBE), and affirmative action requirements.
 4. Define and establish requirements for safety, first-aid, emergency actions, and security.
 5. Explain and discuss selected laws, codes, and permit requirements of public agencies and their regulations.
 6. Discuss procedures for processing change notices, change orders, correspondence, RFIs, shop drawings, submittals, product data, and samples.
 7. Discuss monthly progress payments.
 8. Discuss final payments.
 9. Discuss project schedule
- C. The Contractor shall discuss the following at this meeting:
1. Introduce Contractor's representatives, and briefly describe each person's responsibilities.
 2. Distribute and discuss the list identifying major Small Business and Disadvantaged Business Enterprises (SBE and DBE) subcontractors including their areas of responsibility.
 3. Discuss use of office, haul routes, storage areas, staging areas, and construction areas.
 4. Define housekeeping procedures.
 5. Discuss construction means and methods.

6. Discuss coordination and notifications required for utility work and services.
7. Discuss deliveries and priorities.
8. Discuss breakdown of schedule of values lump sum items.
9. Discuss construction progress schedule.

1.04 CONSTRUCTION PROGRESS MEETINGS

- A. Construction progress meetings will be scheduled by DTPW, conducted by the Engineer and held as required but not more often than semi-monthly during the period of performance of the Contract. Progress meetings shall include representatives of subcontractors who are or will be performing Work during the current and following month.
- B. The Contractor shall distribute notices of these meetings before such meetings to subcontractors.
- C. The agenda for construction progress meetings will be prepared by the Engineer and will generally include the following:
 1. Introduce new attendees and areas of responsibility.
 2. Review minutes of previous meetings amend minutes if necessary and accept minutes.
 3. At the first meeting of each month, analyze Work accomplished since previous meeting, offsite fabrication problems, product delivery problems, submitted schedule slippages, proposed changes, and circumstances that might affect progress of work.
 4. At each meeting, display and discuss the status of the Critical Path activities. If they are behind schedule describe the methods intended to be used to bring these activities back on schedule. Discuss corrective measures to maintain progress.
 5. Discuss the Two-Week Look-Ahead Schedule submitted as specified in Section 01321 Construction Contract Schedules, and last Work plan for the previous period showing activities accomplished and those not completed in accordance with the prior submittal. Discuss the reasons for failure to complete the Work as shown in the schedule and the methods to be implemented to complete the unfinished activities.
 6. Discuss Work quality observations, problems, and employee Work standards.
 7. Discuss coordination of utility work.
 8. Discuss Work by outside parties.
 9. Discuss changed conditions, time extensions, and other relevant subjects as they affect the progress of the work.
 10. Discuss the status of Contract changes: new changes, status of negotiations and completed changes.
 11. Discuss SBE/DBE, and any Apprenticeship Program issues.
- D. Each of the Contractor's inquiries, requests for information (RFI) or requests for solutions of problems presented during such meetings shall be answered, when possible, during the meeting; those not answered during the meeting will be answered, the answer documented and presented by the Contractor at the next meeting. Answers provided orally at the meetings shall be recorded in the minutes.
- E. Review the minutes of the meeting prepared and submit any requested corrections. Minutes will be prepared in action-item format with named responsible parties and dates for completion indicated for each item.

1.05 PROGRESS PAYMENT MEETINGS: The Contractor and the Engineer shall meet to discuss the monthly progress payment.

1.06 CHANGE ORDER MEETINGS: As necessary the Contractor and the Engineer shall meet to review change orders.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01321

PROJECT SCHEDULE

PART 1: GENERAL

1.01 DESCRIPTION

- A. This section covers the preparation of a schedule in the form of a bar chart. (The Contractor will be allowed to use his preferred scheduling system, if approved by the DTPW. If the Contractor wishes to propose his own system, he shall so request prior to the required submittal timetables listed in this section.)
- B. Final Schedule:
 - 1. A bar chart schedule shall be used by the Contractor to control the progress and time fixed for completion of this project. This system shall be implemented by the Contractor. Prior to approval of the final construction schedule, the Contractor shall provide DTPW with letters from all his subcontractors and suppliers indicating that they have reviewed the Contractor's schedule and concur with the sequence of events, activity durations and rates of production implied therein.
 - 2. All work shall be done in accordance with the schedule and all costs incurred by the Contractor to correctly implement the schedule shall be borne by the Contractor and are a part of his contract.
 - 3. The schedule must be updated monthly and submitted with the Contractor's pay request. No payment will be made to the Contractor unless this monthly updated schedule and progress report is submitted with the Contractor's pay request. Even if no invoice is submitted in a particular month, the Contractor shall submit monthly schedule updates and progress reports to the satisfaction of the Engineer.
 - 4. This schedule shall consider the work restrictions indicated in Section 01110, Article 1.7.A., and demonstrate the sequencing of the Work so as to not impact the contract duration.

PART 2: PREPARATION

2.01 PREPARATION OF FINAL SCHEDULE:

- A. Preparation:
 - 1. Within 7 days after the date of Notice to Proceed (NTP), the Contractor shall develop and submit a comprehensive and detailed Final Schedule, hereinafter referred to as the final schedule. Work performed prior to NTP shall not be allowed under this Contract.
 - 2. When completed, the bar chart diagram shall represent the Contractor's own plan for the project as well as the sequence of each operation and all the

involved parties. The schedule shall also identify the project's critical path. It shall be the responsibility of the Contractor to ensure that all of this work is described by the diagram and that the diagram does correctly represent the sequence in which he plans to do his work and the time in which he expects to do it.

3. As a minimum, the final schedule will cover the following areas:
 - Shop drawing preparation, review and approval
 - Procurement of major equipment or material
 - Permit acquisition activities
 - Material samples
 - Material delivery
 - All major work elements
 - Punch list activities
 - Rates of Production
4. The final schedule will be printed on a 11" x 17" sheet suitable for reproduction. The Contractor will submit 3 copies of this schedule.
5. A written narrative on separate 8 1/2" x 11" sheets will be included with the contractor's final schedule. This narrative will describe the contractor's general approach for performing the work and any additional or unusual requirements not clearly represented in the schedule including, but not limited to, equipment to be used and the time equipment is to be on-site, anticipated delivery dates for material and/or equipment, crews and crew sizes, estimated quantities and rates of production. The narrative shall explain the basis for the contractor's determination of durations for major work items and describe his approach for meeting the interim and final completion dates in his schedule. The narrative shall also address workdays per week, hours per shift, rain days, holidays or any other non-work periods that the contractor is assuming in the planning of the work. Activities which may be expedited by the use of overtime or additional shifts shall be identified. Sequencing and other restraints such as manpower, material or equipment shall be identified and explained. A form to be used by the Contractor to prepare his baseline narrative shall be requested from DTPW at time of award of contract.
6. When completed, the final schedule shall be submitted to the Engineer for approval. The Contractor shall incorporate the Engineer schedule review comments within 10 days after receipt. The Engineer shall be the final authority in deciding the acceptability of the schedule. Upon approval by the Engineer, this shall become the Final Schedule for the contract. No deviations from the final schedule will be allowed without the approval of DTPW.
7. The Contractor shall identify all available float or slack time in his schedule in a format suitable to the DTPW. Float or slack time is not for the exclusive use or benefit of either the Contractor or DTPW. Float or slack time is considered project float as it is for the benefit of both parties. As such, it is not to be used exclusively by either party but is to be used by the party that needs it first. No more than 15% to 25% of the activities in the contractor's schedule may be on or near the critical path. ("Near the critical path" is defined as any activity having float of 10 days or less)

2.02 MONTHLY SCHEDULE UPDATES

1. The Contractor shall submit monthly schedule updates to show progress, as applicable, on all activities in progress. Such progress shall be shown in a format suitable to the Engineer. Three 11" x 17" copies of the updated schedule shall be submitted by the Contractor.
2. The Contractor shall submit an updated narrative in the form of monthly progress reports in a format acceptable to the Engineer. Such reports shall include sections for describing "progress this period", "planned progress for next period", "problems and solutions" (including a listing of all delayed activities, the reasons for delay and proposed recovery actions) and "changes since last period". Any special concerns and or questions regarding the schedule should also be included in the progress report. As applicable, signed material delivery tickets indicating when material was delivered on-site or to the fabrication plant will be provided with the narrative on a monthly basis. A form to be used by the Contractor to prepare his monthly update narrative is to be requested from the Engineer prior to use for the first time.
3. The Contractor shall submit on a bi-weekly basis a simplified two-week look-ahead bar chart schedule showing all anticipated work scheduled to take place during the next 14 calendar days. This two-week look-ahead schedule shall be based on the approved baseline schedule.

PART 3: PAYMENT

3.01 PAY REQUESTS

1. The Contractor's pay request shall include an update of the final schedule. The contractor will not be eligible to receive payment until his contract baseline schedule and schedule of values is approved and no payment will be made to the Contractor unless this schedule update and schedule of values is submitted with the pay request.
2. 5% of each Contractor's pay request amount will be retained in accordance with Section 3.8 of the Special Requirements.
3. All Contractor pay requests will be submitted in a form suitable to DTPW based on a County approved schedule of values.

3.02 FINAL PAYMENT

Final payment shall be made in accordance with Article the terms and conditions of the Miscellaneous Construction Contract.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01325
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section specifies the maintaining, marking, recording and submitting of project record documents.
- B. DEFINITIONS:
 - 1. Conformed Contractor Contract Documents: The conformed documents provided to the Contractor Firm at the time the Contractor contract was executed, prior to the start of the Contractor Contract. This set is separate and apart of the Permit set.
 - 2. Contractor Document Transmittal (CDT): Reviewed and approved drawings, catalog cuts, samples or other documents submitted by the Contractor Firm for review showing in detail how the Contractor proposes to carry out the work.
 - 3. Project Record Documents (As-Built): During construction, a set of released-for-construction drawings and specifications, shall be kept current by marking in red all “as-built” construction conditions and changes arising out of RFIs, clarifications, directed field changes and sketches, etc. At the end of construction activities, the information contained in these drawings and specifications shall be submitted to the Engineer for incorporating into Compact Disks (CD / DVD) containing the latest conformed drawings including revisions to the contract documents made during construction. (Changes to specifications are typically only affected through change orders. However, in some occasions clarifications may require a modification to the specifications). The revised CADD drawings, which include the information incorporated from the drawings and specifications, become The Project Record Documents.
 - 4. Shop Drawings: Final CAD files to be provided in Autocad as well as 11x17 PDF's. See Contractor Firm Document Transmittals.

1.02 SUBMITTALS

- A. Upon completion of the work, the Contractor Firm shall submit the As-Built to the Engineer in time to be used for the final inspection and acceptance and for verification. Availability of As-Built shall be prerequisite to scheduling a final inspection of this Contractor Contract. Non-availability of As-Built or inaccuracies therein may be grounds for cancellation and postponement of any scheduled final inspection by the Engineer until such time as the discrepancy has been corrected. Upon completion of the work, the As-Built shall become the property of DTPW. The Contractor Firm will transmit the As-Built to the Engineer with an attached Project Records “As-Built” Drawings Index Form uniquely identifying and describing each document.
- B. The Contractor shall sign each red line drawing certifying the accuracy and validity of the as-built information contained therein

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 MAINTENANCE OF DOCUMENTS:

- A. The Contractor shall maintain one copy of each of the following:
- B. Contractor Contract Documents
 - 1. Conformed Contractor Contract Drawings and Conformed Specifications.
 - 2. Construction Safety Manual.
 - 3. Change Orders, Change Notices and other modifications to the Contractor Contract.
 - 4. Engineer Field Order or written instruction.
 - 5. Approved shop drawings, product data and samples.
 - 6. Field test reports/records.
 - 7. Updated set of Construction Documents (Drawings and Technical Specifications) marked in red to show field changes.
 - 8. Request for information (RFI).
 - 9. All directed Field Changes and sketches.
- C. Equal Employment and Affirmative Action Records.

3.02 RECORDING "AS-BUILT" DRAWINGS

- A. Record information concurrently with construction progress on The Construction Documents (Drawings and Technical Specifications). During construction, this set is known as "As-Built" documents.
- B. Do not conceal any work until the required information is recorded.
- C. Drawings: legibly mark in red to record actual construction depicting the as-constructed configurations resulting from field and/or design changes:
 - 1. Location of internal utilities, electrical conduits and appurtenances, referenced by dimensions to permanent, visible and accessible features of the structure.
 - 2. Field changes of dimension and detail.
 - 3. Details not on original Contractor Documents.
 - 4. Changes made by Change Notice or by Change Order.
- D. Legibly mark up each section of specifications to record:
 - 1. Manufacturer, trade name, catalogue number, and supplier of each product and item of equipment actually installed.
 - 2. Changes made by Change Notice or by Change Order.
- E. Any changes due to RFIs, clarifications and field sketches shall be incorporated into the record drawings by affixing sketches and other 8 1/2" x 11" sheets to the Contract Documents.
- F. Do not use the record drawing set for construction progress purposes.

3.03 DOCUMENT MAINTENANCE:

- A. Provide for storage of documents to maintain in clean, dry and legible condition.
- B. Make documents available for inspection by the Engineer.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01330 SUBMITTALS

1.01 DESCRIPTION:

- A. This section includes specifications for the general requirements and procedures for preparing and submitting design and construction information and data for information and review. Other requirements for submittals are specified under applicable sections of the Contract Documents.

2.01 SUBMITTAL REQUIREMENTS:

- A. Schedule of Submittals: Within fifteen (15) days after the effective date of Notice to Proceed (NTP), the Contractor shall submit a completed submittal schedule and list of products for all items requiring the Engineer's review, as follows:
 - 1. Design Drawings and Project (Specifications) Manual
 - 2. Submittal Schedule
 - 3. Shop Drawings, including description of the items and name of manufacturers, trade names, and model numbers
 - 4. Contract Project (Specification) Manual Section Reference
 - 5. Intended Submission & Resubmission Date(s)
 - 6. Order Release Dates
 - 7. Lead Times to Delivery and Anticipated Delivery Date(s)
 - 8. Highlight items that require expedited review to meet the project schedule, and are within the critical path of the schedule
- B. The Engineer will withhold acceptance of submittals which depend on other submittals not yet submitted or not yet reached a status of "No Exceptions Taken".
- C. These schedules shall be presented in a form that is readily reproducible and shall be updated and sent to the Engineer on a monthly basis. Identify all submittals that are required by the Contract Documents and determine the date on which each submittal will be submitted in conformance with the schedules specified under this contract.
- D. Provide a title block for drawings containing the following information:
 - 1. Date and Revision Date(s)
 - 2. Contract Title and Number
 - 3. The names of the Contractor, Sub-Contractors, Suppliers, and Manufacturers as applicable.
 - 4. Identification of product by description, model number, style number, serial number, or lot number
 - 5. Subject identification by Contract Drawing or Specification Reference.
- E. Professional Engineer's Seal Required:

Submittals involving delegated engineering expertise, such as excavation support structures, framework for concrete, civil and structural designs, load calculations and operating systems engineering final design shall be sealed and signed by a professional engineer, currently registered in the State of Florida, for the discipline involved and in accordance with Florida law.

F. Submittal Stamps and Action Block Space:

Include a 5-inch square blank space, in the lower right corner, just above the title block, in which the Engineer may indicate the action taken. Please note that the Engineer may opt to issue a separate “Submittal Review” document indicating all comments. This Submittal Review document shall be affixed by the GC to the submittal documents.

G. Review Period:

1. Prepare submittals sufficiently in advance so that review may be given before commencement of related work.
2. Allow thirty (30) calendar days after receipt by the Engineer for review of each submittal.
3. The Contractor shall be responsible for determining whether or not certain governmental entities and utility companies will require longer review periods. The Engineer will assist in this effort. Where longer review periods are required, the Contractor shall schedule the work accordingly, so that the work and construction schedules are not adversely impacted.

H. Submittal Delivery:

Ship submittals prepaid (FedEX, etc...) or deliver by hand directly to the DTPW Engineer's office.

I. Transmittal Form:

Accompany all submittals with a transmittal form, including a brief description of the items that have been included.

J. Changes in Reviewed Submittals:

Changes in reviewed submittals will not be permitted unless those approved submittals with changes have been resubmitted and reviewed, in the same manner as the original submittal.

K. Supplemental Submittals:

Supplemental submittals initiated by the Contractor for consideration of corrective procedures shall contain sufficient data for review. Make supplemental submittals in the same manner as initial submittals.

L. Incomplete submittal packages will be returned without review

3.01 CONTRACTOR'S RESPONSIBILITIES:

A. Contractor's Review:

1. Each submittal shall be reviewed, stamped, and signed as reviewed and approved by the Contractor before submission.
2. If the submittal is designated to be sent to the Engineer for information, approval by the designated approval authority shall take place before submission to the Engineer.
3. The Contractor shall coordinate each submittal with the requirements of the work, placing particular emphasis upon ensuring that each submittal of one trade is compatible with other submittals of that trade and with the submittals of other trades. Ensure submittal is complete with all relevant data required for review.
4. Review of drawings and associated information as deemed appropriate by the Engineer shall not relieve the Contractor from the responsibility for errors or omissions in the drawings and associated information, or from deviations from the Contract Documents, unless submittals containing such deviations were submitted to the Engineer and the deviations were specifically called to the attention of the Engineer in the letter of transmittal, and recommended by the Engineer as a Contract Change.
5. The Contractor's liability to work, in case of deviations in the submittals from the requirements of the Contract Documents, is not relieved by the Engineer's review of submittals containing deviations, unless the Engineer expressly recommends acceptance of the deviations to the DTPW and the issuing of a Contract Change Order.
6. The Contractor shall be responsible for the correctness of the drawings, for shop fits and field connections, and for the results obtained by the use of such drawings.

B. Submittal Quantities:

Unless noted otherwise, Contractor shall submit seven (7) copies of all submittals and electronic files in a form acceptable to the Engineer. Where permits and licenses and other such documents are obtained in DTPW's name, submit the original and six (6) copies.

C. Distribution of Submittals after Review:

Distribute prints or copies of reviewed submittals, bearing the Engineer's or designated approval authority's stamp and signature, to affect and concerned sub-contractors,

suppliers, and fabricators; and to affected and concerned members of the Contractor's workforce.

- D. Maintain at the job site a complete up-to-date, organized file of all past and current submittals including an index and locating system which identifies the status of each submittal:
1. Assign a sequential number to each submittal, which shall indicate the applicable specification section for which the submittal is required.
 2. Assign a revision number, using an alphanumeric sequence (i.e., 15, 15A, 15B, etc.) to all submittals.

4.01 PROJECT CONSULTANTS REVIEW:

- A. Submittals will be reviewed for conformance with requirements of the Contract Documents. Review of a separate item will not constitute review of an assembly in which the item functions. Review will not relieve the Contractor from Contractor's responsibility for accuracy of submittals, for conformity of submittals to requirements of Contract Documents, for compatibility of described product with contiguous products and the rest of the system, or for prosecution and completion of the Contract in accordance with the Contract Documents.
- B. The Engineer will indicate in its reviews of submittals and the action taken by means of the submittal stamp or a separate Submittal Review document. If a submittal stamp is used it will be affixed by the Engineer within the action block and the stamp will be signed and dated.
- C. The submittal stamp action block marks will have the following general meanings: Please note that different professionals may use a slightly different version of each of these generalized statements in their stamps or in their Submittal Review document.
1. The mark "NO EXCEPTIONS TAKEN" means that every illustration and description appears to conform to the respective requirements of the Contract Documents; that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed; and that the submittal need not be resubmitted.
 2. The mark "NOTE COMMENTS" means that every illustration and description appears to conform to the respective requirements of the Contract Documents upon incorporation of the reviewer's corrections, and that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed. Submittals so marked need not be resubmitted unless the Contractor challenges the review/s exception.
 3. The mark "MAKE CORRECTIONS NOTED" means that every illustration and description appears to conform to the respective requirements of the Contract Documents, and that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed after incorporation of the reviewers corrections and verification by the

Engineer that the reviewer's corrections have been properly incorporated in the submittal.

4. The mark "REVISE AND RESUBMIT" means that no every illustration and description appears to conform to the respective requirements of the Contract documents, and that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may not proceed until incorporation of the reviewers corrections and re-submittal for re-review. Resubmission is also required if the Contractor challenges the reviewer's corrections.
5. The mark "REJECTED" means that the submittal is deficient to the degree that the reviewer cannot correct the submittal with a reasonable degree of effort, has not made a thorough review of the submittal, and that the submittal needs revision and is to be corrected and resubmitted.

- D. Review stamps or other approval methods of the various designated approval authorities may not be the same as those described herein. The Contractor shall coordinate (through the Engineer) with the various designated approval authorities and shall obtain approvals in the clearest and most straight forward manner possible.
- E. Contractor shall attend meetings as requested by the Engineer to address issues related to the review of submittals.
- F. The Engineer will return submittals to the Contractor within thirty (30) calendar days after submittals have been received.
- G. Contractor shall include at least thirty (30) days in the project schedule for the Engineer to review submittals.
- H. Allow thirty (30) days for review by the Engineer of all re-submittals.

5.01 MEASUREMENT AND PAYMENT

A. MEASUREMENT

Work under this Section will not be separately measured for payment.

B. PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01620

SUBSTITUTIONS AND PRODUCT OPTIONS

1.01 DESCRIPTION:

- A. This Section specifies the procedures to be followed for preparing, submitting, amending and updating of lists of products proposed to be incorporated in the work.

2.01 SELECTED PRODUCTS:

- A. Within ten (10) days after the effective date of NTP, submit five (5) copies of the list of selected products. Arrange the list in the order of each Section's appearance in the specification.
 - 1. For products specified only by reference standards, any product satisfying those standards may be selected. Show name and address of manufacturer; trade name, model number or catalog designation of the product; manufacturer's reference standards and pertinent performance and test data.
 - 2. For products specified by naming one product or by naming several products, this establishes a product standard. Any other product, which is equal in the opinion of DTPW and EOR may be furnished. A request must be submitted to the DTPW as required for substitutions, for acceptance of products not specifically named.
 - 3. **Equal:** Where named products or sources listings are accompanied by the term "or equal" or "or approved equal" or other language of similar effect, provide one of the specified products, or submit a request for substitution for a product not named, in accordance with the requirements of this Section, which the Contractor judges to be of equal or better quality.
 - 4. Amend and update list as changes concerning the information become known.

3.01 LIST OF SUBSTITUTE PRODUCTS AND METHODS:

- A. Formal requests from the Contractor will be considered by DTPW and EOR for substitution of products and methods in place of those specified, but only if these requests are submitted within ten (10) days after effective date of NTP. No substitutions request will be considered after ten (10) days. Acceptance of substitute products and methods shall be only for the characteristics and use named in the acceptance and shall be interpreted neither as a modification to the Specification and Drawing requirements nor to establish acceptance of products and methods for other portions of the Transit System. DTPW and the EOR shall judge the quality and suitability of the substitute product and method and his decision shall be final. Where use of a substitute product and method involves redesign of other parts of the

work, the cost and time required to affect that redesign will be considered in evaluating the suitability of the substitute product and method.

B. Submit five (5) copies of list of substitute products and methods, including the following information:

1. Complete data substantiating compliance of the proposed substitution with the requirements of the Specifications (Technical Specifications) and Drawings.
2. For products:
 - a. Product identification, including manufacturer's name and address
 - b. Manufacturer's literature, including product description, performance and test data and pertinent reference standards
3. For construction methods:
 - a. Detailed description of proposed method
 - b. Working drawings illustrating methods
4. Itemized comparison of proposed substitution with product specified. Comparison shall include cost, differences in estimated life, estimated maintenance, availability of spare parts and repair services, energy consumption, performance capacity, salvage-ability, manufacturer's warranties and other material differences.
5. Data relating to changes in construction schedule.
6. Accurate cost data on proposed substitution in comparison with product and method specified except that cost data will not be required on substitutes proposed as equal, equivalent or superior to specified brand names and for which no request is made for price adjustment to the sub-contract.
7. Equitable adjustment and credit that the Contractor proposes to offer work if the substitutions are not equal, equivalent or superior to specified brand names.

C. In making request for substitution, Contractor shall verify:

1. That he has personally investigated the proposed product and method and that to the best of his knowledge, information and belief, the product and method is either equivalent or superior to that product and method specified and that he will update information as new or different data become known to him.
2. That he will furnish the same guarantee for substitution as he would for the product and method specified.

3. That he will coordinate installation of the accepted substitution into the work and will make those changes required for the work to be complete and operable.
 4. That cost data is complete and includes related costs and excludes cost of engineering redesign.
 5. That he waives claims for additional time and costs related to the substitution, which become apparent.
- D. Amend and update list as changes concerning information on the list become known to him.
- E. Substitutions will not be considered, if indicated or implied on Shop Drawings or Product Data Submittals for which no formal request for substitution has been submitted. Requests for substitutions will not be considered if acceptance will require substantial revisions of drawings and specifications or both.

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

5.01 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01732 CUTTING AND PATCHING

PART 1: GENERAL

1.01 REQUIREMENTS INCLUDED:

- A. Contractor responsibility: All cutting, fitting and patching, including attendant excavation and backfill required to complete the work to:
 - 1. Make its several parts fit together properly.
 - 2. Uncover portions for the work to provide for the installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to requirements of Contract Documents.
 - 5. Remove samples of installed work as specified for testing.
 - 6. Remove routine penetrations of non-structural surfaces for installation of piping and electrical conduits.

1.02 SUBMITALS: In accordance with Section 01330

- A. Submit a written request to the Engineer well in advance of executing any cutting or alteration which affects:
 - 1. Work of the DTPW or any separate contractor.
 - 2. Structural value or integrity of any element of the Project.
 - 3. Integrity or effectiveness of weather-exposed or moisture resistant elements or systems.
 - 4. Efficiency, operational life, maintenance or safety of operational elements.
 - 5. Visual qualities of sight-exposed elements.
- B. Include with each request:
 - 1. Identification of the Project.
 - 2. Description of affected work
 - 3. The necessity for cutting alteration or excavation.
 - 4. Effect on work of DTPW or any separate contractor, or on structural or weatherproof integrity of Project.
 - 5. Description of proposed work:
 - a. Scope of cutting, patching, alteration, or excavation.
 - b. Trades who will execute the work
 - c. Products proposed to be used
 - d. Extent of refinishing to be done.
 - 6. Alternatives to cutting and patching.
 - 7. Cost proposal, when applicable.
 - 8. Written permission of any separate contractor whose work will be affected.

- C. Should conditions of Work or the schedule indicate a change of Products from original installation, submit request for substitution.
- D. Submit written notice to the Engineer designating of the date and time the work will be uncovered.

PART 2: PRODUCTS

2.01 MATERIALS:

- A. Comply with specifications and standards for each specific product involved.

PART 3: EXECUTION

3.01 INSPECTION:

- A. Inspect existing conditions of Project, including elements subject to damage or movement during cutting or patching.
- B. After uncovering work, inspect conditions affecting installation of Products, or performance of work.
- C. Report unsatisfactory or questionable conditions to the Engineer in writing; do not proceed with work until the Engineer has provided further instruction.

3.02 PREPARATION:

- A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.
- B. Provide devices and methods to protect other portions of Project and the rest of the building from damage including the migration of dust, fumes or other debris from the limits of construction area.
- C. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching work and maintain excavations far from water.

3.05 PERFORMANCE:

- A. Execute cutting and demolition by methods which will prevent damage to other work, and which will provide proper surfaces to receive installation of repairs.
- B. Execute cutting and demolition only during allowed periods as indicated in Section 01110, Article 1.7.A. Restriction of hours for this type of work will be strictly enforced by the DTPW and User.

- C. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.
- D. Employ original Installer or Fabricator to perform cutting and patching for:
 - 1. Weather-exposed or moisture-resistant elements.
 - 2. Sight-exposed finished surfaces.
- E. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- F. Restore work which has been cut or removed, install new products to provide complete work in accord with requirements of Contract Documents.
- G. Fit work airtight to pipes, sleeves, ducts, conduit and other penetration through surfaces.
- H. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
 - 1. For continuous surfaces, refinish to nearest intersection.
 - 2. For an assembly, refinish entire unit.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will not be separately measured for payment

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01740 CLEANING

PART 1: GENERAL

1.01 DESCRIPTION:

This Section specifies the maintenance of the work site in a clean, orderly hazard-free condition.

1.02 QUALITY ASSURANCE:

- A. Conduct cleaning and disposal operations in accordance with local ordinances and anti-pollution laws. Rubbish, volatile wastes, and other construction wastes shall be neither burned nor buried on the work site, and shall not be disposed of into storm drains, sanitary drains, streams or other waterways.
- B. Final cleaning shall be accomplished either by workmen experienced in cleaning operations or by professional cleansers.

PART 2: PRODUCTS

2.01 CLEANING MATERIALS:

Cleaning materials shall be as recommended by the manufacturer of the surface to be cleaned.

PART 3: EXECUTION

3.01 SAFETY REQUIREMENTS:

- A. Maintain work site in accordance with local ordinances and anti-pollution laws applicable to work site cleanliness, and in a neat, orderly and hazard-free condition until final acceptance of the work. Work site sidewalks and walkways adjacent to the work site shall be kept free from hazards caused by construction activities.
- B. No volatile substances are to be used on the job site.
- C. Prevent accumulation of waste, which creates hazardous conditions.
- D. Artificially ventilate indoor spaces, which are not naturally ventilated, and which have the HVAC systems shut off, when construction dust exists, or noxious substances are being used and until all is completely cleaned (See Article 3.03).

3.02 INTERIM CLEANING:

- A. Perform cleaning every workday for duration of the work. All areas of the work site and public and private properties shall be maintained free from accumulations of

waste materials and rubbish caused by construction operations on the work site. Waste material will be removed from the work site or put in a waste container.

- B. Remove or secure loose material on open decks and on other exposed surfaces at end of each day's work or more often to maintain work site in hazard-free condition. Prevent dislodgment of materials due to wind and other forces.
- C. Empty on-site waste containers whenever necessary so that trash overflow does not occur. Legally dispose of contents at either public or private dumping areas.
- D. Control the handling of materials, debris and rubbish; do not drop or throw from heights.
- E. Immediately remove spillages of construction-related materials from hauling routes.
- F. Perform cleaning operations such that dust and other contaminants resulting from cleaning processes will not fall on structures or pedestrian traffic below.

3.03 FINAL CLEANING:

- A. In preparation for substantial completion, conduct final inspection of exposed interior and exterior surfaces and of concealed spaces.
- B. Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials from finished surfaces.
- C. Maintain cleaning operations until project has been finally accepted.

3.04 DAMAGE TO EXISTING FINISHES:

- A. Repair any existing (or newly installed) finish that has been damaged by construction activity.
- B. Repaint to match existing areas of damaged paint due to Contractors operation.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will not be separately measured for payment

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 02221
EXCAVATING, BACKFILLING, AND COMPACTION FOR UTILITIES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. Division 15 - Mechanical Work.
2. Division 16 - Electrical Work.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D1556-90(96) Test Method for Density of Soil in Place by the Sand-Cone Method.
2. D1557-91 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort
3. D2487-93 Classification of Soils for Engineering Purposes (Unified Soil Classification System).

B. Occupational Safety and Health Administration (OSHA): Trench Safety Act.

1.03 DEFINITIONS

- A. "Satisfactory Fill Material" includes materials classified in ASTM D2487 as GW and SW, properly worked by Contractor to obtain optimum moisture and compaction.

1.04 SUBMITTALS: In accordance with Section 01330.

- A. Submit copies of tests and records performed as specified to the Engineer for review before starting work.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with OSHA, Trench Safety Act, Standard 29 C.F.R.s., Chapter XVII, Subpart P (para. 1926.650 thru 1926.653).

1.06 PROJECT CONDITIONS

- A. Excavation, filling, and backfilling for utilities complete for underground utility

lines and structures as specified and as shown on the drawings.

B. Existing Utilities:

1. Protect existing utilities from movement, settlement, or other damages according to Instructions to Bidders and General Conditions.

C. Trench Safety Act: Provide trench safety systems at all trench excavations where workers may be exposed to moving ground or cave-ins regardless of depth of trench. All trenches more than 5 feet in depth shall comply with OSHA "Trench Safety Act".

PART 2 PRODUCTS

2.01 MATERIALS

- A. Trench Backfill Materials: Either satisfactory excavated material or fill materials as specified.
- B. Pipe Bedding Material: Bedding material shall be selected or satisfactory backfill material and free of any rocks or stones larger than 2 inches in diameter for sanitary pipe. Limerock screenings or sand shall be used for copper or other metal tubing. (Underground copper lines are 3-inch diameter or less.)

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 EXCAVATION

A. General:

1. Perform excavating of every description and of whatever substance encountered to depths indicated or specified.
2. Pile materials suitable for backfilling a sufficient distance from banks of trenches to prevent slides or cave-ins.
3. Remove excavated materials not required nor suitable for backfill from site.

4. Excavating shall be by open cut.

B. Trench Excavations:

1. Make trench of necessary width and depth for proper laying of pipe, with bank as vertical as practical.
2. Coordinate trench excavation to avoid open trenches for prolonged periods.
3. Grade bottom of trenches accurately to provide uniform bearing and support for each section of pipe on undisturbed soil at every point along their entire length, except portions of pipe sections where it is necessary to excavate for couplings and for proper making of pipe joints or where unsatisfactory materials incapable of properly supporting pipe and utility structures are encountered at bottom of trench.
4. Dig holes and depressions for joints after trench bottom has been graded of length, depth, and width required for properly making the particular type of joint.
5. When unsatisfactory soil, incapable of properly supporting pipe, is encountered at the bottom of the trench, remove such soil to a minimum depth of 12 inches, or 1/4 of the pipe diameter, whichever is greater, below the bottom of pipe and backfill material specified.
6. Over-depths in unstable soil excavation and unauthorized over-depths shall be at the expense of Contractor.

C. Special requirements relating to specific utilities are as follows:

1. Sanitary Sewers:
 - a. Where shown on drawings, make width of trench at and below top of pipe adequate to allow space for workers to place and properly joint pipe.
 - b. Clear space between the barrel of the pipe and trench wall shall not exceed 8 inches on either side of the pipe.
 - c. Width of the trench above the level may be as wide as necessary for proper performance of the work.
 - d. Round the bottom of the trench so at least the bottom quadrant of the pipe shall rest firmly on undisturbed soil or select bedding for as nearly the full length of the barrel as proper joining operations will allow.
 - e. Perform this part of the excavation manually a few feet ahead of the pipe laying operation by workers skilled in this type of work.

2. Water Lines:

- a. Where shown on drawings, make depth of trench to allow a minimum of 24 inches of cover over the top of the pipe / tubing from finished grade unless otherwise indicated or required by local utility.
- b. Avoid interference of water lines with other utilities, grade water lines to avoid air pockets.

3. Electrical Conduit or Cables:

- a. Trenches for plastic conduits shall be a depth providing not less than 12 inches or greater of cover from underside of slabs to accommodate bending radii, unless otherwise indicated. Install warning tape 8 inches below finish grade or underside of slab.
- b. Trenches for plastic conduit and cables shall be cut to an over-depth of not less than 3 inches and a cushion of rock free soil or coarse sand used for not less than 3 inches bedding and 3 inches backfill over the plastic conduit and cable.

3.03 PROTECTION OR REMOVAL OF UTILITY LINES

A. Protection:

1. Protect existing utility lines indicated on drawings (or the locations of which are made known to Contractor before excavating and trenching) specified to remain, including utility lines constructed during trenching operations, from damage during trenching, backfilling, and compacting operations.
 - a. If such new or existing utility lines are damaged during trenching, backfilling, and compacting operations, repair or replace at no cost to Owner.
2. When utility lines specified to be removed or replaced are encountered within the area of operations, issue notices in ample time for measures to be taken to coordinate necessary interruption of services.

B. Repair of Damage to Unknown Existing Utility Lines:

1. Existing utility lines not shown on drawings (or the location of which is not known to Contractor in time to avoid damage) damaged during trenching operations shall be repaired by Contractor and an adjustment to the Contract Price will be made according to Instructions to Bidders and

General Conditions.

3.04 BACKFILLING

A. General:

1. Coordinate backfilling with testing of utilities.
2. Carefully backfill trenches with satisfactory specified materials.
3. Bring backfill up evenly in 9-inch maximum layers, loose depth, and thoroughly and carefully compact with mechanical or hand tampers until pipe has a minimum cover of one foot. Take care not to damage the pipe.
4. Deposit remainder on the satisfactory backfill material in the trench 6-inch layers and compact by mechanical means to percentages as specified.
5. Keep excavations free of water until backfilling operation is complete.

B. Compaction:

1. Material may be compacted by a hand tamper, a powered hand tamper, a vibrating tamper, or mechanized power tamper provided such compaction percentages meet the required density as specified below.
2. Backfilling and compacting by means of hydraulic methods will not be allowed.
 - a. Compact each layer to not less than the percentage of maximum density specified below, determined according to ASTM D1557, Method D:

<u>FILLS AND BACKFILL</u>	<u>COHESIONLESS SOIL</u>
Under slabs	95%
Under walk areas, top 12 inches	95%
Under walk areas, below top 12 inches	90%
Under landscape areas	85%
Under other areas noted on Site Plan	85%

3.05 TESTING

- A. Notify the Engineer of the contracted Testing Laboratory to perform specified tests at Contractor's expense.
- B. Tests of Materials shall be as follows:
 1. Laboratory Tests for Moisture Content and Density:

- a. According to ASTM D1557, one test for each material encountered or proposed to be used.
- 2. Field Tests for Moisture Content and density:
 - a. According to ASTM D1556, one test per layer per 100 linear feet of ditch.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 2 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 2 Work.

END OF SECTION

SECTION 03200 CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 QUALITY ASSURANCE

- A. Codes and Standards: Comply with the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. Wire Reinforcement Institute, Manual Standard Practice, 1979.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A82-95a Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - 2. A185-94 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
 - 3. A496-95a Specification for Steel Wire, Deformed, for Concrete Reinforcement.
 - 4. A497-95 Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.

1.03 SUBMITTALS

- A. General:
 - 1. Submit shop drawings for fabrication and placement of reinforcement.
- B. Accessories: Show accessories, supports, chairs, bolsters, and spacers necessary to complete the installation.

PART 2 PRODUCTS

2.01 REINFORCING MATERIALS

- A. Comply with ACI 301.
- B. Welded Wire Fabric Reinforcing:
 - 1. Unless indicated otherwise the minimum concrete protective cover specified in ACI 301 is the specified cover for this project unless indicated otherwise.
- C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening welded wire fabric in place. Use wire bar type supports complying with CRSI Class C or Class A as required acceptable.

PART 3 EXECUTION

3.01 PLACING REINFORCEMENT

- A. Clean reinforcement of loose rust and mill scale, dirt, and other materials that reduce or destroy bond with concrete.
- B. Accurately position, support, and secure reinforcement against displacement by concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers as required.
- C. Place reinforcement to obtain at least minimum coverages for concrete protection.
 - 1. Arrange, space, and securely tie to hold reinforcement in position during concrete placement operations.
 - 2. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 3 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 3 Work.

END OF SECTION

SECTION 03300 CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03200 - Concrete Reinforcement
2. 07900 - Joint Sealers.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

- | | | |
|----|----------------|---|
| 1. | A615/A-96a | Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement. |
| 2. | C150-96 | Specification for Portland Cement. |
| 3. | C260-95 | Specification for Air-Entraining Admixtures for Concrete. |
| 4. | C309-97 | Specification for Liquid Membrane-Forming Compounds for Curing Concrete. |
| 5. | C494-92 | Specification for Chemical Admixtures for Concrete. |
| 6. | D1751-83(1991) | Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types). |

1.03 SUBMITTALS: In accordance with Section 01330

A. Submit shop drawings for reinforcement and accessories:

1. Show slab reinforcing in plan view, not scheduled, and drawn to a minimum scale of 1/8" = 1'-0". Show reinforcing on the plan view along with size, quantity, marks, and spacing.
2. Other items may be detailed as needed.
3. Engineer will not accept drawing submitted not complying with these requirements. verify detailing proceeds as specified to avoid untimely reinforcing arrival.

B. Materials and methods of curing.

C. Concrete materials and mix designs.

D. Certifications required for admixtures (chloride and solids).

E. Chlorides in concrete.

F. Test reports.

G. Waterstops and premolded joint fillers.

H. Curing compounds.

1.04 STANDARDS

- A. Concrete work shall comply with requirements of ACI 301 - Specifications for Structural Concrete for Buildings, except as specified.
- B. The Contractor shall familiarize himself with the requirements of ACI 301 and this specification.
- C. The requirements that follow are listed in the sequence of chapter numbers of ACI 301 for ready reference purposes.
- D. Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 MATERIALS

- A. Comply with Chapter 1 of ACI 301.

2.02 MATERIALS FOR CONCRETE

- A. Comply with Chapter 2 of ACI 301 and the following:
 - 1. Cement: Type I or III complying with ASTM C150.
 - 2. Admixtures:
 - a. Water Reducing Admixture: The admixture shall comply with ASTM C494, Type A, and not contain more chloride ions that are present in municipal drinking water.
 - 1) Eucon WR-75 by Euclid Chemical Co.
 - 2) Pozzolith 200N by Master Builders.
 - 3) Plastocrete 160 by Sika Chemical Corp.
 - 4) Or approved equal
 - b. Water Reducing, Retarding Admixture: The admixture shall comply with ASTM C494, Type D, and not contain more chloride ions that are present in municipal drinking water.
 - 1) Eucon Retarder-75 by Euclid Chemical Co.
 - 2) Pozzolith 100XR by Master Builders.
 - 3) Plastiment by Sika Chemical Corp.
 - 4) Or approved equal
 - c. High Range Reducing Admixture (Superplasticizer): The admixture shall comply with ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water.
 - 1) Eucon 37 by Euclid Chemical Co.
 - 2) Sikament by Sika Chemical Corp.
 - 3) Or approved equal
 - d. Non-Chloride Accelerator: The admixture shall comply with ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water.
 - 1) Accelguard 80 by Euclid Chemical Co.
 - 2) Darex Set Accelerator by W.R. Grace.
 - 3) Or approved equal.

3. Air Entraining Admixture: Complying with ASTM C260.
 4. Calcium Chloride: Calcium chloride or admixture containing more than 0.1 percent chloride ions are not allowed.
- B. Certification: Written compliance to above-mentioned requirements and the chloride ion content will be required from the admixture manufacturer (include admixtures) before mix design review by the Engineer.

2.03 PROPORTIONING

- A. Comply with Chapter 3 of ACI 301 and the following:
1. Strength: Normal weight concrete - see drawings.
 - a. Concrete slab: 28-day compressive strength not less than 4,000 psi and a flexural strength (modulus of rupture) of not less than 650 psi when tested according to "Method of Test for Flexural Strength of concrete (using simple beam with third point loading)", ASTM C78. Include curb or curb and gutters.
 2. Durability:
 - a. Pumped Concrete:
 - 1) Testing shall be completed at the final discharge location after pumping.
 - 2) Testing shall be completed at the truck before pumping.
 - 3) Samples shall include samples for both slump and strength tests.
 - 4) Adding of water to transit mixers/agitators.
 - a) Contractor shall maintain a maximum time limit of 90 minutes on the introduction of water into the cement.
 - b) Only 1 addition of water on the site to bring the mix to the producer's mix slump criteria is allowed.
 - b. Design Mixes:
 - 1) Design mixes for concrete intended to be placed as-is from the truck shall be designed as such.
 - 2) Design mixes for concrete intended to be pumped shall be made on one of the following bases:
 - a) The mix shall be designed as a truly plastic mix by proper proportioning. See ACI 304.2R - Placing Concrete by Pumping Methods for guidelines for a pumpable plastic workable mix. Trial batches shall be made, and without a device to test pumping ability, results of field trials shall be used.
 - b) Water shall not be added at the pump. One addition of water at the truck to meet the design slump (at the truck) is allowed.
 - c) A super plasticizer may be used.
 - c. Concrete required to be air entraining shall contain the "Air Entraining Admixture", and air content shall comply with table 3.4.1 of ACI 301.
 - d. Pumped concrete and concrete with a water/cement ratio less than 0.50 shall contain the "High Range Water Reducing Admixture".
 - e. The "Water Reducing", Type A, or "Water Reducing and Retarding", Type D admixtures complying with ASTM C494 may be used at the option of the Contractor.

- f. Concrete containing the "High Range Water Reducing Admixture" (superplasticizer) shall have a maximum slump of 8 inches unless otherwise directed by the Engineer. The concrete shall be proportioned for a slump of 2 to 3 inches, be verified, then the high range water reducing admixture added to increase the slump to the approved level.
 - g. All other concrete shall be proportioned to have a maximum slump of 5 inches.
- 3. Normal weight concrete shall be air-entrained per ACI.

2.04 FORM WORK – Not Applicable

2.05 REINFORCEMENT

- A. Comply with ACI 301 and Section 03200 - Concrete Reinforcement for the required welded wire fabric.

2.06 JOINTS AND EMBEDDED ITEMS

- A. Comply with ACI 301 and the following:
 - 1. Expansion Joints:
 - a. Premolded joint fillers shall be preformed bituminous type, ASTM D1751 for joints without sealant.
 - b. Premolded joint fillers for joints with sealant and where indicated shall be non-extruding and resilient type of ASTM D1752, compatible with urethane joint sealant compounds.

2.07 PRODUCTION OF CONCRETE

- A. Comply with Chapter 7 of ACI 301 and following:
 - 1. Ready-Mixed Concrete:
 - a. Provide copies of each delivery ticket to the Engineer. Include mix designation on delivery ticket.
 - b. Do not place concrete over 90 minutes old from the time it was batched.

2.08 PLACING

- A. Comply with ACI 301:

2.09 SLABS

- A. Comply with ACI 301 and the following:
 - 1. Finishes: Finishes shall be according to Paragraph 11.8 of ACI 301 except as specified.
 - 2. Maximum allowable tolerances for floor slab.

2.010 CURING AND PROTECTION

- A. Comply with ACI 301 and the following:
 - 1. Preservation of moisture.
 - 2. Curing and Sealing Compound: Super Floor Coat or Super Pliocure by the Euclid Chemical Company or Masterseal 66 by Master Builders or approved equal. The compound shall comply with ASTM C309, Type 1 or Type 1D, 30 percent solids content minimum, and have test data from an

- independent laboratory indicating a maximum moisture loss of 0.030 grams per sq.cm. when applied at a coverage rate of 300 sq.ft. per gallon. Manufacturers certification required.
3. Curing and Hardening Compound: "Eucosil" by the Euclid Chemical Company or "Curetox" by Toch Brothers or approved equal. The compound shall be sodium silicate type.
 4. Apply compounds according to manufacturer's directions.
 5. Submit manufacturer's data.
 6. Application of Curing and Sealing and Curing and Hardening Compound: Apply compound to concrete slabs according to manufacturer's directions and as follows:
 - a. After fresh placed concrete surface has been finished and will not be marred by application, uniformly apply undiluted compound by spray, brush or squeegee without allowing compound to collect in low spots.
 - b. Keep traffic off surface for 24 hours or until surface is completely dry.
 - c. Within 1 week of a date set by the Engineer, thoroughly clean and wash exposed concrete interior floors, then apply a second uniformly applied coat of the specified Curing and Sealing Compound without allowing compound to collect in low spots. Keep traffic off surface for 24-hours following the second coat, or until surface is completely dry.

2.011 TESTING

- A. Comply with ACI 301 and the following:
 1. Testing Agencies: The cost of all concrete cylinder testing services will be by the Contractor
- B. Testing Services:
 1. For strength test of concrete, mold, cure, and test 5 specimens. Test 1 at 3 days, 1 at 7 days, and 3 at 28 days.
 2. Make 1 strength test for each 50 cubic yards or fraction thereof placed in any 1 day.

2.012 EVALUATION AND ACCEPTANCE OF CONCRETE

- A. Comply with ACI 301.

PART 3 - NOT USED.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 3 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 3 Work.

END OF SECTION

SECTION 07900 JOINT SEALERS

PART 1 GENERAL

1.01 SUMMARY

- A. System Description: Joint sealers, fillers, and other related materials compatible with one another, with joint substrate, and other adjacent materials including finishes.

1.02 SUBMITTALS: In accordance with Section 01330.

- A. Shop Drawings: Detail proper joint sealer and backing for the following joints:
1. Vertical and horizontal surfaces at interior locations.

1.03 QUALITY ASSURANCE

- A. Provide single source responsibility for each type of joint materials.

1.04 WARRANTY

- A. Manufacturer shall provide warranties covering joint sealers for 10 years from date of Substantial Completion.
- B. Contractor shall furnish the Board a 2-year written warranty covering quality of construction from applicator.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Joint Sealers:
1. Sika Chemical Corp.
 2. Sonneborn Building Products.
 3. Thiokol/Speciality Chemical Division.
 4. Thoro Systems Products.
 5. Tremco Manufacturing Co.
 6. Or approved equal

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 7 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay item for Division 7 Work.
- C. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 7 Work.

END OF SECTION

SECTION 08110 STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Steel doors and frames including necessary accessories.
- B. Related Sections:
 - 1. 07900 - Joint Sealers.
 - 2. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
 - 3. 09900 - Painting.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A366-96 Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
 - 2. A653/A-96 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 3. A924/A-96a Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- B. Factory Mutual (FM), latest edition.
- C. National Builders Hardware Association - "Recommended Locations for Builders", latest edition.
- D. Steel Door Institute (SDI), latest editions.
 - 1. SDI 100 Standard Steel Doors and Frames, latest edition.
 - 2. SDI 105 Recommended Erection Instructions for Steel Frames.
 - 3. SDI 107 Hardware on Steel Doors (reinforcement application).
- E. Underwriters Laboratories (UL), latest edition.
- F. National Fire Protection Association (NFPA)
 - 1. NFPA 101 Life Safety Code.
- G. Florida Building Code (FBC).
- H. Americans with Disabilities Act and Accessibility Guidelines (ADA).
- I. American National Standards Institute (ANSI):
 - 1. A250.4-1994 Test Procedure and acceptance criteria for physical endurance, steel doors and frames.
 - 2. A224.1-1980 Test Procedure and acceptance criteria for prime painted steel surfaces for steel doors and frames.
- J. Warnock Hersey International (WHI), Division of Inchcape Testing Services.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified product data including manufacturer's specifications and installation instructions before starting work, and any information necessary to indicate compliance to these specifications.
- B. Shop Drawings:
 - 1. Indicate manufacturer's model number, door and frame elevations and sections, materials, gauges and finishes, fabrication and erection details, as well as location of finish hardware by dimension. Do not proceed with any fabrication until all details are approved.
- C. Upon request, submit nonreturnable samples necessary to be evaluated for construction compliance.

1.04 QUALITY ASSURANCE

- A. Provide doors and frames complying with SDI 100 and as specified.
- B. The DTPW reserves the right to cut open, at no additional cost, a random door to verify construction and reinforcements for compliance with accepted manufacturer's shop drawings. Non-Compliance will be grounds for removal and replacement of installed door at no expense to the DTPW.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver steel doors and frames cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.
- B. Inspect steel doors and frames upon delivery for damage. Minor damage may be repaired if refinished items are equal in all respects to new work and acceptable to the Engineer. Remove and replace damaged items as directed.
- C. Store doors and frames under cover. Place units on minimum 4-inch-high wood blocking. Avoid use of non-vented plastic or canvas shelters that could create a humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.
- D. Deliver all doors and frames to the jobsite in a timely manner to not delay progress of other trades.

1.06 WARRANTY

- A. Hollow metal doors and frames shall be supplied with a one-year warranty against defects in materials and construction.
- B. Warranty shall begin on date of substantial completion of the project.

1.07 DEFINITIONS

- A. Areas subject to wet mopping include assembly rooms where food may be consumed, restroom areas (toilets, locker/showers), custodial, and other similar spaces with hard or resilient flooring.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Steel Doors and Frames:

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1. Ceco Corporation, Door Division, Carol Stream, IL.
2. Curries Company, Mason City, IA.
3. Firedoor Corporation, Miami, FL.
4. Quality Engineered Products Co., Inc., Tampa, FL.
5. Republic Builders Products, Pembroke Park, FL.
6. Or approved equal

2.02 DOOR FRAMES

- A. Fabricate interior frames to profiles indicated of 16 gage hot-dip zinc-iron alloy coated sheet steel, A366, with A60 coating designation according to ASTM A924 and ASTM A653 0.50 oz. zinc per sq.ft. total both sides. Steel shall be of commercial quality, stretcher leveled flatness.
- B. Frames: Fully welded with mitered or butted head and jamb members with integral stops and with combination buck and trim as shown.
 1. Corners shall have continuous flush and smooth welds without dishing.
 2. Sanitary or hospital type stops shall have 6-inch-high cutoffs with 45-degree caps.
- C. Hardware Reinforcements and Preparations:
 1. Frames shall be mortised, reinforced, and drilled/ tapped for mortised hardware according to approved finish hardware schedule and templates by hardware supplier.
 - a. Drilling and tapping for surface applied hardware shall be done in the field.
 - b. Locate finish hardware according to "Recommended Locations for Builder's Hardware" published by National Builders Hardware Association, or as otherwise directed by the Engineer.
 2. Butt (Hinge) Reinforcing:
 - a. Steel plate 3/16" thick by 1-1/4" minimum to 1-1/2" maximum by 10 inches long, offset as required to have faces of butts flush with doorframe edge and secured by not less than 6 spot welds.
 3. Strike Reinforcement: Offset clips of 12 gage steel, 1-1/4" x 4-7/8" long.
 4. Closer Shoe Reinforcing for Parallel Arm:
 - a. 12 gage steel plates (minimum 20" long x 1-3/4" wide) at bottom of doorstop located next to door rabbet on hinge.
 - b. Provide styrofoam or treated wood over plates to allow closer foot screws to seat without interference from grout fill.
- D. Silencer (Mute) Provisions: Punch frames to receive silencers on strike jamb.
- E. Center Hardware Mullions, Removable: Grout filled and fabricated with only one thickness of metal occurring at point of silencer punch-outs, 2" x 3", 11 gage hardware mullions by exit device manufacturer.
- F. Grout:

1. Grout Guards:
 - a. Provide 26 gage sheet metal covers welded to the back of frames at hinges, lock, bolts, tapped reinforcements at hardware and silencer locations.
 - b. At Silencer locations, furnish suitable removable plugs in holes to keep grout free.
2. Coatings:
 - a. Provide full coverage at frame interior before grouting with corrosion inhibiting bituminous coating.
3. Grout at Frames:
 - a. Grout fill doorframes at metal stud walls.
 - b. Grout shall be a mortar mix complying with ASTM C270, Type S-1800 psi minimum.
- G. Jamb Anchors: Provide according to frame manufacturer's recommendations for attachment to metal stud system as shown on drawings to allow grout fill.
- H. Floor Anchors: Provide 14 gage galvanized sheet steel angle shaped anchors for each jamb extending to the floor, punched for not less than two 1/4" diameter bolts.
- I. Spreaders: Provide frames with temporary steel spreader bars tack welded to jambs to maintain full rigidity and proper alignment during installation.

2.03 HOLLOW METAL DOORS

- A. Fabricate interior doors to profiles indicated of 16 gage hot-dip zinc-iron alloy coated sheet steel, A366, with A60 coating designation according to ASTM A924 and ASTM A653 0.50 oz. zinc per sq. ft. total both sides. Steel shall be of commercial quality, stretcher leveled flatness.
- B. Types: Flush, seamless hollow construction with louvers or vision cutouts as shown or specified.
- C. Sizes and Thickness: Sizes shall be as indicated and with 1-3/4" thickness unless otherwise specified or shown.
 1. Provide undercuts where indicated for ventilation.
- D. Door Perimeters:
 1. Stile Edges: Bevel for single acting doors shall be 1/8" in 2 inches.
 2. Reinforcing: Refer to the Drawings
 3. Top and Bottom Channels.
 - a. Not less than 16 gage A60 zinc coated steel channels-flush or inverted.
 - b. Welded to the face sheets.
- E. Doors:
 1. Classification: SDI Grade III - Model 2, 16-gage, seamless, and steel stiffened with required reinforcement and as shown on Drawings.
 2. Doors shall have minimum 20-gage, continuous one-piece, vertical steel stiffeners spaced not to exceed 6 inches apart and welded at 6 inches on center to face skin.

3. Lock Rail shall be one-piece, full height minimum 16-gage channel.
 4. Hinge Rail Reinforcement Manufacturer's Option:
 - a. One-piece, full height, 12-gage channel formed, and tapped for hinges.
 - b. One-piece, full height, minimum 16-gage channel formed and with minimum 3/16" thick steel by minimum 8" long at each hinge.
 5. Cylindrical Lock Reinforcement: Minimum 16-gage standard hardware lock box.
 6. All spaces between stiffeners shall be insulated with fiberglass or mineral insulation.
 7. Door closer reinforcement shall be minimum 12-gage channel or box, welded to top channel. Bottom of reinforcement shall be a minimum of 5-3/4" from top of door, by width of door.
 8. Astragals: Flat security type or "Z" as indicated in drawings or specifications.
 9. All doors shall comply with ANSI A250.4-1994 Level "A" criteria and be tested to 1,000,000 operating cycles and 23 twist tests.
 - a. Certification of Level "A" doors shall be submitted with approval drawings by the distributor.
 - b. Do not bid or supply any type or gage of door not having been tested and passed this criterion.
- F. Core material.
1. Stiffeners: Provide vertical members spaced not more than 6 inches o.c. with shape standard to manufacturer.
 2. Core Fill: Provide fiberglass or mineral standard to manufacturer.
- G. Hardware Reinforcements and Preparation:
1. Hardware Reinforcement: Comply with manufacturer's drawings.
 2. Hardware preparation.
 - a. Drill for hardware according to accepted finish hardware schedule and templates furnished by hardware supplier.
 - b. Drilling and tapping for surface applied hardware shall be done in the field.
 - c. Locate finish hardware according to recommended locations for hardware as shown on drawings.
 - d. Through bolts for exit devices and locksets shall be by manufacturer.
 - e. Lock reinforcement shall be located as height required for standard and disabled users as shown on drawings and as specified.

2.04 FINISHING AND SHOP PAINT

- A. After Fabrication: Grind exposed weld marks smooth and flush, clean and degrease surfaces, apply metallic filler, sand smooth, and apply shop coat of manufacturer's standard rust-inhibitive metal primer baked on.
- B. Prime Coat: Thoroughly cover all surfaces to provide uniform dry film thickness of not less than 1.0 mil without runs, smears, or bare spots.
- C. Primer Coat: Use manufacturer's standard rust inhibiting primer complying with ANSI A-224.1-1990.

PART 3 EXECUTION

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3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Frames:
 - 1. Install plumb, level, and true to line, secured in openings.
 - 2. Install frames according to accepted shop drawings, manufacturer's printed instructions.
 - 3. Grout fill doorframes at metal stud walls.
- B. Doors:
 - 1. Install in openings plumb, level, and true to line.
 - 2. Apply hardware and adjust to achieve smooth and quiet operation.
 - 3. Apply all door accessories plumb, level and true to line at locations indicated in the drawings.

3.03 ADJUST AND CLEAN

- A. Prime Coat Touch-Up: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective plastic wrappings from prefinished doors.
- C. Fill all dents, holes, etc. with metal filler and sand smooth flush with adjacent surfaces-paint to match.
- D. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition. Provide final adjustment as follows:
 - 1. Door Contact with Silencers: Doors shall strike a minimum of two silencers without binding lock or latch bolts in the strike plate.
 - 2. Head, Strike, and Hinge Jamb Margin: 1/8".
 - 3. Meeting Edge Clearance, Pairs of Doors: $\pm 1/16$ ".
 - 4. Bolts and Screws: Leave tight and firmly seated.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 8 Work.

- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 8 Work.

END OF SECTION

PART 1 GENERAL

A. Section Includes:

- ## B. Related Sections:

- ## 1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):

- 09200 1

1.03 SUBMITTALS: In accordance with Section 01330

A. Product Data: Submit manufacturer's product data for cementitious materials, lath, metal support components, and accessories.

B. Material Certificates:

1. Submit producer's certificate for each kind of plaster aggregate indicated materials comply with requirements.

1.04 QUALITY ASSURANCE

A. Design Criteria:

1. Coordinate layout and installation of suspension system components for suspended ceilings with other work supported by or penetrating through ceiling.
2. Clear bonding agents are not allowed.
3. Metal corner beads are not allowed. Use plastic trim accessories.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Supports:

1. Dale/Incor.
2. Dietrich.
3. Gold Bond Building Products Division.
4. Unimast Inc. (USG Co.)
5. Or approved equal

B. Accessories:

1. Dietrich.
2. Gold Bond Building Products Div.
3. United States Gypsum Co.
4. Vinyl Corp., Miami, FL.
5. Or approved equal

C. Portland Cement Plaster/Stucco:

1. Rinker Materials Corp.
2. United States Gypsum Co.
3. Or approved equal

D. One Coat Veneer Plaster Over Cement Board: 3/32" Imperial Finish over 5/8" Durock cement board by US Gypsum Co. or approved equal over 20ga. metal framing at 16 inches o.c. maximum or accepted equivalent. UL U407 for 1-hour rating.

2.02 MATERIALS

A. Metal Supports - Suspended and Furred Ceilings:

1. Portland Cement Plaster/Stucco Installation: ASTM C926.
2. Wire for Hangers and Ties: ASTM A641, 16 gage monel.
3. Rod Hangers: Mild steel, zinc, or cadmium coated.
4. Flat Hangers: Mild steel, zinc, or cadmium coated or protected with rust inhibitive paint.
5. Channels:
 - a. Cold-rolled steel, minimum 0.0598" thickness of uncoated base metal, allowable bending stress of 18,000 psi. Protect with rust inhibitive paint or galvanizing complying with ASTM A924 for G60 coating designation.
 - b. Carrying Channels: 1-1/2" deep x 7/16" wide flanges, 475 lbs. per 1,000 feet painted, 508 lbs. per 1,000 feet galvanized.
 - c. Furring Channels: 3/4" deep x 7/16" wide flanges, 300 lbs. per 1,000 feet painted, 316 lbs. per 1,000 feet galvanized.
6. Hanger Anchorage Devices:
 - a. Screws, cast-in-place concrete inserts, or other devices appropriate for anchorage to the form of structural framing indicated and whose suitability for use intended has been proven through standard construction practices or certified test data.
 - b. Size devices to develop full strength of hanger

minimum 3 times calculated hanger loading, except size direct pullout concrete inserts for 5 x calculated hanger loading.

B. Steel Studs and Runners/Tracks:

1. Non-Load (Axial) Bearing Studs and Runners:

- a. ASTM C645 and complying with following requirements for minimum thickness of uncoated base metal and other characteristics:
- b. Stud Thickness: 0.0359" (20 ga.), unless otherwise indicated.
- c. Stud Depth: As indicated on the drawings.

C. Vertical Metal Furring:

1. Channel Furring and Braces:

- a. Cold-rolled steel, minimum 0.0598" thickness of uncoated base metal.
- b. Allowable Bending Stress: 18,000 psi.
- c. Protected with rust inhibitive paint finish or galvanizing.
- d. 3/4" deep x 7/16" wide flanges.
- e. 300 lbs. per 1,000 feet with painted finish.
- f. 316 lbs. per 1,000 feet with galvanized finish.

2. Z-Furring Member:

- a. Manufacturer's standard screw-type zee-shaped furring members formed from zinc-coated steel sheet.
- b. Minimum 0.0179" uncoated base metal thickness, complying with ASTM A924, Coating G60.
- c. Design for mechanical attachment of insulation boards or blankets to monolithic concrete and masonry walls.

3. Furring Brackets: Serrated-arm type, minimum 0.0329" thickness of base (uncoated) metal, adjustable from 1/4" to 2-1/4" wall clearance for channel furring.

D. Portland Cement Plaster Materials:

1. Base (Skim) Coat Cements: Portland Cement, ASTM C150, Type I or III.
2. Sand Aggregate - Base Coats: ASTM C897.
3. Fiber - Base Coat:
 - a. Alkaline-resistant glass fibers, 1/2" long, free of contaminants, manufactured for use in Portland cement plaster.
 - b. Product: Dur-O-Fiber AR Glass by Dur-O-Wal, Inc. or approved equal.

E. Miscellaneous Materials:

1. Water for Mixing and Finishing Plaster: potable, free of substances capable of affecting plaster set or of damaging plaster, or accessories.
2. Bonding Agent - Portland cement: ASTM C932.

2.03 MIXES

A. Portland Cement Plaster Mixes and Compositions - Base (Skim) Coat:

1. Comply with ASTM C926.
2. Base Coat:
 - a. Proportion materials for respective base coats in parts by volume for cementitious materials and in parts by volume per sum of cementitious materials for aggregates.
 - b. Adjust mix proportions below within limits specified to attain workability.
 - c. 1-part Portland cement, 2-1/2 to 4 parts sand.

B. Mixing: Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Ceiling Suspension Systems:

1. Preparation and Coordination:

- a. Coordinate installation of ceiling suspension system with existing overhead structural systems to ensure structural anchorage provisions have been installed to receive ceiling hangers to allow development of their full strength and at spacings required to support ceiling.
- b. Powder activated fasteners are not allowed during normal business work hours of the facility.

2. Hanger: Attach hangers to structure above ceiling to comply with Metal Lath/Steel Framing Association (ML/SFA) Specifications for Metal Lath and Furring and with referenced standards.

3. Ceiling Suspension System:

- a. Install components of sizes and spacings indicated but not in smaller sizes or greater spacings than required by installation standards.
- b. Wire Hangers: Space maximum 48 inches o.c. parallel with, and maximum 36 inches perpendicular to, direction of carrying channels, unless otherwise indicated, and within 6 inches of carrying channel ends.
- c. Carrying Channels: Space carrying channels maximum 36 inches o.c. with 48 inches o.c. hanger spacing.

B. Steel Stud Wall/Partition Support System:

1. Install components for steel stud wall/partition support systems to comply with directions of steel stud manufacturer for application indicated.
2. Non-Load (axial) Bearing Stud Systems: Comply with ASTM C754.
3. Extend studs to structure above and attach to existing structural components.

C. Portland Cement Plaster Application:

1. Apply Portland cement plaster materials, compositions, and mixes to comply with ASTM C926.
2. Skim Coat: Floated finish unless otherwise indicated.
3. Moist cure Portland cement plaster skim coat to comply with ASTM C926.
4. Sequence plaster application with installation and protection of other work, so neither will be damaged by installation of other.

3.02 ADJUSTING, CLEANING, AND PROTECTION

A. Cutting and Patching:

1. Cut, patch, point-up, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections.
2. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dryouts, efflorescence, sweat-out and similar defect, and where bond to substrate has failed.

B. Cleaning:

1. Remove temporary protection and enclosure of other work.
2. Promptly remove plaster from door frames, windows, and other surfaces that are not to be plastered.
3. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering work.
4. When plastering is completed, remove unused materials, containers, and equipment, and clean floors of plaster debris.

- C. Protection: Provide final protection and maintain conditions, in manner suitable to Installer, that ensures plaster work being without damage or deterioration at time of Substantial Completion.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract lump sum price under Alternate #2-Pay Item for Division 9 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09280 CEMENTITIOUS BOARD

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 09200 -Metal Studs, Lath, Suspension Ceiling, and Plaster.
2. 09310 – Floor and Wall Tile.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C 473 Test Methods for Physical Testing of Cement Panel Products.
2. C 1325 Specification for Fiber-Mat Reinforced Non-Asbestos Cement Interior Substrate Sheets.
3. C 1002 Specification for Steel Drill screws for the Application of Cement Panel Products or Metal Plaster Bases.

1.03 SUBMITTALS

- A. Before starting work, provide product data and samples as directed by the Engineer.

1.04 QUALITY ASSURANCE

- A. Finish work shall be subject to inspection using a lighting level of not less than 50-foot candles at the surface of the cement board. Surfaces judged to be unsuitable for finishing, even if finish has been applied, shall be rejected.
- B. The Engineer will direct repair or replacement of rejected work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in original unopened packages. Provide protection from damage and exposure to the elements.
- B. Prevent damage to edges and surfaces. Do not bend or damage metal corner beads and trim.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements: Proceed with installation of cement board materials only if building is weather tight.
1. Maintain temperature in areas receiving cement board materials between 55 degrees and 90 degrees F. during and after installation and provide adequate ventilation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Cement board:
 - 1. National Gypsum Company-Permabase.
 - 2. United States Cement Company (USG)-Durock.
 - 3. Or approved equal
- B. Accessories shall be by cement board manufacturer.

2.02 MATERIALS

- A. Cement board:
 - 1. Cement Board: ASTM C36, tapered edge, 5/8" thick x 48 inches wide x longest stock length, with vinyl-coated woven glass fiber embedded on both surfaces, both edges wrapped.
 - 2. Compressive strength: ASTM D2394-min. 2,250psi.
 - 3. Water absorption: ASTM C473-max 8% after 24hrs of testing
- B. Fasteners: Drill point screws (No. 8), wafer or bugle head, corrosion resistant, or accepted equivalent, with lengths as specified by manufacturer.
- C. Joint Treatment: Reinforcing tape, taping, or embedding and topping materials as recommended and manufactured by cement board manufacturer.
- D. Joint Reinforcement, Fasteners, Adhesives, and Grout: According to manufacturer's recommendation.
- E. Accessories:
 - 1. Use internal and external corner beads, casing beads, and control joints, to provide a finished job with true, straight edges against adjoining work.
 - 2. Provide expansion joints as required for conditions and according to manufacturer's recommendations.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Place panels with long dimension parallel to the framing members and abutting edges occurring over stud flanges.
 - 1. Fit ends and edges closely (maximum 1/16" between boards), but not forced together.
 - 2. Stagger end joints in successive courses. Place end or edge joints on opposite sides of framing in different locations to avoid creating joints of panels ending on the same stud.
 - 3. Panel edge above floor shall be 1/2" clear.
- B. Panel Attachment:
 - 1. Drive fasteners in field of panel first, working toward ends and edges.
 - 2. Hold panel in firm contact with framing while driving fasteners.

3. Install perimeter fasteners at 3/8" from ends or edges and spaced a maximum of 8 inches on center.
 4. Attach cement panels in field of panel with fasteners spaced a maximum of 12 inches on center.
- C. Accessories: Apply accessories according to manufacturer's instructions. Sand after application of final joint treatment coat and leave surface smooth and ready for work by other trades.
1. Treat metal accessories with not less than 2 coats of joint compound in the same manner as joints. Feather joint compound out from 8 to 10 inches on both sides of corners.
 2. Apply metal trim at intersections where cement board abuts other materials, unless detailed otherwise, and at all other locations indicated. Neatly fit and secure corner beads over external corners.
 3. Install expansion joints where detailed or per manufacturer recommendation.
 4. Install control joints where detailed or per manufacturer recommendation.
- D. Joint Treatment Application:
1. Taping and Embedding:
 - a. Apply taping or embedding compound in a thin, uniform layer to joints and angles.
 - b. Immediately apply reinforcing tape centered over joint or angle and firmly seat into compound. Sufficient compound (approximately 1/64" to 1/32") shall remain under tape to provide proper bond.
 - c. Immediately follow with a thin skim coat to embed tape but not to function as a second coat.
 - d. Fold and embed tape properly at interior angles to provide a true angle.
 - e. Tape or embedding coat shall be thoroughly dry before application of second coat.
 2. Second Coat Embedding:
 - a. Apply a second coat of joint compound over embedding coat, filling panel taper flush with surface.
 - b. Cover tape and feather out at least 2 inches on each side beyond first coat.
 - c. On joints with no taper, cover tape and feather out at least 4 inches on either side of tape.
 - d. Allow second coat to dry thoroughly before application of finish coat.
 3. Topping:
 - a. Spread a finish coat evenly over and extend at least 2 inches on each side beyond second coat on joints and feather to a smooth uniform finish.
 - b. Over tapered edges, do not allow finished joint to protrude beyond plane of surface.
 - c. Apply finish coat to cover tape and taping compound at taped angles and provide a true angle.
 - d. Where necessary, sand between coats and following final application of compound to provide a smooth surface ready for painting.
- E. Finishing Fasteners:
1. Apply a taping or all-purpose type compound to fastener depressions as the first coat.
 2. Follow with minimum of 2 additional coats of topping compound, leaving depressions level with plane of surface.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09310 FLOOR AND WALL TILE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03300 -Cast-In-Place Concrete.
2. 07900 -Joint Sealers.
3. 09200 -Metal Studs, Lath, Suspension Ceiling, and Plaster.
4. 09280 -Cementitious Board.
5. 15421 -Drains and Cleanouts.
6. 15440 -Plumbing Fixtures, Trim, and Supports.

1.02 REFERENCES

A. American National Standards Institute (ANSI) latest edition:

1. A108.1 Installation of Glazed Wall Tile, Ceramic Mosaic Tile, Quarry and Paver Tile with Portland Cement Mortar.
2. A108.5-85 Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
3. A108.10-85 Installation of Grout in Tilework.
4. A118.1-85 Dry-Set Portland Cement Mortar.
5. A118.6-85 Ceramic Tile Grouts.
6. A137.1-80 Specifications for Ceramic Tile.

1.03 SUBMITTALS: In accordance with Section 01330.

A. Product Data: Submit material specifications, printed installation and mixing instructions, and maintenance recommendations for ceramic tile and accessories.

B. Samples: Submit the following:

1. Panels: 12 inches square, of each type, color, and pattern of tile required.
2. Tile manufacturer's full color and pattern range for each type of tile required.
3. Grout manufacturer's full color range samples.
4. Each type of trim shape and special shape required, if requested.

1.04 QUALITY ASSURANCE

A. Tile shall conform to requirements of TCA 137.1, Standard Grade.

1.05 MAINTENANCE

A. Maintenance Materials: At the job site, provide 2 unopened boxes of each color and type of tile installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Porcelain Tile:
 - 1. Everstone International Company (Durastone), distributed by Dal-Tile (Porcelain tile Basis of Design).
 - 2. Or approved equal.

2.02 MATERIALS

- A. Slip-Resistant Porcelain Mosaic Floor Tile (Showers): 2 inches x 2 inches x 1/4" thick, unglazed, plain face, cushioned edges, having a minimum Dynamic Coefficient of Friction of 0.67, attained without use of abrasive impregnation.
- B. Porcelain Floor and Wall Tile:
 - 1. Floor Tile: Nominal 12" x 12" x 5/16" thick, matte, cushioned edges having a minimum Dynamic Coefficient of Friction of 0.42, attained without use of abrasive impregnation.
 - 2. Wall Tile: Nominal 12" x 24" x 5/16" thick (24" dimension in horizontal plane), matte, cushioned edges having a minimum Dynamic Coefficient of Friction of 0.42, attained without use of abrasive impregnation

Color and Pattern:

 - 3. As shown on the drawings (colors and patterns)
 - 4. Where colors or patterns are not shown, tile equivalent in cost to standard solid colors shall be bid upon, assuming not more than 10 colors.
 - 5. Engineer's range of color selection shall not be limited to colors stocked locally but by entire color line of specific manufacturer.
- C. Trim and Special Shapes: Provide the following trim units and special shapes of same material and finish as the wall tile:
 - 1. Base: Cove base units, width and height to match wall tile.
 - 2. External Corners: Bullnose shapes with round out base and top trim special shapes.
 - 3. Internal Corners: Field-buttet square with square in-corner base and top trim special shapes.
- D. Setting Materials: Dry-Set pre-sanded mortar according to ANSI A118.1-1985 and by manufacturer licensed by the Tile Council of America.
- E. Mortar Additive: Laticrete 3701 latex additive or approved equal.
- F. Grout: Certified by the tile manufacturer as suitable for type of tile and application.
 - 1. Dry-Set Grout: A mixture of Portland cement and additives furnished by a firm licensed to manufacture products and tested and approved by the Tile Council of America. Colors as selected by the Engineer.
 - 2. Commercial Latex-Portland Cement Grout: A mixture of Portland cement and mortar additive conforming to ANSI A118.6.
 - a. Color: Natural mortar color.
- G. Tile Cleaner: Biscayne Chemical Laboratories, Inc., "Blue Boy" or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Tile Setting Requirements:

1. Examine surfaces for foreign matter, unevenness, flatness, plumb planes, and damage. Make repairs if necessary to substrate to be in the proper condition to receive tile. Verify waterproofing at shower receptors will not affect tile installation adversely.
2. Construct sloped mortar beds using mortar consisting of 1-part Portland cement, 4 parts damp sand by volume, and gauged with mortar additive according to ANSI A108.5.
3. Secure tile firmly in place with uniform joints well filled and lines straight and true.
 - a. Bring finished surfaces to true and flat planes, plumb on walls.
 - b. Completed work shall be free of cracked or broken tiles.
4. Form intersections and returns perfectly and perform cutting and drilling of tile neatly without marring tile face.
 - a. Carefully grind and joint cut edges of tile against any trim, finish, and built-in fixtures.
 - b. Fit tile close around plumbing pipes, fixtures and fittings so usual plates, collars, or coverings will overlap tile.
5. Where borders, lines, patterns, panels, or other effects are a part of the work, properly space tiles and accurately reproduce required designs.
6. Where acoustic lay-in tile ceilings occur, install wall tile to a line 2 to 4 inches above plane of exposed surface of ceiling.
7. Layout tile work on floors or walls so, wherever possible, no tiles less than half full size will occur unless indicated.
8. Movement Joints:
 - a. Provide control, isolation, expansion, and contraction joints according to movement joint designs and install according the TCA Handbook for Ceramic or Porcelain Tile Installation.
 - b. Locate movement joints:
 - 1) At 24 to 36 feet in each direction.
 - 2) At tile abutting perimeter walls, dissimilar floors, pipes, and columns.
 - 3) Over cold joints and saw-cuts in the slab.
 - c. Extend joints through the setting bed to the concrete substrate equal in width to the tile grout joints.
 - d. Provide approved solid neoprene filler and approved polysulfide caulking.
9. Where tile abuts restraining surfaces, cut tile to match contour of that surface.
10. At shower receptors continue slip-resistant mosaic floor tile up and over curbs to meet floor tile in adjoining areas using special shapes where necessary.
11. At floor drains, slope floor tile from high points at walls around perimeter of rooms down to floor drains.

B. Setting Tile with Dry-Set Mortar:

1. Concrete Substrate:

- a. Set tile according to applicable requirements of ANSI A108.5.
 - b. Set tile with dry-set mortar, 3/32" to 1/8" thick.
 - c. Provide latex mortar additive in setting mortar per manufacturer's directions.
- C. Grouting: Comply with ANSI A108.10.
 - 1. Porcelain mosaic floor tile: Use commercial latex Portland cement grout.
 - 2. Porcelain floor and wall tile: Use dry-set grout.
 - 3. Force grout into joints to fill solid.
 - a. Remove and re-grout discolored joints. Fill voids in joint grout.
- D. Thresholds: Set where indicated or at dissimilar floor finishes with the same material used for setting mosaic floor tile or as indicated in the drawings.
- E. Tolerances: Finished installation shall be trued to a tolerance of $\pm 1/8"$ in a 10-foot radius and $+1/16"$ within any given running foot.

3.02 CLEANING

- A. Apply tile cleaner according to cleaner manufacturer's printed instructions.
- B. Leave finished installation clean and free of cracked, chipped, broken, and unbonded or otherwise defective tile.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- C. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09510 ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
1. 09200 -Metal Studs, Suspension Ceilings and Plaster.
 2. 09310 – Floor and Wall Tile.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. A653-96 Standard Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-iron Alloy-coated (Galvannealed) by the Hot-dip Process.
 2. C635-95 Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 3. C636-96 Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 4. E1264-96 Classification for Acoustical Ceiling Products.
- B. Ceiling and Interior Systems Contractors Association (CISCA) publication (current edition): Acoustical Ceilings - Use and Practice.
- C. Underwriters Laboratories (UL) fire rating listings and classifications.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified product data, including properties of lay-in panels, fire tests, details of suspension grid system, and installation instructions for review before starting work.
- B. Shop Drawings: As may be required by the Engineer. Coordinate grid erection drawings with lighting fixtures, air-conditioning outlets / inlets, access panels, sound system, and other openings and irregularities.
- C. Samples: Submit identified samples of each of the following for review and selection:
1. Exposed grid suspension system with angle.
 2. Acoustical lay-in panel, 12 inches square piece.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Acoustical Lay-in Panels, Mineral Fiber Type:
1. 24 inches x 24 inches.
 2. Complying with ASTM E1264, Class A, Type 3, Form 2, square edged.
 3. Nominal Thickness: 5/8".
 4. Finish: Factory applied, washable white. At no additional cost to the Owner, up to two (2) alternate

- colors (to use as accent tiles) may be selected by the Engineer.
5. Manufacturers:
- a. Directional Panels:
 - 1) Armstrong: Fissured #705 lay-in panels, angled tegular.
 - 2) Equivalent from Celotex.
 - 3) Equivalent from USG Interiors.
 - 4) Or approved equal
 - b. Non-directional Panels:
 - 1) Armstrong: Cortega #770 Fissured lay-in panels, angled tegular
 - 2) Equivalent from Celotex.
 - 3) Equivalent from USG Interiors.
 - 4) Or approved equal
- B. Hangers: 12 gage (0.109" diameter) annealed steel wire, galvanized.
- C. Exposed Suspension Grids for Acoustical Lay-in Panels:
- 1. 2 feet x 2 feet grid pattern with steel caps for exposed 15/16" grid tee and angle members complying with ASTM C635, zinc-coated or hot-dipped galvanized complying with A653, factory painted steel parts with factory applied white baked enamel or polyester finish. At no additional cost to the Owner, up to two (2) alternate colors may be selected by the Engineer.
 - 2. Manufacturers:
 - a. Armstrong.
 - b. Celotex.
 - c. USG Interiors, Inc. (Donn).
 - d. Or approved equal

PART 3 EXECUTION

3.01 INSTALLATION

- A. Powder activated fasteners are not allowed during normal business hours of the building.
- 1. Coordinate and provide inserts, anchors, bolts, hangers, or other means to support ceilings suspended from structure.
- B. Install specified suspension system and acoustical lay-in panels according to ASTM C636 and Cisca Publication "Acoustical Ceilings - Use and Practice", and applicable manufacturer's printed instructions.
- 1. Complete partitions indicated to be extended to overhead construction with finishes applied before installation of ceilings abutting such partitions.
 - 2. Provide one hanger minimum for each 16 square feet of ceiling.
 - a. Locate hanger wire not more than 1 foot away from main runners resting on wall trim.

C. Acoustical Lay-in Panels:

1. Fit acoustical lay-in panels to grid accurately, without dented, broken, cracked, chipped, or soiled surfaces.
2. A cut panel shall be a size that will not expose an edge when the panel is slid to the opposite side.

D. Light Fixtures:

1. Fit acoustical lay-in panels accurately around surface mounted and stem mounted electrical fixture outlets.
2. Adequately support tees supporting light fixtures by hanger wires so grid is level after light fixture installation.
 - a. Provide a hanger wire within 3 inches of each recessed lay-in light fixture corner.

E. Alignment:

1. Align suspension members for true level surfaces and straight lines. Run joints and exposed grid members parallel to the room axis in both directions.
2. Install exposed suspension grids per installers accepted grid layout drawings, properly coordinated with air conditioning and electrical trades.

F. Border Balance:

1. Balance border areas to avoid acoustical units less than 1/2 unit wide.

3.02 ADJUSTING AND CLEANING

- A. Replace dirty or discolored acoustical panel surfaces following erection and leave free from defects.
- B. Remove damaged or improperly installed acoustical panels and replace.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- B. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 9 Work.

END OF SECTION

SECTION 09900 PAINTING OF UNPAINTED SURFACES

PART 1 GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Field painting of exposed and covered pipes, ducts (including color coding), hangers, and walls as indicated in the drawings.
 - 2. Six-year warranty for labor and materials from the paint manufacturer.
- B. Related Section:
 - 1. 07900 - Joint Sealers.
 - 2. 09901 – Painting of Previously Painted Surfaces

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. D3359-95a Test Methods for Measuring Adhesion by Tape Test.
 - 2. D3927-87 Standard Guide for State and Institutional Purchasing of Paint.
 - 3. D4262-83(88) pH of Chemically Cleaned or Etched Concrete Surfaces.
- B. OSHA Workers Environmental Conditions.
- C. National Fire Protection Association (NFPA): NFPA 30 - Flammable and Combustible Liquids Code.

1.03 DEFINITIONS

- A. Alkyd: Oil-based paint.
- B. Latex: Water-based paint.
- C. New Work: Surface or area of a surface not previously painted, including areas patched, replaced, or sandblasted causing a painted or unpainted surface or part of a painted or unpainted surface to exist.
- D. Old Work: Surface that has been previously painted (See Section 09901).
- E. Paint: All coating systems materials, including primers, emulsions, enamels, stains, varnishes, sealers and fillers, and other applied materials used as prime, intermediate, or finish coats.
- F. Smooth: A surface free from roughness, ridges, and projections.

1.04 SUBMITTALS: In accordance with Section 01330.

- A. Product Data: Submit Manufacturer Safety Data Sheet (MSDS), manufacturer's technical information, including paint label analysis and application instructions for each material proposed for use.
- B. Samples:

1. Color Chips:
 - a. Before starting work, furnish color chips for surfaces to be painted to the Engineer. Color chips shall comply with approved colors as selected by Engineer.
 - b. Use representative colors when preparing samples for review.
 2. Representative Samples:
 - a. Submit representative samples for review of color and texture only.
 - b. Provide listing of material and application for each coat of each finish sample.
 - c. Provide three samples of each color and material on min. 6" x 6" panels with texture simulating actual finish. Label and identify each by location.
 - d. Resubmit samples as requested by Engineer until acceptable sheen, color, and texture are achieved.
 3. Paint Sample: Provide 4-one-quart containers of each color or type. Label each container with the facility name, project number, name of the Contractor, name of the supplier, designated use, and type of paint in the container.
- C. Warranty:
1. Submit paint manufacturer's proposed 6-year warranty document.
 2. Submit paint manufacturer's proposed program of inspection and approval before and during the Work as required by paint manufacturer to implement the submitted 6-year warranty.
 3. At the end of the paint work, provide to the DTPW, from the authorized paint manufacturer representative, a signed and notarized letter stating that the surfaces painted have met all the conditions for paint adhesion.

1.05 QUALITY ASSURANCE

- A. Qualifications: Paint applicator shall be licensed in the State of Florida or in Miami-Dade County and use state or county-certified journeymen. Provide a legible copy of license and, when applicable, a journeyman's certification attesting to required qualifications.
- B. Certifications:
1. Paint applicator shall provide a certification attesting to having worked on projects similar in scope to this project. Paint applicator not providing such documentation or not having the required experience will be removed from the project and replaced by the Contractor.
- C. Quality assurance issues, including but not limited to, material selection, surface integrity and other tests, surface preparation, painting procedures, workmanship, and warrantability require review and acceptance by Engineer.
- D. Pre-Construction Meeting: At this meeting, the following will be discussed. Attendance by the paint applicator and manufacturer representative is encouraged:
1. Review of proposed materials and compliance with specifications.
 2. Procedures to be followed and methods to be used in painting of new work and repainting of existing surfaces, with special emphasis on testing, repair, and preparation of existing surfaces.
 - a. Discuss and agree to modifications to the procedures established in Part 3 of this section required by the paint manufacturer to uphold the required 6-year warranty. Modifications, if

any, are to be noted in writing by the manufacturer. Provide signed and notarized copies to Engineer and to all other parties present at the preconstruction meeting.

3. Coordination of any mockup requirements of this section and of other related sections.
4. Review of extent, procedures, and schedules for on-site tests, observation, and supervision by Materials Manufacturer's Representative according to requirements of this section and to enable the manufacturer to issue the required guarantees.
5. Review of warranties and guarantees required by the various parties, as specified in this section, in addition to the general guarantee required by Instructions to Bidders and General Conditions and statement by all parties concerned of their agreement or objection to the terms. Such statements shall be recorded in writing as part of the minutes of the meeting, with action suggested or taken to comply with contract requirements.

E. Coordination of Work:

1. Review other sections of the specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates.
2. Upon request from other trades, furnish information or characteristics of finish materials to be provided, to ensure compatible prime coats are used.
3. Phase projects to allow a minimum of 28 days for plaster to cure properly. If painting begins before the 28-day curing period, then a moisture and pH test shall be made according to ASTM D4262 and ASTM D4263. Provide a written record of such test and receive written approval from the Engineer and paint manufacturer.

F. Mockups:

1. Provide an in-place mockup of each wall surface condition, allowing space for a minimum of 50 sq. Ft. for each color of paint to be used for project wall surfaces. Construct and cure, for a minimum of 28 days, the mockup walls in the same manner as required for the permanent walls.
2. After coordinating and receiving approval for application onto designated mockup sample walls, apply the approved paint samples.
3. Duplicate painted finishes of prepared samples on actual interior wall surfaces.
4. Provide full coat finish samples on at least 50 sq. Ft. of surface, as directed, until required sheen, color, and texture are obtained. Simulate finished lighting conditions for review of in-place Work.
 - a. Final acceptance of colors will be from samples applied on mockup.
5. Engineer may test the mockup sample or selected painted surface according to ASTM D3359. If test fails, retesting shall be at the Contractor's expense.

G. Surfaces to be Painted:

1. Except where natural finish of material is specifically noted as surface not to be painted, paint exposed surfaces with colors as selected by the Engineer.
2. Where items or surfaces are not specifically mentioned, paint same as similar adjacent materials or areas.
3. If color or finish is not designated, coordinate with the Engineer for selection.
4. Paint (red), using stencils, identifications and warnings, following text specified in other sections.
5. Paint (yellow), door-swing arcs and warning lines where required.

H. The following categories of Work are not included as part of field-applied finish work, unless otherwise specified:

1. Pre-Finished Items: Do not include painting of factory-finished or installer-finished specified items

such as, but not limited to, pre-finished partition systems, acoustic materials, architectural woodwork and casework, attached signs, finished mechanical, electrical equipment, light fixtures and building systems components (Fire Alarm, Security, Wifi, etc.).

2. Concealed Surfaces: Painting is not required, unless noted otherwise on the Drawings, of surfaces such as walls or ceilings in concealed and areas of limited access.
 3. Finished Metal Surfaces: Painting is not required at metal surfaces of anodized or enameled aluminum, stainless steel, chromium plate, bare copper, bare bronze, and metals of similar finish. Paint visible galvanized steel and mill-finish aluminum surfaces.
 4. Operating Parts: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts are not required to be painted.
- I. Do not paint over code-required labels such as Underwriters Laboratories (UL) and Factory Mutual (FM), name, equipment identification, performance rating, or nomenclature plates, or at piping or circuit identifiers.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in original, new, and unopened packages and containers bearing manufacturer's name and label, and following information:
1. Name or title of material.
 2. Federal Specification number.
 3. Manufacturer's stock number and date of manufacture.
 4. Manufacturer's name.
 5. Contents by volume, for major pigment and vehicle constituents.
 6. Application instructions.
 7. Color name and number.
- B. Storage:
1. Store materials not in actual use in tightly covered containers.
 2. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
 3. Protect from freezing or extreme heat, 95 degrees F. or above.
 4. Keep storage area neat and orderly.
 5. Remove from the project site contaminated products from oil-based products and their by-products by the end of each working day.

1.07 PROJECT CONDITIONS

- A. Environmental Requirements:
1. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50- and 90-degrees F., unless otherwise allowed by paint manufacturer's printed instructions.
 2. Do not apply paint when relative humidity exceeds 85 percent, or to damp or wet surfaces, unless otherwise allowed by paint manufacturer's printed instructions.
 3. Do not apply paint in areas that are not broom clean and free of dust and debris.
 4. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.
- B. Workers Environmental Conditions:
1. Comply with the standards established in OSHA Workers Environmental Conditions.

2. Take precautions to ensure that personnel and work areas are adequately protected from fire and health hazards resulting from handling, mixing, and application of paints.
3. Illumination: Provide lighting equal to the permanent lighting planned for designated space.
4. Ventilation: Provide adequate ventilation to prevent buildup of fumes.

1.08 SEQUENCING AND SCHEDULING

- A. Phase projects to allow a minimum of 28 days to properly cure plaster surfaces before the application of paint.
- B. Phase the project to allow reasonable time for the inspection and written approval at each phase of the work by the Paint Manufacturer's Representative.

1.09 WARRANTY

- A. Provide a written guarantee, co-signed jointly and severally by the Painting Subcontractor and Materials Manufacturers, against cracking, peeling, flaking, chalking, and mildew on interior painted surfaces, and additionally against erosion and unreasonable fading on exterior surfaces, for 6 years; agreeing to repair and repaint surfaces affected by such defects, at no cost to the DTPW including necessary removal or protection of other work, without limit, within 30 days after notification by the DTPW, and to perform such work based on the provisions of this section, including extension of the guarantee to cover new work.

1.010 MAINTENANCE

- A. Provide two 5-gallon containers, properly labeled and sealed, of each type and color of finished paint used on the project. If less than 10 gallons of a particular type and color was used, then provide 1 one-gallon container.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Benjamin Moore
- B. Sherwin-Williams
- C. PPG
- D. Or approved equal

2.02 MATERIALS

- A. Use Latex-based materials for painting of interior finishes.
- B. Primers, Undercoats, Split and Finish Coats: Use materials from same manufacturer when such materials are applied on same surface.
- C. Paints for interior use shall be factory tinted with each stage of coating application (primer, first coat, and finish coat) to be visually distinguishable from the preceding coat until the final coat. The final coat shall match the selected color.
 1. Label each container indicating whether it is primer, first coat, or finish coat.
 2. Label each container with the name and number of the color.
 3. Label each container indicating if it is intended for exterior or interior usage.
- D. Color Selection:

1. Engineer will select colors from samples and materials submitted under Article 1.04.
2. If color is not listed for a specific area or item, Contractor is not relieved of responsibility for providing colors subsequently selected.
3. Color selection made by Engineer is to determine basic color required for surface.
4. Colors with same designation but produced from two or more sources shall match when viewed from distance of 24 inches or more.
5. Final application of colors shall match prepared samples approved by the Engineer.

2.03 INSPECTION

- A. Pre-Construction Inspection: In conjunction with the meeting required in Part 1 of this section, the Painting Subcontractor and the Materials Manufacturer Representative shall conduct on-site inspections and perform tests to determine
 1. Whether the corrective and preparatory work specified below is adequate, excessive, or insufficient to obtain the required performance criteria required in this section and the guarantee.
- B. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- C. Start of painting operations implies contractor's acceptance of the surface conditions and responsibility for required standards of quality and appearance.

2.04 PREPARATORY WORK

- A. Remove electrical outlet and switch cover plates, finish hardware escutcheons and cover plates, air-conditioning registers, and other finished items installed on surfaces to be painted and replace afterwards or provide protection as approved by Engineer. Protect items and surfaces that cannot be removed or that do not interfere with the painting and leave clean and completely free of paint.
- B. Clean surfaces of all dirt, dust, or other contaminants that affect adhesion of paint or appearance of paint. Clean grease and oil from metal surfaces with turpentine or mineral spirits and wipe dry before priming. Wire brush or sand metal surfaces to remove rust and scale. Touch-up factory primed surfaces with compatible factory primers. Schedule the cleaning so that contaminants from the cleaning process will not fall onto the wet painted surfaces.
- C. Fill nail holes, cracks, open joints, and other defects after priming or first coat is dry and before second coat is applied.
- D. Allow all coats to dry thoroughly before applying succeeding coats. Comply with paint manufacturer's recommendations.
- E. Prime finished work, not shop coated, when delivered to the job or as soon as possible after delivery.
- F. Clean and sand surfaces between coats with 150 Fine sandpaper or as recommended by the paint manufacturer.

2.05 APPLICATION

- A. General:
 1. Perform work in a thorough and professional manner in conformance with accepted good practices and requirements of authorities having jurisdiction.
 2. Protect finished materials and areas not to be painted by using drop cloths, masking, or other

- accepted methods.
 - 3. Provide adequate ventilation for proper drying of surfaces before and after painting.
 - 4. Drying Period: Allow each coat to dry thoroughly before succeeding coats are applied. Minimum drying time shall be according to manufacturer's recommendations.
 - 5. Paint Shading: Each coat of paint shall vary sufficiently to easily distinguish it from previous coats of paint, both interior and exterior applications.
 - 6. Observation and Acceptance: As required by paint manufacturer between coats before application of next coat of paint materials.
- B. Apply materials, as they come from manufacturer, to dry surfaces according to manufacturer's directions as printed on container. Any mixing on site requires specific and special approval of the Engineer.
 - C. Apply paint materials to give an even, solid color with each coat. For deep tone finish colors, use deep base primers recommended by manufacturer.
 - D. Apply paint materials by brush, roller, or spray method.
 - 1. Select method best suited to profile, texture, and finish of existing surface, subject to suitability regarding safety and conditions in existing or occupied areas, and subject to approval by paint manufacturer and Engineer.
 - 2. Apply materials evenly, smoothly flowed on and cut in neatly, without runs, sags, wrinkles, shiners, streaks, and brush marks; drying uniformly to color and sheen selected. Make dividing lines that separate colors straight and clean cut.
 - E. Dry Film Thickness:
 - 1. Comply with manufacturer's specifications.
 - 2. Minimum Dry Film Thickness: 5 mils (unless otherwise recommended by paint manufacturer), total finished application. Reduction of minimum thickness due to special coating characteristics or application procedures requires written approval for each case.

2.06 FIELD QUALITY CONTROL

- A. Notify Engineer and material manufacturers' representatives when critical points in the painting and repainting work are reached, to allow timely inspection and approvals. Critical points include during and after the operation, plus other points designated by the Engineer, or material manufacturer representatives:
 - 1. Surface patching and preparation.
 - 2. Sealing of surfaces.
 - 3. Application of primer and transition coats. Adhesion testing of transition coats may be required.
 - 4. Intermediate and finish coats.

2.07 ADJUSTING AND CLEANING

- A. Remove construction debris, material containers, equipment, and other trash resulting from work of project.
- B. Upon completion of work, remove stains and paint spots from floors, wall, woodwork, electric trim, hardware, fixtures, and other items of the work areas.
- C. Dispose oil-based products, their by-products, and waste contaminated by them, in a manner acceptable to DERM (RER).

D. INTERIOR SPACES PAINT SCHEDULE

1. Walls:

1st Coat	Acrylic latex wall primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

2. Walls (Veneer Plaster only)

1st Coat	Alkyd-based penetrating chalky wall primer/sealer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

3. Metal Doors:

1st Coat	Field applied rust inhibitive primer over shop primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

4. Ceilings Not Acoustically Treated:

1st Coat	Acrylic latex primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

E. INTERIOR METALS PAINT SCHEDULE

1. Galvanized Metal: Apply neutralizer and allow to dry thoroughly.

1st Coat	Galvanized metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

2. Metal Sash - Doors and Frames:

1st Coat	Metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

3. Exposed Ferrous Metal:

1st Coat	Rust inhibitive primer.
2nd Coat	Acrylic latex enamel.
3rd Coat	Acrylic latex enamel.

4. Other Metals Not Previously Mentioned:

1st Coat	Rust inhibitive metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).

3rd Coat Acrylic latex enamel (or aluminum paint).

PART 3 MEASUREMENT AND PAYMENT

3.01 MEASUREMENT:

Work under this Section will be separately measured for payment

3.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09901

PAINTING OF PREVIOUSLY PAINTED SURFACES

PART 1 GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Repainting existing interior surfaces.
 - 2. Six-year warranty for labor and materials from the paint manufacturer.
- B. Related Section:
 - 1. 07900 - Joint Sealers.
 - 2. 09900 – Painting of Unpainted Surfaces

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. D3359-95a Test Methods for Measuring Adhesion by Tape Test.
 - 2. D3927-87 Standard Guide for State and Institutional Purchasing of Paint.
 - 3. D4262-83(88) pH of Chemically Cleaned or Etched Concrete Surfaces.
 - 4. D4263-83(93) Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- B. OSHA Workers Environmental Conditions.
- C. National Fire Protection Association (NFPA): NFPA 30 - Flammable and Combustible Liquids Code.

1.03 DEFINITIONS

- A. Alkyd: Oil-based paint.
- B. Latex: Water-based paint.
- C. New Work: Surface or area of a surface not previously painted, including areas patched, replaced, or sandblasted causing a painted or unpainted surface or part of a painted or unpainted surface to exist.
- D. Old Work: Surface that has been previously painted.
- E. Paint: All coating systems materials, including primers, emulsions, enamels, stains, varnishes, sealers and fillers, and other applied materials used as prime, intermediate, or finish coats.
- F. Smooth: A surface free from roughness, ridges, and projections.

1.04 SUBMITTALS: In accordance with Section 01330

- A. Product Data: Submit Manufacturer Safety Data Sheet (MSDS), manufacturer's technical information, including paint label analysis and application instructions for each material proposed for use.
- B. Samples:

1. Color Chips:
 - a. Before starting work, furnish color chips for surfaces to be painted to the Engineer. Color chips shall conform to approved colors as selected by the Engineer and from DTPW Colors.
 - b. Use representative colors when preparing samples for review.
 2. Representative Samples:
 - a. Submit representative samples for review of color and texture only.
 - b. Provide listing of material and application for each coat of each finish sample.
 - c. Provide three samples of each color and material on 6" x 18" panels with texture to simulate actual finish. Label and identify each by location.
 - d. Resubmit samples as requested by Engineer until acceptable sheen, color, and texture are achieved.
 3. Paint Sample: Provide 4-one-quart containers of each color or type. Label each container with the school name, project number, name of the Contractor, name of the supplier, designated use, and type of paint in the container.
- C. Warranty:
1. Submit paint manufacturer's proposed 6-year warranty document.
 2. Submit paint manufacturer's proposed program of inspection and approval before and during the Work as required by paint manufacturer to implement the submitted 6-year warranty.
 3. At the end of the paint work, provide to the DTPW, from the authorized paint manufacturer representative, a signed and notarized letter stating that the surfaces painted have met all the conditions for paint adhesion.

1.05 QUALITY ASSURANCE

- A. Qualifications: Paint applicator shall be licensed in the State of Florida or in Miami-Dade County and use state or county certified journeymen. Provide a legible copy of license and, when applicable, a journeyman's certification attesting to qualification requirements.
- B. Certifications:
 1. Paint applicator shall provide a certification attesting to having worked on projects similar in scope to this project. Paint applicator not providing such documentation or not having the required experience will be removed from the project and replaced by the Contractor.
- C. Quality assurance issues, including but not limited to, material selection, surface integrity and other tests, surface preparation, painting procedures, workmanship, and warrantability require review and acceptance by Engineer.
- D. Pre-Construction Meeting: At this meeting, the following will be discussed. Attendance by the paint applicator and manufacturer representative is encouraged:
 1. Review of proposed materials and compliance with specifications.
 2. Procedures to be followed and methods to be used in painting of new work and repainting of existing surfaces, with special emphasis on testing, repair, and preparation of existing surfaces.

- a. Discuss and agree to modifications to the procedures established in Part 3 of this section required by the paint manufacturer in order to uphold the required 6-year warranty. Modifications, if any, are to be noted in writing by the manufacturer. Provide signed and notarized copies to Engineer and to all other parties present at the preconstruction meeting.
 - b. Review of improved or alternate methods suggested to prepare existing surfaces for repainting, based on on-site surveys and tests made by the parties present.
 3. Coordination of the mockup requirements of this section and of other related sections.
 4. Review of extent, procedures, and schedules for on-site tests, observation, and supervision by Materials Manufacturer's Representative according to requirements of this section and to enable the manufacturer to issue the required guarantees.
 5. Review of warranties and guarantees required by the various parties, as specified in this section, in addition to the general guarantee required by Instructions to Bidders and General Conditions; and statement by all parties concerned of their agreement or objection to the terms. Such statements shall be recorded in writing as part of the minutes of the meeting, with action suggested or taken to comply with contract requirements.
- E. Coordination of Work:
1. Review other sections of the specifications in which paint primers are provided to ensure compatibility of total coatings system for various substrates.
 2. Upon request from other trades, furnish information or characteristics of finish materials to be provided, to ensure compatible prime coats are used.
 3. Phase projects to allow a minimum of 28 days for stucco and plaster to cure properly. If painting begins before the 28-day curing period, then a moisture and pH test shall be made according to ASTM D4262 and ASTM D4263. Provide a written record of such test and receive written approval from the Engineer and paint manufacturer.
- F. Mockups:
1. Provide an in-place mockup of each wall surface condition, allowing space for a minimum of 50 sq.ft. for each color of paint to be used for project wall surfaces. Construct and cure, for a minimum of 28 days, the mockup walls in the same manner as required for the permanent walls.
 2. After coordinating and receiving approval for application onto designated mockup sample walls, apply the approved paint samples.
 3. Duplicate painted finishes on actual interior wall surfaces.
 4. Provide full coat finish samples on at least 50 sq. Ft. of surface, as directed, until required sheen, color, and texture are obtained. Simulate finished lighting conditions for review of in-place Work.
 - a. Final acceptance of colors will be from samples applied on mockup.
 5. Engineer may test the mockup sample or selected painted surface according to ASTM D3359. If test fails, retesting shall be at the Contractor's expense.
- G. Surfaces to be Painted:
1. Except where natural finish of material is specifically noted as surface not to be painted, paint exposed surfaces with colors as selected by the Engineer.
 2. Where items or surfaces are not specifically mentioned, paint same as similar adjacent materials or areas.
 3. Any existing wall surface which abuts a new construction surface to be painted under Section 09900, is to be painted in its entirety from corner to corner to match the new work's paint.
 4. If color or finish is not designated, coordinate with Engineer for selection.

- H. The following categories of Work are not included as part of field-applied finish work, unless otherwise specified:
1. Pre-Finished Items: Do not include painting of factory-finished or installer-finished specified items such as, but not limited to, pre-finished partition systems, acoustic materials, architectural woodwork and casework, attached signs, finished mechanical and electrical equipment, light fixtures and building systems components (Fire Alarm, Security, Wifi, etc.)
 2. Concealed Surfaces: Painting is not required, unless noted otherwise on the Drawings, of surfaces such as walls or ceilings in concealed and areas of limited access.
 3. Finished Metal Surfaces: Painting is not required at metal surfaces of anodized or enameled aluminum, stainless steel, chromium plate, bare copper, bare bronze, and metals of similar finish. Paint visible galvanized steel and mill-finish aluminum surfaces.
 4. Operating Parts: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts are not required to be painted.
- I. Do not paint over code-required labels such as Underwriters Laboratories (UL) and Factory Mutual (FM), name, equipment identification, performance rating, or nomenclature plates.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in original, new, and unopened packages and containers bearing manufacturer's name and label, and following information:
1. Name or title of material.
 2. Federal Specification number.
 3. Manufacturer's stock number and date of manufacture.
 4. Manufacturer's name.
 5. Contents by volume, for major pigment and vehicle constituents.
 6. Application instructions.
 7. Color name and number.
 8. Indicate if paint is for interior or exterior use.
- B. Storage:
1. Store materials not in actual use in tightly covered containers.
 2. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
 3. Protect from freezing or extreme heat, 95 degrees F. or above.
 4. Keep storage area neat and orderly.
 5. Remove from the project site contaminated products from oil-based products and their by-products, by the end of each working day.

1.07 PROJECT CONDITIONS

- A. Environmental Requirements:
1. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50- and 90-degrees F., unless otherwise allowed by paint manufacturer's printed instructions.
 2. Do not apply paint when relative humidity exceeds 85 percent, or to damp or wet surfaces, unless otherwise allowed by paint manufacturer's printed instructions.
 3. Do not apply paint in areas that are not broom clean and free of dust and debris.

4. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

B. Workers Environmental Conditions:

1. Comply with the standards established in OSHA Workers Environmental Conditions.
2. Take precautions to ensure that personnel and work areas are adequately protected from fire and health hazards resulting from handling, mixing and application of paints.
3. Illumination: Provide lighting equal to the permanent lighting planned for designated space.
4. Ventilation: Provide adequate ventilation to prevent buildup of fumes.
5. Contain and prevent vapors or dust generated by the Work from polluting adjacent occupied spaces.

1.08 SEQUENCING AND SCHEDULING

- A. Phase projects to allow a minimum of 28 days to properly cure plaster surfaces before the application of paint.
- B. Phase the project to allow reasonable time for the inspection and written approval at each phase of the work by the Paint Manufacturer's Representative.

1.09 WARRANTY

- A. Provide a written guarantee, co-signed jointly and severally by the Painting Subcontractor and Materials Manufacturers, against cracking, peeling, flaking, chalking and mildew on interior painted surfaces, and additionally against erosion and unreasonable fading on exterior surfaces, for six years; agreeing to repair and repaint surfaces affected by such defects, at no cost to the DTPW including necessary removal or protection of other work, without limit, within 30 days after notification by the DTPW, and to perform such work based on the provisions of this section, including extension of the guarantee to cover new work.

1.010 MAINTENANCE

- A. Provide 2 five-gallon containers, properly labeled and sealed, of each type and color of finished paint used on the project. If less than 10 gallons of a particular type and color was used, then provide 1 one-gallon container.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Benjamin Moore
- B. Sherwin-Williams
- C. PPG
- D. Or approved equal

2.02 MATERIALS

- A. Use Latex-based materials for painting of interior surfaces.
- B. Primers, Undercoats, Split and Finish Coats: Use materials from same manufacturer when such materials are applied on same surface.
- C. Paints for interior use shall be factory tinted with each stage of coating application (primer, first coat, and finish coat) to be visually distinguishable from the preceding coat until the final coat. The final coat shall match the selected color.

1. Label each container indicating whether it is primer, first coat, or finish coat.
 2. Label each container with the name and number of the color.
 3. Label each container indicating if it is intended for exterior or interior usage.
- D. Color Selection:
1. Engineer will select colors from samples and materials submitted under Article 1.04.
 2. If color is not listed for a specific area or item, Contractor is not relieved of responsibility for providing colors subsequently selected.
 3. Color selection made by Engineer is to determine basic color required for surface.
 4. Colors with same designation but produced from two or more sources shall match when viewed from distance of 24 inches or more.
 5. Final application of colors shall match prepared samples approved by Engineer.
- E. Storage Cabinets and Disposal Containers for Flammable Materials:
1. Meet the requirements of NFPA 30.
 2. Contain Factory Mutual (FM) label and Underwriters Laboratories label.

PART 3 EXECUTION

3.01 INSPECTION

- A. Pre-Construction Inspection: In conjunction with the meeting required in Part 1 of this section, the Painting Subcontractor and the Materials Manufacturer Representative shall conduct on-site inspections and perform tests to determine:
1. Condition of existing paint finishes.
 2. Suitability for receiving the new specified repainting materials.
 3. Whether the corrective and preparatory work specified below is adequate, excessive, or insufficient to obtain the required performance criteria required in this section and the guarantee.
- B. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- C. Start of painting operations implies acceptance of the surface conditions and responsibility for required standards of quality and appearance.

3.02 PREPARATORY WORK

- A. Remove electrical outlet and switch cover plates, finish hardware escutcheons and cover plates, air-conditioning registers, and other finished items installed on surfaces to be painted and replace afterwards or provide protection as approved by Engineer. Protect items and surfaces that cannot be removed or that do not interfere with the painting and leave clean and completely free of paint.
- B. Clean surfaces of all dirt, dust, or other contaminants that affect adhesion of paint or appearance of paint. Clean grease and oil from metal surfaces with turpentine or mineral spirits and wipe dry before priming. Wire brush or sand metal surfaces to remove rust and scale. Touch-up factory primed surfaces with compatible factory primers. Schedule the cleaning so that contaminants from the cleaning process will not fall onto the wet painted surfaces.
- C. Fill nail holes, cracks, open joints, and other defects after priming or first coat is dry and before second coat is

applied.

- D. Allow all coats to dry thoroughly before applying succeeding coats. Comply with paint manufacturer's recommendations.
- E. Prime finished work, not shop coated, when delivered to the job or as soon as possible after delivery.
- F. Clean and sand surfaces between coats with 150 Fine sandpaper or as recommended by the paint manufacturer.
- G. Special Preparatory and Corrective Work on Previously Painted Surfaces: As a minimum, in addition to the general requirements specified above, perform the following work on existing painted surfaces before starting application of new materials:
 - 1. Interior: Remove loose, peeling, or flaking paint, chalking, and mildew. Sand surfaces to produce a smooth, even surface, free of sharp edges where paint has been partially removed, with an even texture and uniform absorptive quality. Provide additional partial or total priming coats if required to obtain uniform finish in color and sheen.
 - a. Mildew Removal: Prepare a diluted bleach solution with one volume of fresh household bleach to three volumes of water. Add to each gallon of diluted bleach two-thirds cup of trisodium phosphate (Solilax or equivalent) and one-third cup of detergent (Tide or equivalent). Allow to stand for 45 minutes. Clean thoroughly with high-pressure water and allow to dry completely before starting painting operations. Repeat treatment in areas that show signs of mildew after surface is dry.
 - 1) Workers shall wear proper safety clothing and necessary accessories, such as goggles.
 - 2) Protect adjacent surfaces that will be affected by the application of the mildew removal solution.
 - b. Preparation for Latex-Based Coating Over Oil-Based Coating: Prepare existing oil-based coating according to latex-based coating manufacturer's recommendations.

3.03 APPLICATION

- A. General:
 - 1. Perform work in a thorough and professional manner in conformance with accepted good practices and requirements of authorities having jurisdiction.
 - 2. Protect finished materials and areas not to be painted by using drop cloths, masking, or other accepted methods.
 - 3. Provide adequate ventilation for proper drying of surfaces before and after painting.
 - 4. Drying Period: Allow each coat to dry thoroughly before succeeding coats are applied. Minimum drying time shall be according to manufacturer's recommendations.
 - 5. Paint Shading: Each coat of paint shall vary sufficiently to easily distinguish it from previous coats of paint, both interior and exterior applications.
 - 6. Observation and Acceptance: As required by paint manufacturer between coats before application of next coat of paint materials.
- B. Apply materials, as they come from manufacturer, to dry surfaces according to manufacturer's directions as

printed on container. Any mixing on site requires specific and special approval of the Engineer.

- C. Apply paint materials to give an even, solid color with each coat. For deep tone finish colors, use Deep Base Primers recommended by manufacturer.
- D. Apply paint materials by brush, roller, or spray method.
 - 1. Select method best suited to profile, texture, and finish of existing surface, subject to suitability regarding safety and conditions in existing or occupied areas, and subject to approval by paint manufacturer and Engineer.
 - 2. Apply materials evenly, smoothly flowed on and cut in neatly, without runs, sags, wrinkles, shiners, streaks and brush marks; drying uniformly to color and sheen selected. Make dividing lines that separate colors straight and clean cut.
- E. Dry Film Thickness:
 - 1. Comply with manufacturer's specifications.
 - 2. Minimum Dry Film Thickness: 5 mils (unless otherwise recommended by paint manufacturer), total finished application. Reduction of minimum thickness due to special coating characteristics or application procedures requires written approval for each case.

3.04 FIELD QUALITY CONTROL

- A. Paint Adhesion Test:
 - 1. Prepare two representative areas in Area 3 for testing adhesion of new paint to existing surfaces. Each area shall be a minimum of 9 square feet (3'-0" x 3'-0").
 - 2. Allow newly painted test area to dry within the manufacturer's recommended drying time.
 - 3. Engineer will test the selected painted surface according to ASTM D3359. If test fails, retesting shall be at the Contractor's expense.
- B. Notify Engineer and material manufacturers' representatives, when critical points in the painting and repainting work are reached, to allow timely inspection and approvals. Critical points include during and after the operation, plus other points designated by the Engineer, or material manufacturer representatives:
 - 1. Removal of existing paint.
 - 2. Surface patching and preparation.
 - 3. Sealing of surfaces.
 - 4. Application of primer and transition coats. Adhesion testing of primer and topcoats may be required.
 - 5. Intermediate and finish coats.

3.05 ADJUSTING AND CLEANING

- A. Remove construction debris, material containers, equipment, and other trash resulting from work of project.
- B. Upon completion of work, remove stains and paint spots from floors, wall, woodwork, electric trim, hardware, fixtures, and other items of the DTPW's property.
- C. Dispose oil-based products, their by-products, and waste contaminated by them, in a manner acceptable to DERM (RER).
- D. INTERIOR SPACES PAINT SCHEDULE
 - 1. Walls and Ceilings not Acoustically Treated: Convert from oil to latex all previously painted surfaces.

This conversion requires the use of an oil-based transition primer/sealer.

1st Coat	Acrylic latex wall primer or oil-based transition primer sealer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

2. Other Interior Ceilings Not Covered:

1st Coat	Acrylic latex primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

3. Metal Doors:

1st Coat	Field applied rust inhibitive primer over shop primer.
2nd Coat	Acrylic latex semi-gloss undercoat.
3rd Coat	Acrylic latex semi-gloss.

E. INTERIOR METALS PAINT SCHEDULE

1. Galvanized Metal: Apply neutralizer and allow to dry thoroughly.

1st Coat	Galvanized metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

2. Metal Sash - Doors and Frames:

1st Coat	Metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

3. Exposed Ferrous Metal:

1st Coat	Rust inhibitive primer.
2nd Coat	Acrylic latex enamel.
3rd Coat	Acrylic latex enamel.

4. Other Metals Not Previously Mentioned:

1st Coat	Rust inhibitive metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- C. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 15010 GENERAL PROVISIONS

PART 1 GENERAL

1.01 SUMMARY

A. Substitutions and Product Options:

1. Products List: in accordance with Section 01330, submit list of major products proposed to be used with names of manufacturers and installing subcontractors.
2. Contractor's Options:
 - a. For products specified only by standard, select any product meeting standard.
 - b. For products specified by naming 1 or more products by manufacturer's name and catalog number, select any 1 of the products or manufacturers named.
3. Substitutions: Contractor may submit a request for substitution for any product or manufacturer not specifically named, in accordance with Section 01620.

1.02 SUBMITTALS: In accordance with Section 01330

- A. Submit shop and detail drawings, factory certified prints, brochures, and materials lists for items specified in accordance with Section 01330.
- B. Substantial Completion Submittal Requirements:
1. Operating and Maintenance Manuals and Charts: Provide 3 complete sets of operating and maintenance instructions, literature, and information concerning equipment under this Division, including, but not limited to HVAC systems, indexed and bound in accepted loose leaf binders.
 2. Record Prints (Project Record Documents): In accordance with Section 01325

1.03 QUALITY ASSURANCE

- A. Qualifications: Perform work by workers skilled in their respective trades and install specified materials and equipment according to manufacturer's recommendations.
- B. Where special qualifications are required, i.e., for welders or brazers, a currently active certificate of qualification from a recognized testing laboratory and dated within 12 months before performance of work will be required.
1. If quality of work of any such specially qualified worker creates reasonable doubt as to skill, ENGINEER may require worker to be removed and replaced.
- C. Tradesperson Qualifications and verification:
1. Comply with Miami-Dade County Code-Chapter 10 and the DTPW General Conditions

1.04 WARRANTY

- A. Furnish copies to DTPW of guarantees for equipment or materials per the DTPW General Conditions.
- B. Inspections at End of Warranty:
1. At the end of the 1-year warranty period, DTPW will decide if the warranty items cited during the course of the warranty period have been completed to the satisfaction of DTPW.
 2. Meet on-site with Engineer before the end of the 1-year warranty period and address unresolved warranty items to the satisfaction of DTPW.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide new materials, free from defects, of domestic manufacture unless otherwise noted.

2.02 EQUIPMENT

- A. Use equipment scheduled in the Construction Documents to determine space and service requirements.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Clean surfaces free of grease, scale, rust, and other foreign matter and leave ready for painting.
- B. Field paint exposed piping, ducts, hangers, and supports as specified in Section 09900 or 09901.
 - 1. Touch-up factory finishes marred in construction with factory touch-up kits.
- C. Electrical items furnished shall conform to the requirements of Division 16.

3.02 FIELD SUPERVISION

- A. Verify measurements at building site before starting work. Submit discrepancies and differences to Engineer for consideration and decision before proceeding with work.
- B. Obtain full information regarding:
 - 1. Peculiarities and limitations of space available for installation of equipment.
 - 2. Materials under contract.
 - 3. Accessibility required to dampers, valves, and other apparatus, including any part of any system needing maintenance or operation.
- C. Provide accurate layout, grades, and elevations. Set sleeves and openings in ample time for other trades to proceed in a timely manner. Take proper precautions to protect work and equipment from damage.
- D. Cut openings and chases required to accommodate the Work and repair floors, walls, and ceilings damaged by such cuttings.
- E. Perform required tests in the presence of Engineer and authorities having jurisdiction. Give 48-hour notice before tests.
- F. Insure compliance with safety codes and other codes and ordinances applicable to the performance of work under this Division.

3.03 FIELD QUALITY CONTROL

- A. Work will be inspected by Engineer and/or EOR (as instructed by Engineer) during construction.
- B. Existing HVAC systems shall be operational in the areas of work for a period of at least 3 days (72 hours) before installation of specified interior finishes and until interior finish installations are completed and accepted by DTPW. Exterior openings shall be kept closed during these periods by using temporary or permanent barriers.
- C. Maintain a repair log of equipment before substantial completion.
- D. Prerequisites to substantial completion inspection shall be completed construction, testing, adjustments, repair

logs, balancing, start-up, and required instruction periods on specified mechanical equipment and systems.

1. Air-conditioning:

- a. Ductwork shall be installed complete with required dampers, deflectors, hangers, and insulation.
- b. Control system components shall be installed and tested for function.
- c. System testing and balancing shall be completed.

3.04 DEMONSTRATION

- A. As a condition for substantial completion and after systems have been tested and checked as complete and operational, instruct DTPW's staff in the operation of any air-conditioning, air circulation system and valve component and control.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15023 CODES AND STANDARDS

PART 1 GENERAL

1.01 REFERENCES

A. Comply with the following:

1. Florida Building Code (FBC).
2. Florida Building Code (FMC) - Mechanical.
3. Florida Building Code (FPC) - Plumbing.
4. National Electrical Code - 1999 (NFPA 70).
5. National Fire Protection Association - 1997 (NFPA). NFPA 101 and other NFPA codes as applicable, except NFPA 101 10-2.2.7 and 10.2.2.7 Exit Passageways.
6. American National Standards Institute (ANSI) A117.1, 1995.
7. American Society of Civil Engineers (ASCE) 7-98.

1.02 QUALITY ASSURANCE

- A. Where materials and equipment are available under the continuing inspection and listing service of Underwriters Laboratories (UL) and National Electrical Manufacturer's Association (NEMA), furnish materials and equipment so listed.

PART 2 NOT USED

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will not be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15044 GENERAL COMPLETION

PART 1 NOT USED

PART 2 NOT USED

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Construction, satisfactory testing, adjustments, balancing, start-up, and required instruction shall have been completed on specified mechanical equipment and systems before substantial completion inspection. All safety equipment shall be in place and operational. There shall be no undue equipment noises, leaks, or misalignment.
 - 1. Air-conditioning:
 - a. Ductwork: Installed complete, including required dampers, deflectors, hangers, and insulation.
 - b. Insulation: Installed with no condensation leaks.
 - c. Control System Components: Installed and tested for function.
 - d. Safety Equipment: Installed and tested.
 - e. System Testing and Balancing: Completed for the areas of work under this contract only.
 - 2. Plumbing:
 - a. Piping: Pressure testing complete. System free flowing.
 - b. Plumbing Fixtures: Unchipped, leveled, clean, and handicapped accessible. Grouting completed.
 - c. Toilet Room Accessories. Installed and secured.
 - d. Insulation: Installed.
 - e. Domestic water: Permanent connection with backflow preventers in place.
 - f. Safety Equipment: Installed and tested.
 - g. Valving: Open.
 - 3. Fire Protection: There is no fire protection sprinkler system scope of work.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.

- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15047 IDENTIFICATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Identification including necessary accessories indicated on Construction Documents and specified in this section or as required for proper identification of equipment and piping.
- B. Related Sections:
 - 1. 02221 -Excavating, Backfilling, and Compaction for Utilities.
 - 2. 15410 - Piping (Plumbing).

1.02 SUBMITTALS: in accordance with Section 01330

- A. Submit properly identified product and technical data including printed installation instructions before starting work.

1.03 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Color Coding: ANSI Z535.1 (latest edition) shall take precedence over any discrepancies in determining proper color code identification.
 - 2. Conform to the standards established in ANSI A13.
 - 3. Comply with OSHA standards.

PART 2 PRODUCTS

2.01 EQUIPMENT IDENTIFICATION

- A. Identify equipment served by piping systems by number or legend as shown on Construction Documents.
- B. Engraved Plastic Name Plates: Provide engraved laminated plastic name plates with 1-inch high letters on equipment cabinets.
- C. Brass Tags: Provide appropriately sized brass tags on equipment where cabinets do not exist.
- D. Piping Identification:
 - 1. Color Coding: Identify piping with markers and directional arrows according to the following color-coding system:

<u>Description</u>	<u>Background</u>	<u>Letters</u>
Hot Water	Yellow	Black
Cold Water	Green	White
Fire	Red	White

- 2. Piping Identification Materials:
 - a. Identify contents and flow direction of piping or pipes wrapped with insulation by using:

- 1) Brady B-946 self-sticking vinyl.
- 2) Champion America Inc., pressure sensitive vinyl.
- 3) Seton Opti-Code.
- 4) Ready Made adhesive pipe markers.
- 5) Or approved equal

3. Valve Identification:

- a. Identify location and system under valve control with a color-coded thumb tack under valve and lay-in ceiling tile. Use other methods (paint or adhered colored material) in access panel doors.

E. Underground Tapes:

1. Electrical Warning Tape: 6 mil, 3 inches wide polyethylene.

- a. BURIED ELECTRICAL LINE BELOW - No.37236 by Seton or approved equal.

2. 2" Metallic Detection Tapes:

- a. BURIED SEWER LINE BELOW - No.37220 by Seton or approved equal.
- b. BURIED WATER LINE BELOW - No.37222 by Seton or approved equal.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- B. Verify surfaces are clean and dry before application of identification signage.

3.02 INSTALLATION

A. Brass Tags or Engraved Plastic Name Plates:

1. Install brass tags or engraved plastic name plates according to manufacturer's instructions.
 - a. Place brass tags or name plates in locations easily visible within the space at normal eye level or as otherwise directed by Project Engineer.

B. Piping Markers and Directional arrows:

1. Location:
 - a. Pipes Passing Through Walls: Provide pipe markers and directional arrows on the pipe on each side of the wall.
 - b. Pipes Behind Access Doors/Panels: Provide pipe markers and directional arrows within view.
 - c. Continuous Run Pipe Lines: Provide pipe markers and directional arrows at intervals not exceeding 50 feet.
 - d. Risers and Joints: Provide pipe markers and directional arrows at each riser and joint.
 - e. Vertical and Horizontal Change of Direction: Provide pipe markers and directional arrows at

each vertical and horizontal change of direction.

2. Special Requirements:

a. Directional Arrows: When identifying by directional arrows, point arrowhead away from pipe markers and in the direction of flow.

1) Direction of Flow: If the flow can be in both directions, identify by using double-headed directional arrows.

b. Thin Film Pipe Markers and Thin Film Directional Arrows: When using both thin film pipe markers and thin film directional arrows on soft insulation, provide a spiral wrap of accepted pipe banding tape around the pipe as foundation for both markers and directional arrows.

C. Underground Tapes: There are no exterior electrical, plumbing or air-conditioning lines in the scope of work.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.

B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15090 SUPPORTS, ANCHORS, AND SEALS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
1. 15410 - Piping (Plumbing).
 2. 15430 - Piping Specialties (Plumbing).
 3. 15515 - Valves, Hangers, and Specialties.

1.02 REFERENCES

- A. Pipe Supports: ANSI B31.1, Power Piping.

1.03 SUBMITTALS: in accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Inserts:
1. Malleable iron case of galvanized steel shell expander plugs for threaded connection with lateral adjustment, top slot for reinforcing rods, and lugs for attaching to forms.
 2. Size insert to suit threaded hanger rods.
 3. Wall Support:
 - a. Pipe Sizes to 3 Inches: Cast iron hook.
 - b. Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamps.
 4. Vertical Support: Steel riser clamp.
 5. Provide copper plated supports for copper piping or provide sheet lead packing between support and piping.
- B. Hanger Rods: Provide steel hanger rods, threaded both ends, threaded one end, or continuous threaded.
- C. Sleeves:
1. Pipe Through Floors: Form from 18 gage galvanized sheet metal.
 2. Pipes Through Beams, Walls, Fireproofing, Footings, Potentially Wet Floor: Form from steel plate or 18 gage galvanized sheet metal.
 3. Size large enough to allow for movement due to expansion.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Supports:
 - 1. Support riser piping independently of connected horizontal piping where practical.
- B. Priming: Prime coat exposed steel (not galvanized) supports.
- C. Sleeves: Where piping passes through floor, ceiling, or wall, close space between pipe or duct and construction with noncombustible insulation. Provide tight fitting metal caps on both sides and caulk.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15180 MECHANICAL SYSTEMS INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15410 - Piping (Plumbing).
2. 15515 - Valves, Hangers, and Specialties.
3. 15890 - Ductwork.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

- | | | |
|-----|----------|---|
| 1. | C534-94 | Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form. |
| 2. | C547-95 | Specification for Mineral Fiber Pipe Insulation. |
| 3. | C552-91 | Specification for Cellular Glass Thermal Insulation. |
| 4. | C553-92 | Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications. |
| 5. | C585-90 | Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System). |
| 6. | C612-93 | Specification for Mineral Fiber Block and Board Thermal Insulation. |
| 7. | D1056-91 | Specification for Flexible Cellular Materials-Sponge or Expanded Rubber. |
| 8. | D1668-95 | Specification for Glass Fabrics (Woven and Treated) for Roofing and Waterproofing. |
| 9. | E84-96a | Test Method for Surface Burning characteristics of Building Materials. |
| 10. | E96-95 | Test Methods for Water Vapor Transmission of Materials. |

B. National Bureau of Standards (NBS).

C. National Fire Protection Institute: NFPA 90A.

D. Underwriters Laboratories (UL) - 723.

E. Insulation Contractor's Association of South Florida Inc.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's catalog cuts, performance curves, and procedures before starting work.

1.04 DELIVERY AND STORAGE

- A. Protect materials from the weather during storage and installation.

1.05 QUALITY ASSURANCE

- A. Materials shall be labeled, listed, or have certified test reports submitted from testing laboratory

accepted by the DTPW.

- B. Comply with the most stringent requirements between the Insulation Contractors Association of South Florida Inc. and as specified.
- C. There shall be no fiberglass in contact with the HVAC airstream anywhere in the system whether protected by encapsulation or not.
- D. Foam plastic insulation shall be certified, by an independent third-party national recognized laboratory, that the product emits less than 1 part per million formaldehyde out gassing after 24 hours.

1.06 FIRE HAZARD RATING

- A. Fire hazard rated materials shall be UL labeled or a certified test report by a DTPW accepted testing laboratory shall be submitted indicating compliance with specified fire hazard requirements.
- B. Insulation (including adhesives) shall be fire retardant or self-extinguishing. Finishing jackets, insulation, and adhesives shall have composite fire and smoke ratings complying with ASTM E84, NFPA 255, and UL 723, as plain or on a composite basis.
- C. When insulation, vapor barrier covering, wrapping materials, and adhesives are applied separately in field, each item shall be tested individually.
- D. When insulation, vapor barrier covering, wrapping materials, and adhesives are factory composite systems, they shall be tested as an assembly.
- E. Insulation materials, adhesives, coatings, and other accessories shall have a fire hazard rating not more than 25 for flame developed and not more than 50 for fuel contributed and smoke developed, except as follows:
 - 1. Flexible unicellular insulation.
 - 2. Nylon anchors for securing insulation to ducts or equipment.
 - 3. Factory premolded 1-piece PVC fitting and valve covers
- F. Flame resistance treatments subject to deterioration due to effects of moisture or high humidity are not acceptable.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Insulation:
 - 1. Armaflex.
 - 2. Armstrong.
 - 3. Certain-Teed.
 - 4. Cell-U-Foam.
 - 5. Foamglas.
 - 6. Manville.
 - 7. Owens-Corning.
 - 8. Pittsburgh Corning.
 - 9. Or approved equal

B. Insulating Cement:

1. Keene Powerhouse.
2. Benjamin Foster.
3. Fibrex FBX fast set.
4. Or approved equal

2.02 MATERIALS

A. Insulation: Type and thickness as specified.

1. Provide fire retardant or self-extinguishing insulation, including adhesives.
2. Finishing jackets, insulation, and adhesives shall have composite fire and smoke ratings per ASTM E84, NFPA 255, and UL 723.

B. Domestic Hot Water Supply Piping Insulation:

1. 1" thick molded fiberglass insulation with pre-sized factory applied FRJ jacket of glass cloth with longitudinal lap and butt joint strips with self-sealing adhesive.
2. Insulation may be 1/2" insulation for vertical branches to individual fixtures.
3. Minimum density of 7-1/4 pounds per cubic foot, maximum thermal conductivity factor of 0.26K at 75 degrees F. mean temperature, and alkalinity of 0.696.
4. Flame Spread: 25 or less.
5. Smoke Developed: 50 or less.
6. Accessories: Adhesives, mastics, cements, tapes for fittings, and related materials shall have the same composite ratings as listed above.

C. Cold Drainage Piping and Electric Water Cooler Drain Piping Insulation:

1. Elastomeric (foam plastic) thermal insulation 1 inch thick with built-in vapor barrier rated self-extinguishing ASTM D1056.
2. Maximum thermal conductivity factor of 0.26K at 70 degrees F. mean temperature, density of 5-6 pounds per cubic foot, and a water vapor transmission of 0.1 perms.

D. Tape: As recommended by the insulation manufacturer or 3M adhesive EC-1329 or approved equal.

E. Insulating Cement: All-purpose mineral wool cement.

F. Flexible Fiberglass Duct wrap Blanket Insulation:

1. 2.2/2.3 inches thick, 3/4" pcf density fiberglass blanket with UL approved aluminum foil vapor seal facing reinforced with fiberglass scrim, laminated to 30 lb. kraft paper, R = 6.5.
2. Comply with ASTM C553, TYPE I, Class B-4.
3. Maximum Thermal Conductivity: 0.24K factor at 75 degrees F.

G. Accessories:

1. The following accessories shall be used in the application of thermal insulation:
 - a. PVC fittings cover and PVC jacketing:

- 1) Certain-Teed "Snap Form".
 - 2) Manville Corp. "Zeston".
 - 3) Proto.
 - 4) Or approved equal
- b. Vapor Seal Mastic:
- 1) Benjamin Foster 30-86 or 30-25.
 - 2) Childers CP-30.
 - 3) Or approved equal
- c. Lagging Adhesive:
- 1) Benjamin Foster 81-42W.
 - 2) Childers CP-50.
 - 3) Or approved equal
- d. Breather Mastic:
- 1) Benjamin Foster 45-00 or 30-86.
 - 2) Childers CP-10.
 - 3) Or approved equal
- e. Insulation Bonding Adhesive (to metal):
- 1) Benjamin Foster 85-20, or 85-15.
 - 2) Childers CP-82.
 - 3) Or approved equal
- f. Insulating and Finishing Cement:
- 1) Fibrex Inc. FBX Super Blend Cement.
 - 2) Manville Corp. No.375 Insulating and Finishing Cement.
 - 3) Keene Corp. Super Powerhouse.
 - 4) Or approved equal
- g. Coatings: Sealfas G-P-M mastic or approved equal.
- h. Fire Resistive Mastic: As manufactured by Benjamin Foster or approved equal.
- i. Sealants: 81-33 as manufactured by Benjamin Foster or approved equal.
- j. Staples: Type 304 or 316 stainless steel outward clinching type.
- k. Wire: 16 gage, copper weld wire.
- l. Bands: 3/4 by 0.015" thick galvanized steel.
- m. Glass Fabric:
- 1) Woven open mesh type glass fabric conforming to ASTM D1668.
 - 2) Type I asphalt treated for below ground use.
 - 3) Type III light color organic resin treated for aboveground or below ground use.
- n. Insulation Jackets:
- 1) Jackets inside building shall comply with fire hazard classifications as specified. Insulation jackets shall not support mold growth.

2) Vapor Barrier Jackets:

- a) For Cold Pipelines (-30 degrees F. to 60 degrees F.): Perm rating not more than 0.05, ASTM E96 Procedure A. Puncture resistance not less than 50 beach units.
- b) For Air-conditioning Ducts: Perm rating not more than 0.05, ASTM E96, Procedure A. Puncture resistance not less than 25 beach units.

2.03 SYSTEMS INSULATION BY TYPE

- A. Interior Domestic Hot Water Supply/Return Piping Insulation:
 - 1. Molded Fiberglass Pipe Insulation: 1 inch thick with pre-sized factory applied FRJ jacket of glass cloth with longitudinal lap and butt joint strips with self-sealing adhesive.
 - 2. Contractor's Option: Foamed plastic insulation, 1 inch thick.
- B. Electric Water Cooler Drain, Cold Drainage Piping Refrigerant Suction Piping, and Interior Condensate Drain Piping Insulation:
 - 1. Foamed Plastic Insulation: 1 inch thick with field applied vapor barrier mastic at joints.
- C. Interior Concealed Ductwork Insulation:
 - 1. Flexible fiberglass Duct wrap Blanket Insulation:
 - a. 2.2 inches thick, 3/4 pcf density.
 - b. 2.0 inches thick, 1-1/2 pcf density.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install insulation according to applicable codes and regulations.
- B. Except as specified, install materials according to manufacturer's recommendations and specifications for obtaining conformance to construction documents.
- C. Packages or standard containers of insulation, jacket material, cements, adhesives, and coatings delivered for use and samples required for acceptance shall have manufacturer's stamp or label attached listing manufacturer, brand name, and a description of material.
- D. Provide allowances for expansion/contraction, and wall and manhole penetrations.
- E. Run continuous through wall, floor, and ceiling penetrations.
- F. Insulation materials shall not be applied until:
 - 1. Test results specified in other sections of these specifications are completed and accepted.
 - 2. Rust, scale, dirt, and any other foreign material have been removed.
 - 3. Ductwork or piping material are clean, dry, joints firmly butted together, and tightly sealed at all joints, seams, and fittings.

- G. Wrap butt joints with a 3-inch-wide strip of the same material as the jacket.
- H. Provide aluminum jackets over the insulation where sealant is required.
- I. Insulation shall be kept clean and dry at all times.
- J. Duct Materials:
 - 1. Internal duct lining is not allowed.
 - 2. Duct materials solid exposed to the airflow shall be noncombustible metal.
 - 3. Duct insulation for thermal or acoustical purposes shall be separated from airflows by solid metal.
 - 4. Provide natural noise attenuation procedures, as recommended in ASHRAE, Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), and industry good engineering practices.
 - 5. Fiberglass ducts or duct boards shall not be used to convey air.
- K. Protection Shield: Where pipe or tubing insulation pass through hangers, provide:
 - 1. For Piping 4 inches and smaller: A protection shield, 180-degree arc, 16 gage galvanized sheet metal covering, minimum 12 inches long.
 - 2. For Piping Larger than 4-inch diameter: A protection shield, 180-degree arc, 16 gage galvanized sheet metal covering, minimum 18 inches long.
 - 3. Hangers not exceeding maximum spacing distances recommended by insulation manufacturer to prevent crushing or compressing insulation.
- L. Ductwork sizes shown on drawings are actual internal "air side" dimensions.
- M. Flanges, Fittings, and Valves on Insulated Piping:
 - 1. Provide pre-molded glass fiber fittings wired or taped on and adhered with canvas jacket.
 - 2. Terminate insulation and jacket neatly and finish with insulating cement troweled to a bevel and of the same thickness as adjoining insulation.
 - 3. Vapor seal insulation on cold systems.
- N. Vapor Barriers:
 - 1. Intact and continuous.
 - 2. Do not install with staples.
- O. Omit Pipe Insulation from the Following:
 - 1. Screwed unions, except at "cold drains" and air- conditioning wastes. Terminate insulation neatly at both sides of unions with insulation cement.
 - 2. Discharge lines from safety and relief valves.
 - 3. Nickel or chrome plated piping.
- P. All ductwork shall be insulated, except as noted below:
 - 1. Outside air intake ductwork.
 - 2. Exhaust air ductwork.
 - 3. Supply air ductwork exposed in air-conditioned spaces. (Note: Ceiling plenums, and mechanical equipment rooms are not to be considered air-conditioned spaces.)

- Q. Ceiling supply air registers located on perimeter rooms and corridors shall be field insulated with flexible fiberglass duct wrap insulation as specified. Insulation shall cover the upper body and installation flanges.
- R. All appurtenances subject to condensation shall be protected as necessary and covered with vapor seal mastic.

3.02 APPLICATIONS

- A. Molded Fiberglass Pipe Insulation Installation (Hot Water Supply/Return):
 - 1. Tightly butt together sections of insulation on pipe runs sealing longitudinal seams of jacket with self-sealing laps. Position longitudinal seam so seam is on bottom to prevent dirt and moisture infiltration. Seal end joints with 3-inch-wide straps of vapor barrier tape. Seal ends of insulation with vapor seal mastic at valves, fittings and flanges.
 - 2. Cover valves, fittings, and flanges with insulation similar to adjacent pipe covering, or one-piece PVC cover sections as specified.
- B. Foamed Plastic Insulation Installation (Return Suction Piping, Interior Condensate Drains, and Electric Water Cooler Drains):
 - 1. Insulation shall be slipped on pipe without slitting. Butt joints shall be sealed with the manufacturer's recommended adhesive.
 - 2. Where slip-on techniques are not possible, the insulation shall be carefully slit and applied to the pipe. Seal joints with the manufacturer's recommended adhesive.
 - 3. Insulate valves and fittings with fabricated foamed plastic insulation, or one-piece PVC cover sections as specified.
 - 4. Provide mastic vapor barrier for chilled water service insulation for areas subject to conditions of 90 degrees F or 85 percent relative humidity or higher.
- C. Flexible Fiberglass Duct wrap Blanket Insulation Installation:
 - 1. Apply insulation to duct with joints tightly butted. Prepare stretch-out dimensions and cut out insulation so a 2-inch minimum overlap is created that will overlap the facing and insulation at the other end, and the adjoining seam. Install so insulation is not excessively compressed at duct edges. Foil face shall be on outside. Seams shall be stapled approximately at 6 inches on center with outward clinching staples.
 - 2. On ductwork having a 24 inch or larger dimension, insulation shall be secured to the bottom of the duct with mechanical fasteners spaced at not more than 18 inches on center. and held in place with washers or clips. Cut off protruding pin after clips are secured.
 - 3. Seal all insulation joints, pinheads, tears, punctures, washers, clips, and staples with 2 coats of a vapor barrier mastic type sealant, reinforced with 1 layer of 4-inch woven glass fabric.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15410 PIPING (PLUMBING)

PART 1 GENERAL

1.1 SUMMARY

- A. Related Sections:
 - 1. 15440 - Plumbing Fixtures, Trim and Supports.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A53-96 - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A74-96 - Specification for Cast Iron Soil Pipe and Fittings.
 - 3. A106-95 - Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
 - 4. B32-96 - Specification for Solder Metal.
 - 5. B88-96 - Specification for Seamless Copper Water-Tube.
 - 6. B306-96 - Specification for Copper Drainage Tube (DWV).
 - 7. C564-95a - Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
 - 8. D312-95a - Specification for Asphalt Used in Roofing.

1.3 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.
- B. Shop Drawings:
 - 1. Pipe and Fittings: Manufacturer's name and mill reports.
 - 2. Expansion Joints: Catalog cuts.
 - 3. Dielectric Unions: Catalog cuts.

PART 2 PRODUCTS

2.1 MATERIALS:

- A. Materials shall be new, unused, and best of their respective kinds, free from defects in labor quality, complying with latest publications in effect at time of bidding, and according to Construction Documents. Be aware that though indicated herein all of the materials listed are not necessarily included in the project at bid time. As such, information is listed in case it applies to changes to the work.
- B. Cast Iron Drainage Pipe and Fittings:
 - 1. Hub and Spigot: Service weight centrifugally spun cast iron, hub and spigot, tar coated inside and out, ASTM A74.
 - 2. No-Hub: Service weight centrifugally spun cast iron, no-hub, tar coated inside and out, CISPI 310.
- C. Galvanizing: By hot process on both inside and outside of pipe with zinc coating averaging at least 2 ounces per square foot and free from defects.
- D. Copper Tubing:
 - 1. Type K or L: Seamless hard drawn or annealed, ASTM B88.
 - 2. Type DWV: Seamless hard drawn, ASTM B306.
- E. Ductile Iron Pipe: ANSI/AWWA C151/A21.51.

- F. Cast Iron No-Hub Pipe Joint:
 - 1. Cast Iron: ASTM A888.
 - 2. Neoprene Gaskets: ASTM C564.
 - 3. Aboveground: Stainless Steel Clamp and Shield Assembly: 300 Series, CISPI 301-69T or approved equal.
 - 4. Underground: ASTM C1277, cast iron couplings with neoprene compression gasket and stainless-steel bolts.
- G. Cast Iron Fittings and Flanges:
 - 1. Standard Weight: ANSI B16.1, unless otherwise noted.
 - 2. Extra Heavy: ANSI B16.2.
- H. Brass Fittings:
 - 1. Copper Tubing Solder Drainage Fittings: Wrought copper, ANSI B16.22.
 - 2. Copper Tubing Solder Fittings: Wrought copper, ANSI B16.22.
 - 3. Threaded: Standard weight, banded, ANSI B16.15.
- I. Press Fittings for Copper: Type K copper and bronze, ASME B16.18 or ASME B16.22. O-rings for copper press fittings shall be EPDM.
 - 1. Viega, Lakewood, OH.
 - 2. Ridge Tool Co., Elyria, OH.
 - 3. Or Approved equal.
- J. Compression Gaskets, Cast Iron Soil Pipe: ASTM C564.
- K. Solder Metal:
 - 1. Similar to silver-tin-copper alloy ASTM B32.
 - 2. All solder shall be certified no-lead.
- L. Joint Compound: Tite-Seal or approved equal.
- M. Unions: As specified in Section 15430.
- N. Protective Coating: Cabot's Flexi-Black or approved equal.

PART 3 EXECUTION

3.1 MATERIALS

- A. Run piping as indicated in Construction Documents subject to modifications as required to suit field conditions, to avoid interference with other trades, and for proper, convenient, and accessible locations to parts of the piping system.
- B. Run piping in wall chases, recesses, pipe shafts, and hung ceilings where provided.
 - 1. Do not run gas or water piping in floor fill.
 - 2. Run piping as high as possible under building, above ceilings, and close to slabs.
 - 3. Do not permanently close, furr in, or cover piping before examination and final tests.
- C. Run piping straight and where concealed as direct as possible with risers erected plumb and true.
 - 1. Install piping with minimum 1-inch clearance between finished pipe coverings and adjacent work.
 - 2. Support piping from structure above, maintaining maximum headroom available.

- D. Do not run piping in telephone rooms, electrical equipment rooms/closets, transformer vaults or rooms containing related equipment, or close to or above control panels, switch boards and electric motors except required branch piping to pumps. If pipes are installed in these rooms, they shall be relocated at no extra cost to the DTPW.
- E. Provide control valves where noted or required for complete regulating control of systems, plumbing fixtures, and equipment. Provide valves in accessible locations or accessible through access panels.
- F. Coat Underground metal piping, except cast iron, with 1/16" thick black bituminous protective coating.
- G. Fittings, Valves, and Hangers on Chrome Plated Piping: Chrome plated finish to match.
- H. Provide reducing fittings for changes in pipe sizes. Bushings will not be allowed.
- I. Provide extra heavy pipe for nipples where unthreaded pipe is less than 1-1/2".
 - 1. Do not use close nipples. Use saddle nipples.
 - 2. Provide galvanized iron sleeves for pipes passing through roof slabs, interior floors, ceilings, walls, or partitions.
- J. Expansion Swings:
 - 1. Make adequate provisions for proper expansion and contraction of piping and for piping passing through building expansion joints.
 - 2. Make branch connections from risers with ample swing or offset to avoid strain on fittings or short pipe lengths. Anchor horizontal runs of pipe over 50 feet in length to walls or supporting structure about midway of run to allow expansion evenly divided toward ends.
 - 3. Provide sufficient number of elbow swings or accepted expansion joints to allow proper expansion and contraction of mains and risers.
- K. Pipe Slopes:
 - 1. Lay horizontal soil and waste pipes, unless otherwise noted on drawings, to:
 - a. 1/8" per foot minimum for pipe 3 inches and larger
 - b. 1/4" per foot minimum for pipe less than 3 inches
 - c. Horizontal vent lines shall have a minimum grade back to the stacks or vertical lines and shall run as direct and free from bends as possible.
- L. Piping Materials by System:
 - 1. Sanitary Soil, Waste, and Vent Piping:
 - a. Aboveground: Service weight no-hub cast iron pipe and fittings.
 - b. Under Ground Floor Slabs:
 - 1) Cast iron hub push joint with neoprene compression gaskets.
 - 2. Vandalproof Vent Caps:
 - a. Install according to manufacturer's printed instructions.
 - 3. Domestic Water Supply Piping: Drilling tubes for field manufactured fittings is not allowed.
 - a. Aboveground Interior:
 - 1) Copper Tubing Type L:
 - a) Wrought copper solder joint fitting without the use of lead components. Tubing used with this type shall not be soft drawn.
 - b) Bending of tubing having a radius of not less than 4 tube diameters without deformation may be used for tubing diameters not exceeding 1 inch. Copper tubing used for this type connection shall be bending temper.
 - c) Victaulic copper connection system with Style 606 couplings. Tubing used with this type connection shall be drawn temper.

- b. Optional Press Connections for Aboveground Interior Copper Tubing Type L and Underground Exterior Copper Tubing Type K:
 - 1) Press fittings shall be made according to the manufacturer's installation instructions.
 - 2) The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting.
 - 3) The fitting alignment shall be checked against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting.
 - 4) The joints shall be pressed using the tool approved by the manufacturer.
- M. Joints and Methods of Connections:
 - 1. Cast Iron Pipe:
 - a. Aboveground: No-Hub Joint with neoprene rubber sleeve and stainless-steel ring clamp according to manufacturer's instructions.
 - b. Underground: Under slab, hub push Joint with neoprene compression gaskets.
- N. Pipe Cleaning Systems:
 - 1. Domestic Water Piping: Entire domestic water distribution systems shall be flushed clean after the permanent water meter has been installed and before the bacteria testing is conducted.

3.2 TESTS

- A. Furnish necessary instruments, test equipment, and personnel required to perform tests and remove test equipment and drain pipes after tests have been made and accepted.
- B. After portions of mechanical work are completed and ready for testing, given 48 hours' notice to Engineer and perform tests in Engineer's and EOR's presence (as directed by the Engineer).
- C. Tests may be made of isolated portions of piping to facilitate the general progress of installation.
 - 1. Revisions subsequently made in piping system shall require retesting of such affected portions of piping systems.
 - 2. Subject piping and connections to a hydrostatic or pneumatic pressure test before painting, installation of insulation or concealment.
 - 3. Sanitary, Storm, and Acid Waste Drainage Systems:
 - a. Apply a water test to all parts of drainage systems before pipes are concealed or fixtures set in place.
 - b. Close openings of each system to be tested tightly except highest openings above roof and fill entire system with water up to overflow point of highest opening.
 - c. Subject systems to not less than 10 feet of hydrostatic head, except uppermost 10 feet of piping directly below opening.
 - 1) Water shall remain in the systems for not less than 60 minutes after which time no leaks occur at any point and no lowering of water level at overflow point is visible.
 - 4. Water Supply Piping:
 - a. Apply a pressure test to water system before piping is concealed or insulated and before fixtures and equipment are connected.
 - b. Apply a hydrostatic pressure of not less than 200 psig for 2 hours, with no leaks occurring in the system.
 - 1) Water used for tests shall be obtained from a potable source of supply.

3.3 CLEANING AND ADJUSTING

- A. Clean fixtures, equipment, piping, and exposed work.
 - 1. Show traps, wastes, and supplies free and unobstructed.
 - 2. Plated, polished bronze, or painted surfaces bright and clean.

- B. After installation, adjust valves, faucets, and automatic control devices for quiet operation. Balance system as required for proper operation.
- C. Disinfection: After cleaning and testing domestic water system, disinfect by introducing a solution of calcium hypochlorite with 50 parts per million of chlorine.
 - 1. Open and close all valves while system is being chlorinated. After disinfecting agent has been applied for 24 hours, test for residual chlorine at ends of pipe.
 - 2. If less than 5 ppm is indicated, repeat process until it is equal to or greater than 5 ppm or according to AWWA C601 Standards.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15421 DRAINS AND CLEANOUTS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. 15410 - Piping (Plumbing).

1.02 SUBMITTALS: In accordance with Section 01330

- A. Product Data: Submit properly identified manufacturer's literature before starting work.
- B. Submit Shop Drawings/Catalog cuts on the following:
 - 1. Drains.
 - 2. Cleanouts.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Model numbers are taken from Josam (basis of design).
 - 1. Accepted equivalents:
 - a. Jay R. Smith Mfg. Co.
 - b. Blucher-Josam.
 - c. Wade.
 - d. Zurn.
 - 2. Or Approved equal

2.02 MATERIALS

- A. Drains:
 - 1. Shower Stall:
 - a. Coated cast iron floor drain, 2-piece body, double drainage flange, invertible non-puncturing flashing collar, weepholes, bottom outlet, inside caulk connection, and adjustable satin Nikaloy 6" X 6" super-flo strainer.
 - b. Josam No.30000-6S-X.
 - 2. Toilet Room:
 - a. Same as Shower Stall above except for primer trap.
 - b. Josam No.30000-6S-50-X by Josam.

B. Cleanouts and Cleanout Access Covers:

1. Floor, Interior Finished Rooms:

- a. Cast iron, adjustable inside caulk outlet, brass internal plug, Nikaloy scoriated cover plate secured by countersunk plug.
- b. No.56020-88-15 by Josam.

2. Stack Base for Use in Block Walls:

- a. Cast iron "T" branch tee with plated cast iron countersunk plug, lead seal, satin stainless-steel round access cover plate secured with countersunk screw.
- b. No.58790-15 by Josam.

3. Stack Base for Use in Plaster Walls:

- a. Cast iron "T" branch tee coated cast iron countersunk plug, lead seal, cast brass round access cover with anchor lugs, satin stainless-steel cover secured with countersunk screw.
- b. No.58750-15 by Josam.

4. Stack Base for Use in Tile Walls:

- a. Cast iron "T" branch with brass countersunk plug, cast brass square access cover with satin top, anchor lugs, cover plate secured with 4 screws.
- b. No.58770-15 by Josam.

5. Exterior, Heavy Duty:

- a. Cast iron, inside caulk outlet bronze internal plug, ductile iron scoriated heavy duty cover.
- b. No. 56040-15 by Josam.

6. Cleanout Sizes:

- a. Full pipe size up through 4 inches, pipe cleanouts with bodies of standard pipe size and caulking ferrules conforming to thickness required for pipe and fittings of same metal.

7. Removable Cleanout Plugs:

- a. Cast bronze with screw threads and recessed bronze socket. No.58540 by Josam.

C. Wall Access:

- 1. Cast bronze, polished chrome plated square frame and cover, 12" X 12" minimum opening or larger, as required.
- 2. No.58640 by Josam.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide drains and cleanouts as scheduled on drawings.
- B. Cleanouts:
 - 1. Place pipe cleanouts at the foot of each soil and waste stack in sanitary system and place pipe cleanouts in horizontal runs not to exceed 50 foot spacing.
 - 2. Install access covers as specified.
- C. Interior Flush Cleanouts:
 - 1. Flush cleanouts with recessed sockets (without access covers) may be used in non-finished areas such as equipment rooms, storage rooms, and the like, if top of hub is installed in level position and top of clean out plug is flush with the concrete floor.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15430 PIPING SPECIALTIES (PLUMBING)

PART 1 GENERAL

1.01 SUMMARY

- A. Related Section:
 - 1. 15410 - Piping (Plumbing).

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A126-95 Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.
- B. Submit Shop Drawings/catalog cuts for the following:
 - 1. Shock Absorbers.
 - 2. Unions and Flanges.
 - 3. Hangers and Inserts.
 - 4. Trap Resealers.
 - 5. Vacuum Breakers.
 - 6. Gages and Thermometers.
 - 7. Firestop Devices.
 - 8. Water Hammer Arrestors.

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Trap Resealers:
 - 1. Water Closet Valve: Chrome plated with tubing to wall and wall flange. Water closet shall be no more than 20 feet from floor drain. No.F-72-A1 by Sloan Valve Co. or approved equal.
 - 2. Lavatory or Sink: Cast brass chrome plated with 1/2" female union connection and 1/2" female outlets, integral vacuum breaker.
 - a. Manufacturers:
 - 1) Josam, No.88250.
 - 2) Chicago Faucet Co., No.447.
 - 3) Zurn Industries, Inc., No.Z-1022.
 - 4) Or approved equal
 - 3. Remote Location:

- a. Machined brass valve with integral vacuum breaker, pressure adjustment and distribution units with visual operations inspection cover where required for multiple connections.
 - b. By Precision Plumbing Products Model P.1 or P.2 as applicable, or approved equal.
- B. Shock Absorbers:
 - 1. Stainless steel shell, elastomeric bellows, pressurized argon charge, sized per PDI-WH 201 at each branch of cold and hot water supplies, group toilets, and as shown on Construction Documents.
 - a. Zurn Industries, Inc., No.Z-1700.
 - b. Josam, No.75000.
 - c. Or approved equal
 - 2. Copper shell at individual toilet rooms and isolated fixtures. By Josam 75000-S or approved equal.
- C. Water Hammer Arrestors:
 - 1. Sioux Chief Mfg. or approved equal.
- D. Vacuum Breakers:
 - 1. Hose Bibb Vacuum Breaker: Non-removable. No 8A by Watts Regulator Co. or approved equal.
 - 2. Atmospheric Type: No.288A by Watts Regulator Co. or approved equal.
 - 3. For Plumbing Fixtures: see Section 15440.
- E. Unions and Flanges:
 - 1. Steel Pipe 2" and Smaller: Malleable iron unions with brass seat. Galvanized pipe requires galvanized unions.
 - 2. Steel Pipe 2-1/2" and Larger: Bronze flanged connections 150-pound Class. Galvanized pipe requires galvanized unions.
 - 3. Copper Pipe 2" and Smaller: Bronze unions.
 - 4. Copper Pipe 2-1/2" and Larger: Bronze flanged connections 150-pound Class.
 - 5. Dielectric Unions or Flanges:
 - a. Meet dimensional requirements and tensile strength of pipe unions or flanges according to Fed. Spec. WW-U-531D.
 - b. Suitable for required operating pressures and temperature conditions.
 - c. Provide metal connections on both ends. Ends shall be threaded or soldered to match adjacent piping.
 - d. Separate metal parts at union to prevent current flow between dissimilar metals.
- F. Escutcheons:
 - 1. Provide escutcheons securely in place on exposed pipes passing through walls, partitions, floors, and ceilings of finished areas unless otherwise noted on Construction Documents.
 - 2. Provide escutcheons with sufficient outside diameter to adequately cover sleeved openings.
 - 3. Interior Walls, Partitions, and Ceilings: Solid or stamped chrome plated brass or stainless steel, one piece or split pattern.
 - 4. Floors and Exterior: Solid cast brass, rough chrome plated or cast nickel bronze alloy, one piece or split pattern.
- G. Pressure Gages:

1. Cast aluminum alloy case, face diameter minimum 3-1/2", range selected so operating pressure is at middle of range.
 2. Accuracy: ANSI Grade A maximum of 1.5 percent error at any reading on scale.
 3. Manufacturers:
 - a. Ashcroft.
 - b. Marshalltown.
 - c. Taylor Instrument Company.
 - d. Or approved equal
- H. Thermometers:
1. Straight type mercury filled, 9-inch scale, □V□ shaped adjustable angle separable socket well.
 2. Accuracy to 1 percent of scale range.
 3. Manufacturers:
 - a. Ashcroft.
 - b. Marshalltown.
 - c. Taylor Instrument Company.
 - d. Or approved equal
- I. Thermometer Wells:
1. Brass construction with extension neck (2 inches minimum) with brass cap and chain.
 2. Manufacturers:
 - a. Ashcroft.
 - b. Marshalltown.
 - c. Taylor Instrument Company.
 - d. Or approved equal
- J. Pressure Reducing Valves:
1. 25 to 75 psi range, union connection, built-in bypass, all bronze, monel screen.
 - a. 1/2" through 2": 600 Series by Wilkins or approved equal.
 - b. 1/2" through 3": for higher flow capacities, 500 Series by Wilkins or approved equal.
 - c. 1/2" to 1": for lower flow capacities, 70 Series by Wilkins or approved equal.
- K. Pipe Hangers and Supports:
1. Provide hangers, supports, and supplementary steel as specified for different applications.
 2. Insert, Hangers, Rods, and Clamps: Figure numbers used refer to Grinnell. You can provide also from Fee and Mason or Elcen Metal Products or approved equal.
 - a. Inserts:
 - 1) Universal Concrete Insert: Fig.282.
 - 2) CB Junior Concrete Insert: Fig.279.
 - 3) Wedge Type Concrete Insert: Fig.281.
 - 4) Expansion Case: Fig.117.
 - b. Hangers: Adjustable clevis type.

- 1) Cast Iron Pipe: Fig.590.
- 2) Copper Tubing: Fig.CT-65.
- 3) Insulated Steel Pipe: Fig.300.
- 4) Uninsulated Steel Pipe: Fig.146.

c. Clamps:

- 1) V.F.S. beam clamp with weldless eyenut, Fig.292, clamp size 1, rod size 3/4".
- 2) C-clamp with retaining clip, Fig.87.
- 3) I-beam clamp, Fig.131.
- 4) Universal side I beam clamp, Fig.225.
- 5) C-clamp, copper finish, Fig.CT88.

d. Rods: Galvanized with continuous thread, Fig.146.

e. Riser Clamps:

- 1) Black Steel, Fig.261.
- 2) Plastic coated, Fig.261C
- 3) Copper finish, Fig.CT121.

3. Horizontal Copper Piping:

<u>Pipe</u>	<u>Rod Diameter</u>	<u>Clamp or Hanger Maximum Spacing</u>
Up to 1-inch	3/8"	6 feet
1-1/4 and 1-1/2"	3/8"	6 feet
2 inches	3/8"	8 feet
2-1/2"	1/2"	8 feet
3 and 4 inches	1/2"	8 feet

4. Horizontal Cast Iron Piping:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 4 inches	1/2"	5 feet
4 inches	5/8"	5 feet
6 inches and larger	3/4"	5 feet

5. Wall Support:

- a. U-clamps as accepted.
- b. Unistrut supports.

6. Vertical Support: Steel riser clamps.

L. Insulation Protection Shield: Fig.167.

M. Access Panels (Wall or Ceiling): As indicated in drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Inserts:

1. Use inserts for suspending hangers from reinforced concrete slabs or beams when possible.

2. Provide flush inserts at concrete to be a finished surface.
- B. Sleeves:
1. Seal space between pipe or duct and surrounding floor, wall, or ceiling construction with noncombustible insulation and tight-fitting metal caps on both sides with caulking.
 - a. Pipe Through Floors: Form from 18 gage galvanized sheet metal.
 - b. Pipes Through Beams, Walls, Fireproofing, Footings, and Potentially Wet Floors: Form from steel plate or 18 gage galvanized sheet metal.
 2. Size sleeves to allow movement caused by expansion.
 3. Seal and fireproof penetrations.
- C. Pipe Hangers and Supports: Also see Sections 15090 and 15515 for complimentary information.
1. Provide adjustable hangers, inserts, brackets, rolls, clamps, and supplementary steel as required for proper support of pipelines.
 - a. Design hangers to allow for expansion and contraction of pipelines. Size to allow pipe covering to run continuously through hangers. Allow for proper anchoring and movement of all hot lines.
 - b. Install hangers to allow 1/2" minimum clear space between finished covering and adjacent work.
 - c. Place a hanger within 1 foot of each horizontal elbow.
 - d. Use hangers with 1-1/2" minimum vertical adjustment after piping is erected.
 - e. Provide multiple or trapeze hangers if several pipes can be installed in parallel and at the same elevation.
 - f. Support riser piping independently of connected horizontal piping when practical.
 - g. Piping shall not be supported by equipment.
 - h. Coordinate location of hangers with light fixtures.
 - i. Wire brush steel or iron supports and prepare surfaces ready for painting specified under Sections 09900 and 09901. Prime coat exposed non galvanized hangers and supports.
 - j. Provide copper plated hangers and supports for copper piping or provide sheet lead packing between hanger or support and piping. Dissimilar metal contact is not allowed.
 2. Horizontal Cast Iron Pipe: Place hangers within 18 inches of hub or joint.
 3. Hubless Joints: Provide support at every other joint. Support each joint when length between supports exceeds 4 feet.
 4. Trapeze Clamp or Hangers:
 - a. Secure pipes supported by trapeze clamp or hangers and not mounted on pipe rolls to trapeze with pipe clamps or "U" bolts.
 - b. Place clamp or hangers at each change of direction.
 - c. Place clamp or hangers within 1 foot of valves and other appurtenances in horizontal piping.
 - d. Place clamp or hangers maximum 3 feet from end of each branch runout.
 5. Insulated Pipes:
 - a. Provide hangers with a diameter large enough to include insulation.
 - b. Install a protection shield with each hanger. 180-degree arc, 16 gage galvanized sheet metal covering, minimum 12 inches long.
 - c. Provide support saddles for insulated piping over 2 inches in diameter.

6. Special Supports: Clamps, hangers, and supports required by equipment manufacturers shall be installed according to equipment manufacturer's recommendations.
 7. Plumbers tape, straps, chain, wire hangers, or perforated bar are not allowed for hanging pipe.
- D. Water Hammer Arresters:
1. Supply Piping: Provide a water hammer arrester for each fixture supply including hot and cold water. Do not provide air chambers where water hammer arresters are installed.
- E. Unions and Flanges: Provide at connections of equipment and at strainers and control valves.
- F. Escutcheons: Fit and firmly secure escutcheons to pipes passing through finished floors, ceilings and walls.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15440 PLUMBING FIXTURES, TRIM, AND SUPPORTS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. 15410 - Piping (Plumbing).
 - 2. 15430 - Piping Specialties (Plumbing).

1.02 SUBMITTALS: In accordance with Section 01330.

- A. Submit Shop Drawings for the following:
 - 1. Fixtures: Catalog cuts with rough-in dimensions identified as designated in fixture schedule, riser diagrams, and as specified.
 - 2. Faucets: Catalog cuts and templates for drilled openings.
 - 3. Fixture Trim: Catalog cuts.
 - 4. Carriers: Catalog cuts.

1.03 QUALITY ASSURANCE

- A. Certification: Submit a letter, signed jointly by the manufacturer of the product and the installer of the product, attesting that no lead is contained in any piece of equipment or in the piping connections that could contaminate water, drinks, or food by contact.
- B. Comply with Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fixtures: As indicated in Plumbing Fixture Schedule.

2.02 FIXTURES

- 1. Water Closets:
 - 1. Wall Hung Water Closet (WC - 1):
 - 1. White, top spud, siphon jet flush action, 1.28 gpf, elongated bowl.
 - 1) Aftwall – 2856.128 by American Standard or approved equal.
 - 2. Flush Valve: Sloan Royal 111 or approved equal
 - 3. Seat: Elongated, heavy duty, open front less cover.
 - 2. Wall Hung Water Closet, HC Accessible (WC - 2):
 - 1. White, top spud, siphon jet flush action, 1.28 gpf, and elongated bowl.

- 1) Aftwall ADA - 2856.128 by American Standard or approved equal.
 2. Flush Valve: Sloan Royal 111 or approved equal
 3. Seat: Elongated, heavy duty, open front less cover.
3. Floor Mounted Water Closet, HC Accessible (WC - 3):
 1. White, top spud, siphon jet flush action, 1.28 gpf, and elongated bowl.
 - 1) Madera 17 inches high, 1.28/FV 10 inch rough – 2854.128 by American Standard or approved equal.
 2. Bolt Caps: 481310-100 by American Standard or approved equal.
 3. Flush Valve: Sloan Royal 111 or approved equal.
 4. Seat: Elongated, open front less cover.
2. Urinal (UR - 1):
 1. Siphon Jet Flush Action: Wall hung, 0.125 gpf, vitreous china, 3/4" top inlet spud.
 1. Wash brook Flowise High Efficiency 6590.001 by American Standard or approved equal.
 2. Flush Valve: Oscillating non-hold open handle. 186-0.125 by Sloan Royal or approved equal,
3. Mop Receptor (MSK - 1):
 1. Molded resin, 24 inches x 24 inches x 10 inches, rim guards, center drain.
 1. Model MSR-2424 by Florestone or approved equal.
 2. Fitting: Exposed yoke, wall mounted, vacuum breaker, top brace, stops in shanks.
 1. Heritage 8354.111 by American Standard or approved equal.
4. Lavatories:
 1. Wall Hung LAV/HC Lav (L -1):
 1. Enameled cast iron, 20 inches x 18 inches, single hole, with lug holes for concealed carrier arms.
 - 1) Lucerne 0356.421 by American Standard or approved equal.
 2. Hot and Cold Water Fitting, accessible: Selectronic integrated electronic proximity lavatory faucet with thermostatic mixing valve and power kit.
 - 1) 705B.105 by American Standard or approved equal.
 3. HC Hot Water Guard:

- 1) Manufacturers:
 - 1) Handi Lav-Guard Insulation Kit 102/105 - white, by Truebro or approved equal.
 - 2) Use manufacturer's vandal resistant fasteners.
 4. Supply Pipe: 3/8" rigid riser with loose key control. By McGuire or approved equal.
 5. "P" Trap: Adjustable offset with tubing drain to wall, cleanout plug and wall escutcheon. By McGuire or approved equal.
 6. Grid drain: Perforated, chrome plated, 1-1/4" offset tailpiece. By McGuire or approved equal.
 7. Floor Mounted Carrier Arms: Josam 17100-M-628 or approved equal.
5. Double Compartment Stainless Steel Sink:
 1. (SK - 1), Lustertone, 18 gage, Type 304 stainless steel, self-rimming, double ledge.
 1. LRAD-33160 by Elkay or approved equal.
 2. Fitting: Single control faucet with vandal resistant aerator.
 1. 4205.001 by American Standard or approved equal.
 3. Tailpiece: Offset with grid strainer, chrome plated P-trap with swivel joint, chrome plated flexible supplies with loose key stops: McGuire or approved equal.
6. Washbasins (WSHB - 1):
 1. 4 station units with cold and hot water fitting as specified in plumbing fixture schedule.
 1. Intersan 1.0-4, stainless steel or approved equal
7. Locker Room Showers:
 1. Wall Mounted Shower Heads.
 1. Vandalproof with concealed mounting screws, adjustable spray pattern by user, 30-degree spray angle, brass construction, flow not to exceed 2.5 gpm.
 2. Manufacturers:
 - 1) 1662.601 by American Standard.
 - 2) Or approved equal.
8. Electric Water Coolers (EWC - 1):
 1. Wall Mounted, 2-stream mound building projector, self-closing valve with automatic stream regulator, polished chrome plated brass bubbler, push bars in front and on both sides, for handicapped and standard use. See Drawings for mounting elevations.
 2. Manufacturers:
 1. Elkay LVRCTLSC or approved equal

3. No lead shall be allowed in the manufacture of any piece of equipment within water coolers nor in any piping joint or connection within the unit.
9. Floor Drain Reseal: VBF-72-A1 by Sloan or approved equal.

2.03 CARRIERS

- A. All carriers shall be fully bolted to floor and installed as recommended by manufacturer.
 1. Lavatory/Lavatory HC:
 1. Rectangular structural steel uprights with integral welded heavy steel foot, cast iron concealed arms. Model 17100 by Josam or approved equal.
 2. Urinal:
 1. Rectangular structural steel uprights with integral welded steel foot, hanger bracket, lower bearing plate. Model 17560 by Josam or approved equal.
 3. Water Closet:
 1. Josam 12000 Series Chase-Saver II, 4-inch pipe size, with pylon feet, adjustable, provided with vandal proof trim, supply pipe support and adjustable chase extensions or approved equal.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected.

3.02 EQUIPMENT AND FIXTURE CONNECTIONS

- A. Provide necessary material and labor to connect fixtures and equipment having plumbing connections including fixtures and equipment specified and furnished in other sections.
- B. Supply Pipe Cut-off Valves:
 1. Equip supply pipes to each item of equipment or fixture (except faucets furnished with an integral stop) with a cutoff valve to enable isolation of the item of equipment or fixture for repair and maintenance without interfering with operation of other items of equipment or fixtures.
- C. Supply Pipe Support: Anchor supply piping to all items of equipment or fixtures to prevent movement.
- D. Templates: Furnish templates and rough opening dimensions to fabricators of countertops and case work for location and sizes of openings for faucets and sink.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15457 WATER HEATERS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: A complete hot water generating system with necessary accessories as indicated on Construction Documents, as specified, and as required by code.
- B. Related Sections:
 - 1. 15410 - Piping (Plumbing).
 - 2. 15430 - Piping Specialties (Plumbing).

1.02 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.
- B. Shop Drawings:
 - 1. Water Heaters: Catalog cuts, performance characteristics.
 - 2. Pressure and Temperature Relief Valve: Catalog cuts, capacity.
 - 3. Gages: Catalog cuts.
 - 4. Recirculating Pumps: Catalog cuts and performance characteristics.

PART 2 PRODUCTS

2.01 EQUIPMENT

- 1. Electric Water Heaters:
 - 1. 18 KW, 120-gallon size, as indicated on Drawings.
 - 2. Double element, drain pan, wired for simultaneous use.
 - 3. 1-inch thick fiberglass or foamed plastic insulation jacket.
 - 4. DRE-120 by A.O. Smith or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide a gate valve and union at cold water connection to heater. A union shall be provided at hot water connection.
- B. Provide on cold water supply to heater a vacuum relief valve of sufficient size to protect tank from back pressures.
- C. Pressure relief valve and drain pan drain shall discharge to outside per code regulation or according to local ordinances.
- D. Provide thermometer on top of heater in oversized tee and nipple on outlet piping of heater.

- E. Adjust individually controlled elements to start at 5 degrees F. temperature differential for each heater element.
- F. The water heater shall fit properly in the floor space provided. Installation shall be according to local, municipal, state, and national codes.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.

END OF SECTION

SECTION 15515 VALVES, HANGERS, AND SPECIALTIES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15090 - Supports, Anchors, and Seals.
2. 15410 - Piping (Plumbing).

1.02 REFERENCES

A. The American Society of Mechanical Engineers (ASME) Publications: ASME Boiler and Pressure Vessel Code - Current edition.

1.03 SUBMITTALS: In accordance with Section 01330

A. Submit the following:

1. Pressure Relief and Reducing Valves: Catalog cuts; pressure range, and settings.
2. Air Vents: Catalog cuts.
3. Flexible Connectors: Catalog cuts.
4. All Valves: Catalog cuts, schedule of proposed installation locations, pressure ratings, and materials of construction.
5. Inserts: Catalog cuts and load tables.
6. Supports: Catalog cuts or drawings.
7. Anchors: Drawings and details of installation.
8. Water Flow Tube Station: Catalog cuts, pressure drop charts, and engineering information.
9. Shop Drawings of support equipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Valves:

1. Nibco.
2. Or approved equal

2.02 VALVES.

A. General:

1. Gate and globe valves shall not be installed with the stem pointing downwards. Valves may be installed with the stem at or above a horizontal plane. Provide adequate clearance for stem rise.
2. Check valves may be installed either in the horizontal or vertical position. Non-spring-loaded check valves shall only be installed in the vertical position when the flow is upwards.
3. Butterfly valves may be installed with the stem in any position. Whenever possible the stem shall be installed as outlined for gate and globe valves.
4. Provide all valves with a 1-1/2" diameter brass tag having 1/2" high black filled numbers and 1/4" high legend above, as manufactured by Seton or approved equal.

- a. Legend shall include abbreviations such as: PLMG, CW, HW, GAS, HVAC, etc.
 - b. Valve tag fasteners shall consist of No.6 brass beaded chain with brass "S" hooks. The use of color-coded one-piece nylon ties is acceptable instead of beaded chain fasteners. Brass "S" hooks are required with ties.
 - c. Record all valve tag numbers in project record drawings and submit before requesting final payment.
- 5. Provide ease of access to valve handwheel or lever to maintenance personnel.
 - a. Valves installed above a ceiling shall have the stem placed 15 degrees above the horizontal position whenever possible.
 - b. Provide colored thumbtack indexes at all ceiling tiles where valves are installed directly above.
 - c. Index all colored thumbtacks in the project record drawings.
- B. Check Valves:
 - 1. To 2":
 - a. Class 125 or Class 200, bronze, screwed bonnet, Y pattern, renewable Teflon discs, soldered or threaded ends.
 - b. Manufacturers:
 - 1) Nibco T/S-235-Y.
 - 2) Grinnell 3300.
 - 3) Milwaukee 590-S.
 - 4) Or approved equal.
- C. Ball Valves:
 - 1. Plumbing: Allowed only for balancing service in domestic hot water return.
 - 2. HVAC: Allowed only for shut-off, not for balancing service. Provide 3-inch stem extensions for insulated line.
 - 3. Porting: No reduced ports shall be acceptable in any ball valve.
 - 4. Up to 2":
 - a. Class 150, 400/600 psi WOG, full port, three-piece construction, blowout-proof stem, non-asbestos packing, bronze body, silicone bronze stem, bronze/ brass/chrome plated ball, Teflon resilient seat, and EPDM O ring seal.
 - b. Manufacturers:
 - 1) Nibco T/S-595-Y.
 - 2) Hammond 8604/8601.
 - 3) Milwaukee BA-300SS/350S.
 - 4) Or approved equal.

2.03 HOSE BIBBS

- A. Interior:
 - 1. Concealed Supply:

- a. Flanged, all brass, chrome plated, 3/4" angle hose valve, with vacuum breaker.
 - b. Manufacturers: No.952 by Chicago Faucet or approved equal.
 - c. Provide isolation valve in branch.
- B. Pressure Relief Valves:
 - 1. 3/4": Brass body, micro finished bevel for seats, cadmium plated springs, manual chilled lift ring, ASME Std. Bell and Gossett or water or approved equal.
- C. Pressure Reducing Valves:
 - 1. 3/4": Brass body and brass working parts with built-in strainer, 125 W.S.P. Bell and Gossett or approved equal.
- D. Pressure Gages:
 - 1. Standard depth, cast aluminum, black finished, chrome plated close type ring, clear glass window, bronze bourdon tube, precision movement and ± 0.5 percent accuracy.
 - 2. Gage shall have a minimum 4-1/2" diameter face and with the operating pressure displaying at the middle range of the scale. Bottom connection shall be at least 1/2" diameter.
 - 3. Manufacturers: H.O. Trerice, Marshalltown, Ashcroft, or Taylor or approved equal.
- E. Gage valves:
 - 1. Brass, 1/2" needle valve type.
 - 2. Manufacturers: H.O. Trerice, Model No.735-2 or approved equal.
 - 3. Provide pressure snubbers at gage cocks manufactured by H.O. Trerice, Model 872. Provide also from Marshalltown, Ashcroft, or Taylor or approved equal.
- F. Dielectric Pipe Fittings:
 - 1. Dielectric pipe fittings shall consist of insulators, insulating gasket, pipe connector and nut or flange as required.
 - 2. Pipe connectors shall be suitable for soldered, screwed, or welded joints as required.
 - 3. Dielectric unions shall be rated at 250 psi and cast-iron flange unions at 175 psi.
 - 4. Dielectric fitting shall be plated according to Federal Specifications of 0.005".
 - 5. Fittings shall be as manufactured by Epco or approved equal.
- G. Water Flow Sensors:
 - 1. As manufactured by Annubar ANR-75, stainless steel or approved equal.
 - 2. Instrument connections shall be No.C-22.
 - 3. 1/4" valves on 1-3/8" square head.
 - 4. Valve rating shall be maximum 5,000 psi at 100 degrees F.
 - 5. Flow sensor in steel pipe shall be weld nipple mounted.
 - 6. Flow sensor in PVC pipe shall be saddle mounted.
 - 7. Manufacturers: Dietrich Standard Corp or approved equal.

2.04 PIPE HANGERS AND SUPPORTS

- A. Provide hangers, supports, and supplementary steel as required for the different applications.
- B. Inserts, Hangers, Rods, and Clamps: Fig. numbers used refer to Grinnell, Fee and Mason, or Michigan Hanger

Co. An "or approved equal" can be submitted for review.

1. Inserts: (Galvanized or stainless steel except as noted.)
 - a. Universal concrete insert, Fig.282.
 - b. Wedge type concrete insert, Fig.281.
 - c. Expansion case, Fig.117.
2. Clamps:
 - a. UFS beam clamp with weldless eye nut, Fig.292, clamp size 1, rod size 3/4".
 - b. C-clamp with retaining clip, Fig.87.
 - c. 1 beam clamp, Fig.131.
 - d. Universal side 1 beam clamp, Fig.225.
 - e. C-clamp, copper finish, Fig.CT-88.
3. Hangers: Use adjustable clevis type hangers as specified. Hangers for insulated pipes shall have a diameter large enough to include insulation and a protection shield shall be installed with each hanger.
 - a. Cast iron pipe: Fig.590.
 - b. Copper tubing: Fig.CT-65.
 - c. Insulated steel pipe: Fig.300.
 - d. Uninsulated steel pipe: Fig.260.
 - e. Trapeze.
4. Rods: Continuous thread, Fig.146. Sizes shall be as specified.
5. Riser Clamps:
 - a. Black steel, Fig.261.
 - b. Plastic coated, Fig.261C.
 - c. Copper finish, Fig.CT121.

C. Horizontal Steel Piping Support Spacing and Rod Size:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 1-1/4"	3/8"	8 feet
1-1/2" & 2"	3/8"	10 feet
2-1/2" & 3"	1/2"	12 feet
4" & 5"	5/8"	12 feet
6"	3/4"	15 feet
8" & 12"	7/8"	18 feet
14" & 16"	1"	24 feet

D. Horizontal Copper Piping:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 1-1/2"	3/8"	6 feet
2"	3/8"	8 feet
2-1/2", 3", & 4"	1/2"	8 feet

- E. Insulation Protection Shield: Fig.167.
- F. Wall Access: Refer to drawings and to Section 15010 .

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide shut-off valves at inlets and outlets of equipment and branch connections to mains and as shown on Construction Documents.
- B. Final connections to apparatus, equipment, automatic control valves, and pressure reducing valves shall be made with flanges or unions between shut-off valve and connection.
- C. Connections to cooling coils and refrigeration machines shall have flanges or unions next to equipment to allow tube removal without extensive dismantling of piping.
- D. Pressure Relief Valves: Provide at cooling coil side of shut-off valves and where shown on Construction Documents.
- E. Flexible Connectors: Provide between vibrating equipment and piping.
- F. Location of Valves and Chain Operators:
 - 1. Install valves to be accessible for operation and free from interferences when operated.
 - 2. Position so leakage will not contact any electrical equipment located below.
 - 3. Provide valve chain operators for valves 4 inches and larger if the valve handle is more than 6 feet above the operating equipment room floor level.
- G. Pressure Gages: Provide as shown on Construction Documents and at following locations:
 - 1. At suction and discharge of circulating pumps.
 - 2. At inlet and outlet of evaporator and condenser.
 - 3. At makeup water inlet to expansion tanks and equipment.
- H. Pipe Hangers and Supports:
 - 1. Provide adjustable hangers, inserts, brackets, rolls, clamps, and supplementary steel as required for proper support of pipe lines.
 - 2. Design hangers to allow for expansion and contraction of pipe lines and of adequate size to allow covering to run continuously through hangers.
 - 3. Support piping independently of equipment.
 - 4. Coordinate location of hangers with light fixtures.
 - 5. Wire brush steel or iron supports and prepare surfaces under this section for painting.
 - 6. Pipes supported by trapeze hangers and not mounted on pipe rollers shall be secured to the trapeze with pipe clamps or "U" bolts.
 - 7. Hangers shall be placed at each change of direction, within 1 foot of valves and other appurtenances installed in horizontal piping and not more than 3 feet from end of each branch runout.
 - 8. Special Supports: Provide clamps, hangers, and supports according to equipment manufacturer's recommendations.

9. Supports of wire, rope, wood, chain, strap, perforated bar, or any other makeshift devices are not allowed.
 10. Where overhead construction does not allow fastening hanger rods in required locations, provide additional steel framing as required.
 11. Provide "Vibration Isolation" at supports subject to vibration.
 12. Maximum loading on inserts shall not exceed 75 percent of catalog rating.
 13. Floor supports, wall brackets, and expansion tank supports as shown on Construction Documents or as required to support equipment. Submit shop drawings.
 14. Buckling of piping due to inadequate provision for expansion shall be Contractor's responsibility. Piping shall be properly guided between expansion joints and anchor points.
- I. Water Flow Sensors: Install water flow tube stations according to manufacturer's published recommendations and as shown on Contract Documents.
- J. Dielectric Fittings: Provide dielectric fittings between piping of dissimilar metals.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15890 DUCTWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Related Sections:
 - 1. 15910 - Duct Accessories.
 - 2. 15940 - Outlets (HVAC).

1.2 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), latest edition:
 - 1. HVAC Duct Construction Standards (Metal and Flexible).
 - 2. High Velocity Duct Construction Standards.
- B. National Fire Protection Association (NFPA):
 - 1. NFPA 45 - Standard on Fire Protection for Laboratories Using Chemicals.
 - 2. NFPA 90A - Standard for the Installation of Air-conditioning and Ventilating Systems of Other than Residence Type.
 - 3. NFPA 96 - Removal of Smoke and Grease Laden Vapors from Commercial Cooking Equipment.
- C. National Electrical Code - NEC 70 (Edition applicable to the Project).
- D. American Society of Heating, Refrigerating, and Air-conditioning Engineers, Inc. (ASHRAE) 62 - Ventilation for Acceptable Indoor Air Quality.

1.3 SYSTEM DESCRIPTION

- A. All ductwork shall be sealed to comply with SMACNA:
 - 1. Seal Class A.
 - 2. Leakage Class 6 for rectangular ducts.
 - 3. Leakage Class 3 for round and oval ducts.
- B. Use of fiberglass or components containing coated or exposed fiberglass within airstreams is prohibited.

1.4 SUBMITTALS: In accordance with Section 01330

- A. Ductwork:
 - 1. Provide 1/4" scale composite Shop Drawings. Shop Drawings shall be coordinated with other trades before submitting.
 - 2. Catalog Cuts: Medium pressure ductwork, duct sealer, and turning vanes.
 - 3. Catalog Cuts, Ratings, and Performance Data: Flexible ductwork.
- B. Casings, Plenums, and Housings: Details of construction.
- C. Provide details of proposed typical ductwork fittings including:
 - 1. Seams and joints.
 - 2. Elbows, vaned and radius.
 - 3. Transitions and Offsets.

4. Taps and outlet frames.
 5. Branch connections and tees.
 6. Splitter dampers.
- D. Duct Hanger System: Catalog cuts and shop drawing.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Flexible: Genflex or Flexible Technologies or approved equal.
- B. Ductwork and Fittings:
1. Metal Aire.
 2. Semco.
 3. Spiramatic.
 4. United Sheet Metal.
 5. Or approved equal

2.2 MATERIALS

- A. Ductwork shall be fabricated and installed according to the SMACNA Standards, except as shown on drawings or specified.
- B. Ductwork shall have manufacturer's gage stamp intact.

2.3 LOW PRESSURE DUCTWORK

- A. Includes ductwork from low pressure air handlers, exhaust, and outside and return air ductwork. Velocities shall not exceed 1,300 fpm and static pressures not to exceed 2 inches WG.
- B. Provide galvanized steel ductwork, designed, constructed, installed and tested according SMACNA - "HVAC Duct Construction Standards" and as shown on drawings. Ductwork to have manufacturer's gage stamp. Provide cross-breaking or beading to prevent flexing, but do not reduce gage of metal below that required for flat ductwork sheets.
- C. Provide galvanized steel saddles at points of support of insulated piping saddles.
- D. The following ductwork and plenums shall be insulated, unless noted otherwise.
1. Return air ductwork in non-conditioned spaces, including mechanical rooms and space above ceilings.
 2. Return air transfer boots.
 3. Return/outside air plenums at air handlers.
- E. Plenums:
1. Galvanized steel with the largest dimension of 30 inches and larger shall be 18 gages.
 2. Plenums shall be constructed, designed, installed, and tested according to SMACNA as specified. Joints shall be angle reinforced pocket type. Provide fully gasketed joints between plenums and filter sections.
 3. Provide plenum access doors where indicated on drawings. Doors shall be constructed according to Figure 6-12 of SMACNA - HVAC Duct Construction Standards.
- F. Flexible Insulated Ductwork:

1. Lightweight duct, core of corrosion resistant reinforcing wire helix permanently bonded within fabric, insulated with 1-1/2" thick, 3/4 lb. density fiberglass flexible insulation and covered with a vapor barrier of aluminum metalized polyester film laminated to glass mesh, elastomer back coated. Duct shall meet NFPA 90A requirements and be listed as Class 1 Air Duct Material, UL 181.
 2. Manufacturers:
 - a. Atco Rubber Products.
 - b. Genflex.
 - c. Thermaflex II.
 - d. Venture Type VTKC.
 - e. Wiremold Co.
 - f. Or approved equal
- G. Ductwork and splitter dampers within the ductwork shall be made of the same material.
- H. Turning vanes shall be provided in square elbows and shall be of same material as the ductwork. Turning vanes shall be of airfoil type, double thickness factory fabricated.

PART 3 EXECUTION

3.1 GENERAL

- A. Install low and medium velocity ductwork as shown on drawings. 90-degree bends shall not be made in medium pressure flexible ducts.
- B. Before systems are tested and balanced, ducts shall be thoroughly cleaned and blown out.
- C. Where interferences arise during construction, make transition or division of ductwork on basis of pressure drop equivalent to original size. Obtain approval from the Engineer and EOR, as directed by the Engineer, before fabrication.

3.2 INSTALLATION

- A. Install ductwork materials and accessories according to the latest edition of SMACNA Low Velocity Duct Construction Standards as specified. These written specifications shall take precedence in case of conflict.
- B. Seal all duct joints with sealer as specified for field sealing of high-pressure ductwork according to SMACNA.

3.3 LOW PRESSURE DUCTWORK

- A. Seams and joints in ductwork shall be made airtight. Make exhaust ducts passing through return air chases airtight.
- B. Install flexible ductwork shall be installed in sizes to match diffuser necks as indicated on drawings schedules. Duct length shall be not less than 5 feet and no longer than 7 feet. Duct shall be adequately supported to prevent kinks and sharp bends. Install according to manufacturer's recommendations and as shown on drawings.

3.4 DUCTWORK SUPPORTS AND HANGERS

- A. Provide support and hangers according to SMACNA HVAC Duct Construction Standards.

- B. Hangers shall be galvanized steel hung from inserts or clip angles secured to structure with expansion bolts in shear or tension as follows:
1. Roof Slab: In tension.
 2. Structural Beams: In shear, 12 inches minimum from bottom of beam.
 3. Joists: Use existing forming bolts openings only. Hangers shall be bent under ductwork at least 2 inches. Hangers for ducts over 48 inches wide shall be secured to bottom and sides of duct.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15910 DUCT ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. 15890 - Ductwork.
 - 2. 15940 - Outlets (HVAC).

1.02 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): Low and High Velocity Duct Manuals.
- B. National Fire Protection Association (NFPA) 90-A Standard for the Installation of Air-conditioning and Ventilating Systems of Other Than Residential Type.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Volume Dampers: Shop drawings.
- B. Low Pressure Ductwork Round Fittings: Shop Drawings or catalog cuts.
- C. Flexible Connections: Catalog cuts.
- D. Test Holes: Pipe couplings, catalog cuts, and proposed installation locations.

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Volume Dampers:
 - 1. Dampers shall be manual or automatic as indicated on drawings. Dampers furnished with automatic actuators shall be installed under this section.
 - 2. Volume dampers shall have opposed blades.
 - 3. Volume dampers shall be 2 gages heavier than the installed duct and shall be reinforced to prevent vibration and noise.
 - a. Dampers shall be according to SMACNA "Low Velocity Manual", as referred to in "Ductwork". Dampers shall have an indicating device with lock to hold damper in position for proper setting.
 - b. Splitter dampers shall be double thickness at the leading edges.
 - c. Volume dampers shall be fabricated according to Figure 2-12 of SMACNA Low Pressure Manual.
 - 4. Bridge lock type quadrant operators of dampers shall mount flush with surface of duct insulation.

- B. Flexible Connectors: Size flexible connections at a minimum of 4 inches between connected items. Provide 30-ounce glass fabric fire retardant and airtight, coated with neoprene on both sides. Ventglass by Ventfabrics, Inc. or Neoprene Fabriduct by Elgen or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Flexible connections shall be provided as shown on drawings. Lengths shall be between 3 feet and 8 feet.
- B. Low pressure ductwork round fittings shall be installed as shown on drawings and according to manufacturers recommendations.
- C. Provide test holes at mains and main branches and as required by test and balance contractor.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15940 OUTLETS (HVAC)

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15890 - Ductwork.
2. 15910 - Duct Accessories.

1.02 SUBMITTALS: In accordance with Section 01330

- A. Outlets: Catalog cuts and schedules of installation and performance data at noted capacities.
- B. Outlet Accessories: Plaster frames, opposed blade dampers, and square to round neck adapter catalog cuts.
- C. Samples: Submit color chips for manufacturer's standard baked enamel colors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Air Outlets:

1. Air Guide
2. Price
3. Grille Tech
4. Or approved equal

2.02 MATERIALS

- A. Plaster frames shall be provided for plaster and dry wall ceiling and wall installations.
- B. Finishes shall be as follows:
1. Devices installed on surfaces to be painted shall match surface color. Factory prime coat.
 2. All Other Areas: Factory applied baked enamel. Color to match color chip furnished by the Engineer.
 3. Aluminum Devices: Satin aluminum baked enamel, except as specified.
- C. Provide a synthetic sponge rubber gasket between each frame and mounting surface forming an airtight seal.
- D. Manufacturer's published performance data shall be obtained from testing performed in a laboratory certified by the Air Diffusion Council. Testing shall be according to ADC Test Code 1062R4.
- E. Air diffusers shall be provided with opposed blade volume dampers adjustable from diffuser

face, blanking for proper coverage, and blow without producing objectionable noise or air motion at occupied level.

1. Diffusers in the same room shall be the same size and type, except as otherwise noted.
2. Diffusers shall be suitable for operation at 5 percent excess and 25 percent less than noted capacities.
3. Louvered face ceiling diffusers shall be of square, round, or rectangular face patterns. Provide:
 - a. Removable central core, snap-in type.
 - b. Flat flanged frame.
 - c. Welded aluminum construction.
 - d. White baked enamel finish.
4. Perforated ceiling diffusers are not allowed.

F. Grilles and Registers.

1. Ceiling return and exhaust registers shall be 1/2" x 1/2" x 1/2" grid type with opposed blade dampers and aluminum construction with white baked enamel finish. Frame shall be suitable for plaster frame mounting where required.
2. Sidewall return and exhaust registers shall be aluminum flange frame with fixed 45 degrees louvers spaced 3/4" with an opposed blade damper. Louvers shall be parallel to the long dimension.
3. Grilles shall be as specified for registers except dampers are not required. Perforated ceiling return grilles shall be of the lay-in type to match perforated ceiling diffusers.

G. Sidewall supply grilles and registers shall be aluminum flange framed, with 2 sets of adjustable vanes parallel to the long and the short sides and an opposed blade damper.

H. Supply and return, registers, diffusers, and grilles shall be provided with frames and finishes suitable for wall or ceiling finish and construction where installed. Coordinate with Construction Documents for ceiling types and locations.

I. Air outlets shall be provided as indicated on drawings. If outlet type is not indicated on the drawings, provide type used in similar areas elsewhere in the building.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Manufacturer of air distribution devices shall be responsible for examining application of each diffuser, grille, and register and guaranteeing each will provide comfort space conditions without drafts and excessive noise at noted capacity.

3.02 INSTALLATION

- A. Install and connect all light troffer diffusers as required by the construction documents.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 16023 CODES AND STANDARDS

PART 1 GENERAL

1.01 REFERENCES

- A. Comply with the following:
 - 1. Florida Building Code (FBC).
 - 2. National Electrical Code - 1999 (NEC), (NFPA 70).
 - 3. Florida Fire Prevention Code - 2014

1.02 QUALITY ASSURANCE

- A. Where materials and equipment are available under the continuing inspection and listing service of Underwriters Laboratories (UL), furnish materials and equipment so listed.

PART 2 NOT USED

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16100 BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 SUMMARY

A. Coordination with Other Trades:

1. Examine drawings and specifications. Visit site to determine work to be performed by Electrical, Mechanical, HVAC, and other trades.
2. Provide required electrical materials and equipment to put work into operation, completely wired, tested, and ready for use including raceways, conductors, disconnects, starters/contactors, or other devices for proper operation and sequences of electrical, mechanical, or other systems or equipment.
3. Unless otherwise noted, conduit, wire for controls, and devices, both line and low voltage, shall be provided and installed as described in this or other parts of the Construction Documents.
 - a. Install boxes or housings necessary for conduit and wire to controls, excluding items to be installed in piping, ducts, tanks, machinery, solenoid valves, pressure switches, aquastats, or similar devices.
 - b. These items are specified for installation in other sections. Connecting wiring is specified in this Division.
4. Control wiring in separate conduit between HVAC sensing devices and control panels or motors, shall be installed under this Division after verification from approved shop drawings of the required locations and connections.
5. Connect electrical equipment and devices as parts of the equipment or furniture furnished under other sections.

1.02 SUBMITTALS: In accordance with Section 01330

A. Manufacturers Data:

1. Complete list of materials to be furnished under this section.
2. Manufacturers' specifications and other data required to assure specification compliance.
3. Catalog cuts, clearly marked for identification of items to be provided, including disconnects, breakers, fuses, starters, lighting fixtures, transformers, or other materials not requiring specially prepared Shop Drawings.

B. Shop Drawings for nonstandard items, including but not limited to panelboards, switchboards, control centers, anchoring layouts and details, lighting fixtures, or similar products.

C. Contract Closeout Submittals:

1. Project Record Drawings.
2. Warranties.
3. Operating Instructions, maintenance manuals, and parts lists.
4. Point-to-point wiring diagrams.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage:

1. Deliver materials to jobsite in their original unopened containers with labels and certifications intact and clearly legible at time of use.
2. Store materials according to manufacturers' recommendations and as approved by the Engineer.

B. Replacement: In case of damage, pilferage, or other loss, make immediate repair or replacement of materials necessary to obtain approvals of the Engineer, without cost to the DTPW.

C. Protection: Use necessary means to protect materials of this section before, during, and after installation, including protection of installed work and materials of other trades.

PART 2 NOT USED

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16112 RACEWAYS AND CONDUIT

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16120 - Wire and Cable.

1.02 SYSTEM DESCRIPTION

- ##### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Product Data: Manufacturer's literature including printed installation instructions and recommendations before starting work. Submit samples if requested.

1.04 QUALITY ASSURANCE

- ##### A. Electrical Component Standard: Components and installation shall comply with NFPA 70 - National Electrical Code - 2014 (NEC).

PART 2 PRODUCTS

2.01 EQUIPMENT

- ##### A. Conduit shall be sized according to NEC, unless otherwise noted. Feeders and home runs shall not be less than 3/4" diameter.

B. Electrical Metallic Tubing (EMT):

1. Galvanized steel tubing with smooth interior coat of lacquer enamel or zinc coat.
2. Comply with ANSI C80.3-1983, and UL 797, and Article 348 of the NEC.

C. Flexible Metal Conduit:

1. Steel: Flexible galvanized steel conduit (Greenfield) complying with UL 1 and Article 350 of the NEC.
2. Liquid Tight: Flexible galvanized steel conduit with oil and water-resistant overall plastic sheath, complying with UL 1, and Article 351 of the NEC.
3. Minimum size for flexible metal conduit 1/2" except 3/8" where allowed by Section 349 of the NEC for connections to lighting fixtures.

D. Conduit Fittings:

1. EMT fittings: Zinc or cadmium plated steel or malleable iron of the compression type or stainless-steel multiple point locking (set screw) type. Connectors shall have insulated throats. Fittings shall comply with ANSI C80.3-1983. Die cast zinc alloy fittings are not allowed.
2. Flexible metal conduit fittings: Steel or malleable iron only with insulated throat,

- complying with Fed. Spec. W-F-406B. Die cast zinc alloy fittings are not allowed.
3. Bushings and connectors shall incorporate an insulating insert of at least 150 degrees C. rated plastic or 105 degrees C. rated nylon. Conduit bushings made entirely of nonmetallic material are not allowed. Grounding and bonding bushings shall have clamp type terminal for copper conductor.
 4. Expansion Fittings and Sealing Fittings: UL listed with ground continuity means.

E. Conduit Supports:

1. Straps: Formed zinc coated steel or malleable iron one-hole pipe straps or conduit clamps sized for conduits or tubing.
2. Fastenings: Zinc coated, or cadmium plated steel screws, bolts, toggles, and expansion anchors as required.
3. Electrical steel channels shall be Unistrut P-3000 Series or approved equal. Provide trapeze, clamps, supports, concrete inserts, galvanized steel or plated steel with galvanized conduit clamps, and threaded 1/4" diameter minimum suspension rods.
4. For individual branch circuit EMT or flexible metal conduit concealed above accessible hung ceilings only, "caddy clips" spring steel conduit clamps.

F. Wireways and Auxiliary Gutters:

1. Hot dip galvanized code gage sheet steel, complete with knockouts, enclosures, and removable covers unless indicated as hinged.
 - a. Manufacturers:
 - 1) Hoffman.
 - 2) Lee Products.
 - 3) Keystone.
 - 4) Square D.
 - 5) Or approved equal
2. Exterior locations shall have weathertight gasketed covers, joints, and drip-proof rain shields. Paint after installation with exterior enamel paint.
3. Wireways and gutters shall comply with Articles 362 and 374 of the NEC.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not proceed with the work of this Section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Provide where indicated and where required, ducts, conduits, tubing, wireways, and gutters to form a complete and integrally grounded raceway system. The system shall be installed according to NEC and local code requirements. Components of the system shall be of sufficient size, strength, and capacity to allow for placements, pulling-in, or other installation of conductors, wires, cables, splices, taps, and terminations whether included in this Contract or for future use without strain or injury to those items being installed.
- B. Provide pull wires in empty raceways where no conductors are installed in this Contract. Allow 10 inches minimum slack at each end of pull wire and securely caulk in place. Provide marking

tags showing opposite destination noting building and closet number at each end.

- C. The minimum size of, EMT, and flexible metallic conduit shall be according to NEC except as follows:
1. Unless otherwise specified under "Products" or shown on the Drawings.
 2. Unless otherwise shown on the Drawings, telephone conduits shall be not less than 1-inch trade size.
 3. Feeders and homeruns shall not be less than 3/4" diameter.
- D. Check sizes of raceways to determine the green equipment ground conductor specified, shown, or required can be installed in the same raceway with phase and neutral conductors according to the percentage of fill requirements of NEC. If necessary, increase the duct, conduit, tubing, or raceway sizes shown or specified to accommodate conductors without additional cost to the DTPW.
- E. Raceway and Conduit Locations: Unless indicated otherwise, conduit types specified shall be used in the following locations. Any deviation from this schedule shall be submitted for approval with corresponding price adjustments before installation. Any conduit installed and not of the specified type shall be removed and replaced with the specified type at no additional cost to the DTPW.
1. Interior Raceways:
 - a. Embedded in Concrete Walls or Floors Above Grade:
 - 1) EMT with concrete tight steel fittings.
 - b. Concealed in Masonry Walls:
 - 1) EMT with concrete tight fittings.
 - c. Concealed in dry wall construction, or in suspended ceilings: EMT or flexible metal conduit with steel fittings.
 - d. Interior Exposed:

EMT with steel fittings.
 2. PVC conduit shall not be used indoors either exposed or concealed.
- F. Raceway and Conduit Installation:
1. Conduit Routing:
 - a. Route feeders, homeruns, and conduits as indicated, except for minor deviations as accepted.
 - b. Maintain a minimum separation of 12 inches between conduits containing emergency feeders and conduits containing normal feeders.
 - c. The routing of conduit, as shown on the plans, is general.
 - d. Before installing any work, examine the working layouts of all other trades to determine exact locations and clearances.
 - e. Where equipment is installed by other trades requiring connection as specified in this section, determine exact conduit entry locations from the approved shop drawings.

- f. Modifications to conduit runs shown on the electrical drawings, based on this section, shall be made without additional cost to the DTPW, and shall be subject to Engineer approval.
 - g. In determining clearances, conduit shall not be run within 6 inches of any heated pipe or duct, or if unavoidable, the conduit must be kept at least 1 inch from the outer covering.
2. Conduits in Finished Spaces:
- a. Conduits, fittings, outlet boxes, and pull boxes shall be concealed in ceilings, floor slabs, walls, or partitions of the buildings.
 - b. Provide sufficient space at concealed conduits over conduit and coupling for the applications of finished floor, walls, and ceilings.
 - c. Examine the Drawings, and if necessary, confer with the Engineer to determine the type of construction containing the concealed conduits and the space available for such conduits.
3. Conduit Bending, Cutting, and Placement:
- a. Conduit bends and offsets shall be avoided where possible.
 - b. Required bends shall be made with standard benders designed for the purpose and with a minimum radius of 6 times the internal conduit diameter.
 - c. Make conduit bends according to the NEC unless otherwise shown on the contract Drawings. Use of a pipe tee or vise for bending conduit is not allowed.
 - d. Conduit crushed or deformed shall not be installed.
 - e. Bends shall be free from dents or flattening. Bends more than 360 degrees are not allowed in conduit between any 2 terminations of pull boxes.
 - f. Make no bend in surface raceways. Use factory formed fittings for surface raceways.
 - g. Raceways shall not contain more than two 90-degree bends or equivalent. Provide additional junction or pull boxes to meet this requirement.
 - h. The ends of conduit shall be carefully reamed out free from burrs before installation and after threading.
 - 1) Cuts shall be made square.
 - 2) Coupling of conduits by means of running threads is not allowed.
 - 3) Where it is impossible to run the conduit and coupling sections together, an Erickson coupling or an approved equal combination coupling shall be used.
 - 4) Joints shall be made up tight.
 - 5) Joints in conduits concealed in slab, floor fill, earth, etc., shall be made using approved silicone paint on threads.
 - i. Prevent lodgment of plaster, dirt, or trash in raceways, boxes, fittings, and equipment during course of construction. Clogged raceways shall be entirely freed of obstructions or replaced.
 - j. During installation of conduit, unfinished runs and terminations in pull boxes, cabinets, etc., shall be capped until conductors are installed.
 - k. Plastic caps designed for this specific purpose shall be used to cover and align conduits before concrete pours and shall remain on conduit stub-ups until conduit is extended. Caps shall have self-aligning, interlocking male or female wings molded on each side. Duct or electrical tape and wire are unacceptable.
4. Conduit Connections:

- a. Conduit and EMT runs shall be mechanically and electrically continuous from service entrance to outlets. Unless otherwise specified, each conduit shall enter and be securely connected to a cabinet, junction box, pull box or outlet box by means of a locknut on the outside and a bushing on the inside or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter. Where nominal circuit voltage exceeds 250 volts:
 - 1) In EMT or flexible metal conduit, the 1 locknut shall be made wrench-tight.
 - 2) Locknuts shall be the bonding type with sharp edges for digging into the metal wall of an enclosure and shall be installed to provide a locking installation.
 - 3) Locknuts and bushings or self-locking adapters will not be required where conduits are screwed into tapped connections.
 - 4) Protect vertical runs of conduit or EMT terminating in the bottoms of wall boxes or cabinets, etc., from the entrance of foreign material before the installation of conductors.
 - b. The end of each conduit one inch and smaller shall be provided where it enters a junction box, outlet box, cabinet, etc., with the locknut and bushing. For conduits 1-1/4" and larger, use insulated bushings with ground stud. If insulated bushings are of the fully insulated type, use additional locknuts inside the junction box or cabinet before installing the bushing. Provide conduit entering main distribution switchboard feeder pull boxes with insulated bushing with ground stud regardless of size.
 - c. Install the conduit system complete before any conductors are drawn in. Each run of conduit shall be blown through and swabbed after plaster is finished and dry, and before conductors are installed.
 - d. Install conduit to drain any moisture, collecting in the conduit, to the nearest outlet or pull box, where possible.
 - e. Where metallic conduit is exposed to different temperatures, seal the conduit to prevent condensation and passage of air from one area to the other.
 - f. Light and power conduit shall run from a permanent and continuous ground return back to the service ground connection point. Conduits used on systems entirely isolated from the light and power distribution system shall be electrically continuous and grounded in an approved manner.
5. Conduit Penetrations and Supports:
- a. Sleeves, conduits, or other pipes passing through floor slabs, beams, or walls shall be located to not impair the strength of the structure.
 - b. Conduits penetrating the walls or smoke partitions shall be fire stopped (sealed). Filling materials for openings in floors shall be fire-resistive, and finished to prevent passage of water, smoke and fumes. Filling material for openings in walls shall be fire-resistive where it occurs in fire walls and shall be installed to prevent the passage of air, smoke or fumes. Where conduit and wiring pass through fire walls or floor slabs, the Contractor shall fill the opening with fireproof sealant.
 - c. Where conduits passing through the openings are exposed in finished rooms, the finishes of the filling materials shall match and be flush with the adjoining floor, ceiling, or wall finishes.
 - d. Where unused sleeves or slots are provided for future installation of conduit, etc., they shall be suitably identified if not readily recognizable.
 - e. EMT and conduits not embedded in concrete or masonry shall be securely and independently supported so that no strain will be transmitted to outlet box and

- pull box supports, etc. Supports shall be rigid enough to prevent distortion of conduits during wire pulling.
- f. Run conduits exposed in unfinished spaces, mechanical equipment spaces, where specifically indicated on the Drawings, or with the expressed permission of the Engineer.
- 1) Feeder conduits shall be run exposed or in hung ceilings, except as noted.
 - 2) Where exposed conduits are installed, they shall be run parallel to the building walls or partitions, using approved conduit fittings.
 - 3) Exposed conduits shall be securely supported with malleable iron pipe straps, angle iron pipe straps, angle iron or steel channel racks or other approved means as required for clearance of other piping or ductwork.
 - 4) Spacing of conduit supports shall not exceed 7 feet.
 - 5) Horizontal feeder conduit banks shall have their hangers fastened to the building structure by approved means.
 - 6) Hangers for banks consisting of 1 or 2 conduits may be fastened from inserts in the slab.
 - 7) Auxiliary steel for fastening shall be furnished and installed under this section.
- g. Support individual conduits not larger than 1-1/2" diameter by means of one-hole pipe straps or individual pipe hangers. Support individual horizontal conduits larger than 1-1/2" diameter by individual pipe hangers.
- h. Conduit located in hung ceilings shall be supported in approved manner similar to exposed conduits.
- i. Branch circuit conduits above suspended ceilings may be supported from the floor construction above or from the main ceiling support members, however, the finished installation shall not interfere with the removability of ceiling panels. Individual branch conduits above suspended ceilings with removable panels may be supported from the ceiling suspension wires provided the load imposed on any individual wire is not greater than 64 pounds, including the ceiling weight.
- j. Unsupported vertical drops over 10 feet from bus ducts or at motors shall be in rigid steel conduit. For vertical drops of less than 10 feet EMT may be used. Brace conduit to prevent swaying.
- k. Space conduits installed against concrete or masonry surfaces away from the surface by clamp backs or other approved means.
- l. In dry locations, spring steel fasteners, clips, or clamps specifically designed for supporting exposed single conduits may be used instead of pipe straps or pipe hangers.
- 1) Hanger rods used with spring steel fasteners shall be not less than 1/4" diameter steel with corrosion resistant finish.
 - 2) Spring steel fasteners shall be specifically designed for supporting single conduits or EMT
 - 3) Type, size and spacing of spring steel fasteners with accessories shall be approved by the Engineer.
 - 4) Submit applicable load and rating data for approval.
 - 5) Wire shall not be used for support.
 - 6) Nails are not allowed for the support of conduit.
- m. Where 2 or more horizontal conduits or EMT run parallel and at the same elevation, they shall be supported on multiple trapeze pipe hangers. Each conduit or EMT shall be secured to the horizontal hanger member by a U-bolt,

- one-hole strap, or other suitably designed and approved fastener.
- n. U-bolts, clamps, attachments, and other hardware necessary for hanger assembly, and for securing hanger rods and conduits shall be provided. Each multiple hanger shall be designed to support a load equal to or greater than the sum of the weights of the conduits, wires, hanger, plus 200 pounds. Hardware shall be hot-dip galvanized after fabrication.
6. Conduit Fastening: Fasten raceways as follows:
- a. To Hollow Masonry: Toggle bolts or expansion bolts as required. Holes not used to be filled.
 - b. To Concrete or Solid Brick Masonry: By expansion bolts. Holes drilled to a depth of more than 1-1/2".
 - c. To Steel Work: Machine screws, welded threaded studs, or spring-tension clamps. Raceways or pipe straps shall not be welded to steel structures.
 - d. To Light Steel Construction Partitions: Sheet metal screws. Bar hangers may be attached with saddle ties of 16 gage double strand zinc-coated steel wire.
 - e. Nail-type nylon anchors with lock washers and nuts may be used instead of expansion bolts or machine screws.
 - f. Explosive charge setting devices are not allowed for any type of fastening on the project.
 - g. Conduits, tubing, or raceways shall be continuous from outlet to outlet, cabinet, junction box, or pull box.
 - h. Surface Wireways and Auxiliary Gutters: Fasten according to manufacturer's directions with fastenings appropriate for surface as specified.
 - i. Cable Supports in Vertical Raceways: According to NEC Article 300-19.
7. Flexible Conduit:
- a. Flexible conduits shall be used for connections to motors and other electrical equipment when it is subject to movement, vibration, misalignment, cramped quarters, or where noise transmission is to be eliminated or reduced. Flexible conduit used to meet the above requirements shall be of the liquid-tight type when installed under any of the following conditions:
 - 1) Moisture or humidity laden atmosphere where it is possible for condensation to accumulate.
 - 2) Corrosive atmospheres.
 - 3) Where water or spray due to wash-down operations is frequent or possible.
 - 4) Wherever there is a possibility of seepage, dripping, etc., of oil, grease, or water.
 - b. Flexible conduit shall be used for short connections to control devices, recessed fixtures, and similar items with enough slack to avoid tension. Connection between structure and first point of attachment to vibrating equipment shall be flexible.
8. Empty Conduits: Where empty conduit or tubing is indicated for wiring to be installed in future by utility company or by separate contract, install conduit or tubing according to previous requirements for conduit and tubing with following additional requirements:
- a. No length of run shall exceed 75 feet for 3/4" size and 150 feet for 1 inch or larger sizes.

- b. Raceways shall not contain more than two 90-degree bends or equivalent.
 - c. Install additional pull or junction boxes to comply with above limitations, whether or not indicated.
 - d. Inside radii of bends in conduits of 1 inch or larger shall be not less than 10 times nominal diameter.
 - e. Provide pull wire in empty raceways.
9. Painting: Paint exposed conduit to match the surrounding wall or ceiling it is mounted against.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16120 WIRE AND CABLE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16112 - Raceways and Conduit.

1.02 SYSTEM DESCRIPTION

- ##### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Submit product data and descriptive literature before starting work.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Wire and Cable:

1. Wire and cable shall be soft annealed 98 percent conductivity copper with 600-volt A.C. thermoplastic insulation unless otherwise noted.
2. Wire and cable shall be new and manufactured not more than 12 months before installation.
3. Each coil or reel shall bear UL label and wire marked with AWG or circular mil wire size, voltage rating, insulation type, type stranding, and the manufacturer's name.
4. Unmarked wire found installed shall be replaced at no additional cost to the DTPW.
5. Wiring shall comply with NEMA WC-5, NEMA WC-7, IPCEA S-61-402 and IPCEA S-66-524.

B. Light and Power Wiring Circuit Conductors:

1. Light and power wiring circuit conductors shall be stranded in all sizes, and concentric strand Class B for conductors No.8 AWG and larger.

C. Wiring Insulation shall be as follows:

1. For Feeders and Motor and Equipment Power Circuits: *Type THWN-75 degrees C. in wet or dry locations, and THHN-90 degrees C. only at dry locations.*
2. For Branch Circuit Wiring for Lighting and Power Circuits: *Type THWN-75 degrees C. in wet or dry locations, and THHN-90 degrees C. only at dry locations.*
3. For Wiring Through Fluorescent Fixtures Where Fixture Is Used as Wireway: *Type THHN-90 degrees C.*

D. Color Coding:

1. Wire of Size No.8 and smaller shall be factory color coded 600 volt, THWN, or THHN. Sizes larger than No.8 may be factory color coded or color coded with 3M tape or

approved equal. Should tape be used, it shall cover not less than 6 inches of cable within enclosure.

2. Colors to be used in coding shall be:

120/208 Volt System

Neutral - White
Phase A - Black
Phase B - Red
Phase C - Blue
Ground - Green

277/480 Volt System

Neutral - Gray
Phase A - Brown
Phase B - Orange
Phase C - Yellow
Ground - Green

3. All other colors (violet, traced, etc.) shall only be used for switch legs, control, or communication circuits.
4. Conductors for control wiring shall be color coded, using different color coding than the energy conductor coding specified above. Control wires shall be numbered.

- E. Minimum Wire Size: Use No.12 AWG for control over 200 feet, unless otherwise noted. Control wiring may be No.14 AWG if distance is less than 200 feet.

1. Fire alarms, CCTV, intercoms, and intrusion systems shall have cable and wiring according to manufacturer's specifications or as specified.

- F. Wire and Cable Connectors and Terminations:

1. For splices in branch circuit conductors solid or stranded size No.10 AWG and smaller, use UL listed soft plastic wire nut with sharp self-cutting interior threads, 3M Scotchlok, Ideal Supernut, or T&B Piggy or approved equal, of the size to match the wire.
2. For terminations of stranded or solid wire in size No.10 AWG and smaller at equipment terminals, use UL listed, tin-plated copper, 600-volt vinyl insulated compression type ring or fork type equivalent to T&B "Sta-Kon" or Burndy "Vinylug" or approved equal.
3. For No.8 AWG and Larger: T&B "Locktite" connectors, Burndy "Versitap" connectors, or OZ-Gedney or approved equal, solderless connectors, with insulating covers, tape or heat shrink insulation system.
 - a. Terminations and splices in feeders may be made with solderless pressure type connectors complete with composition insulating covers, field insulating tape, or heat shrink insulation system.
 - b. Connectors and lugs for 250 mcm cable and larger shall be of the 2-hole type and for compression type shall have at least 2 indents.
 - c. Compression lugs and connectors shall be tin plated wrought copper, of size to match the cable.
4. Splices in underground exterior wiring shall be made fully waterproof by potting or encapsulating.
5. Insulating tapes shall be of a type approved for the application and shall be flame retardant. Tapes shall be as manufactured by 3M or Bishop Electric or approved equal.
6. Cable Ties: T&B "Ty-Rap" or Burndy "Unirap" or approved equal.
7. Cable Identification: Branch circuits wire markers 3M "Scotch Code" or approved equal. For feeder sizes, non-ferrous metal stencil tags.
8. Thermal Fusion Connections: "Catalytic thermal weld" by Cadweld or approved equal.

PART 3

EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Wire and Cable Installation:

1. Wire and cable shall be suitably protected from weather or damage during storage and handling and shall be in first-class condition when installed.
2. Conductors shall not be pulled into conduit until raceway system is substantially complete. Wiring shall be continuous within conduit runs. Splices will be allowed only at outlet and junction boxes. Joints shall be mechanically and electrically secure.
3. Pulling lubricants, if used, shall comply with UL requirements for the type of conduit material and cable insulation being used.
4. Care shall be taken to prevent cutting and abrasion of cable insulation during the pulling of feeders.
 - a. Ropes used for pulling of feeders shall be made of polyethylene or other suitable nonmetallic material.
 - b. Pulling lines shall be attached to conductor cables by means of either woven basket grips or pulling eyes attached directly to the conductors.
 - c. Rope hitches shall not be used.
 - d. Cables to be installed in a single conduit shall be pulled in together.
 - e. Where polyethylene insulation is used, and a pulling lubricant is required, the lubricant shall be certified by the manufacturer to be noninjurious to such insulation.
5. Do not bend cables during installation, either permanently or temporarily, to radii less than 12 times the outer diameters, except where conditions make the specified radius impracticable and shorter radii are allowed by the NEC and NEMA Standards.
6. Neatly and securely bundle conductors located in branch circuit panelboards, cabinets, control boards, switchboards, and motor control centers. Use nylon bundling straps.
7. Provide suitable installation equipment to prevent cutting or distortion of conduits during the pulling of feeders. Use masking or other means to prevent obliteration of cable identification when solid color coating or colored tracers are used.
8. Control wiring color codes shall be of type as required by its equipment manufacturer. Interconnections of control wiring shall be on numbered terminal strips.
9. Where 2 neutrals are installed in same conduit, their sets of wiring shall be grouped and clearly identified by permanent tags or other means.
10. At each outlet, a loop or end of wire not less than 9 inches long shall be left for connection to lead.
11. Leading end of each conductor pulled shall be carefully examined for damage to jacket. If damage is evident, cable shall be extended and further checked for damage, with good cable only to remain.
12. Cables in junction and pull boxes shall be properly trained and racked.
13. Branch circuit wiring in panelboard gutters shall be installed vertically in the gutter with a 90-degree bend at the supply circuit breaker, wire shall enter the circuit breaker lug horizontally.
14. Install cable supports and boxes at vertical feeders and according to the schedule in the NEC. Boxes shall be built of heavy steel plates not less than No.10 USS gage fastened to an angle iron frame with removable covers secured by brass machine screws. The cable support shall be of the split wedge type that clamps each conductor

firmly and tightens due to the weight of the conductor.

B. Wire and Cable Splicing and Terminations:

1. Splices and terminations of conductors shall be made using specified materials and methods installed according to the manufacturer's recommendations.
2. Splices in branch circuit wiring shall be made by stripping conductor insulation, twisting conductors until mechanically secure, and installing a self-threading insulated type connector. Splices are not allowed within panelboards.
3. Conductors shall be squarely cut and fully inserted into the lug barrel or connector. Insulation shall be stripped without cutting the conductor or removing strands, exposing the conductor for the minimum distance required for connection. Splice connectors shall be of a type and be so installed that the conductor is fully insulated by a skirt of such design or taped so cold flow of the conductor insulation will not be induced when the conductor is positioned in its final operating position.
4. Do not combine conductors under the same lug. Provide individual lugs for individual conductors. Re-tighten bolt type connectors 24 to 48 hours after initial installation and before taping.
5. Connectors shall be insulated by approved type, integral or separate cover, or by means of taping with approved plastic or rubber and friction tapes to provide insulating value equal to that of the conductors being joined. The number and size and combinations of conductors allowed by UL as listed on manufacturers' packaging of connector shall be strictly complied with.
6. Terminations at equipment terminal blocks shall be made using compression type connectors suitable to match terminal type.
7. Continuity of neutral on multi-wire branch circuits shall not be made on any device at terminal blocks, but shall be spliced and a tap brought out, thereby assuring no openings of the neutral in the replacement of a device.
8. Feeders shall be identified by means of nonferrous tags or pressure-sensitive labels securely fastened to all cables, feeders, and power circuits in vaults, pull boxes, manholes, switchboard rooms, terminations of cables, etc. Tags or labels shall be stamped or printed to include the feeder number, source and equipment supplied. If suspended type tags are provided, they shall be attached by nylon cables ties or other nonconductive permanent means.
9. Branch circuit conductors shall be identified at supply circuit breakers, with the circuit number using pressure sensitive adhesive wire markers.
10. Branch circuit wiring for lighting and other single phase 277 volt or 120-volt applications shall be multi-wired utilizing common neutrals. Under no circumstances shall any switch break a neutral conductor. Branch circuit wiring extending more than 100 feet to the nearest outlet from a panel shall be No.10.
11. Circuiting work shall comply with the following:
 - a. Loads on panel busses shall be balanced on phases as evenly as possible.
 - b. No neutral conductor shall be common to more than 1 circuit conductor connected to the same phase leg of the supply system.
 - c. Circuiting of panelboards shall allow breakers to be grouped logically by functions.

C. Voltage Drops at New Construction:

1. Total Allowable Drop for Service Source to Load: Limit to a maximum drop of 5 percent. Increase wire size, where necessary, to comply with this requirement.
 - a. Branch Circuits: Limit to a maximum drop of 3 percent.

- b. Service Source to Individual Panelboards: Limit to a maximum drop of 2 percent.
- D. Voltage Drops at Existing Construction:
 - 1. Total Allowable Drop for Service Source to Load: Limit to a maximum drop of 5 percent. Increase wire size, where necessary, to comply with this requirement.
 - a. Branch Circuits: Limit to a maximum drop of 3 percent.
 - b. Service Source to Individual Panelboards: Limit to a maximum drop of 3 percent.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16131 OUTLET, PULL, AND JUNCTION BOXES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16112 - Raceways and Conduits.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Materials shall bear Underwriters Laboratories (UL) labels.
2. Box size shall comply with NEC for number and size of conductors in boxes.
3. Box size shall comply with NEC for number and size of conduits entering and exiting each box.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Submit manufacturer's literature and technical data before starting work.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Outlet Boxes:

1. Provide outlet boxes at required locations, where shown on the drawings, and as specified.
 - a. Fixture studs shall be securely fastened in an acceptable manner.
 - b. Plaster covers shall have depths suitable to the finish being applied to the walls.
 - c. Sheet steel boxes shall be properly drilled and tapped.
 - d. There shall be not more holes in any of the outlet boxes than are required for the entering conduits.
 - e. Depth of boxes shall allow for easy wire pulling and proper installation of wiring devices.
2. Outlet boxes shall be galvanized steel or rust resistant malleable iron alloy and comply with ANSI C33.65.
3. Outlet Boxes shall be as follows:
 - a. For Recessed Ceiling Fixtures:
 - 1) 4-inch square sheet steel box with blank cover and suitable hanger bar-box to be fastened to ceiling suspension members in an acceptable manner not more than 1 foot from fixture opening.
 - b. For Surface or Stem Mounted Ceiling Fixtures from Slab with Concealed Conduit:
 - 1) 4-inch sheet steel octagon concrete ring of a depth suitable to the construction and furnished with top cover having a 3/8" fixture stud.

- c. For Ceiling and Wall Bracket Outlets on Exposed Conduit in Dry Locations:
 - 1) 4-inch octagon sheet steel box with 3/8" fixture stud.
- d. For Surface Mounted Ceiling Fixture or Hung Ceilings:
 - 1) 4-inch octagon sheet steel hung ceiling box with suitable hanger bars and 3/8" fixture stud. Box to be fastened to ceiling suspension in an acceptable manner.
- e. For Surface Mounted Wall Bracket Fixtures with Concealed Conduit:
 - 1) 4-inch square sheet box with round opening plaster cover and 3/8" fixture stud.
- f. For Ceiling and Wall Bracket Outlets on Exposed Conduit at Damp or Wet Locations:
 - 1) 4-inch cast iron.
- g. For Switches and Receptacles in Tile, Plastered, or Gypsum Board Walls:
 - 1) 4-inch square sheet steel box or multi-gang box with proper plaster covers as required. Two gangs may be provided by means of a 4-inch square box with two gang plaster cover.
- h. For Switches and Receptacles in Enameled or Face Brick walls, Unfinished Walls, and Woodwork:
 - 1) Single or multi-gang sheet steel utility boxes as required.
- i. For Switches and Receptacles on Exposed Exterior Conduit Work:
 - 1) Type FS or FD conduit.
- j. For Telephone or Computer Outlets:
 - 1) 4-11/16" square X 2-1/2" deep.
- 4. Boxes for fire alarm or signal systems, clocks, pilot lights, and other specialty equipment shall be by the manufacturer of the enclosed equipment.
- 5. Wet/Damp Locations:
 - a. Provide gasketed, weathertight, screw covers, code gage galvanized steel pull boxes with weatherproof conduit hubs, Myers Scru-Hub or approved equal, for pull boxes with multiple conduit entries.
 - b. Provide cast metal hub type, dipped in rust inhibitor and with gaskets for individual conduit runs.
- 6. Extension Rings: Do not use to increase the volume of boxes, except where necessary due to multiple conduit run conflicts.
 - a. Where such conflicts occur, an extension ring may be allowed for changes in direction of conduit to make necessary clearances.

- 1) Not more than one extension ring may be used for each box where necessary.

B. Pull and Junction Boxes:

1. Where indicated in the plans and specifications or where necessary for compliance with code requirements for cable installation, install junction and pull boxes of the proper size for conduits over 1-inch trade size. Pull and junction boxes shall be of adequate size to accommodate installation of conductors without excessive bending of conductors that could damage insulation.
2. Pull and junction boxes shall comply with Fed. Spec. WJ-800 and be of all steel construction, spot or seam welded at joints, and hot dip galvanized after fabrication.
3. Boxes shall be drip proof with screw attached covers. Each box shall have a turned-in lip welded at joint to develop full strength. Lip shall be drilled and tapped for 1/8" or 3/16" round head screws, symmetrically placed. To provide adequate length of thread, nuts shall be tack welded on inside of lip, or lip shall be made double thickness.
4. Pull and junction boxes shall be sufficiently rigid to withstand moderate twisting strains. Steel boxes shall comply with the following:
 - a. 100 cubic inches or less shall be of No.14 gage steel.
 - b. Between 101 and 8500 cubic inches shall be No.12 gage steel.
 - c. Larger boxes shall be No.10 gage steel.
 - d. Barriers and reinforcing angles shall be supplied as required.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work or this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Locations of outlets on electrical drawings are approximate only.
1. Do not scale drawings.
 2. Consult architectural plans, sections, elevations, and details for exact locations of outlets and equipment and rooms and spaces having furring or hung ceilings.
 3. Verify door swings on architectural drawings for properly locating light switches.
- B. Determine the proper position of outlets and receptacles. Relocate any outlet or receptacle without additional cost to the DTPW if improperly located.
- C. The Engineer reserves the right to change the location of any outlet, apparatus, or equipment up to the time of roughing in without additional cost to the DTPW, provided conduit runs are not substantially increased.
- D. Fasten and secure boxes to the building structure independent of the conduit. Provide acceptable plaster stops for boxes to be set in plastered walls and ceilings.
- E. Boxes and supports shall be fastened as follows:
1. To concrete or brick: Bolts and expansion shields.
 2. To hollow masonry: Toggle bolts, or bolts and expansion shields.
 3. To steel work: Machine screws or welded studs.
 4. Explosive charge setting devices are not allowed.

- F. Recessed wall outlets shall be flush with the wall surface. Install box in wall with cover to allow block or wall surface to fit tight against lip of cover.
- G. Where shown together on the plans, switches shall be ganged in one outlet.
 - 1. Switches and receptacles shall be ganged together only where plans specifically indicate such combinations.
- H. Outlets for duplex receptacles shall be arranged for vertical mounting of the receptacles except as specifically indicated on plans.
- I. Barriers shall be provided as necessary to isolate voltage classes.
- J. Under no circumstances shall outlet boxes for adjoining spaces be placed back to back in partition walls.
- K. Circuit breakers and switches shall not be grouped or ganged in outlet boxes unless they can be arranged where the voltage between exposed live metal parts of adjacent switches does not exceed 300 volts. Provide barriers between 120- and 277-volt switches where ganged together.
- L. Align rows of outlet boxes for ceiling lights.
- M. Unless noted, specified, or directed otherwise, wall outlets shall be centered above finished floor as follows:
 - 1. Convenience outlets: 18 inches to bottom of box.
 - 2. Utility outlets: 18 inches to bottom of box.
 - 3. Clock outlets: 90 inches to center.
 - 4. Exit lights: 6 inches over doorway.
 - 5. Switch outlets: 46 inches to bottom of box.
 - 6. Special purpose outlets: as directed.
 - 7. Telephone outlets: 18 inches to bottom of box.
 - 8. Fire alarm visuals with or without horns: 78 inches to bottom of box.
 - 9. Fire alarm horns: 6" minimum below adjacent surface, but not less than 8'6" or greater than 10'0" above finish floor.
 - 10. Fire alarm pull station: 46 inches to bottom of box.

Refer to Architectural drawings for additional mounting heights.
- N. Pull and junction boxes shall be provided at locations required to reduce length of cable pull or reduce number of elbows between outlets.
- O. Provide blank covers for outlet boxes when devices or wiring has been removed or not installed.
- P. Paint exposed boxes to match the color of the wall or ceiling to which they are mounted.
- Q. Where several feeders pass through a common pull box, tag each feeder to clearly indicate electrical characteristics, circuit number, and panel designation.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16140 WIRING DEVICES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. Division 16 - Electrical.

1.02 SUBMITTALS: In accordance with Section 01330

A. Submit properly identified manufacturer's literature and data before starting work.

1.03 QUALITY ASSURANCE

A. Comply with Florida Building Code (FBC).

1. Convenience outlets installed within 6 feet of water supplies, wet locations, and toilet rooms shall have a ground fault circuit interrupt (GFI) protection device.
2. Use of isolated ground receptacles is prohibited.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wiring devices shall be as manufactured by Hubbell (basis of design) or approved equal.

2.02 COMPONENTS

A. Wiring Devices: Comply with NEMA Wd6 and NEC (NFPA 70).

1. Switches:
 - a. Rated at 20 amps, 277 volts AC, horsepower rated for 1HP at 120 volts.
 - b. Provide for back (not push-in) or side wiring.
 - c. Key type switches shall be keyed identically.
 - d. Manufacturers: Hubbell CSB 120 Series.
2. Duplex Convenience Receptacles:
 - a. Comply with NEMA 5-20R as applicable, be of specification grade, back (not push-in) and side wired, U-slotted grounding type, 3-wire, rated 20 amp, 125 volts AC.
 - b. Double Duplex: Consist of 2 receptacles under a common plate. Single receptacles shall be similar to duplex receptacles.
 - c. Manufacturers: Hubbell CR20L.
3. Ground Fault Receptacles:
 - a. NEMA 5-20R type, rated at 20 amps, 120 volts with 5 ± 1 mA trip threshold, and UL nominal trip time of 0.025 sec.
 - b. Manufacturers: Hubbell GF5352.
4. Special Purposes Receptacles:
 - a. Comply with NEMA 5-20R, of specification grade, back (not push-in) or side wired.
 - b. Provide ratings and type as indicated on Drawings.

5. Wiring devices shall be ivory color unless noted otherwise.
- B. Lighting and Exhaust Fan Switch at Single Use Toilet Rooms: Switch with built-in time delay.
 1. Fan and light operate together when control is in "on" position.
 2. Fan continues to operate for a minimum of 5 minutes after light is turned off.
 3. 120V, 60 Hz, 4-amp capacity for each light circuit and fan circuit, ivory.
 4. No.5C209 by Broan or approved equal.
- C. Cover Plates:
 1. Outlets in shall have brushed stainless steel plates.
 2. Provide ganged switches to a maximum of three. If more are required on Drawings, provide in multiples of two or three.
 3. Provide weatherproof receptacles with cast aluminum, spring loaded dock-type gasketed wet location cover.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install wiring devices according to manufacturer's recommendations.
- B. Verify location of wiring devices before rough-in of outlet boxes and conduit with Architectural Drawings for door swings and furniture details. Duplex receptacles in finished areas shall be vertically mounted.
- C. Boxes mounted back-to-back are not allowed.
- D. Install devices tightly within box with screws provided. Do not rely upon plate for device alignment and support to assure devices are grounded to box. In receptacles, use self-grounding screws, separate ground conductor or bond wire to box.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16440 DISCONNECT SWITCHES

PART 1 GENERAL

1.01 SUMMARY

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels. Label for "SERVICE ENTRANCE" where so applied.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit manufacturer's literature and technical data before starting work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Disconnect Switches:
1. G.E.
 2. Siemens.
 3. Square D.
 4. Eaton
 5. Or approved equal

2.02 EQUIPMENT

- A. Disconnect switches shall comply NEMA KSI-1975 for type HD and shall be of heavy-duty type, enclosed, of quick-make, quick-break construction. Rating shall be as indicated on drawings. Switches shall be horsepower and I2t rated, UL labeled.
- B. Disconnect Switch Enclosure:
1. NEMA 1 for indoor use.
 2. NEMA 3R for outdoor use.
- C. Disconnect switch operating handle shall be of insulated box mounted type that directly drives switch mechanism suitable for padlocking in "OFF" position.
- D. Defeatable, front accessible, "coin-proof" interlocks shall be provided to prevent opening of cover when switch is in "ON" position and prevent turning switch ON when door is open. Securely fastened metallic nameplate shall include highly visible "ON-OFF" indication.
- E. Motor Disconnect Means: Provide each motor with an in-sight disconnect means, when required by NEC, and where shown on the drawings.
- F. Provide fuses for disconnect switches so indicated. Fuses shall be dual element type. See Section 16475.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install the disconnect switches vertically with top not more than 6 feet above the floor, and rigidly and securely attached to the building. Disconnect switches shall not depend upon conduit for support.
- B. Where used as service entrance main disconnects, switches shall be permanently labeled "MAIN SWITCH 1 of 4", "MAIN SWITCH 2 of 4", etc.
- C. Optional Mounting:
 - 1. Plywood Panel: Mount panelboards on backboard of 3/4" exterior grade plywood, finished one side, primed all surfaces, painted with one coat gray of fire-retardant enamel (finished side) and secure to wall with approved shields or screws as directed by the Engineer.
 - 2. Unistrut: Mount disconnect switches on Unistrut P-3000 mounting channels at top and bottom, secured similarly to wall.
- D. Label switch covers in 1-inch high stenciled letters showing equipment served.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16460 DRY-TYPE TRANSFORMERS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16120 - Wires and Cables.

1.02 SYSTEM DESCRIPTION

- ##### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Submit manufacturer's catalog cuts and technical data before starting work.
- ##### B. Submit test data for transformers as requested.

1.04 QUALITY ASSURANCE

- ##### A. Dry type transformer installation shall comply with NFPA 70 National Electrical Code - 1999 (NEC).

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Dry Type Transformers:

1. General Electric Corp.
2. Siemens
3. Square D.
4. Eaton
5. Or approved equal

2.02 EQUIPMENT

A. Rating:

1. Transformers shall be ventilated dry type, 3 phase, 60 Hertz, 480 volts delta primary and 208Y/120 volts secondary, with four 2-1/2 percent FCBN taps and two 2-1/2 percent FCAN taps. KVA rating shall be as shown on drawings.
2. Transformer insulation shall be Class "H", 220 degrees Centigrade insulation systems and shall be rated for operation (150 degrees C. rise above 40 degrees C. ambient). Insulating materials shall be according to NEMA ST20 standards.
3. Transformer sound level shall not exceed following values when measured according to ANSI C89.2-1974: 9 KVA to 45 KVA-45 DB, 50 to 150 KVA-50 DB, 150 to 300 KVA-55 DB.

2.03 DESIGN AND CONSTRUCTION

- A. Core and coil assembly shall be vacuum impregnated for maximum resistance to moisture and shall be mounted on vibration isolation pads.
 - 1. Transformers shall be provided with a drip-proof, rodent-proof, enclosure, having a durable finish and a rustproof diagrammatic nameplate.
 - 2. Wiring compartments shall have adequate space for terminating cables and shall be front connected for easy accessibility.
 - 3. Where transformers are exposed to the weather, provide weather shields.
- B. Core of the transformer shall be of high quality, cold-rolled, grain-oriented steel, annealed by manufacturer for low loss and exciting current.
 - 1. Laminations shall be formed to eliminate burrs and annealed to reduce losses to a minimum.
 - 2. Winding conductors shall be annealed and insulated by transformer manufacturer.
 - 3. Conductor surfaces shall be free from slivers, burrs, and other irregularities.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Dry type transformers shall be installed by Contractor according to manufacturer's instructions in rooms assigned for the installation of equipment.
- B. Transformer enclosures and secondary neutral shall be securely grounded to a cold-water pipe, 3/4" diameter by 10 feet long buried in direct contact with the earth, with a copper conductor sized according to NEC Table 250-94.
- C. Dry type transformers shall be floor mounted or bracket mounted as shown on drawings. Transformers shall be bolted to floor if floor mounted and shall be bolted to steel angles if bracket mounted, or as shown on drawings. Provide a 3-inch-high concrete pad under floor mounted transformers.
- D. Transformers shall be vibrationally isolated from the building structure by means of double neoprene pads (DNP), in addition to the vibration isolation built into the transformer. Neoprene shall be similar to Mason Industries Type W, or approved equal, 40 durometers minimum or sized for proper weight load.
- E. Conduit connections to the equipment shall be made with flexible conduit, loosely installed.
- F. Dry type transformers shall be installed with wiring compartment to front to allow removal.
- G. Maintain manufacturers recommended clearness from walls or surfaces to allow adequate ventilation. In no case shall the transformers be installed less than 6 inches from any wall.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16470 PANELBOARDS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide a complete Distribution Panelboard system as indicated on the drawings, and as specified herein.
- B. All materials shall be listed by an OSHA approved Nationally Recognized Testing Laboratory (NRTL).
- C. Related Sections:
 - 1. 16120 - Wire and Cable.

1.2 SYSTEM DESCRIPTION

- A. Panelboards used as service entrance equipment shall be NRTL labeled as service entrance equipment.

1.3 SUBMITTALS: In accordance with Section 01330

- A. Submit shop drawings, manufacturer's literature, and technical data before starting work.
- B. All switchboards and panelboards submitted shall be designed and manufactured according to the latest revisions of the following specifications:
 - 1. UL 50, UL 67, UL 89, UI489, UI 891, UL 1283, UL 1449
 - 2. Nema AB-1, PB1, PB1.1, PB2, PB2.1 PB 2.2
 - 3. NFPA 70
 - 4. Federal Specifications: W-C-375B, W-P-115C

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Panelboards:
 - 1. General Electric.
 - 2. Siemens.
 - 3. Square D.
 - 4. Eaton
 - 5. Or approved equal

2.2 EQUIPMENT

- A. Distribution and Power Panelboards:
 - 1. Interior: Provide fully rated plated copper bus. Plating shall run the entire length of the bus bar. Solid neutral and ground bar shall be copper. Maximum rating: 1200 amp.

2. Main breaker shall be horizontally mounted. Main breakers shall have conspicuous marking labels.
3. Trims shall have door with keyed lock. All locks shall be keyed the same.
4. Provide directory holder and typed directory for all circuits.
5. Enclosure shall be galvanized galvanneal steel constructed in accordance with UL50 and NEMA 250. Box end walls shall be blank.
6. Short circuit current ratings shall be equal to or greater than available fault current at point of application. NRTL listed series ratings may be utilized, where not in violation of NEC 240.86. Provide documentation of NRTL listed series rating used.
7. Surge Protective Devices (SPD) shall be provided when specified in the design and associated electrical plans, with optional peak surge current of 260kA.
8. Distribution panels for use at 120/208 volts shall be NRTL listed with minimum integrated assembly rating of 22K AIC.
9. Distribution panelboards, 400 amperes and over, shall be provided with molded case circuit breakers tested and labeled according to UL 489.

B. Lighting, Receptacle and Power Panelboards

1. Interior: Provide fully rated plated copper bus. Plating shall run the entire length of the bus bar. Solid neutral and ground bar to be copper. Maximum rating: 600amp.
2. Main breaker shall be vertically or horizontally located and have conspicuous marking labels.
3. Trims shall have door with keyed lock. All locks to be keyed the same. Provide trims with concealed door hinges and trim screws for panels 600 amps or less.
4. Provide directory holder and typed directory for all circuits.
5. Enclosure shall be galvanized steel constructed in accordance with UL50. Box end walls shall be blank.
6. Short circuit current ratings shall be equal to or greater than available fault current at point of application. NRTL listed series ratings may be utilized, where not in violation of NEC 240.86. Provide documentation of NRTL listed series rating used.
7. Provide SPD's when specified in the design and associated electrical plans, with optional peak surge current of 100kA.
8. Minimum rating of breakers shall be as follows:
 - a. Lighting and power panels for use at 120/208 volts: 225 amp maximum with circuit breakers rated at 10K AIC symmetrical at 240 volts.
 - b. Lighting and power panels for use at 480/277 volts: 225 amp maximum with circuit breakers rated at 14K AIC symmetrical at 480 volts.
9. Interiors shall be factory assembled and designed to allow switching and protective devices to be replaced without disturbing adjacent units, without removing the main bus connectors, and allowing circuits to change without machining, drilling or tapping.
10. Branch circuits shall be arranged using double row construction unless narrow column panels are indicated. A nameplate shall be provided listing panel type and ratings. Circuit breakers shall be bolt-on type.
11. Unless otherwise noted, full size insulated neutral bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral bussing shall have a suitable lug for each outgoing feeder requiring a neutral connection. A ground bus shall be provided in all panels.

C. Boxes and Trims shall meet the following criteria:

1. Boxes shall be at least 20 inches wide made from code gage galvanized sheet steel.
 - a. Provide minimum gutter space according to NEC requirements.

- b. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional required wiring space.
 - c. At least 4 interior mounting studs with adjustable nuts shall be provided.
 - 2. Switching device handles shall be accessible.
 - a. Doors and panelboard trims shall not uncover any live parts.
 - b. Doors shall have flush chrome plated handle with cylinder lock and catch, except doors over 48 inches in height shall have auxiliary fasteners top and bottom of door in addition to the flush type cylinder lock and catch.
 - c. Panelboard switching devices with individual dead front doors shall be acceptable instead of standard door in trim design.
 - d. Panelboard trim clamps shall be of the indicating type.
 - 3. Exterior and interior steel surfaces of the trim shall be properly cleaned, primed with rust inhibiting phosphatic coating, and finished with manufacturer's standard gray paint.
 - a. Trims for flush panels shall overlap the box for at least 3/4" all around.
 - b. Surface trims shall have the same width and height as the box.
 - c. Trims shall be mountable by a screwdriver without the need for special tools.
 - d. After installation, trim clamps shall not be accessible when the panel door is closed and locked.
 - 4. Panelboards exposed to the weather shall have NEMA type 3R raintight enclosure or NEMA 4X in corrosive environments.
- D. Electrical Components:
- 1. Main bus bars shall be fully rated copper bus bars, with plating shall running the entire length of the bus bar and shall be sized according to NRTL standards to limit the temperature rise on any current carrying part to a maximum of 50 degrees C. above an ambient of 40 degrees C. maximum. Provide main circuit breakers, main lugs, or sub-feed lugs as required.
 - 2. Each panelboard shall incorporate breakers as shown with AIC or higher, at the application voltage, than the available fault at its location along the electrical distribution system, as determined by the short circuit study. Minimum rating of breakers shall be:
 - a. Lighting and power panels for use at 120/208 volts: 225 amp maximum with circuit breakers rated at 10K AIC symmetrical at 240 volts.
 - b. Lighting and power panels for use at 480/277 volts: 225 amp maximum with circuit breakers rated at 14K AIC symmetrical at 480 volts.
 - c. Distribution panels for use at 120/208 volts: UL listed with minimum integrated assembly rating of 22K AIC.
 - 3. Panels tested and listed according to UL 67 and bearing an integrated short circuit rating shall be determined by the short circuit study on the electrical system with 10,000 AIC minimum.
 - 4. Any 2 single pole circuit breakers shall be replaceable by 1 two-pole circuit breaker and any 3 single-pole breakers shall be replaceable by 1 three-pole circuit breaker.
 - 5. Where new circuit breakers are specified to be installed within existing panelboards, they shall be compatible in terms of manufacture, type, and AIC.
 - 6. Breakers 100 ampere through 400 ampere frame sizes shall be thermal-magnetic trip with inverse time current characteristics, unless otherwise noted.
 - 7. Provide ground fault circuit interrupter circuit breakers where indicated.

8. Emergency Panelboards Identification: Paint door red and stencil in 1-inch high yellow letters "EMERGENCY PANEL" in addition to appropriate individual panel identification as shown on drawings.

PART 3 EXECUTION

3.1 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.2 INSTALLATION

- A. Panelboards shall be installed where indicated and with top of cabinet 6'-6" above floor and shall be rigidly and securely attached to building construction and shall not depend upon conduit for support. Allow at least 1/2" air space behind wall mounted panelboards.
- B. Install panelboards according to manufacturer's recommended data. Maintain clearances required by the National Electrical Code, with particular attention to working space around panelboards. Maintain clear space above panelboards, coordinate with other trades to avoid placement of panelboards below piping, ductwork, or other foreign appurtenances. Relocate panels at no additional cost should such interferences occur.
- C. Supply panelboards with phenolic nameplate 1-inch x 3 inch on exterior of panels and engraved with panel designation and voltage rating. Lighting and power panelboard shall be provided with a clear plastic enclosed typewritten directory inside. Circuit identification shall include load type (lighting, receptacles, etc.) and rooms served.
- D. Where flush type panelboards are indicated, provide one 3/4" empty conduit terminated in accessible ceiling above for each 3 spare circuit breakers provided in the panelboard.
- E. Install circuit breakers in existing panelboards according to manufacturer's recommendation. Verify tightness of connections including mains. Identify new circuits on the panel directory. If none exists, provide one.
- F. Clean and touch up panelboard as required at completion of the project.
- G. Support surface mounted panelboards for other than masonry walls, from floor slab secured "Kindorf" or "Unistrut" or approved equal channels. Mount those installed on masonry walls to back boards secured to walls, and according to manufacturer's recommendations and applicable codes and regulations. Contractor shall coordinate manufacturer's actual panelboard dimensions with room clearances to conform with NEC requirements.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16475 OVERCURRENT PROTECTIVE DEVICES

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections
 - 1. 16440 - Disconnect Switches.

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature and technical data before starting work.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Fuses shall comply with NEMA FUI and ANSI C33.42.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Circuit Breakers:
 - 1. GE.
 - 2. Siemens.
 - 3. Square D.
 - 4. Or approved equal.
- B. Fuses:
 - 1. Bussman.
 - 2. Cefco.
 - 3. Little fuse, Inc.
 - 4. Or approved equal

2.02 EQUIPMENT

- A. Circuit Breakers:
 - 1. Circuit breakers shall be a circuit interrupting device operating both manually for normal switching functions and automatically under overload and short circuit conditions, while providing circuit and self protection when applied in its ratings. Provide at voltage, phase, and amps indicated, with symmetrical amperes interrupting rating to be equal or larger than that shown on drawings. Control and signaling function may be incorporated by use of accessories.
 - 2. Operating mechanism shall be entirely trip-free so contacts cannot be held close against an abnormal over-current or short circuit condition.

3. Operating handle of circuit breaker shall open and close all poles of a multi-pole breaker simultaneously. Circuit breakers shall meet applicable NEMA AB-1 and have UL label. Each circuit breaker shall have a trip unit to provide overload and short circuit protection. Trip element shall operate a common trip bar that shall open all poles in case of an overload or short circuit through any 1 pole.
4. Ampere rating shall be clearly visible. Contacts shall be of non-welding silver alloy. Circuit breakers to be used in switch boards, lighting and power panel boards, distribution panel boards and individually enclosed shall be 1, 2, or 3 poles as indicated on drawings.

B. Molded Case:

1. Molded case circuit breakers shall be bolt-on type, mounted in lighting and power panel boards and individually enclosed units.
2. Molded case circuit breakers shall be quick-make, quick-break action.
3. Molded case circuit breakers for panel boards shall have the following minimum symmetrical ampere interrupting capacities (RMS):
 - a. 120 volts: 10,000 SAIC power panel boards.
 - b. 277 volts: 14,000 SAIC lighting panel boards.
 - c. 277/480 volts: Up to 50,000 SAIC distribution panel boards, or as shown on drawings.
4. Each molded case circuit breaker shall have a thermal magnetic trip device with trip ratings as shown on drawings.

C. Combination Molded Case and Current Limiting Fuse:

1. Bolt-on type mounted in switch boards.
2. Circuit breaker section shall be molded case and shall have the features previously mentioned for molded case breakers.
3. Fuse compartment located within molded case enclosure with accessibility for fuse replacing.
4. Unit circuit breaker shall trip as any of its fuses blows.
5. Unit shall be rated at 100,000 AIC RMS minimum.
6. Current limiting fuses provided as specified in this section.

D. Fuses:

1. Provide fuses for fusible equipment.
2. The time-current characteristic and ratings shall assure positive selective coordination.
3. Fuses, 601 amperes and larger, shall comply with UL Class L standard and be Shawmut Form 480 "Amp-Trap" or Bussman "Hi Cap".
4. Fuses, 600 amperes and lower, where applied to general feeder and branch circuit protection, shall comply with UL Class RKI standards and be Shawmut dual element "Amp- Trap" or Bussman "Low Peak" Limitron.
5. Dual element fuses shall have low resistance and relatively low operating temperatures. Fuses shall be provided with thermal protection against damage from poor contact. Fuse shall open when temperature at thermal cutout reaches 280 degrees F., preventing damage to clips and switches before fuse opens. They shall combine high interrupting capacity (200,000 ampere RMS symmetrical) with time delay, holding 500 percent load for a minimum of 10 seconds.
6. Current limiting fuses shall be designed to provide high interrupting capacity (200,000 AIC SYM RMS) plus fast clearing time restricting let-thru current and energy to very low values. Clearing time on a severe short circuit shall be limited to less than 1/4 cycle.
7. Individual motor circuit fuses shall be sized at approximately 150 percent of motor full load current. Fuses, below 600 amperes shall comply with UL Class RK5 standards and be Shawmut dual element "Amp-Trap" or Bussman Fusetron. Fuses or approved equal, 601 amperes and larger, shall comply

- with UL Class L standards and be Shawmut Form 480 "Amp-Trap" or Bussman "Hi Cap" KTU or approved equal.
8. Fuses, where required for circuit breaker backup protection shall comply with UL Class RK1 standards and be Chase-Shawmut Class RK1 "Amp-Trap" or Bussman "Limitron" or approved equal.
 9. Provide 10 percent spares (minimum of three) of each size and type of fuses furnished. Spare fuses shall be placed in a wall-mounted cabinet located in the main electric room.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install according to manufacturer's recommendations applicable codes and regulations and accepted submittals.
- B. Two and three pole breakers must be true two and three pole breakers.
 1. Do not combine single pole breakers with common handle connection to meet multiple pole breaker requirements.
- C. Label circuit breaker enclosures with 1-inch high stenciled letters showing equipment served.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16511 LIGHTING FIXTURES AND LAMPS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. 16112 - Raceways and Conduits.
 - 2. 16120 - Wire and Cable.

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.
- B. Explosion-proof, shielded, and vapor tight and wet location fixtures shall bear UL labels appropriate for the type of application.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit manufacturer's literature and technical data before starting work.
- B. Furnish certified photometric data for fixtures.
- C. Upon request, a sample of each fixture proposed for use and specified unit shall be submitted to the Engineer for review.
- D. Provide lighting calculations to comply with Florida Building Code (FBC) and IES minimum foot-candle level when required.

1.04 QUALITY ASSURANCE

- A. Comply with Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Lighting Fixtures:
 - 1. Provide lighting fixtures as indicated on the drawings and as specified.
 - 2. The schedule and details of lighting fixtures, appearing on the drawings, indicate the type, construction, appearance, quality, and performance of the fixtures required.
 - a. Any proposed deviation from the fixtures specified shall equal or be superior to the item specified under these headings.
 - b. Proposed substitute lighting fixtures will be judged on overall quality on construction.
 - c. Provide 120V working sample of proposed substitution with cord, plug, and lamp.
 - d. The fixture manufacturers products scheduled are considered acceptable, based on the equivalency of individual units as determined by the Engineer.

3. Materials used in the manufacture of fixtures shall be new and the best of their respective kind, and shall be formed and assembled in a neat, accurate, and professional manner.
 - a. Sheet metal shall be of sufficient thickness or shall be ribbed, flanged, or otherwise reinforced so that lighting fixtures and their component parts will withstand the stresses of normal handling and installation and service without undue distortion of shape.
 - b. Plastering or other installation procedures shall not be relied on to reinforce lighting fixtures or their component parts.
 - c. Fixture bases shall be metal and fastened to mounting location with metal components.
4. Finishes:
 - a. Painted steel sheet shall be processed with Bonderize or equal phosphate treatment or shall be Paintlok or Galvanneal or approved equal.
 - b. Unpainted sheet steel shall be Galvanneal, by Republic Steel or approved equal.
 - c. Springs shall be of full hard temper stainless steel.
 - d. Fasteners of ferrous metal shall be cadmium plated or zinc plated with chromate.
 - e. Screws mounting fixture housing in plaster ring shall be minimum #8, pointed to facilitate installation.
 - f. Plaster frame rings shall be of sufficient strength to withstand deformation during installation, and of suitable materials or finish to prevent corrosion from ceiling plasters and mortars.
 - 1) The contractor shall furnish the fixture manufacturer a complete list of fixtures that will be installed in acoustical plaster ceilings with types and quantities.
 - g. Painted finishes shall be baked epoxy, polyester powder coated, acrylic or approved equal finish suitable for the service required including temperature and accepted by the Engineer. Finish shall be applied after fabrication.
5. Fixtures shall be complete with canopies, suspensions of proper lengths, hickey, casing, sockets, holders, reflectors, hardware, and shall be completely wired and assembled. Each troffer shall have 2 earthquake clips minimum, positive enclosed spring-loaded catches, and safety hinges.
6. Furnish suitable plaster rings or plaster stops for fixtures set in plaster ceilings. Consult the "Finish Schedules" on drawings for locations and extent of plaster ceilings

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install fixtures according to manufacturer's recommendations.
- B. Install "Lay-In" type fixtures with 6-foot lengths of flexible conduit to enable fixture relocation with minimum inconvenience. Fixture to be securely fastened to ceiling frame members by

mechanical means as per the NEC.

C. Exit lights:

1. Install wall or ceiling mounted as shown on drawings.
2. Provide directional arrows required to show correct path to exit.
3. Install exit lights at a location and height to assure a clear line of sight from the egress passageway.
4. Relocate exit lights that are not readily visible at no additional cost to the owner.
5. Internally illuminated exit signs shall have LED light source on normal power.

D. Fixture Supports:

1. Support each fixture securely.
2. Each recessed light fixture shall be lay-in type supported by ceiling suspension system. Provide at least 2 earthquake clips.
3. Where pendant fixtures are mounted in continuous rows, the number of hangers shall equal the number of 4-foot lengths, plus 1.
4. Do not support fixtures to plaster or gypsum board ceilings.
5. Furnish and install steel members and supports to fasten and suspend fixtures.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

[illegible]

**TECHNICAL SPECIFICATIONS:
SPECIAL TERMS & CONDITIONS**

TRI-RAIL STATION



RPQ NO. TP-0000027284



**MIAMI DADE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS**

**METRORAIL BATHROOM
RENOVATION TO:**

TRI-RAIL

DTPW PROJECT NO. IRP215R2

**BID DOCUMENTS
TECHNICAL SPECIFICATIONS**

MARCH 30, 2023

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SECTION 01030 ALTERNATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for alternates.

1.03 DEFINITIONS

- A. Additive Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to the Base Bid amount if DTPW decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost for each alternate is the net addition to the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.04 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether indicated as part of alternate or not.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section. The requirements for materials necessary to achieve the work described under each alternate are included in these Technical Specifications. Refer to the appropriate section based on the work involved in each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES: See Section 01110 for complimentary information.

END OF SECTION

SECTION 01110 SUMMARY OF WORK

1.0 BASIC DESCRIPTION OF FACILITY AND OTHER INFORMATION

- A. The facility is located at 2601 E 11 Avenue, Hialeah, Florida, 33013. The Scope of Work is identified in the drawings and summarized above.
 - 1. Intended use of the area of work—bathroom and janitor closet repairs
 - 2. Type of construction—Level I interior alteration only
 - 3. General Systems contained in work—Architecture, Structural, HVAC, Electrical, Plumbing, Fire Alarm, and Building Technology.
- B. References used herein:
 - 1. Owner—Miami-Dade County Department of Transportation and Public Works (DTPW)
 - 2. User—Miami-Dade County Dept. of Transportation and Public Works – Transit Dept. (Transit)
 - 3. Engineer—The designated representative of DTPW in charge of the construction, a/k/a the DTPW Project Manager.
 - 4. General Contractor: The Company under contract with the Owner to do the construction work.
 - 5. A/E / Project Consultant / EOR—The Design Team composed of Architects and Engineers and other sub-consultants under contract with the Owner to design the Work and who signed / sealed the permit set drawings.

1.1 GENERAL SCOPE OF WORK: BASE BID

- A. Contractor shall remove and reset existing restroom fixtures and finishes. Repair existing restroom to comply with FBC 7th edition FBC 2020 accessibility.
- B. Remove and replace all finishes and fixtures with new walls, floor, and ceiling coverings, fixtures, appurtenances, plumbing, electrical, mechanical, communications, P/A speaker and speaker grill, hand free telephone, building systems, and all hardware, equipment and components associated thereto for the complete repairs of Metrorail station bathrooms.
- C. Remove and replace with new cast-iron and copper all existing sanitary drains, waste and vent systems.
- D. Remove and completely re-pipe with new L-type copper all existing water pipe, including trap primers, control valves, and supports for all plumbing fixtures.
- E. Provide new plumbing fixtures "institutional type" ADA compliant.
- F. Provide to all plumbing fixtures acorn duran-ware 16-gauge, type 304 stainless steel rated steel rated for 1000 lbs. with all mounting screws concealed.
- G. Restrooms shall be equipped with as required per DTPW toilet accessories specifications.
- H. All bathroom walls shall be tile from floor to ceiling with ceramic tile of a 6"X6" dimensions.
- I. Bathroom floors shall be anti-slip ceramic tile of a 12"X12".
- J. Provide new mechanical soffit and rigid ceiling with fire alarm and lighting.
- K. Install doors with a min. of a 1.5 hour fire rating.
- L. Provide light fixtures per specification in day brite LED with emergency battery back-up shall be 227V, 2 lamp recessed to match existing.
- M. Furnish and install a new UL listed weather resistance wall mounted hand-free telephone to replace existing one.
- N. Furnish and install one exhaust ventilator with duct and wiring in each restroom.
- O. The smoke detector inside the bathroom must be removed at the beginning of the construction and reinstall before opening the bathroom to the public.
- P. The P/A speaker, speaker enclosure, and grill shall be replace with a new atlas sound speakers to be compatible with existing P/A system.
- Q. Remove existing O/A vent and replace on wall.

1.5 SCHEDULING AND CONCURRENT WORK

- A. Phasing of the Work: There is no phasing of work in this project.
- B. Staging Area: See drawings.
- C. Demolition: All fixtures, components and wall finishes. Entire ground floor slab as required for the installation of the underground sanitary lines. All existing utility connections in Area
 - 1. The allowed schedule for carrying out any demolition work and debris removal is as follows:
 - a. Weekdays (M-Th): Starting at 6:00pm and ending at 6:00am the following day.
 - b. Weekends: Anytime starting at 6:00pm on Friday and ending at 6:00am on Monday

Safety of Occupants and Public: Provide a "safety plan" which delineates areas of construction and construction traffic during the project, maintains required exits, and provides for barriers to separate construction areas from staff. The plan must provide for maintaining fire detection and warning systems in use while the building is occupied. Provide and maintain safety signage barriers, and construction aids. Maintain the safety of the facility and its occupants.

D DELIVERY AND STORAGE

The times of delivery and storage of construction products and equipment shall be coordinated with, the DTPW Site Supervisor and Engineer.

The storage of construction products and equipment fit within the confines of the property and the area is indicated in the drawings.

1.6

- A Parking of workers' vehicles shall be as designated by the DTPW in the pre-construction meeting.

1.7 SITE CONDITIONS

- A. Contractor's Use of Premises:
 - 1. The project site will be made available for general construction activities during normal business hours, Monday through Friday between the hours of 7:00am and 4:30pm. Availability of site for after-hours and / or weekend and Holiday work, for general construction work will have to be coordinated through the Engineer. The project site will be made available for demolition activities only during those periods when the general building operation functions in areas outside the limits of construction on the first floor and on the entire second floor of the building are inactive as indicated in Article 1.5.C above. Coordinate the demolition work schedule with the Engineer.
 - 2. The drawings designate a staging area on-site or for Contractor's use. Keep the area clean, secure, and organized. Do not block the buildings means of egress on the north wall. Work force parking and all access to the site, building and project location within the building to be coordinated with the Engineer.
 - 3. It is important that that the Contractor or any of the sub-contractors / vendors, or any deliveries do not interfere with the DTPW or User operations.
 - 4. Where construction impacts existing parking entrances / exits, areas, exits, staff and public circulation, submit plans showing temporary (for the duration of the work) pedestrian and vehicular traffic circulation for the

- impacted areas. Include barricades and signing necessary during the entire construction period, to direct the public and the vehicles through the construction zone in the submittal.
5. Handle waste and clean areas affected by the work.
 6. Remove debris such as construction material, debris, and spills from site each day. Dispose of lawfully using covered rubbish containers, recycling where possible.
 7. Provide security for products and equipment stored on-site. Maintain the safety of persons in and surrounding the project site.
 8. Provide devices and methods to maintain proper Indoor Air Quality (IAQ), protect other parts of the building outside the limits of construction, from damage including the migration of dust, fumes, smell or other debris. This applies to both horizontal and vertical space adjacencies.
 9. Refer to the latest edition of DTPW Adjacent Construction Safety Manual, made a part of the construction contract, for work restrictions and safety standards, guidelines and requirements.
 10. Before date of Substantial Completion, repair and return all area(s) affected by the construction to the original condition or as needed for the new use, to the satisfaction of DTPW. When work is performed subsequent to Substantial Completion, immediately at the completion of such work, repair and return the affected areas to the original condition or as needed for the new use, to the satisfaction of DTPW.

1.8 UNIT PRICES: Not Applicable in this contract.

1.9 BUY AMERICAN:

This project is designated as a "BUY AMERICAN" job. Do not provide any products, assemblies, or other components not designated as "AMERICAN MADE OR MANUFACTURED" for installation as a part of the work. Should an installed product be found to not be "AMERICAN MADE OR MANUFACTURED" it shall be promptly removed and replaced along with any other component damaged during the process and all at no cost to the Owner. Insure, before submitting for approval or delivering to the project, that the product or system or component complies with the "BUY AMERICAN" requirements of this project.

1.10 CONSTRUCTION DOCUMENT DRAWINGS

A. The Drawings listed in the following Index of Drawings are a part of the Construction Documents:

<u>Sheet #</u>	<u>Drawing #</u>	<u>Drawing Sheet Title</u>
1 of 18	A000	Cover sheet, project team, index
2 of 18	A100	Site Plan, scope of work & selective demolition plan
3 of 18	A101	Floor plans and elevations
4 of 18	A102	Equipment cut sheets
5 of 18	A103	Equipment cut sheets
6 of 18	A104	Equipment cut sheets
7 of 18	S001	General structural notes
8 of 18	S100	Floor plan
9 of 18	S500	Typical details
10 of 18	M001	General notes and legend
11 of 18	M100	Floor plans
12 of 18	M500	Details and schedules
13 of 18	E000	General notes and legend
14 of 18	E100	Floor plan
15 of 18	P001	General notes and legend
16 of 18	P100	Floor plans
17 of 18	P500	Details and schedules
18 of 18	FP100	Fire protection plan

END OF SECTION

SECTION 01297
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Specification establishes the requirements for breakdown of Payment Items.

1.02 SUBMITTAL REQUIREMENTS

- A. Submit to the DTPW a Preliminary Schedule of Values to include all portions of the work within 15 days after NTP.
- B. Submit to the DTPW a Baseline Schedule of Values within 15 days after receipt of DTPW comments on the Preliminary Schedule of Values. The Baseline Schedule of Values shall incorporate all comments associated with Contractor's Preliminary Schedule of Values submittals.
- C. Submit Documentation to support the values with data which will substantiate their accuracy.
- D. Upon acceptance by the DTPW, the Schedule of Values shall be used as the only basis for the Contractor's Applications for Payment. Acceptance of the Contractor's Preliminary/Baseline Schedule of Values is a condition precedent to processing all applications for payment other than payment for start-up costs during the first two months.
- E. The Schedule of Values shall correspond to each of the Payment Items. The breakdown of the progress payment for each Item shall be in accordance with the approved Work Breakdown Structure and each line item shall correspond with an activity in the Construction Schedule.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. The Schedule of Values shall be labeled with identifying information such as: title of contract and location, contract number, name and contact information of Contractor, and date of submission.
- B. The Schedule of Values shall list the installed value of the component parts of the WORK in sufficient detail to serve as the basis for computing values for progress payments during construction.
- C. Identify and list the title and number of the Specifications Section that is associated with the work.
- D. Deviations from the Schedule of Values form and content must be submitted and approved by the DTPW.
- E. Progress payment Items:
 - 1. Payments for progress payment activities will be based upon physical progress (percent complete) for each related activity in the Progress Schedule.
 - 2. The dollar value allocated to progress payment activities shall be representative of the Contractor's actual costs for performing the work including overhead and profit

and shall be balanced to ensure that sufficient funds are allocated for each portion of the work and shall be subject to acceptance by the DTPW.

3. In the case of a disagreement between DTPW and Contractor's, the DTPW shall have the right to make final determination of activity dollar amounts contained in the Schedule of Values.
- F. Each Payment Item shall include a directly proportional amount of the Contractor's overhead and profit.
- G. A new Payment Item will be added to the Schedule of Values for approved Change Order Work. For payment for Time & Materials Change Order Work, the Contractor shall hold a Pre-Work Change Order Meeting with the DTPW, prior to executing the Work.
- H. The sum of all Payment Items listed in the Schedule of Values shall equal the total Contract Price.

1.04 SUB-ACCOUNTS

- A. Include a breakdown of major Payment Items into sub-accounts on which progress payments will be requested. The sub-account breakdown shall include elements for Payment Items as appropriate and show the weight of the sub-accounts equal to 100 percent of major account (Payment Item).
- B. Contractor's Schedule of Values shall list the delivered value of the products, manuals, and services provided under the various Specification Sections. The lists shall be sufficiently detailed to serve as a basis for computing values for progress payments during the construction period.
- C. Copies of paid invoices for component material shall be included with the payment request in which the material first appears.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract Lump Sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01311

PROJECT MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes specifications for project meetings. The Contractor, along with Contractor's superintendent, project manager, superintendents of major subcontractors, as a minimum, shall attend meetings scheduled by the Engineer (DTPW) and shall:
1. Collect and disseminate information related to the Contract.
 2. Advise about Contract-related Safety information, Safety meetings, and Safety-related issues.

- 1.02 **SPECIAL MEETINGS:** Special meetings between the Engineer and the Contractor will be scheduled and conducted by the Engineer throughout the course of construction as the Engineer deems necessary.

1.03 PRECONSTRUCTION MEETING

- A. A pre-construction meeting will be scheduled and conducted by DTPW not more than 15 working days after the effective date of the Notice of Contract Award. Contractor's project manager and superintendent shall attend along with the superintendent of the major sub-contractors. DTPW will provide Contractor written notice of this meeting not less than five working days or one calendar week prior to the date of the meeting.
- B. DTPW will discuss the following at this meeting:
1. Introduce representatives of DTPW, the User, and the Project Design Team.
 2. Explain and discuss the responsibilities and authorities of the Engineer (DTPW).
 3. Discuss Equal Employment Opportunity (EEO), Disadvantaged Business Enterprise (DBE), and affirmative action requirements.
 4. Define and establish requirements for safety, first-aid, emergency actions, and security.
 5. Explain and discuss selected laws, codes, and permit requirements of public agencies and their regulations.
 6. Discuss procedures for processing change notices, change orders, correspondence, RFIs, shop drawings, submittals, product data, and samples.
 7. Discuss monthly progress payments.
 8. Discuss final payments.
 9. Discuss project schedule
- C. The Contractor shall discuss the following at this meeting:
1. Introduce Contractor's representatives, and briefly describe each person's responsibilities.
 2. Distribute and discuss the list identifying major Small Business and Disadvantaged Business Enterprises (SBE and DBE) subcontractors including their areas of responsibility.
 3. Discuss use of office, haul routes, storage areas, staging areas, and construction areas.
 4. Define housekeeping procedures.
 5. Discuss construction means and methods.

6. Discuss coordination and notifications required for utility work and services.
7. Discuss deliveries and priorities.
8. Discuss breakdown of schedule of values lump sum items.
9. Discuss construction progress schedule.

1.04 CONSTRUCTION PROGRESS MEETINGS

- A. Construction progress meetings will be scheduled by DTPW, conducted by the Engineer and held as required but not more often than semi-monthly during the period of performance of the Contract. Progress meetings shall include representatives of subcontractors who are or will be performing Work during the current and following month.
- B. The Contractor shall distribute notices of these meetings before such meetings to subcontractors.
- C. The agenda for construction progress meetings will be prepared by the Engineer and will generally include the following:
 1. Introduce new attendees and areas of responsibility.
 2. Review minutes of previous meetings amend minutes if necessary and accept minutes.
 3. At the first meeting of each month, analyze Work accomplished since previous meeting, offsite fabrication problems, product delivery problems, submitted schedule slippages, proposed changes, and circumstances that might affect progress of work.
 4. At each meeting, display and discuss the status of the Critical Path activities. If they are behind schedule describe the methods intended to be used to bring these activities back on schedule. Discuss corrective measures to maintain progress.
 5. Discuss the Two-Week Look-Ahead Schedule submitted as specified in Section 01321 Construction Contract Schedules, and last Work plan for the previous period showing activities accomplished and those not completed in accordance with the prior submittal. Discuss the reasons for failure to complete the Work as shown in the schedule and the methods to be implemented to complete the unfinished activities.
 6. Discuss Work quality observations, problems, and employee Work standards.
 7. Discuss coordination of utility work.
 8. Discuss Work by outside parties.
 9. Discuss changed conditions, time extensions, and other relevant subjects as they affect the progress of the work.
 10. Discuss the status of Contract changes: new changes, status of negotiations and completed changes.
 11. Discuss SBE/DBE, and any Apprenticeship Program issues.
- D. Each of the Contractor's inquiries, requests for information (RFI) or requests for solutions of problems presented during such meetings shall be answered, when possible, during the meeting; those not answered during the meeting will be answered, the answer documented and presented by the Contractor at the next meeting. Answers provided orally at the meetings shall be recorded in the minutes.
- E. Review the minutes of the meeting prepared and submit any requested corrections. Minutes will be prepared in action-item format with named responsible parties and dates for completion indicated for each item.

1.05 PROGRESS PAYMENT MEETINGS: The Contractor and the Engineer shall meet to discuss the monthly progress payment.

1.06 CHANGE ORDER MEETINGS: As necessary the Contractor and the Engineer shall meet to review change orders.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01321

PROJECT SCHEDULE

PART 1: GENERAL

1.01 DESCRIPTION

- A. This section covers the preparation of a schedule in the form of a bar chart. (The Contractor will be allowed to use his preferred scheduling system, if approved by the DTPW. If the Contractor wishes to propose his own system, he shall so request prior to the required submittal timetables listed in this section.)
- B. Final Schedule:
 - 1. A bar chart schedule shall be used by the Contractor to control the progress and time fixed for completion of this project. This system shall be implemented by the Contractor. Prior to approval of the final construction schedule, the Contractor shall provide DTPW with letters from all his subcontractors and suppliers indicating that they have reviewed the Contractor's schedule and concur with the sequence of events, activity durations and rates of production implied therein.
 - 2. All work shall be done in accordance with the schedule and all costs incurred by the Contractor to correctly implement the schedule shall be borne by the Contractor and are a part of his contract.
 - 3. The schedule must be updated monthly and submitted with the Contractor's pay request. No payment will be made to the Contractor unless this monthly updated schedule and progress report is submitted with the Contractor's pay request. Even if no invoice is submitted in a particular month, the Contractor shall submit monthly schedule updates and progress reports to the satisfaction of the Engineer.
 - 4. This schedule shall consider the work restrictions indicated in Section 01110, Article 1.7.A., and demonstrate the sequencing of the Work so as to not impact the contract duration.

PART 2: PREPARATION

2.01 PREPARATION OF FINAL SCHEDULE:

- A. Preparation:
 - 1. Within 7 days after the date of Notice to Proceed (NTP), the Contractor shall develop and submit a comprehensive and detailed Final Schedule, hereinafter referred to as the final schedule. Work performed prior to NTP shall not be allowed under this Contract.
 - 2. When completed, the bar chart diagram shall represent the Contractor's own plan for the project as well as the sequence of each operation and all the

involved parties. The schedule shall also identify the project's critical path. It shall be the responsibility of the Contractor to ensure that all of this work is described by the diagram and that the diagram does correctly represent the sequence in which he plans to do his work and the time in which he expects to do it.

3. As a minimum, the final schedule will cover the following areas:
 - Shop drawing preparation, review and approval
 - Procurement of major equipment or material
 - Permit acquisition activities
 - Material samples
 - Material delivery
 - All major work elements
 - Punch list activities
 - Rates of Production
4. The final schedule will be printed on a 11" x 17" sheet suitable for reproduction. The Contractor will submit 3 copies of this schedule.
5. A written narrative on separate 8 1/2" x 11" sheets will be included with the contractor's final schedule. This narrative will describe the contractor's general approach for performing the work and any additional or unusual requirements not clearly represented in the schedule including, but not limited to, equipment to be used and the time equipment is to be on-site, anticipated delivery dates for material and/or equipment, crews and crew sizes, estimated quantities and rates of production. The narrative shall explain the basis for the contractor's determination of durations for major work items and describe his approach for meeting the interim and final completion dates in his schedule. The narrative shall also address workdays per week, hours per shift, rain days, holidays or any other non-work periods that the contractor is assuming in the planning of the work. Activities which may be expedited by the use of overtime or additional shifts shall be identified. Sequencing and other restraints such as manpower, material or equipment shall be identified and explained. A form to be used by the Contractor to prepare his baseline narrative shall be requested from DTPW at time of award of contract.
6. When completed, the final schedule shall be submitted to the Engineer for approval. The Contractor shall incorporate the Engineer schedule review comments within 10 days after receipt. The Engineer shall be the final authority in deciding the acceptability of the schedule. Upon approval by the Engineer, this shall become the Final Schedule for the contract. No deviations from the final schedule will be allowed without the approval of DTPW.
7. The Contractor shall identify all available float or slack time in his schedule in a format suitable to the DTPW. Float or slack time is not for the exclusive use or benefit of either the Contractor or DTPW. Float or slack time is considered project float as it is for the benefit of both parties. As such, it is not to be used exclusively by either party but is to be used by the party that needs it first. No more than 15% to 25% of the activities in the contractor's schedule may be on or near the critical path. ("Near the critical path" is defined as any activity having float of 10 days or less)

2.02 MONTHLY SCHEDULE UPDATES

1. The Contractor shall submit monthly schedule updates to show progress, as applicable, on all activities in progress. Such progress shall be shown in a format suitable to the Engineer. Three 11" x 17" copies of the updated schedule shall be submitted by the Contractor.
2. The Contractor shall submit an updated narrative in the form of monthly progress reports in a format acceptable to the Engineer. Such reports shall include sections for describing "progress this period", "planned progress for next period", "problems and solutions" (including a listing of all delayed activities, the reasons for delay and proposed recovery actions) and "changes since last period". Any special concerns and or questions regarding the schedule should also be included in the progress report. As applicable, signed material delivery tickets indicating when material was delivered on-site or to the fabrication plant will be provided with the narrative on a monthly basis. A form to be used by the Contractor to prepare his monthly update narrative is to be requested from the Engineer prior to use for the first time.
3. The Contractor shall submit on a bi-weekly basis a simplified two-week look-ahead bar chart schedule showing all anticipated work scheduled to take place during the next 14 calendar days. This two-week look-ahead schedule shall be based on the approved baseline schedule.

PART 3: PAYMENT

3.01 PAY REQUESTS

1. The Contractor's pay request shall include an update of the final schedule. The contractor will not be eligible to receive payment until his contract baseline schedule and schedule of values is approved and no payment will be made to the Contractor unless this schedule update and schedule of values is submitted with the pay request.
2. 5% of each Contractor's pay request amount will be retained in accordance with Section 3.8 of the Special Requirements.
3. All Contractor pay requests will be submitted in a form suitable to DTPW based on a County approved schedule of values.

3.02 FINAL PAYMENT

Final payment shall be made in accordance with Article the terms and conditions of the Miscellaneous Construction Contract.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01325
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section specifies the maintaining, marking, recording and submitting of project record documents.
- B. DEFINITIONS:
 - 1. Conformed Contractor Contract Documents: The conformed documents provided to the Contractor Firm at the time the Contractor contract was executed, prior to the start of the Contractor Contract. This set is separate and apart of the Permit set.
 - 2. Contractor Document Transmittal (CDT): Reviewed and approved drawings, catalog cuts, samples or other documents submitted by the Contractor Firm for review showing in detail how the Contractor proposes to carry out the work.
 - 3. Project Record Documents (As-Built): During construction, a set of released-for-construction drawings and specifications, shall be kept current by marking in red all "as-built" construction conditions and changes arising out of RFIs, clarifications, directed field changes and sketches, etc. At the end of construction activities, the information contained in these drawings and specifications shall be submitted to the Engineer for incorporating into Compact Disks (CD / DVD) containing the latest conformed drawings including revisions to the contract documents made during construction. (Changes to specifications are typically only affected through change orders. However, in some occasions clarifications may require a modification to the specifications). The revised CADD drawings, which include the information incorporated from the drawings and specifications, become The Project Record Documents.
 - 4. Shop Drawings: Final CAD files to be provided in Autocad as well as 11x17 PDF's. See Contractor Firm Document Transmittals.

1.02 SUBMITTALS

- A. Upon completion of the work, the Contractor Firm shall submit the As-Built to the Engineer in time to be used for the final inspection and acceptance and for verification. Availability of As-Built shall be prerequisite to scheduling a final inspection of this Contractor Contract. Non-availability of As-Built or inaccuracies therein may be grounds for cancellation and postponement of any scheduled final inspection by the Engineer until such time as the discrepancy has been corrected. Upon completion of the work, the As-Built shall become the property of DTPW. The Contractor Firm will transmit the As-Built to the Engineer with an attached Project Records "As-Built" Drawings Index Form uniquely identifying and describing each document.
- B. The Contractor shall sign each red line drawing certifying the accuracy and validity of the as-built information contained therein

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 MAINTENANCE OF DOCUMENTS:

- A. The Contractor shall maintain one copy of each of the following:
- B. Contractor Contract Documents
 - 1. Conformed Contractor Contract Drawings and Conformed Specifications.
 - 2. Construction Safety Manual.
 - 3. Change Orders, Change Notices and other modifications to the Contractor Contract.
 - 4. Engineer Field Order or written instruction.
 - 5. Approved shop drawings, product data and samples.
 - 6. Field test reports/records.
 - 7. Updated set of Construction Documents (Drawings and Technical Specifications) marked in red to show field changes.
 - 8. Request for information (RFI).
 - 9. All directed Field Changes and sketches.
- C. Equal Employment and Affirmative Action Records.

3.02 RECORDING "AS-BUILT" DRAWINGS

- A. Record information concurrently with construction progress on The Construction Documents (Drawings and Technical Specifications). During construction, this set is known as "As-Built" documents.
- B. Do not conceal any work until the required information is recorded.
- C. Drawings: legibly mark in red to record actual construction depicting the as-constructed configurations resulting from field and/or design changes:
 - 1. Location of internal utilities, electrical conduits and appurtenances, referenced by dimensions to permanent, visible and accessible features of the structure.
 - 2. Field changes of dimension and detail.
 - 3. Details not on original Contractor Documents.
 - 4. Changes made by Change Notice or by Change Order.
- D. Legibly mark up each section of specifications to record:
 - 1. Manufacturer, trade name, catalogue number, and supplier of each product and item of equipment actually installed.
 - 2. Changes made by Change Notice or by Change Order.
- E. Any changes due to RFIs, clarifications and field sketches shall be incorporated into the record drawings by affixing sketches and other 8 1/2" x 11" sheets to the Contract Documents.
- F. Do not use the record drawing set for construction progress purposes.

3.03 DOCUMENT MAINTENANCE:

- A. Provide for storage of documents to maintain in clean, dry and legible condition.
- B. Make documents available for inspection by the Engineer.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01330 SUBMITTALS

1.01 DESCRIPTION:

- A. This section includes specifications for the general requirements and procedures for preparing and submitting design and construction information and data for information and review. Other requirements for submittals are specified under applicable sections of the Contract Documents.

2.01 SUBMITTAL REQUIREMENTS:

- A. Schedule of Submittals: Within fifteen (15) days after the effective date of Notice to Proceed (NTP), the Contractor shall submit a completed submittal schedule and list of products for all items requiring the Engineer's review, as follows:
 - 1. Design Drawings and Project (Specifications) Manual
 - 2. Submittal Schedule
 - 3. Shop Drawings, including description of the items and name of manufacturers, trade names, and model numbers
 - 4. Contract Project (Specification) Manual Section Reference
 - 5. Intended Submission & Resubmission Date(s)
 - 6. Order Release Dates
 - 7. Lead Times to Delivery and Anticipated Delivery Date(s)
 - 8. Highlight items that require expedited review to meet the project schedule, and are within the critical path of the schedule
- B. The Engineer will withhold acceptance of submittals which depend on other submittals not yet submitted or not yet reached a status of "No Exceptions Taken".
- C. These schedules shall be presented in a form that is readily reproducible and shall be updated and sent to the Engineer on a monthly basis. Identify all submittals that are required by the Contract Documents and determine the date on which each submittal will be submitted in conformance with the schedules specified under this contract.
- D. Provide a title block for drawings containing the following information:
 - 1. Date and Revision Date(s)
 - 2. Contract Title and Number
 - 3. The names of the Contractor, Sub-Contractors, Suppliers, and Manufacturers as applicable.
 - 4. Identification of product by description, model number, style number, serial number, or lot number
 - 5. Subject identification by Contract Drawing or Specification Reference.
- E. Professional Engineer's Seal Required:

Submittals involving delegated engineering expertise, such as excavation support structures, framework for concrete, civil and structural designs, load calculations and operating systems engineering final design shall be sealed and signed by a professional engineer, currently registered in the State of Florida, for the discipline involved and in accordance with Florida law.

F. Submittal Stamps and Action Block Space:

Include a 5-inch square blank space, in the lower right corner, just above the title block, in which the Engineer may indicate the action taken. Please note that the Engineer may opt to issue a separate “Submittal Review” document indicating all comments. This Submittal Review document shall be affixed by the GC to the submittal documents.

G. Review Period:

1. Prepare submittals sufficiently in advance so that review may be given before commencement of related work.
2. Allow thirty (30) calendar days after receipt by the Engineer for review of each submittal.
3. The Contractor shall be responsible for determining whether or not certain governmental entities and utility companies will require longer review periods. The Engineer will assist in this effort. Where longer review periods are required, the Contractor shall schedule the work accordingly, so that the work and construction schedules are not adversely impacted.

H. Submittal Delivery:

Ship submittals prepaid (FedEX, etc...) or deliver by hand directly to the DTPW Engineer's office.

I. Transmittal Form:

Accompany all submittals with a transmittal form, including a brief description of the items that have been included.

J. Changes in Reviewed Submittals:

Changes in reviewed submittals will not be permitted unless those approved submittals with changes have been resubmitted and reviewed, in the same manner as the original submittal.

K. Supplemental Submittals:

Supplemental submittals initiated by the Contractor for consideration of corrective procedures shall contain sufficient data for review. Make supplemental submittals in the same manner as initial submittals.

L. Incomplete submittal packages will be returned without review

3.01 CONTRACTOR'S RESPONSIBILITIES:

A. Contractor's Review:

1. Each submittal shall be reviewed, stamped, and signed as reviewed and approved by the Contractor before submission.
2. If the submittal is designated to be sent to the Engineer for information, approval by the designated approval authority shall take place before submission to the Engineer.
3. The Contractor shall coordinate each submittal with the requirements of the work, placing particular emphasis upon ensuring that each submittal of one trade is compatible with other submittals of that trade and with the submittals of other trades. Ensure submittal is complete with all relevant data required for review.
4. Review of drawings and associated information as deemed appropriate by the Engineer shall not relieve the Contractor from the responsibility for errors or omissions in the drawings and associated information, or from deviations from the Contract Documents, unless submittals containing such deviations were submitted to the Engineer and the deviations were specifically called to the attention of the Engineer in the letter of transmittal, and recommended by the Engineer as a Contract Change.
5. The Contractor's liability to work, in case of deviations in the submittals from the requirements of the Contract Documents, is not relieved by the Engineer's review of submittals containing deviations, unless the Engineer expressly recommends acceptance of the deviations to the DTPW and the issuing of a Contract Change Order.
6. The Contractor shall be responsible for the correctness of the drawings, for shop fits and field connections, and for the results obtained by the use of such drawings.

B. Submittal Quantities:

Unless noted otherwise, Contractor shall submit seven (7) copies of all submittals and electronic files in a form acceptable to the Engineer. Where permits and licenses and other such documents are obtained in DTPW's name, submit the original and six (6) copies.

C. Distribution of Submittals after Review:

Distribute prints or copies of reviewed submittals, bearing the Engineer's or designated approval authority's stamp and signature, to affect and concerned sub-contractors,

suppliers, and fabricators; and to affected and concerned members of the Contractor's workforce.

- D. Maintain at the job site a complete up-to-date, organized file of all past and current submittals including an index and locating system which identifies the status of each submittal:
1. Assign a sequential number to each submittal, which shall indicate the applicable specification section for which the submittal is required.
 2. Assign a revision number, using an alphanumeric sequence (i.e., 15, 15A, 15B, etc.) to all submittals.

4.01 PROJECT CONSULTANTS REVIEW:

- A. Submittals will be reviewed for conformance with requirements of the Contract Documents. Review of a separate item will not constitute review of an assembly in which the item functions. Review will not relieve the Contractor from Contractor's responsibility for accuracy of submittals, for conformity of submittals to requirements of Contract Documents, for compatibility of described product with contiguous products and the rest of the system, or for prosecution and completion of the Contract in accordance with the Contract Documents.
- B. The Engineer will indicate in its reviews of submittals and the action taken by means of the submittal stamp or a separate Submittal Review document. If a submittal stamp is used it will be affixed by the Engineer within the action block and the stamp will be signed and dated.
- C. The submittal stamp action block marks will have the following general meanings: Please note that different professionals may use a slightly different version of each of these generalized statements in their stamps or in their Submittal Review document.
1. The mark "NO EXCEPTIONS TAKEN" means that every illustration and description appears to conform to the respective requirements of the Contract Documents; that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed; and that the submittal need not be resubmitted.
 2. The mark "NOTE COMMENTS" means that every illustration and description appears to conform to the respective requirements of the Contract Documents upon incorporation of the reviewer's corrections, and that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed. Submittals so marked need not be resubmitted unless the Contractor challenges the review/s exception.
 3. The mark "MAKE CORRECTIONS NOTED" means that every illustration and description appears to conform to the respective requirements of the Contract Documents, and that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed after incorporation of the reviewers corrections and verification by the

Engineer that the reviewer's corrections have been properly incorporated in the submittal.

4. The mark "REVISE AND RESUBMIT" means that no every illustration and description appears to conform to the respective requirements of the Contract documents, and that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may not proceed until incorporation of the reviewers corrections and re-submittal for re-review. Resubmission is also required if the Contractor challenges the reviewer's corrections.
5. The mark "REJECTED" means that the submittal is deficient to the degree that the reviewer cannot correct the submittal with a reasonable degree of effort, has not made a thorough review of the submittal, and that the submittal needs revision and is to be corrected and resubmitted.

- D. Review stamps or other approval methods of the various designated approval authorities may not be the same as those described herein. The Contractor shall coordinate (through the Engineer) with the various designated approval authorities and shall obtain approvals in the clearest and most straight forward manner possible.
- E. Contractor shall attend meetings as requested by the Engineer to address issues related to the review of submittals.
- F. The Engineer will return submittals to the Contractor within thirty (30) calendar days after submittals have been received.
- G. Contractor shall include at least thirty (30) days in the project schedule for the Engineer to review submittals.
- H. Allow thirty (30) days for review by the Engineer of all re-submittals.

5.01 MEASUREMENT AND PAYMENT

A. MEASUREMENT

Work under this Section will not be separately measured for payment.

B. PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01620

SUBSTITUTIONS AND PRODUCT OPTIONS

1.01 DESCRIPTION:

- A. This Section specifies the procedures to be followed for preparing, submitting, amending and updating of lists of products proposed to be incorporated in the work.

2.01 SELECTED PRODUCTS:

- A. Within ten (10) days after the effective date of NTP, submit five (5) copies of the list of selected products. Arrange the list in the order of each Section's appearance in the specification.
 - 1. For products specified only by reference standards, any product satisfying those standards may be selected. Show name and address of manufacturer; trade name, model number or catalog designation of the product; manufacturer's reference standards and pertinent performance and test data.
 - 2. For products specified by naming one product or by naming several products, this establishes a product standard. Any other product, which is equal in the opinion of DTPW and EOR may be furnished. A request must be submitted to the DTPW as required for substitutions, for acceptance of products not specifically named.
 - 3. **Equal:** Where named products or sources listings are accompanied by the term "or equal" or "or approved equal" or other language of similar effect, provide one of the specified products, or submit a request for substitution for a product not named, in accordance with the requirements of this Section, which the Contractor judges to be of equal or better quality.
 - 4. Amend and update list as changes concerning the information become known.

3.01 LIST OF SUBSTITUTE PRODUCTS AND METHODS:

- A. Formal requests from the Contractor will be considered by DTPW and EOR for substitution of products and methods in place of those specified, but only if these requests are submitted within ten (10) days after effective date of NTP. No substitutions request will be considered after ten (10) days. Acceptance of substitute products and methods shall be only for the characteristics and use named in the acceptance and shall be interpreted neither as a modification to the Specification and Drawing requirements nor to establish acceptance of products and methods for other portions of the Transit System. DTPW and the EOR shall judge the quality and suitability of the substitute product and method and his decision shall be final. Where use of a substitute product and method involves redesign of other parts of the

work, the cost and time required to affect that redesign will be considered in evaluating the suitability of the substitute product and method.

B. Submit five (5) copies of list of substitute products and methods, including the following information:

1. Complete data substantiating compliance of the proposed substitution with the requirements of the Specifications (Technical Specifications) and Drawings.
2. For products:
 - a. Product identification, including manufacturer's name and address
 - b. Manufacturer's literature, including product description, performance and test data and pertinent reference standards
3. For construction methods:
 - a. Detailed description of proposed method
 - b. Working drawings illustrating methods
4. Itemized comparison of proposed substitution with product specified. Comparison shall include cost, differences in estimated life, estimated maintenance, availability of spare parts and repair services, energy consumption, performance capacity, salvage-ability, manufacturer's warranties and other material differences.
5. Data relating to changes in construction schedule.
6. Accurate cost data on proposed substitution in comparison with product and method specified except that cost data will not be required on substitutes proposed as equal, equivalent or superior to specified brand names and for which no request is made for price adjustment to the sub-contract.
7. Equitable adjustment and credit that the Contractor proposes to offer work if the substitutions are not equal, equivalent or superior to specified brand names.

C. In making request for substitution, Contractor shall verify:

1. That he has personally investigated the proposed product and method and that to the best of his knowledge, information and belief, the product and method is either equivalent or superior to that product and method specified and that he will update information as new or different data become known to him.
2. That he will furnish the same guarantee for substitution as he would for the product and method specified.

3. That he will coordinate installation of the accepted substitution into the work and will make those changes required for the work to be complete and operable.
 4. That cost data is complete and includes related costs and excludes cost of engineering redesign.
 5. That he waives claims for additional time and costs related to the substitution, which become apparent.
- D. Amend and update list as changes concerning information on the list become known to him.
- E. Substitutions will not be considered, if indicated or implied on Shop Drawings or Product Data Submittals for which no formal request for substitution has been submitted. Requests for substitutions will not be considered if acceptance will require substantial revisions of drawings and specifications or both.

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

5.01 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01732 CUTTING AND PATCHING

PART 1: GENERAL

1.01 REQUIREMENTS INCLUDED:

- A. Contractor responsibility: All cutting, fitting and patching, including attendant excavation and backfill required to complete the work to:
 - 1. Make its several parts fit together properly.
 - 2. Uncover portions for the work to provide for the installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to requirements of Contract Documents.
 - 5. Remove samples of installed work as specified for testing.
 - 6. Remove routine penetrations of non-structural surfaces for installation of piping and electrical conduits.

1.02 SUBMITALS: In accordance with Section 01330

- A. Submit a written request to the Engineer well in advance of executing any cutting or alteration which affects:
 - 1. Work of the DTPW or any separate contractor.
 - 2. Structural value or integrity of any element of the Project.
 - 3. Integrity or effectiveness of weather-exposed or moisture resistant elements or systems.
 - 4. Efficiency, operational life, maintenance or safety of operational elements.
 - 5. Visual qualities of sight-exposed elements.
- B. Include with each request:
 - 1. Identification of the Project.
 - 2. Description of affected work
 - 3. The necessity for cutting alteration or excavation.
 - 4. Effect on work of DTPW or any separate contractor, or on structural or weatherproof integrity of Project.
 - 5. Description of proposed work:
 - a. Scope of cutting, patching, alteration, or excavation.
 - b. Trades who will execute the work
 - c. Products proposed to be used
 - d. Extent of refinishing to be done.
 - 6. Alternatives to cutting and patching.
 - 7. Cost proposal, when applicable.
 - 8. Written permission of any separate contractor whose work will be affected.

- C. Should conditions of Work or the schedule indicate a change of Products from original installation, submit request for substitution.
- D. Submit written notice to the Engineer designating of the date and time the work will be uncovered.

PART 2: PRODUCTS

2.01 MATERIALS:

- A. Comply with specifications and standards for each specific product involved.

PART 3: EXECUTION

3.01 INSPECTION:

- A. Inspect existing conditions of Project, including elements subject to damage or movement during cutting or patching.
- B. After uncovering work, inspect conditions affecting installation of Products, or performance of work.
- C. Report unsatisfactory or questionable conditions to the Engineer in writing; do not proceed with work until the Engineer has provided further instruction.

3.02 PREPARATION:

- A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.
- B. Provide devices and methods to protect other portions of Project and the rest of the building from damage including the migration of dust, fumes or other debris from the limits of construction area.
- C. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching work and maintain excavations far from water.

3.05 PERFORMANCE:

- A. Execute cutting and demolition by methods which will prevent damage to other work, and which will provide proper surfaces to receive installation of repairs.
- B. Execute cutting and demolition only during allowed periods as indicated in Section 01110, Article 1.7.A. Restriction of hours for this type of work will be strictly enforced by the DTPW and User.

- C. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.
- D. Employ original Installer or Fabricator to perform cutting and patching for:
 - 1. Weather-exposed or moisture-resistant elements.
 - 2. Sight-exposed finished surfaces.
- E. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- F. Restore work which has been cut or removed, install new products to provide complete work in accord with requirements of Contract Documents.
- G. Fit work airtight to pipes, sleeves, ducts, conduit and other penetration through surfaces.
- H. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
 - 1. For continuous surfaces, refinish to nearest intersection.
 - 2. For an assembly, refinish entire unit.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will not be separately measured for payment

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01740 CLEANING

PART 1: GENERAL

1.01 DESCRIPTION:

This Section specifies the maintenance of the work site in a clean, orderly hazard-free condition.

1.02 QUALITY ASSURANCE:

- A. Conduct cleaning and disposal operations in accordance with local ordinances and anti-pollution laws. Rubbish, volatile wastes, and other construction wastes shall be neither burned nor buried on the work site, and shall not be disposed of into storm drains, sanitary drains, streams or other waterways.
- B. Final cleaning shall be accomplished either by workmen experienced in cleaning operations or by professional cleansers.

PART 2: PRODUCTS

2.01 CLEANING MATERIALS:

Cleaning materials shall be as recommended by the manufacturer of the surface to be cleaned.

PART 3: EXECUTION

3.01 SAFETY REQUIREMENTS:

- A. Maintain work site in accordance with local ordinances and anti-pollution laws applicable to work site cleanliness, and in a neat, orderly and hazard-free condition until final acceptance of the work. Work site sidewalks and walkways adjacent to the work site shall be kept free from hazards caused by construction activities.
- B. No volatile substances are to be used on the job site.
- C. Prevent accumulation of waste, which creates hazardous conditions.
- D. Artificially ventilate indoor spaces, which are not naturally ventilated, and which have the HVAC systems shut off, when construction dust exists, or noxious substances are being used and until all is completely cleaned (See Article 3.03).

3.02 INTERIM CLEANING:

- A. Perform cleaning every workday for duration of the work. All areas of the work site and public and private properties shall be maintained free from accumulations of

waste materials and rubbish caused by construction operations on the work site. Waste material will be removed from the work site or put in a waste container.

- B. Remove or secure loose material on open decks and on other exposed surfaces at end of each day's work or more often to maintain work site in hazard-free condition. Prevent dislodgment of materials due to wind and other forces.
- C. Empty on-site waste containers whenever necessary so that trash overflow does not occur. Legally dispose of contents at either public or private dumping areas.
- D. Control the handling of materials, debris and rubbish; do not drop or throw from heights.
- E. Immediately remove spillages of construction-related materials from hauling routes.
- F. Perform cleaning operations such that dust and other contaminants resulting from cleaning processes will not fall on structures or pedestrian traffic below.

3.03 FINAL CLEANING:

- A. In preparation for substantial completion, conduct final inspection of exposed interior and exterior surfaces and of concealed spaces.
- B. Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials from finished surfaces.
- C. Maintain cleaning operations until project has been finally accepted.

3.04 DAMAGE TO EXISTING FINISHES:

- A. Repair any existing (or newly installed) finish that has been damaged by construction activity.
- B. Repaint to match existing areas of damaged paint due to Contractors operation.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will not be separately measured for payment

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 02221
EXCAVATING, BACKFILLING, AND COMPACTION FOR UTILITIES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. Division 15 - Mechanical Work.
2. Division 16 - Electrical Work.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D1556-90(96) Test Method for Density of Soil in Place by the Sand-Cone Method.
2. D1557-91 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort
3. D2487-93 Classification of Soils for Engineering Purposes (Unified Soil Classification System).

B. Occupational Safety and Health Administration (OSHA): Trench Safety Act.

1.03 DEFINITIONS

- A. "Satisfactory Fill Material" includes materials classified in ASTM D2487 as GW and SW, properly worked by Contractor to obtain optimum moisture and compaction.

1.04 SUBMITTALS: In accordance with Section 01330.

- A. Submit copies of tests and records performed as specified to the Engineer for review before starting work.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with OSHA, Trench Safety Act, Standard 29 C.F.R.s., Chapter XVII, Subpart P (para. 1926.650 thru 1926.653).

1.06 PROJECT CONDITIONS

- A. Excavation, filling, and backfilling for utilities complete for underground utility

lines and structures as specified and as shown on the drawings.

B. Existing Utilities:

1. Protect existing utilities from movement, settlement, or other damages according to Instructions to Bidders and General Conditions.

C. Trench Safety Act: Provide trench safety systems at all trench excavations where workers may be exposed to moving ground or cave-ins regardless of depth of trench. All trenches more than 5 feet in depth shall comply with OSHA "Trench Safety Act".

PART 2 PRODUCTS

2.01 MATERIALS

- A. Trench Backfill Materials: Either satisfactory excavated material or fill materials as specified.
- B. Pipe Bedding Material: Bedding material shall be selected or satisfactory backfill material and free of any rocks or stones larger than 2 inches in diameter for sanitary pipe. Limerock screenings or sand shall be used for copper or other metal tubing. (Underground copper lines are 3-inch diameter or less.)

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 EXCAVATION

A. General:

1. Perform excavating of every description and of whatever substance encountered to depths indicated or specified.
2. Pile materials suitable for backfilling a sufficient distance from banks of trenches to prevent slides or cave-ins.
3. Remove excavated materials not required nor suitable for backfill from site.

4. Excavating shall be by open cut.

B. Trench Excavations:

1. Make trench of necessary width and depth for proper laying of pipe, with bank as vertical as practical.
2. Coordinate trench excavation to avoid open trenches for prolonged periods.
3. Grade bottom of trenches accurately to provide uniform bearing and support for each section of pipe on undisturbed soil at every point along their entire length, except portions of pipe sections where it is necessary to excavate for couplings and for proper making of pipe joints or where unsatisfactory materials incapable of properly supporting pipe and utility structures are encountered at bottom of trench.
4. Dig holes and depressions for joints after trench bottom has been graded of length, depth, and width required for properly making the particular type of joint.
5. When unsatisfactory soil, incapable of properly supporting pipe, is encountered at the bottom of the trench, remove such soil to a minimum depth of 12 inches, or 1/4 of the pipe diameter, whichever is greater, below the bottom of pipe and backfill material specified.
6. Over-depths in unstable soil excavation and unauthorized over-depths shall be at the expense of Contractor.

C. Special requirements relating to specific utilities are as follows:

1. Sanitary Sewers:
 - a. Where shown on drawings, make width of trench at and below top of pipe adequate to allow space for workers to place and properly joint pipe.
 - b. Clear space between the barrel of the pipe and trench wall shall not exceed 8 inches on either side of the pipe.
 - c. Width of the trench above the level may be as wide as necessary for proper performance of the work.
 - d. Round the bottom of the trench so at least the bottom quadrant of the pipe shall rest firmly on undisturbed soil or select bedding for as nearly the full length of the barrel as proper joining operations will allow.
 - e. Perform this part of the excavation manually a few feet ahead of the pipe laying operation by workers skilled in this type of work.

2. Water Lines:

- a. Where shown on drawings, make depth of trench to allow a minimum of 24 inches of cover over the top of the pipe / tubing from finished grade unless otherwise indicated or required by local utility.
- b. Avoid interference of water lines with other utilities, grade water lines to avoid air pockets.

3. Electrical Conduit or Cables:

- a. Trenches for plastic conduits shall be a depth providing not less than 12 inches or greater of cover from underside of slabs to accommodate bending radii, unless otherwise indicated. Install warning tape 8 inches below finish grade or underside of slab.
- b. Trenches for plastic conduit and cables shall be cut to an over-depth of not less than 3 inches and a cushion of rock free soil or coarse sand used for not less than 3 inches bedding and 3 inches backfill over the plastic conduit and cable.

3.03 PROTECTION OR REMOVAL OF UTILITY LINES

A. Protection:

1. Protect existing utility lines indicated on drawings (or the locations of which are made known to Contractor before excavating and trenching) specified to remain, including utility lines constructed during trenching operations, from damage during trenching, backfilling, and compacting operations.
 - a. If such new or existing utility lines are damaged during trenching, backfilling, and compacting operations, repair or replace at no cost to Owner.
2. When utility lines specified to be removed or replaced are encountered within the area of operations, issue notices in ample time for measures to be taken to coordinate necessary interruption of services.

B. Repair of Damage to Unknown Existing Utility Lines:

1. Existing utility lines not shown on drawings (or the location of which is not known to Contractor in time to avoid damage) damaged during trenching operations shall be repaired by Contractor and an adjustment to the Contract Price will be made according to Instructions to Bidders and

General Conditions.

3.04 BACKFILLING

A. General:

1. Coordinate backfilling with testing of utilities.
2. Carefully backfill trenches with satisfactory specified materials.
3. Bring backfill up evenly in 9-inch maximum layers, loose depth, and thoroughly and carefully compact with mechanical or hand tampers until pipe has a minimum cover of one foot. Take care not to damage the pipe.
4. Deposit remainder on the satisfactory backfill material in the trench 6-inch layers and compact by mechanical means to percentages as specified.
5. Keep excavations free of water until backfilling operation is complete.

B. Compaction:

1. Material may be compacted by a hand tamper, a powered hand tamper, a vibrating tamper, or mechanized power tamper provided such compaction percentages meet the required density as specified below.
2. Backfilling and compacting by means of hydraulic methods will not be allowed.
 - a. Compact each layer to not less than the percentage of maximum density specified below, determined according to ASTM D1557, Method D:

<u>FILLS AND BACKFILL</u>	<u>COHESIONLESS SOIL</u>
Under slabs	95%
Under walk areas, top 12 inches	95%
Under walk areas, below top 12 inches	90%
Under landscape areas	85%
Under other areas noted on Site Plan	85%

3.05 TESTING

- A. Notify the Engineer of the contracted Testing Laboratory to perform specified tests at Contractor's expense.
- B. Tests of Materials shall be as follows:
 1. Laboratory Tests for Moisture Content and Density:

- a. According to ASTM D1557, one test for each material encountered or proposed to be used.
- 2. Field Tests for Moisture Content and density:
 - a. According to ASTM D1556, one test per layer per 100 linear feet of ditch.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 2 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 2 Work.

END OF SECTION

SECTION 03200 CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 QUALITY ASSURANCE

- A. Codes and Standards: Comply with the following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. Wire Reinforcement Institute, Manual Standard Practice, 1979.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):

1. A82-95a Specification for Steel Wire, Plain, for Concrete Reinforcement.
2. A185-94 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
3. A496-95a Specification for Steel Wire, Deformed, for Concrete Reinforcement.
4. A497-95 Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.

1.03 SUBMITTALS

- A. General:

1. Submit shop drawings for fabrication and placement of reinforcement.

- B. Accessories: Show accessories, supports, chairs, bolsters, and spacers necessary to complete the installation.

PART 2 PRODUCTS

2.01 REINFORCING MATERIALS

- A. Comply with ACI 301.

- B. Welded Wire Fabric Reinforcing:

1. Unless indicated otherwise the minimum concrete protective cover specified in ACI 301 is the specified cover for this project unless indicated otherwise.

- C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening welded wire fabric in place. Use wire bar type supports complying with CRSI Class C or Class A as required acceptable.

PART 3 EXECUTION

3.01 PLACING REINFORCEMENT

- A. Clean reinforcement of loose rust and mill scale, dirt, and other materials that reduce or destroy bond with concrete.
- B. Accurately position, support, and secure reinforcement against displacement by concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers as required.
- C. Place reinforcement to obtain at least minimum coverages for concrete protection.
 - 1. Arrange, space, and securely tie to hold reinforcement in position during concrete placement operations.
 - 2. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 3 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 3 Work.

END OF SECTION

SECTION 03300 CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03200 - Concrete Reinforcement
2. 07900 - Joint Sealers.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

- | | | |
|----|----------------|---|
| 1. | A615/A-96a | Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement. |
| 2. | C150-96 | Specification for Portland Cement. |
| 3. | C260-95 | Specification for Air-Entraining Admixtures for Concrete. |
| 4. | C309-97 | Specification for Liquid Membrane-Forming Compounds for Curing Concrete. |
| 5. | C494-92 | Specification for Chemical Admixtures for Concrete. |
| 6. | D1751-83(1991) | Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types). |

1.03 SUBMITTALS: In accordance with Section 01330

A. Submit shop drawings for reinforcement and accessories:

1. Show slab reinforcing in plan view, not scheduled, and drawn to a minimum scale of 1/8" = 1'-0". Show reinforcing on the plan view along with size, quantity, marks, and spacing.
2. Other items may be detailed as needed.
3. Engineer will not accept drawing submitted not complying with these requirements. verify detailing proceeds as specified to avoid untimely reinforcing arrival.

B. Materials and methods of curing.

C. Concrete materials and mix designs.

D. Certifications required for admixtures (chloride and solids).

E. Chlorides in concrete.

F. Test reports.

G. Waterstops and premolded joint fillers.

H. Curing compounds.

1.04 STANDARDS

- A. Concrete work shall comply with requirements of ACI 301 - Specifications for Structural Concrete for Buildings, except as specified.
- B. The Contractor shall familiarize himself with the requirements of ACI 301 and this specification.
- C. The requirements that follow are listed in the sequence of chapter numbers of ACI 301 for ready reference purposes.
- D. Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 MATERIALS

- A. Comply with Chapter 1 of ACI 301.

2.02 MATERIALS FOR CONCRETE

- A. Comply with Chapter 2 of ACI 301 and the following:
 - 1. Cement: Type I or III complying with ASTM C150.
 - 2. Admixtures:
 - a. Water Reducing Admixture: The admixture shall comply with ASTM C494, Type A, and not contain more chloride ions that are present in municipal drinking water.
 - 1) Eucon WR-75 by Euclid Chemical Co.
 - 2) Pozzolith 200N by Master Builders.
 - 3) Plastocrete 160 by Sika Chemical Corp.
 - 4) Or approved equal
 - b. Water Reducing, Retarding Admixture: The admixture shall comply with ASTM C494, Type D, and not contain more chloride ions that are present in municipal drinking water.
 - 1) Eucon Retarder-75 by Euclid Chemical Co.
 - 2) Pozzolith 100XR by Master Builders.
 - 3) Plastiment by Sika Chemical Corp.
 - 4) Or approved equal
 - c. High Range Reducing Admixture (Superplasticizer): The admixture shall comply with ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water.
 - 1) Eucon 37 by Euclid Chemical Co.
 - 2) Sikament by Sika Chemical Corp.
 - 3) Or approved equal
 - d. Non-Chloride Accelerator: The admixture shall comply with ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water.
 - 1) Accelguard 80 by Euclid Chemical Co.
 - 2) Darex Set Accelerator by W.R. Grace.
 - 3) Or approved equal.

3. Air Entraining Admixture: Complying with ASTM C260.
 4. Calcium Chloride: Calcium chloride or admixture containing more than 0.1 percent chloride ions are not allowed.
- B. Certification: Written compliance to above-mentioned requirements and the chloride ion content will be required from the admixture manufacturer (include admixtures) before mix design review by the Engineer.

2.03 PROPORTIONING

- A. Comply with Chapter 3 of ACI 301 and the following:
1. Strength: Normal weight concrete - see drawings.
 - a. Concrete slab: 28-day compressive strength not less than 4,000 psi and a flexural strength (modulus of rupture) of not less than 650 psi when tested according to "Method of Test for Flexural Strength of concrete (using simple beam with third point loading)", ASTM C78. Include curb or curb and gutters.
 2. Durability:
 - a. Pumped Concrete:
 - 1) Testing shall be completed at the final discharge location after pumping.
 - 2) Testing shall be completed at the truck before pumping.
 - 3) Samples shall include samples for both slump and strength tests.
 - 4) Adding of water to transit mixers/agitators.
 - a) Contractor shall maintain a maximum time limit of 90 minutes on the introduction of water into the cement.
 - b) Only 1 addition of water on the site to bring the mix to the producer's mix slump criteria is allowed.
 - b. Design Mixes:
 - 1) Design mixes for concrete intended to be placed as-is from the truck shall be designed as such.
 - 2) Design mixes for concrete intended to be pumped shall be made on one of the following bases:
 - a) The mix shall be designed as a truly plastic mix by proper proportioning. See ACI 304.2R - Placing Concrete by Pumping Methods for guidelines for a pumpable plastic workable mix. Trial batches shall be made, and without a device to test pumping ability, results of field trials shall be used.
 - b) Water shall not be added at the pump. One addition of water at the truck to meet the design slump (at the truck) is allowed.
 - c) A super plasticizer may be used.
 - c. Concrete required to be air entraining shall contain the "Air Entraining Admixture", and air content shall comply with table 3.4.1 of ACI 301.
 - d. Pumped concrete and concrete with a water/cement ratio less than 0.50 shall contain the "High Range Water Reducing Admixture".
 - e. The "Water Reducing", Type A, or "Water Reducing and Retarding", Type D admixtures complying with ASTM C494 may be used at the option of the Contractor.

- f. Concrete containing the "High Range Water Reducing Admixture" (superplasticizer) shall have a maximum slump of 8 inches unless otherwise directed by the Engineer. The concrete shall be proportioned for a slump of 2 to 3 inches, be verified, then the high range water reducing admixture added to increase the slump to the approved level.
 - g. All other concrete shall be proportioned to have a maximum slump of 5 inches.
- 3. Normal weight concrete shall be air-entrained per ACI.

2.04 FORM WORK – Not Applicable

2.05 REINFORCEMENT

- A. Comply with ACI 301 and Section 03200 - Concrete Reinforcement for the required welded wire fabric.

2.06 JOINTS AND EMBEDDED ITEMS

- A. Comply with ACI 301 and the following:
 - 1. Expansion Joints:
 - a. Premolded joint fillers shall be preformed bituminous type, ASTM D1751 for joints without sealant.
 - b. Premolded joint fillers for joints with sealant and where indicated shall be non-extruding and resilient type of ASTM D1752, compatible with urethane joint sealant compounds.

2.07 PRODUCTION OF CONCRETE

- A. Comply with Chapter 7 of ACI 301 and following:
 - 1. Ready-Mixed Concrete:
 - a. Provide copies of each delivery ticket to the Engineer. Include mix designation on delivery ticket.
 - b. Do not place concrete over 90 minutes old from the time it was batched.

2.08 PLACING

- A. Comply with ACI 301:

2.09 SLABS

- A. Comply with ACI 301 and the following:
 - 1. Finishes: Finishes shall be according to Paragraph 11.8 of ACI 301 except as specified.
 - 2. Maximum allowable tolerances for floor slab.

2.010 CURING AND PROTECTION

- A. Comply with ACI 301 and the following:
 - 1. Preservation of moisture.
 - 2. Curing and Sealing Compound: Super Floor Coat or Super Pliocure by the Euclid Chemical Company or Masterseal 66 by Master Builders or approved equal. The compound shall comply with ASTM C309, Type 1 or Type 1D, 30 percent solids content minimum, and have test data from an

- independent laboratory indicating a maximum moisture loss of 0.030 grams per sq.cm. when applied at a coverage rate of 300 sq.ft. per gallon. Manufacturers certification required.
3. Curing and Hardening Compound: "Eucosil" by the Euclid Chemical Company or "Curetox" by Toch Brothers or approved equal. The compound shall be sodium silicate type.
 4. Apply compounds according to manufacturer's directions.
 5. Submit manufacturer's data.
 6. Application of Curing and Sealing and Curing and Hardening Compound: Apply compound to concrete slabs according to manufacturer's directions and as follows:
 - a. After fresh placed concrete surface has been finished and will not be marred by application, uniformly apply undiluted compound by spray, brush or squeegee without allowing compound to collect in low spots.
 - b. Keep traffic off surface for 24 hours or until surface is completely dry.
 - c. Within 1 week of a date set by the Engineer, thoroughly clean and wash exposed concrete interior floors, then apply a second uniformly applied coat of the specified Curing and Sealing Compound without allowing compound to collect in low spots. Keep traffic off surface for 24-hours following the second coat, or until surface is completely dry.

2.011 TESTING

- A. Comply with ACI 301 and the following:
 1. Testing Agencies: The cost of all concrete cylinder testing services will be by the Contractor
- B. Testing Services:
 1. For strength test of concrete, mold, cure, and test 5 specimens. Test 1 at 3 days, 1 at 7 days, and 3 at 28 days.
 2. Make 1 strength test for each 50 cubic yards or fraction thereof placed in any 1 day.

2.012 EVALUATION AND ACCEPTANCE OF CONCRETE

- A. Comply with ACI 301.

PART 3 - NOT USED.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 3 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 3 Work.

END OF SECTION

SECTION 07900 JOINT SEALERS

PART 1 GENERAL

1.01 SUMMARY

- A. System Description: Joint sealers, fillers, and other related materials compatible with one another, with joint substrate, and other adjacent materials including finishes.

1.02 SUBMITTALS: In accordance with Section 01330.

- A. Shop Drawings: Detail proper joint sealer and backing for the following joints:
1. Vertical and horizontal surfaces at interior locations.

1.03 QUALITY ASSURANCE

- A. Provide single source responsibility for each type of joint materials.

1.04 WARRANTY

- A. Manufacturer shall provide warranties covering joint sealers for 10 years from date of Substantial Completion.
- B. Contractor shall furnish the Board a 2-year written warranty covering quality of construction from applicator.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Joint Sealers:
1. Sika Chemical Corp.
 2. Sonneborn Building Products.
 3. Thiokol/Speciality Chemical Division.
 4. Thoro Systems Products.
 5. Tremco Manufacturing Co.
 6. Or approved equal

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 7 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay item for Division 7 Work.
- C. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 7 Work.

END OF SECTION

SECTION 08110 STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Steel doors and frames including necessary accessories.
- B. Related Sections:
 - 1. 07900 - Joint Sealers.
 - 2. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
 - 3. 09900 - Painting.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A366-96 Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
 - 2. A653/A-96 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 3. A924/A-96a Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- B. Factory Mutual (FM), latest edition.
- C. National Builders Hardware Association - "Recommended Locations for Builders", latest edition.
- D. Steel Door Institute (SDI), latest editions.
 - 1. SDI 100 Standard Steel Doors and Frames, latest edition.
 - 2. SDI 105 Recommended Erection Instructions for Steel Frames.
 - 3. SDI 107 Hardware on Steel Doors (reinforcement application).
- E. Underwriters Laboratories (UL), latest edition.
- F. National Fire Protection Association (NFPA)
 - 1. NFPA 101 Life Safety Code.
- G. Florida Building Code (FBC).
- H. Americans with Disabilities Act and Accessibility Guidelines (ADA).
- I. American National Standards Institute (ANSI):
 - 1. A250.4-1994 Test Procedure and acceptance criteria for physical endurance, steel doors and frames.
 - 2. A224.1-1980 Test Procedure and acceptance criteria for prime painted steel surfaces for steel doors and frames.
- J. Warnock Hersey International (WHI), Division of Inchcape Testing Services.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified product data including manufacturer's specifications and installation instructions before starting work, and any information necessary to indicate compliance to these specifications.
- B. Shop Drawings:
 - 1. Indicate manufacturer's model number, door and frame elevations and sections, materials, gauges and finishes, fabrication and erection details, as well as location of finish hardware by dimension. Do not proceed with any fabrication until all details are approved.
- C. Upon request, submit nonreturnable samples necessary to be evaluated for construction compliance.

1.04 QUALITY ASSURANCE

- A. Provide doors and frames complying with SDI 100 and as specified.
- B. The DTPW reserves the right to cut open, at no additional cost, a random door to verify construction and reinforcements for compliance with accepted manufacturer's shop drawings. Non-Compliance will be grounds for removal and replacement of installed door at no expense to the DTPW.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver steel doors and frames cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.
- B. Inspect steel doors and frames upon delivery for damage. Minor damage may be repaired if refinished items are equal in all respects to new work and acceptable to the Engineer. Remove and replace damaged items as directed.
- C. Store doors and frames under cover. Place units on minimum 4-inch-high wood blocking. Avoid use of non-vented plastic or canvas shelters that could create a humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.
- D. Deliver all doors and frames to the jobsite in a timely manner to not delay progress of other trades.

1.06 WARRANTY

- A. Hollow metal doors and frames shall be supplied with a one-year warranty against defects in materials and construction.
- B. Warranty shall begin on date of substantial completion of the project.

1.07 DEFINITIONS

- A. Areas subject to wet mopping include assembly rooms where food may be consumed, restroom areas (toilets, locker/showers), custodial, and other similar spaces with hard or resilient flooring.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Steel Doors and Frames:

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1. Ceco Corporation, Door Division, Carol Stream, IL.
2. Curries Company, Mason City, IA.
3. Firedoor Corporation, Miami, FL.
4. Quality Engineered Products Co., Inc., Tampa, FL.
5. Republic Builders Products, Pembroke Park, FL.
6. Or approved equal

2.02 DOOR FRAMES

- A. Fabricate interior frames to profiles indicated of 16 gage hot-dip zinc-iron alloy coated sheet steel, A366, with A60 coating designation according to ASTM A924 and ASTM A653 0.50 oz. zinc per sq.ft. total both sides. Steel shall be of commercial quality, stretcher leveled flatness.
- B. Frames: Fully welded with mitered or butted head and jamb members with integral stops and with combination buck and trim as shown.
 1. Corners shall have continuous flush and smooth welds without dishing.
 2. Sanitary or hospital type stops shall have 6-inch-high cutoffs with 45-degree caps.
- C. Hardware Reinforcements and Preparations:
 1. Frames shall be mortised, reinforced, and drilled/ tapped for mortised hardware according to approved finish hardware schedule and templates by hardware supplier.
 - a. Drilling and tapping for surface applied hardware shall be done in the field.
 - b. Locate finish hardware according to "Recommended Locations for Builder's Hardware" published by National Builders Hardware Association, or as otherwise directed by the Engineer.
 2. Butt (Hinge) Reinforcing:
 - a. Steel plate 3/16" thick by 1-1/4" minimum to 1-1/2" maximum by 10 inches long, offset as required to have faces of butts flush with doorframe edge and secured by not less than 6 spot welds.
 3. Strike Reinforcement: Offset clips of 12 gage steel, 1-1/4" x 4-7/8" long.
 4. Closer Shoe Reinforcing for Parallel Arm:
 - a. 12 gage steel plates (minimum 20" long x 1-3/4" wide) at bottom of doorstop located next to door rabbet on hinge.
 - b. Provide styrofoam or treated wood over plates to allow closer foot screws to seat without interference from grout fill.
- D. Silencer (Mute) Provisions: Punch frames to receive silencers on strike jamb.
- E. Center Hardware Mullions, Removable: Grout filled and fabricated with only one thickness of metal occurring at point of silencer punch-outs, 2" x 3", 11 gage hardware mullions by exit device manufacturer.
- F. Grout:

1. Grout Guards:
 - a. Provide 26 gage sheet metal covers welded to the back of frames at hinges, lock, bolts, tapped reinforcements at hardware and silencer locations.
 - b. At Silencer locations, furnish suitable removable plugs in holes to keep grout free.
2. Coatings:
 - a. Provide full coverage at frame interior before grouting with corrosion inhibiting bituminous coating.
3. Grout at Frames:
 - a. Grout fill doorframes at metal stud walls.
 - b. Grout shall be a mortar mix complying with ASTM C270, Type S-1800 psi minimum.
- G. Jamb Anchors: Provide according to frame manufacturer's recommendations for attachment to metal stud system as shown on drawings to allow grout fill.
- H. Floor Anchors: Provide 14 gage galvanized sheet steel angle shaped anchors for each jamb extending to the floor, punched for not less than two 1/4" diameter bolts.
- I. Spreaders: Provide frames with temporary steel spreader bars tack welded to jambs to maintain full rigidity and proper alignment during installation.

2.03 HOLLOW METAL DOORS

- A. Fabricate interior doors to profiles indicated of 16 gage hot-dip zinc-iron alloy coated sheet steel, A366, with A60 coating designation according to ASTM A924 and ASTM A653 0.50 oz. zinc per sq. ft. total both sides. Steel shall be of commercial quality, stretcher leveled flatness.
- B. Types: Flush, seamless hollow construction with louvers or vision cutouts as shown or specified.
- C. Sizes and Thickness: Sizes shall be as indicated and with 1-3/4" thickness unless otherwise specified or shown.
 1. Provide undercuts where indicated for ventilation.
- D. Door Perimeters:
 1. Stile Edges: Bevel for single acting doors shall be 1/8" in 2 inches.
 2. Reinforcing: Refer to the Drawings
 3. Top and Bottom Channels.
 - a. Not less than 16 gage A60 zinc coated steel channels-flush or inverted.
 - b. Welded to the face sheets.
- E. Doors:
 1. Classification: SDI Grade III - Model 2, 16-gage, seamless, and steel stiffened with required reinforcement and as shown on Drawings.
 2. Doors shall have minimum 20-gage, continuous one-piece, vertical steel stiffeners spaced not to exceed 6 inches apart and welded at 6 inches on center to face skin.

3. Lock Rail shall be one-piece, full height minimum 16-gage channel.
 4. Hinge Rail Reinforcement Manufacturer's Option:
 - a. One-piece, full height, 12-gage channel formed, and tapped for hinges.
 - b. One-piece, full height, minimum 16-gage channel formed and with minimum 3/16" thick steel by minimum 8" long at each hinge.
 5. Cylindrical Lock Reinforcement: Minimum 16-gage standard hardware lock box.
 6. All spaces between stiffeners shall be insulated with fiberglass or mineral insulation.
 7. Door closer reinforcement shall be minimum 12-gage channel or box, welded to top channel. Bottom of reinforcement shall be a minimum of 5-3/4" from top of door, by width of door.
 8. Astragals: Flat security type or "Z" as indicated in drawings or specifications.
 9. All doors shall comply with ANSI A250.4-1994 Level "A" criteria and be tested to 1,000,000 operating cycles and 23 twist tests.
 - a. Certification of Level "A" doors shall be submitted with approval drawings by the distributor.
 - b. Do not bid or supply any type or gage of door not having been tested and passed this criterion.
- F. Core material.
1. Stiffeners: Provide vertical members spaced not more than 6 inches o.c. with shape standard to manufacturer.
 2. Core Fill: Provide fiberglass or mineral standard to manufacturer.
- G. Hardware Reinforcements and Preparation:
1. Hardware Reinforcement: Comply with manufacturer's drawings.
 2. Hardware preparation.
 - a. Drill for hardware according to accepted finish hardware schedule and templates furnished by hardware supplier.
 - b. Drilling and tapping for surface applied hardware shall be done in the field.
 - c. Locate finish hardware according to recommended locations for hardware as shown on drawings.
 - d. Through bolts for exit devices and locksets shall be by manufacturer.
 - e. Lock reinforcement shall be located as height required for standard and disabled users as shown on drawings and as specified.

2.04 FINISHING AND SHOP PAINT

- A. After Fabrication: Grind exposed weld marks smooth and flush, clean and degrease surfaces, apply metallic filler, sand smooth, and apply shop coat of manufacturer's standard rust-inhibitive metal primer baked on.
- B. Prime Coat: Thoroughly cover all surfaces to provide uniform dry film thickness of not less than 1.0 mil without runs, smears, or bare spots.
- C. Primer Coat: Use manufacturer's standard rust inhibiting primer complying with ANSI A-224.1-1990.

PART 3 EXECUTION

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3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Frames:
 - 1. Install plumb, level, and true to line, secured in openings.
 - 2. Install frames according to accepted shop drawings, manufacturer's printed instructions.
 - 3. Grout fill doorframes at metal stud walls.
- B. Doors:
 - 1. Install in openings plumb, level, and true to line.
 - 2. Apply hardware and adjust to achieve smooth and quiet operation.
 - 3. Apply all door accessories plumb, level and true to line at locations indicated in the drawings.

3.03 ADJUST AND CLEAN

- A. Prime Coat Touch-Up: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective plastic wrappings from prefinished doors.
- C. Fill all dents, holes, etc. with metal filler and sand smooth flush with adjacent surfaces-paint to match.
- D. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition. Provide final adjustment as follows:
 - 1. Door Contact with Silencers: Doors shall strike a minimum of two silencers without binding lock or latch bolts in the strike plate.
 - 2. Head, Strike, and Hinge Jamb Margin: 1/8".
 - 3. Meeting Edge Clearance, Pairs of Doors: $\pm 1/16$ ".
 - 4. Bolts and Screws: Leave tight and firmly seated.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 8 Work.

- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 8 Work.

END OF SECTION

PART 1 GENERAL

A. Section Includes:

- ## B. Related Sections:

- ## 1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

- 09200 1

1.03 SUBMITTALS: In accordance with Section 01330

A. Product Data: Submit manufacturer's product data for cementitious materials, lath, metal support components, and accessories.

B. Material Certificates:

1. Submit producer's certificate for each kind of plaster aggregate indicated materials comply with requirements.

1.04 QUALITY ASSURANCE

A. Design Criteria:

1. Coordinate layout and installation of suspension system components for suspended ceilings with other work supported by or penetrating through ceiling.
2. Clear bonding agents are not allowed.
3. Metal corner beads are not allowed. Use plastic trim accessories.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Supports:

1. Dale/Incor.
2. Dietrich.
3. Gold Bond Building Products Division.
4. Unimast Inc. (USG Co.)
5. Or approved equal

B. Accessories:

1. Dietrich.
2. Gold Bond Building Products Div.
3. United States Gypsum Co.
4. Vinyl Corp., Miami, FL.
5. Or approved equal

C. Portland Cement Plaster/Stucco:

1. Rinker Materials Corp.
2. United States Gypsum Co.
3. Or approved equal

D. One Coat Veneer Plaster Over Cement Board: 3/32" Imperial Finish over 5/8" Durock cement board by US Gypsum Co. or approved equal over 20ga. metal framing at 16 inches o.c. maximum or accepted equivalent. UL U407 for 1-hour rating.

2.02 MATERIALS

A. Metal Supports - Suspended and Furred Ceilings:

1. Portland Cement Plaster/Stucco Installation: ASTM C926.
2. Wire for Hangers and Ties: ASTM A641, 16 gage monel.
3. Rod Hangers: Mild steel, zinc, or cadmium coated.
4. Flat Hangers: Mild steel, zinc, or cadmium coated or protected with rust inhibitive paint.
5. Channels:
 - a. Cold-rolled steel, minimum 0.0598" thickness of uncoated base metal, allowable bending stress of 18,000 psi. Protect with rust inhibitive paint or galvanizing complying with ASTM A924 for G60 coating designation.
 - b. Carrying Channels: 1-1/2" deep x 7/16" wide flanges, 475 lbs. per 1,000 feet painted, 508 lbs. per 1,000 feet galvanized.
 - c. Furring Channels: 3/4" deep x 7/16" wide flanges, 300 lbs. per 1,000 feet painted, 316 lbs. per 1,000 feet galvanized.
6. Hanger Anchorage Devices:
 - a. Screws, cast-in-place concrete inserts, or other devices appropriate for anchorage to the form of structural framing indicated and whose suitability for use intended has been proven through standard construction practices or certified test data.
 - b. Size devices to develop full strength of hanger

minimum 3 times calculated hanger loading, except size direct pullout concrete inserts for 5 x calculated hanger loading.

B. Steel Studs and Runners/Tracks:

1. Non-Load (Axial) Bearing Studs and Runners:

- a. ASTM C645 and complying with following requirements for minimum thickness of uncoated base metal and other characteristics:
- b. Stud Thickness: 0.0359" (20 ga.), unless otherwise indicated.
- c. Stud Depth: As indicated on the drawings.

C. Vertical Metal Furring:

1. Channel Furring and Braces:

- a. Cold-rolled steel, minimum 0.0598" thickness of uncoated base metal.
- b. Allowable Bending Stress: 18,000 psi.
- c. Protected with rust inhibitive paint finish or galvanizing.
- d. 3/4" deep x 7/16" wide flanges.
- e. 300 lbs. per 1,000 feet with painted finish.
- f. 316 lbs. per 1,000 feet with galvanized finish.

2. Z-Furring Member:

- a. Manufacturer's standard screw-type zee-shaped furring members formed from zinc-coated steel sheet.
- b. Minimum 0.0179" uncoated base metal thickness, complying with ASTM A924, Coating G60.
- c. Design for mechanical attachment of insulation boards or blankets to monolithic concrete and masonry walls.

3. Furring Brackets: Serrated-arm type, minimum 0.0329" thickness of base (uncoated) metal, adjustable from 1/4" to 2-1/4" wall clearance for channel furring.

D. Portland Cement Plaster Materials:

1. Base (Skim) Coat Cements: Portland Cement, ASTM C150, Type I or III.
2. Sand Aggregate - Base Coats: ASTM C897.
3. Fiber - Base Coat:
 - a. Alkaline-resistant glass fibers, 1/2" long, free of contaminants, manufactured for use in Portland cement plaster.
 - b. Product: Dur-O-Fiber AR Glass by Dur-O-Wal, Inc. or approved equal.

E. Miscellaneous Materials:

1. Water for Mixing and Finishing Plaster: potable, free of substances capable of affecting plaster set or of damaging plaster, or accessories.
2. Bonding Agent - Portland cement: ASTM C932.

2.03 MIXES

A. Portland Cement Plaster Mixes and Compositions - Base (Skim) Coat:

1. Comply with ASTM C926.
2. Base Coat:
 - a. Proportion materials for respective base coats in parts by volume for cementitious materials and in parts by volume per sum of cementitious materials for aggregates.
 - b. Adjust mix proportions below within limits specified to attain workability.
 - c. 1-part Portland cement, 2-1/2 to 4 parts sand.

B. Mixing: Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Ceiling Suspension Systems:

1. Preparation and Coordination:

- a. Coordinate installation of ceiling suspension system with existing overhead structural systems to ensure structural anchorage provisions have been installed to receive ceiling hangers to allow development of their full strength and at spacings required to support ceiling.
- b. Powder activated fasteners are not allowed during normal business work hours of the facility.

2. Hanger: Attach hangers to structure above ceiling to comply with Metal Lath/Steel Framing Association (ML/SFA) Specifications for Metal Lath and Furring and with referenced standards.

3. Ceiling Suspension System:

- a. Install components of sizes and spacings indicated but not in smaller sizes or greater spacings than required by installation standards.
- b. Wire Hangers: Space maximum 48 inches o.c. parallel with, and maximum 36 inches perpendicular to, direction of carrying channels, unless otherwise indicated, and within 6 inches of carrying channel ends.
- c. Carrying Channels: Space carrying channels maximum 36 inches o.c. with 48 inches o.c. hanger spacing.

B. Steel Stud Wall/Partition Support System:

1. Install components for steel stud wall/partition support systems to comply with directions of steel stud manufacturer for application indicated.
2. Non-Load (axial) Bearing Stud Systems: Comply with ASTM C754.
3. Extend studs to structure above and attach to existing structural components.

C. Portland Cement Plaster Application:

1. Apply Portland cement plaster materials, compositions, and mixes to comply with ASTM C926.
2. Skim Coat: Floated finish unless otherwise indicated.
3. Moist cure Portland cement plaster skim coat to comply with ASTM C926.
4. Sequence plaster application with installation and protection of other work, so neither will be damaged by installation of other.

3.02 ADJUSTING, CLEANING, AND PROTECTION

A. Cutting and Patching:

1. Cut, patch, point-up, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections.
2. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dryouts, efflorescence, sweat-out and similar defect, and where bond to substrate has failed.

B. Cleaning:

1. Remove temporary protection and enclosure of other work.
2. Promptly remove plaster from door frames, windows, and other surfaces that are not to be plastered.
3. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering work.
4. When plastering is completed, remove unused materials, containers, and equipment, and clean floors of plaster debris.

- C. Protection: Provide final protection and maintain conditions, in manner suitable to Installer, that ensures plaster work being without damage or deterioration at time of Substantial Completion.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract lump sum price under Alternate #2-Pay Item for Division 9 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09280 CEMENTITIOUS BOARD

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 09200 -Metal Studs, Lath, Suspension Ceiling, and Plaster.
2. 09310 – Floor and Wall Tile.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C 473 Test Methods for Physical Testing of Cement Panel Products.
2. C 1325 Specification for Fiber-Mat Reinforced Non-Asbestos Cement Interior Substrate Sheets.
3. C 1002 Specification for Steel Drill screws for the Application of Cement Panel Products or Metal Plaster Bases.

1.03 SUBMITTALS

- A. Before starting work, provide product data and samples as directed by the Engineer.

1.04 QUALITY ASSURANCE

- A. Finish work shall be subject to inspection using a lighting level of not less than 50-foot candles at the surface of the cement board. Surfaces judged to be unsuitable for finishing, even if finish has been applied, shall be rejected.
- B. The Engineer will direct repair or replacement of rejected work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in original unopened packages. Provide protection from damage and exposure to the elements.
- B. Prevent damage to edges and surfaces. Do not bend or damage metal corner beads and trim.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements: Proceed with installation of cement board materials only if building is weather tight.
1. Maintain temperature in areas receiving cement board materials between 55 degrees and 90 degrees F. during and after installation and provide adequate ventilation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Cement board:
 - 1. National Gypsum Company-Permabase.
 - 2. United States Cement Company (USG)-Durock.
 - 3. Or approved equal
- B. Accessories shall be by cement board manufacturer.

2.02 MATERIALS

- A. Cement board:
 - 1. Cement Board: ASTM C36, tapered edge, 5/8" thick x 48 inches wide x longest stock length, with vinyl-coated woven glass fiber embedded on both surfaces, both edges wrapped.
 - 2. Compressive strength: ASTM D2394-min. 2,250psi.
 - 3. Water absorption: ASTM C473-max 8% after 24hrs of testing
- B. Fasteners: Drill point screws (No. 8), wafer or bugle head, corrosion resistant, or accepted equivalent, with lengths as specified by manufacturer.
- C. Joint Treatment: Reinforcing tape, taping, or embedding and topping materials as recommended and manufactured by cement board manufacturer.
- D. Joint Reinforcement, Fasteners, Adhesives, and Grout: According to manufacturer's recommendation.
- E. Accessories:
 - 1. Use internal and external corner beads, casing beads, and control joints, to provide a finished job with true, straight edges against adjoining work.
 - 2. Provide expansion joints as required for conditions and according to manufacturer's recommendations.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Place panels with long dimension parallel to the framing members and abutting edges occurring over stud flanges.
 - 1. Fit ends and edges closely (maximum 1/16" between boards), but not forced together.
 - 2. Stagger end joints in successive courses. Place end or edge joints on opposite sides of framing in different locations to avoid creating joints of panels ending on the same stud.
 - 3. Panel edge above floor shall be 1/2" clear.
- B. Panel Attachment:
 - 1. Drive fasteners in field of panel first, working toward ends and edges.
 - 2. Hold panel in firm contact with framing while driving fasteners.

3. Install perimeter fasteners at 3/8" from ends or edges and spaced a maximum of 8 inches on center.
 4. Attach cement panels in field of panel with fasteners spaced a maximum of 12 inches on center.
- C. Accessories: Apply accessories according to manufacturer's instructions. Sand after application of final joint treatment coat and leave surface smooth and ready for work by other trades.
1. Treat metal accessories with not less than 2 coats of joint compound in the same manner as joints. Feather joint compound out from 8 to 10 inches on both sides of corners.
 2. Apply metal trim at intersections where cement board abuts other materials, unless detailed otherwise, and at all other locations indicated. Neatly fit and secure corner beads over external corners.
 3. Install expansion joints where detailed or per manufacturer recommendation.
 4. Install control joints where detailed or per manufacturer recommendation.
- D. Joint Treatment Application:
1. Taping and Embedding:
 - a. Apply taping or embedding compound in a thin, uniform layer to joints and angles.
 - b. Immediately apply reinforcing tape centered over joint or angle and firmly seat into compound. Sufficient compound (approximately 1/64" to 1/32") shall remain under tape to provide proper bond.
 - c. Immediately follow with a thin skim coat to embed tape but not to function as a second coat.
 - d. Fold and embed tape properly at interior angles to provide a true angle.
 - e. Tape or embedding coat shall be thoroughly dry before application of second coat.
 2. Second Coat Embedding:
 - a. Apply a second coat of joint compound over embedding coat, filling panel taper flush with surface.
 - b. Cover tape and feather out at least 2 inches on each side beyond first coat.
 - c. On joints with no taper, cover tape and feather out at least 4 inches on either side of tape.
 - d. Allow second coat to dry thoroughly before application of finish coat.
 3. Topping:
 - a. Spread a finish coat evenly over and extend at least 2 inches on each side beyond second coat on joints and feather to a smooth uniform finish.
 - b. Over tapered edges, do not allow finished joint to protrude beyond plane of surface.
 - c. Apply finish coat to cover tape and taping compound at taped angles and provide a true angle.
 - d. Where necessary, sand between coats and following final application of compound to provide a smooth surface ready for painting.
- E. Finishing Fasteners:
1. Apply a taping or all-purpose type compound to fastener depressions as the first coat.
 2. Follow with minimum of 2 additional coats of topping compound, leaving depressions level with plane of surface.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09310 FLOOR AND WALL TILE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03300 -Cast-In-Place Concrete.
2. 07900 -Joint Sealers.
3. 09200 -Metal Studs, Lath, Suspension Ceiling, and Plaster.
4. 09280 -Cementitious Board.
5. 15421 -Drains and Cleanouts.
6. 15440 -Plumbing Fixtures, Trim, and Supports.

1.02 REFERENCES

A. American National Standards Institute (ANSI) latest edition:

1. A108.1 Installation of Glazed Wall Tile, Ceramic Mosaic Tile, Quarry and Paver Tile with Portland Cement Mortar.
2. A108.5-85 Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
3. A108.10-85 Installation of Grout in Tilework.
4. A118.1-85 Dry-Set Portland Cement Mortar.
5. A118.6-85 Ceramic Tile Grouts.
6. A137.1-80 Specifications for Ceramic Tile.

1.03 SUBMITTALS: In accordance with Section 01330.

A. Product Data: Submit material specifications, printed installation and mixing instructions, and maintenance recommendations for ceramic tile and accessories.

B. Samples: Submit the following:

1. Panels: 12 inches square, of each type, color, and pattern of tile required.
2. Tile manufacturer's full color and pattern range for each type of tile required.
3. Grout manufacturer's full color range samples.
4. Each type of trim shape and special shape required, if requested.

1.04 QUALITY ASSURANCE

A. Tile shall conform to requirements of TCA 137.1, Standard Grade.

1.05 MAINTENANCE

A. Maintenance Materials: At the job site, provide 2 unopened boxes of each color and type of tile installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Porcelain Tile:
 - 1. Everstone International Company (Durastone), distributed by Dal-Tile (Porcelain tile Basis of Design).
 - 2. Or approved equal.

2.02 MATERIALS

- A. Slip-Resistant Porcelain Mosaic Floor Tile (Showers): 2 inches x 2 inches x 1/4" thick, unglazed, plain face, cushioned edges, having a minimum Dynamic Coefficient of Friction of 0.67, attained without use of abrasive impregnation.
- B. Porcelain Floor and Wall Tile:
 - 1. Floor Tile: Nominal 12" x 12" x 5/16" thick, matte, cushioned edges having a minimum Dynamic Coefficient of Friction of 0.42, attained without use of abrasive impregnation.
 - 2. Wall Tile: Nominal 12" x 24" x 5/16" thick (24" dimension in horizontal plane), matte, cushioned edges having a minimum Dynamic Coefficient of Friction of 0.42, attained without use of abrasive impregnation

Color and Pattern:

 - 3. As shown on the drawings (colors and patterns)
 - 4. Where colors or patterns are not shown, tile equivalent in cost to standard solid colors shall be bid upon, assuming not more than 10 colors.
 - 5. Engineer's range of color selection shall not be limited to colors stocked locally but by entire color line of specific manufacturer.
- C. Trim and Special Shapes: Provide the following trim units and special shapes of same material and finish as the wall tile:
 - 1. Base: Cove base units, width and height to match wall tile.
 - 2. External Corners: Bullnose shapes with round out base and top trim special shapes.
 - 3. Internal Corners: Field-buttet square with square in-corner base and top trim special shapes.
- D. Setting Materials: Dry-Set pre-sanded mortar according to ANSI A118.1-1985 and by manufacturer licensed by the Tile Council of America.
- E. Mortar Additive: Laticrete 3701 latex additive or approved equal.
- F. Grout: Certified by the tile manufacturer as suitable for type of tile and application.
 - 1. Dry-Set Grout: A mixture of Portland cement and additives furnished by a firm licensed to manufacture products and tested and approved by the Tile Council of America. Colors as selected by the Engineer.
 - 2. Commercial Latex-Portland Cement Grout: A mixture of Portland cement and mortar additive conforming to ANSI A118.6.
 - a. Color: Natural mortar color.
- G. Tile Cleaner: Biscayne Chemical Laboratories, Inc., "Blue Boy" or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Tile Setting Requirements:

1. Examine surfaces for foreign matter, unevenness, flatness, plumb planes, and damage. Make repairs if necessary to substrate to be in the proper condition to receive tile. Verify waterproofing at shower receptors will not affect tile installation adversely.
2. Construct sloped mortar beds using mortar consisting of 1-part Portland cement, 4 parts damp sand by volume, and gauged with mortar additive according to ANSI A108.5.
3. Secure tile firmly in place with uniform joints well filled and lines straight and true.
 - a. Bring finished surfaces to true and flat planes, plumb on walls.
 - b. Completed work shall be free of cracked or broken tiles.
4. Form intersections and returns perfectly and perform cutting and drilling of tile neatly without marring tile face.
 - a. Carefully grind and joint cut edges of tile against any trim, finish, and built-in fixtures.
 - b. Fit tile close around plumbing pipes, fixtures and fittings so usual plates, collars, or coverings will overlap tile.
5. Where borders, lines, patterns, panels, or other effects are a part of the work, properly space tiles and accurately reproduce required designs.
6. Where acoustic lay-in tile ceilings occur, install wall tile to a line 2 to 4 inches above plane of exposed surface of ceiling.
7. Layout tile work on floors or walls so, wherever possible, no tiles less than half full size will occur unless indicated.
8. Movement Joints:
 - a. Provide control, isolation, expansion, and contraction joints according to movement joint designs and install according the TCA Handbook for Ceramic or Porcelain Tile Installation.
 - b. Locate movement joints:
 - 1) At 24 to 36 feet in each direction.
 - 2) At tile abutting perimeter walls, dissimilar floors, pipes, and columns.
 - 3) Over cold joints and saw-cuts in the slab.
 - c. Extend joints through the setting bed to the concrete substrate equal in width to the tile grout joints.
 - d. Provide approved solid neoprene filler and approved polysulfide caulking.
9. Where tile abuts restraining surfaces, cut tile to match contour of that surface.
10. At shower receptors continue slip-resistant mosaic floor tile up and over curbs to meet floor tile in adjoining areas using special shapes where necessary.
11. At floor drains, slope floor tile from high points at walls around perimeter of rooms down to floor drains.

B. Setting Tile with Dry-Set Mortar:

1. Concrete Substrate:

- a. Set tile according to applicable requirements of ANSI A108.5.
 - b. Set tile with dry-set mortar, 3/32" to 1/8" thick.
 - c. Provide latex mortar additive in setting mortar per manufacturer's directions.
- C. Grouting: Comply with ANSI A108.10.
 - 1. Porcelain mosaic floor tile: Use commercial latex Portland cement grout.
 - 2. Porcelain floor and wall tile: Use dry-set grout.
 - 3. Force grout into joints to fill solid.
 - a. Remove and re-grout discolored joints. Fill voids in joint grout.
- D. Thresholds: Set where indicated or at dissimilar floor finishes with the same material used for setting mosaic floor tile or as indicated in the drawings.
- E. Tolerances: Finished installation shall be trued to a tolerance of $\pm 1/8"$ in a 10-foot radius and $+1/16"$ within any given running foot.

3.02 CLEANING

- A. Apply tile cleaner according to cleaner manufacturer's printed instructions.
- B. Leave finished installation clean and free of cracked, chipped, broken, and unbonded or otherwise defective tile.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- C. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09510 ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
1. 09200 -Metal Studs, Suspension Ceilings and Plaster.
 2. 09310 – Floor and Wall Tile.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. A653-96 Standard Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-iron Alloy-coated (Galvannealed) by the Hot-dip Process.
 2. C635-95 Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 3. C636-96 Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 4. E1264-96 Classification for Acoustical Ceiling Products.
- B. Ceiling and Interior Systems Contractors Association (CISCA) publication (current edition): Acoustical Ceilings - Use and Practice.
- C. Underwriters Laboratories (UL) fire rating listings and classifications.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified product data, including properties of lay-in panels, fire tests, details of suspension grid system, and installation instructions for review before starting work.
- B. Shop Drawings: As may be required by the Engineer. Coordinate grid erection drawings with lighting fixtures, air-conditioning outlets / inlets, access panels, sound system, and other openings and irregularities.
- C. Samples: Submit identified samples of each of the following for review and selection:
1. Exposed grid suspension system with angle.
 2. Acoustical lay-in panel, 12 inches square piece.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Acoustical Lay-in Panels, Mineral Fiber Type:
1. 24 inches x 24 inches.
 2. Complying with ASTM E1264, Class A, Type 3, Form 2, square edged.
 3. Nominal Thickness: 5/8".
 4. Finish: Factory applied, washable white. At no additional cost to the Owner, up to two (2) alternate

- colors (to use as accent tiles) may be selected by the Engineer.
5. Manufacturers:
- a. Directional Panels:
 - 1) Armstrong: Fissured #705 lay-in panels, angled tegular.
 - 2) Equivalent from Celotex.
 - 3) Equivalent from USG Interiors.
 - 4) Or approved equal
 - b. Non-directional Panels:
 - 1) Armstrong: Cortega #770 Fissured lay-in panels, angled tegular
 - 2) Equivalent from Celotex.
 - 3) Equivalent from USG Interiors.
 - 4) Or approved equal
- B. Hangers: 12 gage (0.109" diameter) annealed steel wire, galvanized.
- C. Exposed Suspension Grids for Acoustical Lay-in Panels:
- 1. 2 feet x 2 feet grid pattern with steel caps for exposed 15/16" grid tee and angle members complying with ASTM C635, zinc-coated or hot-dipped galvanized complying with A653, factory painted steel parts with factory applied white baked enamel or polyester finish. At no additional cost to the Owner, up to two (2) alternate colors may be selected by the Engineer.
 - 2. Manufacturers:
 - a. Armstrong.
 - b. Celotex.
 - c. USG Interiors, Inc. (Donn).
 - d. Or approved equal

PART 3 EXECUTION

3.01 INSTALLATION

- A. Powder activated fasteners are not allowed during normal business hours of the building.
- 1. Coordinate and provide inserts, anchors, bolts, hangers, or other means to support ceilings suspended from structure.
- B. Install specified suspension system and acoustical lay-in panels according to ASTM C636 and Cisca Publication "Acoustical Ceilings - Use and Practice", and applicable manufacturer's printed instructions.
- 1. Complete partitions indicated to be extended to overhead construction with finishes applied before installation of ceilings abutting such partitions.
 - 2. Provide one hanger minimum for each 16 square feet of ceiling.
 - a. Locate hanger wire not more than 1 foot away from main runners resting on wall trim.

C. Acoustical Lay-in Panels:

1. Fit acoustical lay-in panels to grid accurately, without dented, broken, cracked, chipped, or soiled surfaces.
2. A cut panel shall be a size that will not expose an edge when the panel is slid to the opposite side.

D. Light Fixtures:

1. Fit acoustical lay-in panels accurately around surface mounted and stem mounted electrical fixture outlets.
2. Adequately support tees supporting light fixtures by hanger wires so grid is level after light fixture installation.
 - a. Provide a hanger wire within 3 inches of each recessed lay-in light fixture corner.

E. Alignment:

1. Align suspension members for true level surfaces and straight lines. Run joints and exposed grid members parallel to the room axis in both directions.
2. Install exposed suspension grids per installers accepted grid layout drawings, properly coordinated with air conditioning and electrical trades.

F. Border Balance:

1. Balance border areas to avoid acoustical units less than 1/2 unit wide.

3.02 ADJUSTING AND CLEANING

- A. Replace dirty or discolored acoustical panel surfaces following erection and leave free from defects.
- B. Remove damaged or improperly installed acoustical panels and replace.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- B. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 9 Work.

END OF SECTION

SECTION 09900 PAINTING OF UNPAINTED SURFACES

PART 1 GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Field painting of exposed and covered pipes, ducts (including color coding), hangers, and walls as indicated in the drawings.
 - 2. Six-year warranty for labor and materials from the paint manufacturer.
- B. Related Section:
 - 1. 07900 - Joint Sealers.
 - 2. 09901 – Painting of Previously Painted Surfaces

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. D3359-95a Test Methods for Measuring Adhesion by Tape Test.
 - 2. D3927-87 Standard Guide for State and Institutional Purchasing of Paint.
 - 3. D4262-83(88) pH of Chemically Cleaned or Etched Concrete Surfaces.
- B. OSHA Workers Environmental Conditions.
- C. National Fire Protection Association (NFPA): NFPA 30 - Flammable and Combustible Liquids Code.

1.03 DEFINITIONS

- A. Alkyd: Oil-based paint.
- B. Latex: Water-based paint.
- C. New Work: Surface or area of a surface not previously painted, including areas patched, replaced, or sandblasted causing a painted or unpainted surface or part of a painted or unpainted surface to exist.
- D. Old Work: Surface that has been previously painted (See Section 09901).
- E. Paint: All coating systems materials, including primers, emulsions, enamels, stains, varnishes, sealers and fillers, and other applied materials used as prime, intermediate, or finish coats.
- F. Smooth: A surface free from roughness, ridges, and projections.

1.04 SUBMITTALS: In accordance with Section 01330.

- A. Product Data: Submit Manufacturer Safety Data Sheet (MSDS), manufacturer's technical information, including paint label analysis and application instructions for each material proposed for use.
- B. Samples:

1. Color Chips:
 - a. Before starting work, furnish color chips for surfaces to be painted to the Engineer. Color chips shall comply with approved colors as selected by Engineer.
 - b. Use representative colors when preparing samples for review.
 2. Representative Samples:
 - a. Submit representative samples for review of color and texture only.
 - b. Provide listing of material and application for each coat of each finish sample.
 - c. Provide three samples of each color and material on min. 6" x 6" panels with texture simulating actual finish. Label and identify each by location.
 - d. Resubmit samples as requested by Engineer until acceptable sheen, color, and texture are achieved.
 3. Paint Sample: Provide 4-one-quart containers of each color or type. Label each container with the facility name, project number, name of the Contractor, name of the supplier, designated use, and type of paint in the container.
- C. Warranty:
1. Submit paint manufacturer's proposed 6-year warranty document.
 2. Submit paint manufacturer's proposed program of inspection and approval before and during the Work as required by paint manufacturer to implement the submitted 6-year warranty.
 3. At the end of the paint work, provide to the DTPW, from the authorized paint manufacturer representative, a signed and notarized letter stating that the surfaces painted have met all the conditions for paint adhesion.

1.05 QUALITY ASSURANCE

- A. Qualifications: Paint applicator shall be licensed in the State of Florida or in Miami-Dade County and use state or county-certified journeymen. Provide a legible copy of license and, when applicable, a journeyman's certification attesting to required qualifications.
- B. Certifications:
 1. Paint applicator shall provide a certification attesting to having worked on projects similar in scope to this project. Paint applicator not providing such documentation or not having the required experience will be removed from the project and replaced by the Contractor.
- C. Quality assurance issues, including but not limited to, material selection, surface integrity and other tests, surface preparation, painting procedures, workmanship, and warrantability require review and acceptance by Engineer.
- D. Pre-Construction Meeting: At this meeting, the following will be discussed. Attendance by the paint applicator and manufacturer representative is encouraged:
 1. Review of proposed materials and compliance with specifications.
 2. Procedures to be followed and methods to be used in painting of new work and repainting of existing surfaces, with special emphasis on testing, repair, and preparation of existing surfaces.
 - a. Discuss and agree to modifications to the procedures established in Part 3 of this section required by the paint manufacturer to uphold the required 6-year warranty. Modifications, if

any, are to be noted in writing by the manufacturer. Provide signed and notarized copies to Engineer and to all other parties present at the preconstruction meeting.

3. Coordination of any mockup requirements of this section and of other related sections.
4. Review of extent, procedures, and schedules for on-site tests, observation, and supervision by Materials Manufacturer's Representative according to requirements of this section and to enable the manufacturer to issue the required guarantees.
5. Review of warranties and guarantees required by the various parties, as specified in this section, in addition to the general guarantee required by Instructions to Bidders and General Conditions and statement by all parties concerned of their agreement or objection to the terms. Such statements shall be recorded in writing as part of the minutes of the meeting, with action suggested or taken to comply with contract requirements.

E. Coordination of Work:

1. Review other sections of the specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates.
2. Upon request from other trades, furnish information or characteristics of finish materials to be provided, to ensure compatible prime coats are used.
3. Phase projects to allow a minimum of 28 days for plaster to cure properly. If painting begins before the 28-day curing period, then a moisture and pH test shall be made according to ASTM D4262 and ASTM D4263. Provide a written record of such test and receive written approval from the Engineer and paint manufacturer.

F. Mockups:

1. Provide an in-place mockup of each wall surface condition, allowing space for a minimum of 50 sq. Ft. for each color of paint to be used for project wall surfaces. Construct and cure, for a minimum of 28 days, the mockup walls in the same manner as required for the permanent walls.
2. After coordinating and receiving approval for application onto designated mockup sample walls, apply the approved paint samples.
3. Duplicate painted finishes of prepared samples on actual interior wall surfaces.
4. Provide full coat finish samples on at least 50 sq. Ft. of surface, as directed, until required sheen, color, and texture are obtained. Simulate finished lighting conditions for review of in-place Work.
 - a. Final acceptance of colors will be from samples applied on mockup.
5. Engineer may test the mockup sample or selected painted surface according to ASTM D3359. If test fails, retesting shall be at the Contractor's expense.

G. Surfaces to be Painted:

1. Except where natural finish of material is specifically noted as surface not to be painted, paint exposed surfaces with colors as selected by the Engineer.
2. Where items or surfaces are not specifically mentioned, paint same as similar adjacent materials or areas.
3. If color or finish is not designated, coordinate with the Engineer for selection.
4. Paint (red), using stencils, identifications and warnings, following text specified in other sections.
5. Paint (yellow), door-swing arcs and warning lines where required.

H. The following categories of Work are not included as part of field-applied finish work, unless otherwise specified:

1. Pre-Finished Items: Do not include painting of factory-finished or installer-finished specified items

such as, but not limited to, pre-finished partition systems, acoustic materials, architectural woodwork and casework, attached signs, finished mechanical, electrical equipment, light fixtures and building systems components (Fire Alarm, Security, Wifi, etc.).

2. Concealed Surfaces: Painting is not required, unless noted otherwise on the Drawings, of surfaces such as walls or ceilings in concealed and areas of limited access.
 3. Finished Metal Surfaces: Painting is not required at metal surfaces of anodized or enameled aluminum, stainless steel, chromium plate, bare copper, bare bronze, and metals of similar finish. Paint visible galvanized steel and mill-finish aluminum surfaces.
 4. Operating Parts: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts are not required to be painted.
- I. Do not paint over code-required labels such as Underwriters Laboratories (UL) and Factory Mutual (FM), name, equipment identification, performance rating, or nomenclature plates, or at piping or circuit identifiers.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in original, new, and unopened packages and containers bearing manufacturer's name and label, and following information:
1. Name or title of material.
 2. Federal Specification number.
 3. Manufacturer's stock number and date of manufacture.
 4. Manufacturer's name.
 5. Contents by volume, for major pigment and vehicle constituents.
 6. Application instructions.
 7. Color name and number.
- B. Storage:
1. Store materials not in actual use in tightly covered containers.
 2. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
 3. Protect from freezing or extreme heat, 95 degrees F. or above.
 4. Keep storage area neat and orderly.
 5. Remove from the project site contaminated products from oil-based products and their by-products by the end of each working day.

1.07 PROJECT CONDITIONS

- A. Environmental Requirements:
1. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50- and 90-degrees F., unless otherwise allowed by paint manufacturer's printed instructions.
 2. Do not apply paint when relative humidity exceeds 85 percent, or to damp or wet surfaces, unless otherwise allowed by paint manufacturer's printed instructions.
 3. Do not apply paint in areas that are not broom clean and free of dust and debris.
 4. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.
- B. Workers Environmental Conditions:
1. Comply with the standards established in OSHA Workers Environmental Conditions.

2. Take precautions to ensure that personnel and work areas are adequately protected from fire and health hazards resulting from handling, mixing, and application of paints.
3. Illumination: Provide lighting equal to the permanent lighting planned for designated space.
4. Ventilation: Provide adequate ventilation to prevent buildup of fumes.

1.08 SEQUENCING AND SCHEDULING

- A. Phase projects to allow a minimum of 28 days to properly cure plaster surfaces before the application of paint.
- B. Phase the project to allow reasonable time for the inspection and written approval at each phase of the work by the Paint Manufacturer's Representative.

1.09 WARRANTY

- A. Provide a written guarantee, co-signed jointly and severally by the Painting Subcontractor and Materials Manufacturers, against cracking, peeling, flaking, chalking, and mildew on interior painted surfaces, and additionally against erosion and unreasonable fading on exterior surfaces, for 6 years; agreeing to repair and repaint surfaces affected by such defects, at no cost to the DTPW including necessary removal or protection of other work, without limit, within 30 days after notification by the DTPW, and to perform such work based on the provisions of this section, including extension of the guarantee to cover new work.

1.010 MAINTENANCE

- A. Provide two 5-gallon containers, properly labeled and sealed, of each type and color of finished paint used on the project. If less than 10 gallons of a particular type and color was used, then provide 1 one-gallon container.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Benjamin Moore
- B. Sherwin-Williams
- C. PPG
- D. Or approved equal

2.02 MATERIALS

- A. Use Latex-based materials for painting of interior finishes.
- B. Primers, Undercoats, Split and Finish Coats: Use materials from same manufacturer when such materials are applied on same surface.
- C. Paints for interior use shall be factory tinted with each stage of coating application (primer, first coat, and finish coat) to be visually distinguishable from the preceding coat until the final coat. The final coat shall match the selected color.
 1. Label each container indicating whether it is primer, first coat, or finish coat.
 2. Label each container with the name and number of the color.
 3. Label each container indicating if it is intended for exterior or interior usage.
- D. Color Selection:

1. Engineer will select colors from samples and materials submitted under Article 1.04.
2. If color is not listed for a specific area or item, Contractor is not relieved of responsibility for providing colors subsequently selected.
3. Color selection made by Engineer is to determine basic color required for surface.
4. Colors with same designation but produced from two or more sources shall match when viewed from distance of 24 inches or more.
5. Final application of colors shall match prepared samples approved by the Engineer.

2.03 INSPECTION

- A. Pre-Construction Inspection: In conjunction with the meeting required in Part 1 of this section, the Painting Subcontractor and the Materials Manufacturer Representative shall conduct on-site inspections and perform tests to determine
 1. Whether the corrective and preparatory work specified below is adequate, excessive, or insufficient to obtain the required performance criteria required in this section and the guarantee.
- B. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- C. Start of painting operations implies contractor's acceptance of the surface conditions and responsibility for required standards of quality and appearance.

2.04 PREPARATORY WORK

- A. Remove electrical outlet and switch cover plates, finish hardware escutcheons and cover plates, air-conditioning registers, and other finished items installed on surfaces to be painted and replace afterwards or provide protection as approved by Engineer. Protect items and surfaces that cannot be removed or that do not interfere with the painting and leave clean and completely free of paint.
- B. Clean surfaces of all dirt, dust, or other contaminants that affect adhesion of paint or appearance of paint. Clean grease and oil from metal surfaces with turpentine or mineral spirits and wipe dry before priming. Wire brush or sand metal surfaces to remove rust and scale. Touch-up factory primed surfaces with compatible factory primers. Schedule the cleaning so that contaminants from the cleaning process will not fall onto the wet painted surfaces.
- C. Fill nail holes, cracks, open joints, and other defects after priming or first coat is dry and before second coat is applied.
- D. Allow all coats to dry thoroughly before applying succeeding coats. Comply with paint manufacturer's recommendations.
- E. Prime finished work, not shop coated, when delivered to the job or as soon as possible after delivery.
- F. Clean and sand surfaces between coats with 150 Fine sandpaper or as recommended by the paint manufacturer.

2.05 APPLICATION

- A. General:
 1. Perform work in a thorough and professional manner in conformance with accepted good practices and requirements of authorities having jurisdiction.
 2. Protect finished materials and areas not to be painted by using drop cloths, masking, or other

- accepted methods.
 - 3. Provide adequate ventilation for proper drying of surfaces before and after painting.
 - 4. Drying Period: Allow each coat to dry thoroughly before succeeding coats are applied. Minimum drying time shall be according to manufacturer's recommendations.
 - 5. Paint Shading: Each coat of paint shall vary sufficiently to easily distinguish it from previous coats of paint, both interior and exterior applications.
 - 6. Observation and Acceptance: As required by paint manufacturer between coats before application of next coat of paint materials.
- B. Apply materials, as they come from manufacturer, to dry surfaces according to manufacturer's directions as printed on container. Any mixing on site requires specific and special approval of the Engineer.
 - C. Apply paint materials to give an even, solid color with each coat. For deep tone finish colors, use deep base primers recommended by manufacturer.
 - D. Apply paint materials by brush, roller, or spray method.
 - 1. Select method best suited to profile, texture, and finish of existing surface, subject to suitability regarding safety and conditions in existing or occupied areas, and subject to approval by paint manufacturer and Engineer.
 - 2. Apply materials evenly, smoothly flowed on and cut in neatly, without runs, sags, wrinkles, shiners, streaks, and brush marks; drying uniformly to color and sheen selected. Make dividing lines that separate colors straight and clean cut.
 - E. Dry Film Thickness:
 - 1. Comply with manufacturer's specifications.
 - 2. Minimum Dry Film Thickness: 5 mils (unless otherwise recommended by paint manufacturer), total finished application. Reduction of minimum thickness due to special coating characteristics or application procedures requires written approval for each case.

2.06 FIELD QUALITY CONTROL

- A. Notify Engineer and material manufacturers' representatives when critical points in the painting and repainting work are reached, to allow timely inspection and approvals. Critical points include during and after the operation, plus other points designated by the Engineer, or material manufacturer representatives:
 - 1. Surface patching and preparation.
 - 2. Sealing of surfaces.
 - 3. Application of primer and transition coats. Adhesion testing of transition coats may be required.
 - 4. Intermediate and finish coats.

2.07 ADJUSTING AND CLEANING

- A. Remove construction debris, material containers, equipment, and other trash resulting from work of project.
- B. Upon completion of work, remove stains and paint spots from floors, wall, woodwork, electric trim, hardware, fixtures, and other items of the work areas.
- C. Dispose oil-based products, their by-products, and waste contaminated by them, in a manner acceptable to DERM (RER).

D. INTERIOR SPACES PAINT SCHEDULE

1. Walls:

1st Coat	Acrylic latex wall primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

2. Walls (Veneer Plaster only)

1st Coat	Alkyd-based penetrating chalky wall primer/sealer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

3. Metal Doors:

1st Coat	Field applied rust inhibitive primer over shop primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

4. Ceilings Not Acoustically Treated:

1st Coat	Acrylic latex primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

E. INTERIOR METALS PAINT SCHEDULE

1. Galvanized Metal: Apply neutralizer and allow to dry thoroughly.

1st Coat	Galvanized metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

2. Metal Sash - Doors and Frames:

1st Coat	Metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

3. Exposed Ferrous Metal:

1st Coat	Rust inhibitive primer.
2nd Coat	Acrylic latex enamel.
3rd Coat	Acrylic latex enamel.

4. Other Metals Not Previously Mentioned:

1st Coat	Rust inhibitive metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).

3rd Coat Acrylic latex enamel (or aluminum paint).

PART 3 MEASUREMENT AND PAYMENT

3.01 MEASUREMENT:

Work under this Section will be separately measured for payment

3.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09901

PAINTING OF PREVIOUSLY PAINTED SURFACES

PART 1 GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Repainting existing interior surfaces.
 - 2. Six-year warranty for labor and materials from the paint manufacturer.
- B. Related Section:
 - 1. 07900 - Joint Sealers.
 - 2. 09900 – Painting of Unpainted Surfaces

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. D3359-95a Test Methods for Measuring Adhesion by Tape Test.
 - 2. D3927-87 Standard Guide for State and Institutional Purchasing of Paint.
 - 3. D4262-83(88) pH of Chemically Cleaned or Etched Concrete Surfaces.
 - 4. D4263-83(93) Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- B. OSHA Workers Environmental Conditions.
- C. National Fire Protection Association (NFPA): NFPA 30 - Flammable and Combustible Liquids Code.

1.03 DEFINITIONS

- A. Alkyd: Oil-based paint.
- B. Latex: Water-based paint.
- C. New Work: Surface or area of a surface not previously painted, including areas patched, replaced, or sandblasted causing a painted or unpainted surface or part of a painted or unpainted surface to exist.
- D. Old Work: Surface that has been previously painted.
- E. Paint: All coating systems materials, including primers, emulsions, enamels, stains, varnishes, sealers and fillers, and other applied materials used as prime, intermediate, or finish coats.
- F. Smooth: A surface free from roughness, ridges, and projections.

1.04 SUBMITTALS: In accordance with Section 01330

- A. Product Data: Submit Manufacturer Safety Data Sheet (MSDS), manufacturer's technical information, including paint label analysis and application instructions for each material proposed for use.
- B. Samples:

1. Color Chips:
 - a. Before starting work, furnish color chips for surfaces to be painted to the Engineer. Color chips shall conform to approved colors as selected by the Engineer and from DTPW Colors.
 - b. Use representative colors when preparing samples for review.
 2. Representative Samples:
 - a. Submit representative samples for review of color and texture only.
 - b. Provide listing of material and application for each coat of each finish sample.
 - c. Provide three samples of each color and material on 6" x 18" panels with texture to simulate actual finish. Label and identify each by location.
 - d. Resubmit samples as requested by Engineer until acceptable sheen, color, and texture are achieved.
 3. Paint Sample: Provide 4-one-quart containers of each color or type. Label each container with the school name, project number, name of the Contractor, name of the supplier, designated use, and type of paint in the container.
- C. Warranty:
1. Submit paint manufacturer's proposed 6-year warranty document.
 2. Submit paint manufacturer's proposed program of inspection and approval before and during the Work as required by paint manufacturer to implement the submitted 6-year warranty.
 3. At the end of the paint work, provide to the DTPW, from the authorized paint manufacturer representative, a signed and notarized letter stating that the surfaces painted have met all the conditions for paint adhesion.

1.05 QUALITY ASSURANCE

- A. Qualifications: Paint applicator shall be licensed in the State of Florida or in Miami-Dade County and use state or county certified journeymen. Provide a legible copy of license and, when applicable, a journeyman's certification attesting to qualification requirements.
- B. Certifications:
 1. Paint applicator shall provide a certification attesting to having worked on projects similar in scope to this project. Paint applicator not providing such documentation or not having the required experience will be removed from the project and replaced by the Contractor.
- C. Quality assurance issues, including but not limited to, material selection, surface integrity and other tests, surface preparation, painting procedures, workmanship, and warrantability require review and acceptance by Engineer.
- D. Pre-Construction Meeting: At this meeting, the following will be discussed. Attendance by the paint applicator and manufacturer representative is encouraged:
 1. Review of proposed materials and compliance with specifications.
 2. Procedures to be followed and methods to be used in painting of new work and repainting of existing surfaces, with special emphasis on testing, repair, and preparation of existing surfaces.

- a. Discuss and agree to modifications to the procedures established in Part 3 of this section required by the paint manufacturer in order to uphold the required 6-year warranty. Modifications, if any, are to be noted in writing by the manufacturer. Provide signed and notarized copies to Engineer and to all other parties present at the preconstruction meeting.
 - b. Review of improved or alternate methods suggested to prepare existing surfaces for repainting, based on on-site surveys and tests made by the parties present.
 3. Coordination of the mockup requirements of this section and of other related sections.
 4. Review of extent, procedures, and schedules for on-site tests, observation, and supervision by Materials Manufacturer's Representative according to requirements of this section and to enable the manufacturer to issue the required guarantees.
 5. Review of warranties and guarantees required by the various parties, as specified in this section, in addition to the general guarantee required by Instructions to Bidders and General Conditions; and statement by all parties concerned of their agreement or objection to the terms. Such statements shall be recorded in writing as part of the minutes of the meeting, with action suggested or taken to comply with contract requirements.
- E. Coordination of Work:
1. Review other sections of the specifications in which paint primers are provided to ensure compatibility of total coatings system for various substrates.
 2. Upon request from other trades, furnish information or characteristics of finish materials to be provided, to ensure compatible prime coats are used.
 3. Phase projects to allow a minimum of 28 days for stucco and plaster to cure properly. If painting begins before the 28-day curing period, then a moisture and pH test shall be made according to ASTM D4262 and ASTM D4263. Provide a written record of such test and receive written approval from the Engineer and paint manufacturer.
- F. Mockups:
1. Provide an in-place mockup of each wall surface condition, allowing space for a minimum of 50 sq.ft. for each color of paint to be used for project wall surfaces. Construct and cure, for a minimum of 28 days, the mockup walls in the same manner as required for the permanent walls.
 2. After coordinating and receiving approval for application onto designated mockup sample walls, apply the approved paint samples.
 3. Duplicate painted finishes on actual interior wall surfaces.
 4. Provide full coat finish samples on at least 50 sq. Ft. of surface, as directed, until required sheen, color, and texture are obtained. Simulate finished lighting conditions for review of in-place Work.
 - a. Final acceptance of colors will be from samples applied on mockup.
 5. Engineer may test the mockup sample or selected painted surface according to ASTM D3359. If test fails, retesting shall be at the Contractor's expense.
- G. Surfaces to be Painted:
1. Except where natural finish of material is specifically noted as surface not to be painted, paint exposed surfaces with colors as selected by the Engineer.
 2. Where items or surfaces are not specifically mentioned, paint same as similar adjacent materials or areas.
 3. Any existing wall surface which abuts a new construction surface to be painted under Section 09900, is to be painted in its entirety from corner to corner to match the new work's paint.
 4. If color or finish is not designated, coordinate with Engineer for selection.

- H. The following categories of Work are not included as part of field-applied finish work, unless otherwise specified:
1. Pre-Finished Items: Do not include painting of factory-finished or installer-finished specified items such as, but not limited to, pre-finished partition systems, acoustic materials, architectural woodwork and casework, attached signs, finished mechanical and electrical equipment, light fixtures and building systems components (Fire Alarm, Security, Wifi, etc.)
 2. Concealed Surfaces: Painting is not required, unless noted otherwise on the Drawings, of surfaces such as walls or ceilings in concealed and areas of limited access.
 3. Finished Metal Surfaces: Painting is not required at metal surfaces of anodized or enameled aluminum, stainless steel, chromium plate, bare copper, bare bronze, and metals of similar finish. Paint visible galvanized steel and mill-finish aluminum surfaces.
 4. Operating Parts: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts are not required to be painted.
- I. Do not paint over code-required labels such as Underwriters Laboratories (UL) and Factory Mutual (FM), name, equipment identification, performance rating, or nomenclature plates.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in original, new, and unopened packages and containers bearing manufacturer's name and label, and following information:
1. Name or title of material.
 2. Federal Specification number.
 3. Manufacturer's stock number and date of manufacture.
 4. Manufacturer's name.
 5. Contents by volume, for major pigment and vehicle constituents.
 6. Application instructions.
 7. Color name and number.
 8. Indicate if paint is for interior or exterior use.
- B. Storage:
1. Store materials not in actual use in tightly covered containers.
 2. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
 3. Protect from freezing or extreme heat, 95 degrees F. or above.
 4. Keep storage area neat and orderly.
 5. Remove from the project site contaminated products from oil-based products and their by-products, by the end of each working day.

1.07 PROJECT CONDITIONS

- A. Environmental Requirements:
1. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50- and 90-degrees F., unless otherwise allowed by paint manufacturer's printed instructions.
 2. Do not apply paint when relative humidity exceeds 85 percent, or to damp or wet surfaces, unless otherwise allowed by paint manufacturer's printed instructions.
 3. Do not apply paint in areas that are not broom clean and free of dust and debris.

4. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

B. Workers Environmental Conditions:

1. Comply with the standards established in OSHA Workers Environmental Conditions.
2. Take precautions to ensure that personnel and work areas are adequately protected from fire and health hazards resulting from handling, mixing and application of paints.
3. Illumination: Provide lighting equal to the permanent lighting planned for designated space.
4. Ventilation: Provide adequate ventilation to prevent buildup of fumes.
5. Contain and prevent vapors or dust generated by the Work from polluting adjacent occupied spaces.

1.08 SEQUENCING AND SCHEDULING

- A. Phase projects to allow a minimum of 28 days to properly cure plaster surfaces before the application of paint.
- B. Phase the project to allow reasonable time for the inspection and written approval at each phase of the work by the Paint Manufacturer's Representative.

1.09 WARRANTY

- A. Provide a written guarantee, co-signed jointly and severally by the Painting Subcontractor and Materials Manufacturers, against cracking, peeling, flaking, chalking and mildew on interior painted surfaces, and additionally against erosion and unreasonable fading on exterior surfaces, for six years; agreeing to repair and repaint surfaces affected by such defects, at no cost to the DTPW including necessary removal or protection of other work, without limit, within 30 days after notification by the DTPW, and to perform such work based on the provisions of this section, including extension of the guarantee to cover new work.

1.010 MAINTENANCE

- A. Provide 2 five-gallon containers, properly labeled and sealed, of each type and color of finished paint used on the project. If less than 10 gallons of a particular type and color was used, then provide 1 one-gallon container.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Benjamin Moore
- B. Sherwin-Williams
- C. PPG
- D. Or approved equal

2.02 MATERIALS

- A. Use Latex-based materials for painting of interior surfaces.
- B. Primers, Undercoats, Split and Finish Coats: Use materials from same manufacturer when such materials are applied on same surface.
- C. Paints for interior use shall be factory tinted with each stage of coating application (primer, first coat, and finish coat) to be visually distinguishable from the preceding coat until the final coat. The final coat shall match the selected color.

1. Label each container indicating whether it is primer, first coat, or finish coat.
 2. Label each container with the name and number of the color.
 3. Label each container indicating if it is intended for exterior or interior usage.
- D. Color Selection:
1. Engineer will select colors from samples and materials submitted under Article 1.04.
 2. If color is not listed for a specific area or item, Contractor is not relieved of responsibility for providing colors subsequently selected.
 3. Color selection made by Engineer is to determine basic color required for surface.
 4. Colors with same designation but produced from two or more sources shall match when viewed from distance of 24 inches or more.
 5. Final application of colors shall match prepared samples approved by Engineer.
- E. Storage Cabinets and Disposal Containers for Flammable Materials:
1. Meet the requirements of NFPA 30.
 2. Contain Factory Mutual (FM) label and Underwriters Laboratories label.

PART 3 EXECUTION

3.01 INSPECTION

- A. Pre-Construction Inspection: In conjunction with the meeting required in Part 1 of this section, the Painting Subcontractor and the Materials Manufacturer Representative shall conduct on-site inspections and perform tests to determine:
1. Condition of existing paint finishes.
 2. Suitability for receiving the new specified repainting materials.
 3. Whether the corrective and preparatory work specified below is adequate, excessive, or insufficient to obtain the required performance criteria required in this section and the guarantee.
- B. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- C. Start of painting operations implies acceptance of the surface conditions and responsibility for required standards of quality and appearance.

3.02 PREPARATORY WORK

- A. Remove electrical outlet and switch cover plates, finish hardware escutcheons and cover plates, air-conditioning registers, and other finished items installed on surfaces to be painted and replace afterwards or provide protection as approved by Engineer. Protect items and surfaces that cannot be removed or that do not interfere with the painting and leave clean and completely free of paint.
- B. Clean surfaces of all dirt, dust, or other contaminants that affect adhesion of paint or appearance of paint. Clean grease and oil from metal surfaces with turpentine or mineral spirits and wipe dry before priming. Wire brush or sand metal surfaces to remove rust and scale. Touch-up factory primed surfaces with compatible factory primers. Schedule the cleaning so that contaminants from the cleaning process will not fall onto the wet painted surfaces.
- C. Fill nail holes, cracks, open joints, and other defects after priming or first coat is dry and before second coat is

applied.

- D. Allow all coats to dry thoroughly before applying succeeding coats. Comply with paint manufacturer's recommendations.
- E. Prime finished work, not shop coated, when delivered to the job or as soon as possible after delivery.
- F. Clean and sand surfaces between coats with 150 Fine sandpaper or as recommended by the paint manufacturer.
- G. Special Preparatory and Corrective Work on Previously Painted Surfaces: As a minimum, in addition to the general requirements specified above, perform the following work on existing painted surfaces before starting application of new materials:
 - 1. Interior: Remove loose, peeling, or flaking paint, chalking, and mildew. Sand surfaces to produce a smooth, even surface, free of sharp edges where paint has been partially removed, with an even texture and uniform absorptive quality. Provide additional partial or total priming coats if required to obtain uniform finish in color and sheen.
 - a. Mildew Removal: Prepare a diluted bleach solution with one volume of fresh household bleach to three volumes of water. Add to each gallon of diluted bleach two-thirds cup of trisodium phosphate (Solilax or equivalent) and one-third cup of detergent (Tide or equivalent). Allow to stand for 45 minutes. Clean thoroughly with high-pressure water and allow to dry completely before starting painting operations. Repeat treatment in areas that show signs of mildew after surface is dry.
 - 1) Workers shall wear proper safety clothing and necessary accessories, such as goggles.
 - 2) Protect adjacent surfaces that will be affected by the application of the mildew removal solution.
 - b. Preparation for Latex-Based Coating Over Oil-Based Coating: Prepare existing oil-based coating according to latex-based coating manufacturer's recommendations.

3.03 APPLICATION

- A. General:
 - 1. Perform work in a thorough and professional manner in conformance with accepted good practices and requirements of authorities having jurisdiction.
 - 2. Protect finished materials and areas not to be painted by using drop cloths, masking, or other accepted methods.
 - 3. Provide adequate ventilation for proper drying of surfaces before and after painting.
 - 4. Drying Period: Allow each coat to dry thoroughly before succeeding coats are applied. Minimum drying time shall be according to manufacturer's recommendations.
 - 5. Paint Shading: Each coat of paint shall vary sufficiently to easily distinguish it from previous coats of paint, both interior and exterior applications.
 - 6. Observation and Acceptance: As required by paint manufacturer between coats before application of next coat of paint materials.
- B. Apply materials, as they come from manufacturer, to dry surfaces according to manufacturer's directions as

printed on container. Any mixing on site requires specific and special approval of the Engineer.

- C. Apply paint materials to give an even, solid color with each coat. For deep tone finish colors, use Deep Base Primers recommended by manufacturer.
- D. Apply paint materials by brush, roller, or spray method.
 - 1. Select method best suited to profile, texture, and finish of existing surface, subject to suitability regarding safety and conditions in existing or occupied areas, and subject to approval by paint manufacturer and Engineer.
 - 2. Apply materials evenly, smoothly flowed on and cut in neatly, without runs, sags, wrinkles, shiners, streaks and brush marks; drying uniformly to color and sheen selected. Make dividing lines that separate colors straight and clean cut.
- E. Dry Film Thickness:
 - 1. Comply with manufacturer's specifications.
 - 2. Minimum Dry Film Thickness: 5 mils (unless otherwise recommended by paint manufacturer), total finished application. Reduction of minimum thickness due to special coating characteristics or application procedures requires written approval for each case.

3.04 FIELD QUALITY CONTROL

- A. Paint Adhesion Test:
 - 1. Prepare two representative areas in Area 3 for testing adhesion of new paint to existing surfaces. Each area shall be a minimum of 9 square feet (3'-0" x 3'-0").
 - 2. Allow newly painted test area to dry within the manufacturer's recommended drying time.
 - 3. Engineer will test the selected painted surface according to ASTM D3359. If test fails, retesting shall be at the Contractor's expense.
- B. Notify Engineer and material manufacturers' representatives, when critical points in the painting and repainting work are reached, to allow timely inspection and approvals. Critical points include during and after the operation, plus other points designated by the Engineer, or material manufacturer representatives:
 - 1. Removal of existing paint.
 - 2. Surface patching and preparation.
 - 3. Sealing of surfaces.
 - 4. Application of primer and transition coats. Adhesion testing of primer and topcoats may be required.
 - 5. Intermediate and finish coats.

3.05 ADJUSTING AND CLEANING

- A. Remove construction debris, material containers, equipment, and other trash resulting from work of project.
- B. Upon completion of work, remove stains and paint spots from floors, wall, woodwork, electric trim, hardware, fixtures, and other items of the DTPW's property.
- C. Dispose oil-based products, their by-products, and waste contaminated by them, in a manner acceptable to DERM (RER).
- D. INTERIOR SPACES PAINT SCHEDULE
 - 1. Walls and Ceilings not Acoustically Treated: Convert from oil to latex all previously painted surfaces.

This conversion requires the use of an oil-based transition primer/sealer.

1st Coat	Acrylic latex wall primer or oil-based transition primer sealer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

2. Other Interior Ceilings Not Covered:

1st Coat	Acrylic latex primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

3. Metal Doors:

1st Coat	Field applied rust inhibitive primer over shop primer.
2nd Coat	Acrylic latex semi-gloss undercoat.
3rd Coat	Acrylic latex semi-gloss.

E. INTERIOR METALS PAINT SCHEDULE

1. Galvanized Metal: Apply neutralizer and allow to dry thoroughly.

1st Coat	Galvanized metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

2. Metal Sash - Doors and Frames:

1st Coat	Metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

3. Exposed Ferrous Metal:

1st Coat	Rust inhibitive primer.
2nd Coat	Acrylic latex enamel.
3rd Coat	Acrylic latex enamel.

4. Other Metals Not Previously Mentioned:

1st Coat	Rust inhibitive metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- C. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 15010 GENERAL PROVISIONS

PART 1 GENERAL

1.01 SUMMARY

A. Substitutions and Product Options:

1. Products List: in accordance with Section 01330, submit list of major products proposed to be used with names of manufacturers and installing subcontractors.
2. Contractor's Options:
 - a. For products specified only by standard, select any product meeting standard.
 - b. For products specified by naming 1 or more products by manufacturer's name and catalog number, select any 1 of the products or manufacturers named.
3. Substitutions: Contractor may submit a request for substitution for any product or manufacturer not specifically named, in accordance with Section 01620.

1.02 SUBMITTALS: In accordance with Section 01330

- A. Submit shop and detail drawings, factory certified prints, brochures, and materials lists for items specified in accordance with Section 01330.
- B. Substantial Completion Submittal Requirements:
1. Operating and Maintenance Manuals and Charts: Provide 3 complete sets of operating and maintenance instructions, literature, and information concerning equipment under this Division, including, but not limited to HVAC systems, indexed and bound in accepted loose leaf binders.
 2. Record Prints (Project Record Documents): In accordance with Section 01325

1.03 QUALITY ASSURANCE

- A. Qualifications: Perform work by workers skilled in their respective trades and install specified materials and equipment according to manufacturer's recommendations.
- B. Where special qualifications are required, i.e., for welders or brazers, a currently active certificate of qualification from a recognized testing laboratory and dated within 12 months before performance of work will be required.
1. If quality of work of any such specially qualified worker creates reasonable doubt as to skill, ENGINEER may require worker to be removed and replaced.
- C. Tradesperson Qualifications and verification:
1. Comply with Miami-Dade County Code-Chapter 10 and the DTPW General Conditions

1.04 WARRANTY

- A. Furnish copies to DTPW of guarantees for equipment or materials per the DTPW General Conditions.
- B. Inspections at End of Warranty:
1. At the end of the 1-year warranty period, DTPW will decide if the warranty items cited during the course of the warranty period have been completed to the satisfaction of DTPW.
 2. Meet on-site with Engineer before the end of the 1-year warranty period and address unresolved warranty items to the satisfaction of DTPW.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide new materials, free from defects, of domestic manufacture unless otherwise noted.

2.02 EQUIPMENT

- A. Use equipment scheduled in the Construction Documents to determine space and service requirements.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Clean surfaces free of grease, scale, rust, and other foreign matter and leave ready for painting.
- B. Field paint exposed piping, ducts, hangers, and supports as specified in Section 09900 or 09901.
 - 1. Touch-up factory finishes marred in construction with factory touch-up kits.
- C. Electrical items furnished shall conform to the requirements of Division 16.

3.02 FIELD SUPERVISION

- A. Verify measurements at building site before starting work. Submit discrepancies and differences to Engineer for consideration and decision before proceeding with work.
- B. Obtain full information regarding:
 - 1. Peculiarities and limitations of space available for installation of equipment.
 - 2. Materials under contract.
 - 3. Accessibility required to dampers, valves, and other apparatus, including any part of any system needing maintenance or operation.
- C. Provide accurate layout, grades, and elevations. Set sleeves and openings in ample time for other trades to proceed in a timely manner. Take proper precautions to protect work and equipment from damage.
- D. Cut openings and chases required to accommodate the Work and repair floors, walls, and ceilings damaged by such cuttings.
- E. Perform required tests in the presence of Engineer and authorities having jurisdiction. Give 48-hour notice before tests.
- F. Insure compliance with safety codes and other codes and ordinances applicable to the performance of work under this Division.

3.03 FIELD QUALITY CONTROL

- A. Work will be inspected by Engineer and/or EOR (as instructed by Engineer) during construction.
- B. Existing HVAC systems shall be operational in the areas of work for a period of at least 3 days (72 hours) before installation of specified interior finishes and until interior finish installations are completed and accepted by DTPW. Exterior openings shall be kept closed during these periods by using temporary or permanent barriers.
- C. Maintain a repair log of equipment before substantial completion.
- D. Prerequisites to substantial completion inspection shall be completed construction, testing, adjustments, repair

logs, balancing, start-up, and required instruction periods on specified mechanical equipment and systems.

1. Air-conditioning:

- a. Ductwork shall be installed complete with required dampers, deflectors, hangers, and insulation.
- b. Control system components shall be installed and tested for function.
- c. System testing and balancing shall be completed.

3.04 DEMONSTRATION

- A. As a condition for substantial completion and after systems have been tested and checked as complete and operational, instruct DTPW's staff in the operation of any air-conditioning, air circulation system and valve component and control.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15023 CODES AND STANDARDS

PART 1 GENERAL

1.01 REFERENCES

A. Comply with the following:

1. Florida Building Code (FBC).
2. Florida Building Code (FMC) - Mechanical.
3. Florida Building Code (FPC) - Plumbing.
4. National Electrical Code - 1999 (NFPA 70).
5. National Fire Protection Association - 1997 (NFPA). NFPA 101 and other NFPA codes as applicable, except NFPA 101 10-2.2.7 and 10.2.2.7 Exit Passageways.
6. American National Standards Institute (ANSI) A117.1, 1995.
7. American Society of Civil Engineers (ASCE) 7-98.

1.02 QUALITY ASSURANCE

- A. Where materials and equipment are available under the continuing inspection and listing service of Underwriters Laboratories (UL) and National Electrical Manufacturer's Association (NEMA), furnish materials and equipment so listed.

PART 2 NOT USED

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will not be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15044 GENERAL COMPLETION

PART 1 NOT USED

PART 2 NOT USED

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Construction, satisfactory testing, adjustments, balancing, start-up, and required instruction shall have been completed on specified mechanical equipment and systems before substantial completion inspection. All safety equipment shall be in place and operational. There shall be no undue equipment noises, leaks, or misalignment.
1. Air-conditioning:
 - a. Ductwork: Installed complete, including required dampers, deflectors, hangers, and insulation.
 - b. Insulation: Installed with no condensation leaks.
 - c. Control System Components: Installed and tested for function.
 - d. Safety Equipment: Installed and tested.
 - e. System Testing and Balancing: Completed for the areas of work under this contract only.
 2. Plumbing:
 - a. Piping: Pressure testing complete. System free flowing.
 - b. Plumbing Fixtures: Unchipped, leveled, clean, and handicapped accessible. Grouting completed.
 - c. Toilet Room Accessories. Installed and secured.
 - d. Insulation: Installed.
 - e. Domestic water: Permanent connection with backflow preventers in place.
 - f. Safety Equipment: Installed and tested.
 - g. Valving: Open.
 3. Fire Protection: There is no fire protection sprinkler system scope of work.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.

- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15047 IDENTIFICATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Identification including necessary accessories indicated on Construction Documents and specified in this section or as required for proper identification of equipment and piping.
- B. Related Sections:
 - 1. 02221 -Excavating, Backfilling, and Compaction for Utilities.
 - 2. 15410 - Piping (Plumbing).

1.02 SUBMITTALS: in accordance with Section 01330

- A. Submit properly identified product and technical data including printed installation instructions before starting work.

1.03 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Color Coding: ANSI Z535.1 (latest edition) shall take precedence over any discrepancies in determining proper color code identification.
 - 2. Conform to the standards established in ANSI A13.
 - 3. Comply with OSHA standards.

PART 2 PRODUCTS

2.01 EQUIPMENT IDENTIFICATION

- A. Identify equipment served by piping systems by number or legend as shown on Construction Documents.
- B. Engraved Plastic Name Plates: Provide engraved laminated plastic name plates with 1-inch high letters on equipment cabinets.
- C. Brass Tags: Provide appropriately sized brass tags on equipment where cabinets do not exist.
- D. Piping Identification:
 - 1. Color Coding: Identify piping with markers and directional arrows according to the following color-coding system:

<u>Description</u>	<u>Background</u>	<u>Letters</u>
Hot Water	Yellow	Black
Cold Water	Green	White
Fire	Red	White
 - 2. Piping Identification Materials:
 - a. Identify contents and flow direction of piping or pipes wrapped with insulation by using:

- 1) Brady B-946 self-sticking vinyl.
- 2) Champion America Inc., pressure sensitive vinyl.
- 3) Seton Opti-Code.
- 4) Ready Made adhesive pipe markers.
- 5) Or approved equal

3. Valve Identification:

- a. Identify location and system under valve control with a color-coded thumb tack under valve and lay-in ceiling tile. Use other methods (paint or adhered colored material) in access panel doors.

E. Underground Tapes:

1. Electrical Warning Tape: 6 mil, 3 inches wide polyethylene.

- a. BURIED ELECTRICAL LINE BELOW - No.37236 by Seton or approved equal.

2. 2" Metallic Detection Tapes:

- a. BURIED SEWER LINE BELOW - No.37220 by Seton or approved equal.
- b. BURIED WATER LINE BELOW - No.37222 by Seton or approved equal.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- B. Verify surfaces are clean and dry before application of identification signage.

3.02 INSTALLATION

A. Brass Tags or Engraved Plastic Name Plates:

1. Install brass tags or engraved plastic name plates according to manufacturer's instructions.
 - a. Place brass tags or name plates in locations easily visible within the space at normal eye level or as otherwise directed by Project Engineer.

B. Piping Markers and Directional arrows:

1. Location:
 - a. Pipes Passing Through Walls: Provide pipe markers and directional arrows on the pipe on each side of the wall.
 - b. Pipes Behind Access Doors/Panels: Provide pipe markers and directional arrows within view.
 - c. Continuous Run Pipe Lines: Provide pipe markers and directional arrows at intervals not exceeding 50 feet.
 - d. Risers and Joints: Provide pipe markers and directional arrows at each riser and joint.
 - e. Vertical and Horizontal Change of Direction: Provide pipe markers and directional arrows at

each vertical and horizontal change of direction.

2. Special Requirements:

a. Directional Arrows: When identifying by directional arrows, point arrowhead away from pipe markers and in the direction of flow.

1) Direction of Flow: If the flow can be in both directions, identify by using double-headed directional arrows.

b. Thin Film Pipe Markers and Thin Film Directional Arrows: When using both thin film pipe markers and thin film directional arrows on soft insulation, provide a spiral wrap of accepted pipe banding tape around the pipe as foundation for both markers and directional arrows.

C. Underground Tapes: There are no exterior electrical, plumbing or air-conditioning lines in the scope of work.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.

B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15090 SUPPORTS, ANCHORS, AND SEALS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
1. 15410 - Piping (Plumbing).
 2. 15430 - Piping Specialties (Plumbing).
 3. 15515 - Valves, Hangers, and Specialties.

1.02 REFERENCES

- A. Pipe Supports: ANSI B31.1, Power Piping.

1.03 SUBMITTALS: in accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Inserts:
1. Malleable iron case of galvanized steel shell expander plugs for threaded connection with lateral adjustment, top slot for reinforcing rods, and lugs for attaching to forms.
 2. Size insert to suit threaded hanger rods.
 3. Wall Support:
 - a. Pipe Sizes to 3 Inches: Cast iron hook.
 - b. Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamps.
 4. Vertical Support: Steel riser clamp.
 5. Provide copper plated supports for copper piping or provide sheet lead packing between support and piping.
- B. Hanger Rods: Provide steel hanger rods, threaded both ends, threaded one end, or continuous threaded.
- C. Sleeves:
1. Pipe Through Floors: Form from 18 gage galvanized sheet metal.
 2. Pipes Through Beams, Walls, Fireproofing, Footings, Potentially Wet Floor: Form from steel plate or 18 gage galvanized sheet metal.
 3. Size large enough to allow for movement due to expansion.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Supports:
 - 1. Support riser piping independently of connected horizontal piping where practical.
- B. Priming: Prime coat exposed steel (not galvanized) supports.
- C. Sleeves: Where piping passes through floor, ceiling, or wall, close space between pipe or duct and construction with noncombustible insulation. Provide tight fitting metal caps on both sides and caulk.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15180 MECHANICAL SYSTEMS INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15410 - Piping (Plumbing).
2. 15515 - Valves, Hangers, and Specialties.
3. 15890 - Ductwork.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C534-94 Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
2. C547-95 Specification for Mineral Fiber Pipe Insulation.
3. C552-91 Specification for Cellular Glass Thermal Insulation.
4. C553-92 Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
5. C585-90 Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).
6. C612-93 Specification for Mineral Fiber Block and Board Thermal Insulation.
7. D1056-91 Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
8. D1668-95 Specification for Glass Fabrics (Woven and Treated) for Roofing and Waterproofing.
9. E84-96a Test Method for Surface Burning characteristics of Building Materials.
10. E96-95 Test Methods for Water Vapor Transmission of Materials.

B. National Bureau of Standards (NBS).

C. National Fire Protection Institute: NFPA 90A.

D. Underwriters Laboratories (UL) - 723.

E. Insulation Contractor's Association of South Florida Inc.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's catalog cuts, performance curves, and procedures before starting work.

1.04 DELIVERY AND STORAGE

- A. Protect materials from the weather during storage and installation.

1.05 QUALITY ASSURANCE

- A. Materials shall be labeled, listed, or have certified test reports submitted from testing laboratory

accepted by the DTPW.

- B. Comply with the most stringent requirements between the Insulation Contractors Association of South Florida Inc. and as specified.
- C. There shall be no fiberglass in contact with the HVAC airstream anywhere in the system whether protected by encapsulation or not.
- D. Foam plastic insulation shall be certified, by an independent third-party national recognized laboratory, that the product emits less than 1 part per million formaldehyde out gassing after 24 hours.

1.06 FIRE HAZARD RATING

- A. Fire hazard rated materials shall be UL labeled or a certified test report by a DTPW accepted testing laboratory shall be submitted indicating compliance with specified fire hazard requirements.
- B. Insulation (including adhesives) shall be fire retardant or self-extinguishing. Finishing jackets, insulation, and adhesives shall have composite fire and smoke ratings complying with ASTM E84, NFPA 255, and UL 723, as plain or on a composite basis.
- C. When insulation, vapor barrier covering, wrapping materials, and adhesives are applied separately in field, each item shall be tested individually.
- D. When insulation, vapor barrier covering, wrapping materials, and adhesives are factory composite systems, they shall be tested as an assembly.
- E. Insulation materials, adhesives, coatings, and other accessories shall have a fire hazard rating not more than 25 for flame developed and not more than 50 for fuel contributed and smoke developed, except as follows:
 - 1. Flexible unicellular insulation.
 - 2. Nylon anchors for securing insulation to ducts or equipment.
 - 3. Factory premolded 1-piece PVC fitting and valve covers
- F. Flame resistance treatments subject to deterioration due to effects of moisture or high humidity are not acceptable.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Insulation:
 - 1. Armaflex.
 - 2. Armstrong.
 - 3. Certain-Teed.
 - 4. Cell-U-Foam.
 - 5. Foamglas.
 - 6. Manville.
 - 7. Owens-Corning.
 - 8. Pittsburgh Corning.
 - 9. Or approved equal

B. Insulating Cement:

1. Keene Powerhouse.
2. Benjamin Foster.
3. Fibrex FBX fast set.
4. Or approved equal

2.02 MATERIALS

A. Insulation: Type and thickness as specified.

1. Provide fire retardant or self-extinguishing insulation, including adhesives.
2. Finishing jackets, insulation, and adhesives shall have composite fire and smoke ratings per ASTM E84, NFPA 255, and UL 723.

B. Domestic Hot Water Supply Piping Insulation:

1. 1" thick molded fiberglass insulation with pre-sized factory applied FRJ jacket of glass cloth with longitudinal lap and butt joint strips with self-sealing adhesive.
2. Insulation may be 1/2" insulation for vertical branches to individual fixtures.
3. Minimum density of 7-1/4 pounds per cubic foot, maximum thermal conductivity factor of 0.26K at 75 degrees F. mean temperature, and alkalinity of 0.696.
4. Flame Spread: 25 or less.
5. Smoke Developed: 50 or less.
6. Accessories: Adhesives, mastics, cements, tapes for fittings, and related materials shall have the same composite ratings as listed above.

C. Cold Drainage Piping and Electric Water Cooler Drain Piping Insulation:

1. Elastomeric (foam plastic) thermal insulation 1 inch thick with built-in vapor barrier rated self-extinguishing ASTM D1056.
2. Maximum thermal conductivity factor of 0.26K at 70 degrees F. mean temperature, density of 5-6 pounds per cubic foot, and a water vapor transmission of 0.1 perms.

D. Tape: As recommended by the insulation manufacturer or 3M adhesive EC-1329 or approved equal.

E. Insulating Cement: All-purpose mineral wool cement.

F. Flexible Fiberglass Duct wrap Blanket Insulation:

1. 2.2/2.3 inches thick, 3/4" pcf density fiberglass blanket with UL approved aluminum foil vapor seal facing reinforced with fiberglass scrim, laminated to 30 lb. kraft paper, R = 6.5.
2. Comply with ASTM C553, TYPE I, Class B-4.
3. Maximum Thermal Conductivity: 0.24K factor at 75 degrees F.

G. Accessories:

1. The following accessories shall be used in the application of thermal insulation:
 - a. PVC fittings cover and PVC jacketing:

- 1) Certain-Teed "Snap Form".
 - 2) Manville Corp. "Zeston".
 - 3) Proto.
 - 4) Or approved equal
- b. Vapor Seal Mastic:
- 1) Benjamin Foster 30-86 or 30-25.
 - 2) Childers CP-30.
 - 3) Or approved equal
- c. Lagging Adhesive:
- 1) Benjamin Foster 81-42W.
 - 2) Childers CP-50.
 - 3) Or approved equal
- d. Breather Mastic:
- 1) Benjamin Foster 45-00 or 30-86.
 - 2) Childers CP-10.
 - 3) Or approved equal
- e. Insulation Bonding Adhesive (to metal):
- 1) Benjamin Foster 85-20, or 85-15.
 - 2) Childers CP-82.
 - 3) Or approved equal
- f. Insulating and Finishing Cement:
- 1) Fibrex Inc. FBX Super Blend Cement.
 - 2) Manville Corp. No.375 Insulating and Finishing Cement.
 - 3) Keene Corp. Super Powerhouse.
 - 4) Or approved equal
- g. Coatings: Sealfas G-P-M mastic or approved equal.
- h. Fire Resistive Mastic: As manufactured by Benjamin Foster or approved equal.
- i. Sealants: 81-33 as manufactured by Benjamin Foster or approved equal.
- j. Staples: Type 304 or 316 stainless steel outward clinching type.
- k. Wire: 16 gage, copper weld wire.
- l. Bands: 3/4 by 0.015" thick galvanized steel.
- m. Glass Fabric:
- 1) Woven open mesh type glass fabric conforming to ASTM D1668.
 - 2) Type I asphalt treated for below ground use.
 - 3) Type III light color organic resin treated for aboveground or below ground use.
- n. Insulation Jackets:
- 1) Jackets inside building shall comply with fire hazard classifications as specified. Insulation jackets shall not support mold growth.

2) Vapor Barrier Jackets:

- a) For Cold Pipelines (-30 degrees F. to 60 degrees F.): Perm rating not more than 0.05, ASTM E96 Procedure A. Puncture resistance not less than 50 beach units.
- b) For Air-conditioning Ducts: Perm rating not more than 0.05, ASTM E96, Procedure A. Puncture resistance not less than 25 beach units.

2.03 SYSTEMS INSULATION BY TYPE

- A. Interior Domestic Hot Water Supply/Return Piping Insulation:
 - 1. Molded Fiberglass Pipe Insulation: 1 inch thick with pre-sized factory applied FRJ jacket of glass cloth with longitudinal lap and butt joint strips with self-sealing adhesive.
 - 2. Contractor's Option: Foamed plastic insulation, 1 inch thick.
- B. Electric Water Cooler Drain, Cold Drainage Piping Refrigerant Suction Piping, and Interior Condensate Drain Piping Insulation:
 - 1. Foamed Plastic Insulation: 1 inch thick with field applied vapor barrier mastic at joints.
- C. Interior Concealed Ductwork Insulation:
 - 1. Flexible fiberglass Duct wrap Blanket Insulation:
 - a. 2.2 inches thick, 3/4 pcf density.
 - b. 2.0 inches thick, 1-1/2 pcf density.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install insulation according to applicable codes and regulations.
- B. Except as specified, install materials according to manufacturer's recommendations and specifications for obtaining conformance to construction documents.
- C. Packages or standard containers of insulation, jacket material, cements, adhesives, and coatings delivered for use and samples required for acceptance shall have manufacturer's stamp or label attached listing manufacturer, brand name, and a description of material.
- D. Provide allowances for expansion/contraction, and wall and manhole penetrations.
- E. Run continuous through wall, floor, and ceiling penetrations.
- F. Insulation materials shall not be applied until:
 - 1. Test results specified in other sections of these specifications are completed and accepted.
 - 2. Rust, scale, dirt, and any other foreign material have been removed.
 - 3. Ductwork or piping material are clean, dry, joints firmly butted together, and tightly sealed at all joints, seams, and fittings.

- G. Wrap butt joints with a 3-inch-wide strip of the same material as the jacket.
- H. Provide aluminum jackets over the insulation where sealant is required.
- I. Insulation shall be kept clean and dry at all times.
- J. Duct Materials:
 - 1. Internal duct lining is not allowed.
 - 2. Duct materials solid exposed to the airflow shall be noncombustible metal.
 - 3. Duct insulation for thermal or acoustical purposes shall be separated from airflows by solid metal.
 - 4. Provide natural noise attenuation procedures, as recommended in ASHRAE, Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), and industry good engineering practices.
 - 5. Fiberglass ducts or duct boards shall not be used to convey air.
- K. Protection Shield: Where pipe or tubing insulation pass through hangers, provide:
 - 1. For Piping 4 inches and smaller: A protection shield, 180-degree arc, 16 gage galvanized sheet metal covering, minimum 12 inches long.
 - 2. For Piping Larger than 4-inch diameter: A protection shield, 180-degree arc, 16 gage galvanized sheet metal covering, minimum 18 inches long.
 - 3. Hangers not exceeding maximum spacing distances recommended by insulation manufacturer to prevent crushing or compressing insulation.
- L. Ductwork sizes shown on drawings are actual internal "air side" dimensions.
- M. Flanges, Fittings, and Valves on Insulated Piping:
 - 1. Provide pre-molded glass fiber fittings wired or taped on and adhered with canvas jacket.
 - 2. Terminate insulation and jacket neatly and finish with insulating cement troweled to a bevel and of the same thickness as adjoining insulation.
 - 3. Vapor seal insulation on cold systems.
- N. Vapor Barriers:
 - 1. Intact and continuous.
 - 2. Do not install with staples.
- O. Omit Pipe Insulation from the Following:
 - 1. Screwed unions, except at "cold drains" and air- conditioning wastes. Terminate insulation neatly at both sides of unions with insulation cement.
 - 2. Discharge lines from safety and relief valves.
 - 3. Nickel or chrome plated piping.
- P. All ductwork shall be insulated, except as noted below:
 - 1. Outside air intake ductwork.
 - 2. Exhaust air ductwork.
 - 3. Supply air ductwork exposed in air-conditioned spaces. (Note: Ceiling plenums, and mechanical equipment rooms are not to be considered air-conditioned spaces.)

- Q. Ceiling supply air registers located on perimeter rooms and corridors shall be field insulated with flexible fiberglass duct wrap insulation as specified. Insulation shall cover the upper body and installation flanges.
- R. All appurtenances subject to condensation shall be protected as necessary and covered with vapor seal mastic.

3.02 APPLICATIONS

- A. Molded Fiberglass Pipe Insulation Installation (Hot Water Supply/Return):
 - 1. Tightly butt together sections of insulation on pipe runs sealing longitudinal seams of jacket with self-sealing laps. Position longitudinal seam so seam is on bottom to prevent dirt and moisture infiltration. Seal end joints with 3-inch-wide straps of vapor barrier tape. Seal ends of insulation with vapor seal mastic at valves, fittings and flanges.
 - 2. Cover valves, fittings, and flanges with insulation similar to adjacent pipe covering, or one-piece PVC cover sections as specified.
- B. Foamed Plastic Insulation Installation (Return Suction Piping, Interior Condensate Drains, and Electric Water Cooler Drains):
 - 1. Insulation shall be slipped on pipe without slitting. Butt joints shall be sealed with the manufacturer's recommended adhesive.
 - 2. Where slip-on techniques are not possible, the insulation shall be carefully slit and applied to the pipe. Seal joints with the manufacturer's recommended adhesive.
 - 3. Insulate valves and fittings with fabricated foamed plastic insulation, or one-piece PVC cover sections as specified.
 - 4. Provide mastic vapor barrier for chilled water service insulation for areas subject to conditions of 90 degrees F or 85 percent relative humidity or higher.
- C. Flexible Fiberglass Duct wrap Blanket Insulation Installation:
 - 1. Apply insulation to duct with joints tightly butted. Prepare stretch-out dimensions and cut out insulation so a 2-inch minimum overlap is created that will overlap the facing and insulation at the other end, and the adjoining seam. Install so insulation is not excessively compressed at duct edges. Foil face shall be on outside. Seams shall be stapled approximately at 6 inches on center with outward clinching staples.
 - 2. On ductwork having a 24 inch or larger dimension, insulation shall be secured to the bottom of the duct with mechanical fasteners spaced at not more than 18 inches on center. and held in place with washers or clips. Cut off protruding pin after clips are secured.
 - 3. Seal all insulation joints, pinheads, tears, punctures, washers, clips, and staples with 2 coats of a vapor barrier mastic type sealant, reinforced with 1 layer of 4-inch woven glass fabric.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15410 PIPING (PLUMBING)

PART 1 GENERAL

1.1 SUMMARY

- A. Related Sections:
 - 1. 15440 - Plumbing Fixtures, Trim and Supports.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A53-96 - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A74-96 - Specification for Cast Iron Soil Pipe and Fittings.
 - 3. A106-95 - Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
 - 4. B32-96 - Specification for Solder Metal.
 - 5. B88-96 - Specification for Seamless Copper Water-Tube.
 - 6. B306-96 - Specification for Copper Drainage Tube (DWV).
 - 7. C564-95a - Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
 - 8. D312-95a - Specification for Asphalt Used in Roofing.

1.3 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.
- B. Shop Drawings:
 - 1. Pipe and Fittings: Manufacturer's name and mill reports.
 - 2. Expansion Joints: Catalog cuts.
 - 3. Dielectric Unions: Catalog cuts.

PART 2 PRODUCTS

2.1 MATERIALS:

- A. Materials shall be new, unused, and best of their respective kinds, free from defects in labor quality, complying with latest publications in effect at time of bidding, and according to Construction Documents. Be aware that though indicated herein all of the materials listed are not necessarily included in the project at bid time. As such, information is listed in case it applies to changes to the work.
- B. Cast Iron Drainage Pipe and Fittings:
 - 1. Hub and Spigot: Service weight centrifugally spun cast iron, hub and spigot, tar coated inside and out, ASTM A74.
 - 2. No-Hub: Service weight centrifugally spun cast iron, no-hub, tar coated inside and out, CISPI 310.
- C. Galvanizing: By hot process on both inside and outside of pipe with zinc coating averaging at least 2 ounces per square foot and free from defects.
- D. Copper Tubing:
 - 1. Type K or L: Seamless hard drawn or annealed, ASTM B88.
 - 2. Type DWV: Seamless hard drawn, ASTM B306.
- E. Ductile Iron Pipe: ANSI/AWWA C151/A21.51.

- F. Cast Iron No-Hub Pipe Joint:
 - 1. Cast Iron: ASTM A888.
 - 2. Neoprene Gaskets: ASTM C564.
 - 3. Aboveground: Stainless Steel Clamp and Shield Assembly: 300 Series, CISPI 301-69T or approved equal.
 - 4. Underground: ASTM C1277, cast iron couplings with neoprene compression gasket and stainless-steel bolts.
- G. Cast Iron Fittings and Flanges:
 - 1. Standard Weight: ANSI B16.1, unless otherwise noted.
 - 2. Extra Heavy: ANSI B16.2.
- H. Brass Fittings:
 - 1. Copper Tubing Solder Drainage Fittings: Wrought copper, ANSI B16.22.
 - 2. Copper Tubing Solder Fittings: Wrought copper, ANSI B16.22.
 - 3. Threaded: Standard weight, banded, ANSI B16.15.
- I. Press Fittings for Copper: Type K copper and bronze, ASME B16.18 or ASME B16.22. O-rings for copper press fittings shall be EPDM.
 - 1. Viega, Lakewood, OH.
 - 2. Ridge Tool Co., Elyria, OH.
 - 3. Or Approved equal.
- J. Compression Gaskets, Cast Iron Soil Pipe: ASTM C564.
- K. Solder Metal:
 - 1. Similar to silver-tin-copper alloy ASTM B32.
 - 2. All solder shall be certified no-lead.
- L. Joint Compound: Tite-Seal or approved equal.
- M. Unions: As specified in Section 15430.
- N. Protective Coating: Cabot's Flexi-Black or approved equal.

PART 3 EXECUTION

3.1 MATERIALS

- A. Run piping as indicated in Construction Documents subject to modifications as required to suit field conditions, to avoid interference with other trades, and for proper, convenient, and accessible locations to parts of the piping system.
- B. Run piping in wall chases, recesses, pipe shafts, and hung ceilings where provided.
 - 1. Do not run gas or water piping in floor fill.
 - 2. Run piping as high as possible under building, above ceilings, and close to slabs.
 - 3. Do not permanently close, furr in, or cover piping before examination and final tests.
- C. Run piping straight and where concealed as direct as possible with risers erected plumb and true.
 - 1. Install piping with minimum 1-inch clearance between finished pipe coverings and adjacent work.
 - 2. Support piping from structure above, maintaining maximum headroom available.

- D. Do not run piping in telephone rooms, electrical equipment rooms/closets, transformer vaults or rooms containing related equipment, or close to or above control panels, switch boards and electric motors except required branch piping to pumps. If pipes are installed in these rooms, they shall be relocated at no extra cost to the DTPW.
- E. Provide control valves where noted or required for complete regulating control of systems, plumbing fixtures, and equipment. Provide valves in accessible locations or accessible through access panels.
- F. Coat Underground metal piping, except cast iron, with 1/16" thick black bituminous protective coating.
- G. Fittings, Valves, and Hangers on Chrome Plated Piping: Chrome plated finish to match.
- H. Provide reducing fittings for changes in pipe sizes. Bushings will not be allowed.
- I. Provide extra heavy pipe for nipples where unthreaded pipe is less than 1-1/2".
 - 1. Do not use close nipples. Use saddle nipples.
 - 2. Provide galvanized iron sleeves for pipes passing through roof slabs, interior floors, ceilings, walls, or partitions.
- J. Expansion Swings:
 - 1. Make adequate provisions for proper expansion and contraction of piping and for piping passing through building expansion joints.
 - 2. Make branch connections from risers with ample swing or offset to avoid strain on fittings or short pipe lengths. Anchor horizontal runs of pipe over 50 feet in length to walls or supporting structure about midway of run to allow expansion evenly divided toward ends.
 - 3. Provide sufficient number of elbow swings or accepted expansion joints to allow proper expansion and contraction of mains and risers.
- K. Pipe Slopes:
 - 1. Lay horizontal soil and waste pipes, unless otherwise noted on drawings, to:
 - a. 1/8" per foot minimum for pipe 3 inches and larger
 - b. 1/4" per foot minimum for pipe less than 3 inches
 - c. Horizontal vent lines shall have a minimum grade back to the stacks or vertical lines and shall run as direct and free from bends as possible.
- L. Piping Materials by System:
 - 1. Sanitary Soil, Waste, and Vent Piping:
 - a. Aboveground: Service weight no-hub cast iron pipe and fittings.
 - b. Under Ground Floor Slabs:
 - 1) Cast iron hub push joint with neoprene compression gaskets.
 - 2. Vandalproof Vent Caps:
 - a. Install according to manufacturer's printed instructions.
 - 3. Domestic Water Supply Piping: Drilling tubes for field manufactured fittings is not allowed.
 - a. Aboveground Interior:
 - 1) Copper Tubing Type L:
 - a) Wrought copper solder joint fitting without the use of lead components. Tubing used with this type shall not be soft drawn.
 - b) Bending of tubing having a radius of not less than 4 tube diameters without deformation may be used for tubing diameters not exceeding 1 inch. Copper tubing used for this type connection shall be bending temper.
 - c) Victaulic copper connection system with Style 606 couplings. Tubing used with this type connection shall be drawn temper.

- b. Optional Press Connections for Aboveground Interior Copper Tubing Type L and Underground Exterior Copper Tubing Type K:
 - 1) Press fittings shall be made according to the manufacturer's installation instructions.
 - 2) The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting.
 - 3) The fitting alignment shall be checked against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting.
 - 4) The joints shall be pressed using the tool approved by the manufacturer.
- M. Joints and Methods of Connections:
 - 1. Cast Iron Pipe:
 - a. Aboveground: No-Hub Joint with neoprene rubber sleeve and stainless-steel ring clamp according to manufacturer's instructions.
 - b. Underground: Under slab, hub push Joint with neoprene compression gaskets.
- N. Pipe Cleaning Systems:
 - 1. Domestic Water Piping: Entire domestic water distribution systems shall be flushed clean after the permanent water meter has been installed and before the bacteria testing is conducted.

3.2 TESTS

- A. Furnish necessary instruments, test equipment, and personnel required to perform tests and remove test equipment and drain pipes after tests have been made and accepted.
- B. After portions of mechanical work are completed and ready for testing, given 48 hours' notice to Engineer and perform tests in Engineer's and EOR's presence (as directed by the Engineer).
- C. Tests may be made of isolated portions of piping to facilitate the general progress of installation.
 - 1. Revisions subsequently made in piping system shall require retesting of such affected portions of piping systems.
 - 2. Subject piping and connections to a hydrostatic or pneumatic pressure test before painting, installation of insulation or concealment.
 - 3. Sanitary, Storm, and Acid Waste Drainage Systems:
 - a. Apply a water test to all parts of drainage systems before pipes are concealed or fixtures set in place.
 - b. Close openings of each system to be tested tightly except highest openings above roof and fill entire system with water up to overflow point of highest opening.
 - c. Subject systems to not less than 10 feet of hydrostatic head, except uppermost 10 feet of piping directly below opening.
 - 1) Water shall remain in the systems for not less than 60 minutes after which time no leaks occur at any point and no lowering of water level at overflow point is visible.
 - 4. Water Supply Piping:
 - a. Apply a pressure test to water system before piping is concealed or insulated and before fixtures and equipment are connected.
 - b. Apply a hydrostatic pressure of not less than 200 psig for 2 hours, with no leaks occurring in the system.
 - 1) Water used for tests shall be obtained from a potable source of supply.

3.3 CLEANING AND ADJUSTING

- A. Clean fixtures, equipment, piping, and exposed work.
 - 1. Show traps, wastes, and supplies free and unobstructed.
 - 2. Plated, polished bronze, or painted surfaces bright and clean.

- B. After installation, adjust valves, faucets, and automatic control devices for quiet operation. Balance system as required for proper operation.
- C. Disinfection: After cleaning and testing domestic water system, disinfect by introducing a solution of calcium hypochlorite with 50 parts per million of chlorine.
 - 1. Open and close all valves while system in being chlorinated. After disinfecting agent has been applied for 24 hours, test for residual chlorine at ends of pipe.
 - 2. If less than 5 ppm is indicated, repeat process until it is equal to or greater than 5 ppm or according to AWWA C601 Standards.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15421 DRAINS AND CLEANOUTS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. 15410 - Piping (Plumbing).

1.02 SUBMITTALS: In accordance with Section 01330

- A. Product Data: Submit properly identified manufacturer's literature before starting work.
- B. Submit Shop Drawings/Catalog cuts on the following:
 - 1. Drains.
 - 2. Cleanouts.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Model numbers are taken from Josam (basis of design).
 - 1. Accepted equivalents:
 - a. Jay R. Smith Mfg. Co.
 - b. Blucher-Josam.
 - c. Wade.
 - d. Zurn.
 - 2. Or Approved equal

2.02 MATERIALS

- A. Drains:
 - 1. Shower Stall:
 - a. Coated cast iron floor drain, 2-piece body, double drainage flange, invertible non-puncturing flashing collar, weepholes, bottom outlet, inside caulk connection, and adjustable satin Nikaloy 6" X 6" super-flo strainer.
 - b. Josam No.30000-6S-X.
 - 2. Toilet Room:
 - a. Same as Shower Stall above except for primer trap.
 - b. Josam No.30000-6S-50-X by Josam.

B. Cleanouts and Cleanout Access Covers:

1. Floor, Interior Finished Rooms:
 - a. Cast iron, adjustable inside caulk outlet, brass internal plug, Nikaloy scoriated cover plate secured by countersunk plug.
 - b. No.56020-88-15 by Josam.
2. Stack Base for Use in Block Walls:
 - a. Cast iron "T" branch tee with plated cast iron countersunk plug, lead seal, satin stainless-steel round access cover plate secured with countersunk screw.
 - b. No.58790-15 by Josam.
3. Stack Base for Use in Plaster Walls:
 - a. Cast iron "T" branch tee coated cast iron countersunk plug, lead seal, cast brass round access cover with anchor lugs, satin stainless-steel cover secured with countersunk screw.
 - b. No.58750-15 by Josam.
4. Stack Base for Use in Tile Walls:
 - a. Cast iron "T" branch with brass countersunk plug, cast brass square access cover with satin top, anchor lugs, cover plate secured with 4 screws.
 - b. No.58770-15 by Josam.
5. Exterior, Heavy Duty:
 - a. Cast iron, inside caulk outlet bronze internal plug, ductile iron scoriated heavy duty cover.
 - b. No. 56040-15 by Josam.
6. Cleanout Sizes:
 - a. Full pipe size up through 4 inches, pipe cleanouts with bodies of standard pipe size and caulking ferrules conforming to thickness required for pipe and fittings of same metal.
7. Removable Cleanout Plugs:
 - a. Cast bronze with screw threads and recessed bronze socket. No.58540 by Josam.

C. Wall Access:

1. Cast bronze, polished chrome plated square frame and cover, 12" X 12" minimum opening or larger, as required.
2. No.58640 by Josam.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide drains and cleanouts as scheduled on drawings.
- B. Cleanouts:
 - 1. Place pipe cleanouts at the foot of each soil and waste stack in sanitary system and place pipe cleanouts in horizontal runs not to exceed 50 foot spacing.
 - 2. Install access covers as specified.
- C. Interior Flush Cleanouts:
 - 1. Flush cleanouts with recessed sockets (without access covers) may be used in non-finished areas such as equipment rooms, storage rooms, and the like, if top of hub is installed in level position and top of clean out plug is flush with the concrete floor.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15430 PIPING SPECIALTIES (PLUMBING)

PART 1 GENERAL

1.01 SUMMARY

- A. Related Section:
 - 1. 15410 - Piping (Plumbing).

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A126-95 Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.
- B. Submit Shop Drawings/catalog cuts for the following:
 - 1. Shock Absorbers.
 - 2. Unions and Flanges.
 - 3. Hangers and Inserts.
 - 4. Trap Resealers.
 - 5. Vacuum Breakers.
 - 6. Gages and Thermometers.
 - 7. Firestop Devices.
 - 8. Water Hammer Arrestors.

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Trap Resealers:
 - 1. Water Closet Valve: Chrome plated with tubing to wall and wall flange. Water closet shall be no more than 20 feet from floor drain. No.F-72-A1 by Sloan Valve Co. or approved equal.
 - 2. Lavatory or Sink: Cast brass chrome plated with 1/2" female union connection and 1/2" female outlets, integral vacuum breaker.
 - a. Manufacturers:
 - 1) Josam, No.88250.
 - 2) Chicago Faucet Co., No.447.
 - 3) Zurn Industries, Inc., No.Z-1022.
 - 4) Or approved equal
 - 3. Remote Location:

- a. Machined brass valve with integral vacuum breaker, pressure adjustment and distribution units with visual operations inspection cover where required for multiple connections.
 - b. By Precision Plumbing Products Model P.1 or P.2 as applicable, or approved equal.
- B. Shock Absorbers:
 - 1. Stainless steel shell, elastomeric bellows, pressurized argon charge, sized per PDI-WH 201 at each branch of cold and hot water supplies, group toilets, and as shown on Construction Documents.
 - a. Zurn Industries, Inc., No.Z-1700.
 - b. Josam, No.75000.
 - c. Or approved equal
 - 2. Copper shell at individual toilet rooms and isolated fixtures. By Josam 75000-S or approved equal.
- C. Water Hammer Arrestors:
 - 1. Sioux Chief Mfg. or approved equal.
- D. Vacuum Breakers:
 - 1. Hose Bibb Vacuum Breaker: Non-removable. No 8A by Watts Regulator Co. or approved equal.
 - 2. Atmospheric Type: No.288A by Watts Regulator Co. or approved equal.
 - 3. For Plumbing Fixtures: see Section 15440.
- E. Unions and Flanges:
 - 1. Steel Pipe 2" and Smaller: Malleable iron unions with brass seat. Galvanized pipe requires galvanized unions.
 - 2. Steel Pipe 2-1/2" and Larger: Bronze flanged connections 150-pound Class. Galvanized pipe requires galvanized unions.
 - 3. Copper Pipe 2" and Smaller: Bronze unions.
 - 4. Copper Pipe 2-1/2" and Larger: Bronze flanged connections 150-pound Class.
 - 5. Dielectric Unions or Flanges:
 - a. Meet dimensional requirements and tensile strength of pipe unions or flanges according to Fed. Spec. WW-U-531D.
 - b. Suitable for required operating pressures and temperature conditions.
 - c. Provide metal connections on both ends. Ends shall be threaded or soldered to match adjacent piping.
 - d. Separate metal parts at union to prevent current flow between dissimilar metals.
- F. Escutcheons:
 - 1. Provide escutcheons securely in place on exposed pipes passing through walls, partitions, floors, and ceilings of finished areas unless otherwise noted on Construction Documents.
 - 2. Provide escutcheons with sufficient outside diameter to adequately cover sleeved openings.
 - 3. Interior Walls, Partitions, and Ceilings: Solid or stamped chrome plated brass or stainless steel, one piece or split pattern.
 - 4. Floors and Exterior: Solid cast brass, rough chrome plated or cast nickel bronze alloy, one piece or split pattern.
- G. Pressure Gages:

1. Cast aluminum alloy case, face diameter minimum 3-1/2", range selected so operating pressure is at middle of range.
 2. Accuracy: ANSI Grade A maximum of 1.5 percent error at any reading on scale.
 3. Manufacturers:
 - a. Ashcroft.
 - b. Marshalltown.
 - c. Taylor Instrument Company.
 - d. Or approved equal
- H. Thermometers:
1. Straight type mercury filled, 9-inch scale, □V□ shaped adjustable angle separable socket well.
 2. Accuracy to 1 percent of scale range.
 3. Manufacturers:
 - a. Ashcroft.
 - b. Marshalltown.
 - c. Taylor Instrument Company.
 - d. Or approved equal
- I. Thermometer Wells:
1. Brass construction with extension neck (2 inches minimum) with brass cap and chain.
 2. Manufacturers:
 - a. Ashcroft.
 - b. Marshalltown.
 - c. Taylor Instrument Company.
 - d. Or approved equal
- J. Pressure Reducing Valves:
1. 25 to 75 psi range, union connection, built-in bypass, all bronze, monel screen.
 - a. 1/2" through 2": 600 Series by Wilkins or approved equal.
 - b. 1/2" through 3": for higher flow capacities, 500 Series by Wilkins or approved equal.
 - c. 1/2" to 1": for lower flow capacities, 70 Series by Wilkins or approved equal.
- K. Pipe Hangers and Supports:
1. Provide hangers, supports, and supplementary steel as specified for different applications.
 2. Insert, Hangers, Rods, and Clamps: Figure numbers used refer to Grinnell. You can provide also from Fee and Mason or Elcen Metal Products or approved equal.
 - a. Inserts:
 - 1) Universal Concrete Insert: Fig.282.
 - 2) CB Junior Concrete Insert: Fig.279.
 - 3) Wedge Type Concrete Insert: Fig.281.
 - 4) Expansion Case: Fig.117.
 - b. Hangers: Adjustable clevis type.

- 1) Cast Iron Pipe: Fig.590.
- 2) Copper Tubing: Fig.CT-65.
- 3) Insulated Steel Pipe: Fig.300.
- 4) Uninsulated Steel Pipe: Fig.146.

c. Clamps:

- 1) V.F.S. beam clamp with weldless eyenut, Fig.292, clamp size 1, rod size 3/4".
- 2) C-clamp with retaining clip, Fig.87.
- 3) I-beam clamp, Fig.131.
- 4) Universal side I beam clamp, Fig.225.
- 5) C-clamp, copper finish, Fig.CT88.

d. Rods: Galvanized with continuous thread, Fig.146.

e. Riser Clamps:

- 1) Black Steel, Fig.261.
- 2) Plastic coated, Fig.261C
- 3) Copper finish, Fig.CT121.

3. Horizontal Copper Piping:

<u>Pipe</u>	<u>Rod Diameter</u>	<u>Clamp or Hanger Maximum Spacing</u>
Up to 1-inch	3/8"	6 feet
1-1/4 and 1-1/2"	3/8"	6 feet
2 inches	3/8"	8 feet
2-1/2"	1/2"	8 feet
3 and 4 inches	1/2"	8 feet

4. Horizontal Cast Iron Piping:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 4 inches	1/2"	5 feet
4 inches	5/8"	5 feet
6 inches and larger	3/4"	5 feet

5. Wall Support:

- a. U-clamps as accepted.
- b. Unistrut supports.

6. Vertical Support: Steel riser clamps.

L. Insulation Protection Shield: Fig.167.

M. Access Panels (Wall or Ceiling): As indicated in drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Inserts:

1. Use inserts for suspending hangers from reinforced concrete slabs or beams when possible.

2. Provide flush inserts at concrete to be a finished surface.
- B. Sleeves:
1. Seal space between pipe or duct and surrounding floor, wall, or ceiling construction with noncombustible insulation and tight-fitting metal caps on both sides with caulking.
 - a. Pipe Through Floors: Form from 18 gage galvanized sheet metal.
 - b. Pipes Through Beams, Walls, Fireproofing, Footings, and Potentially Wet Floors: Form from steel plate or 18 gage galvanized sheet metal.
 2. Size sleeves to allow movement caused by expansion.
 3. Seal and fireproof penetrations.
- C. Pipe Hangers and Supports: Also see Sections 15090 and 15515 for complimentary information.
1. Provide adjustable hangers, inserts, brackets, rolls, clamps, and supplementary steel as required for proper support of pipelines.
 - a. Design hangers to allow for expansion and contraction of pipelines. Size to allow pipe covering to run continuously through hangers. Allow for proper anchoring and movement of all hot lines.
 - b. Install hangers to allow 1/2" minimum clear space between finished covering and adjacent work.
 - c. Place a hanger within 1 foot of each horizontal elbow.
 - d. Use hangers with 1-1/2" minimum vertical adjustment after piping is erected.
 - e. Provide multiple or trapeze hangers if several pipes can be installed in parallel and at the same elevation.
 - f. Support riser piping independently of connected horizontal piping when practical.
 - g. Piping shall not be supported by equipment.
 - h. Coordinate location of hangers with light fixtures.
 - i. Wire brush steel or iron supports and prepare surfaces ready for painting specified under Sections 09900 and 09901. Prime coat exposed non galvanized hangers and supports.
 - j. Provide copper plated hangers and supports for copper piping or provide sheet lead packing between hanger or support and piping. Dissimilar metal contact is not allowed.
 2. Horizontal Cast Iron Pipe: Place hangers within 18 inches of hub or joint.
 3. Hubless Joints: Provide support at every other joint. Support each joint when length between supports exceeds 4 feet.
 4. Trapeze Clamp or Hangers:
 - a. Secure pipes supported by trapeze clamp or hangers and not mounted on pipe rolls to trapeze with pipe clamps or "U" bolts.
 - b. Place clamp or hangers at each change of direction.
 - c. Place clamp or hangers within 1 foot of valves and other appurtenances in horizontal piping.
 - d. Place clamp or hangers maximum 3 feet from end of each branch runout.
 5. Insulated Pipes:
 - a. Provide hangers with a diameter large enough to include insulation.
 - b. Install a protection shield with each hanger. 180-degree arc, 16 gage galvanized sheet metal covering, minimum 12 inches long.
 - c. Provide support saddles for insulated piping over 2 inches in diameter.

6. Special Supports: Clamps, hangers, and supports required by equipment manufacturers shall be installed according to equipment manufacturer's recommendations.
 7. Plumbers tape, straps, chain, wire hangers, or perforated bar are not allowed for hanging pipe.
- D. Water Hammer Arresters:
1. Supply Piping: Provide a water hammer arrester for each fixture supply including hot and cold water. Do not provide air chambers where water hammer arresters are installed.
- E. Unions and Flanges: Provide at connections of equipment and at strainers and control valves.
- F. Escutcheons: Fit and firmly secure escutcheons to pipes passing through finished floors, ceilings and walls.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15440

PLUMBING FIXTURES, TRIM, AND SUPPORTS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15410 - Piping (Plumbing).
2. 15430 - Piping Specialties (Plumbing).

1.02 SUBMITTALS: In accordance with Section 01330.

A. Submit Shop Drawings for the following:

1. Fixtures: Catalog cuts with rough-in dimensions identified as designated in fixture schedule, riser diagrams, and as specified.
2. Faucets: Catalog cuts and templates for drilled openings.
3. Fixture Trim: Catalog cuts.
4. Carriers: Catalog cuts.

1.03 QUALITY ASSURANCE

- A. Certification: Submit a letter, signed jointly by the manufacturer of the product and the installer of the product, attesting that no lead is contained in any piece of equipment or in the piping connections that could contaminate water, drinks, or food by contact.
- B. Comply with Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fixtures: As indicated in Plumbing Fixture Schedule.

2.02 FIXTURES

1. Water Closets:

1. Wall Hung Water Closet (WC - 1):

1. White, top spud, siphon jet flush action, 1.28 gpf, elongated bowl.
 - 1) Aftwall – 2856.128 by American Standard or approved equal.
2. Flush Valve: Sloan Royal 111 or approved equal
3. Seat: Elongated, heavy duty, open front less cover.

2. Wall Hung Water Closet, HC Accessible (WC - 2):

1. White, top spud, siphon jet flush action, 1.28 gpf, and elongated bowl.

- 1) Aftwall ADA - 2856.128 by American Standard or approved equal.
 2. Flush Valve: Sloan Royal 111 or approved equal
 3. Seat: Elongated, heavy duty, open front less cover.
3. Floor Mounted Water Closet, HC Accessible (WC - 3):
 1. White, top spud, siphon jet flush action, 1.28 gpf, and elongated bowl.
 - 1) Madera 17 inches high, 1.28/FV 10 inch rough – 2854.128 by American Standard or approved equal.
 2. Bolt Caps: 481310-100 by American Standard or approved equal.
 3. Flush Valve: Sloan Royal 111 or approved equal.
 4. Seat: Elongated, open front less cover.
2. Urinal (UR - 1):
 1. Siphon Jet Flush Action: Wall hung, 0.125 gpf, vitreous china, 3/4" top inlet spud.
 1. Wash brook Flowise High Efficiency 6590.001 by American Standard or approved equal.
 2. Flush Valve: Oscillating non-hold open handle. 186-0.125 by Sloan Royal or approved equal,
3. Mop Receptor (MSK - 1):
 1. Molded resin, 24 inches x 24 inches x 10 inches, rim guards, center drain.
 1. Model MSR-2424 by Florestone or approved equal.
 2. Fitting: Exposed yoke, wall mounted, vacuum breaker, top brace, stops in shanks.
 1. Heritage 8354.111 by American Standard or approved equal.
4. Lavatories:
 1. Wall Hung LAV/HC Lav (L -1):
 1. Enameled cast iron, 20 inches x 18 inches, single hole, with lug holes for concealed carrier arms.
 - 1) Lucerne 0356.421 by American Standard or approved equal.
 2. Hot and Cold Water Fitting, accessible: Selectronic integrated electronic proximity lavatory faucet with thermostatic mixing valve and power kit.
 - 1) 705B.105 by American Standard or approved equal.
 3. HC Hot Water Guard:

- 1) Manufacturers:
 - 1) Handi Lav-Guard Insulation Kit 102/105 - white, by Truebro or approved equal.
 - 2) Use manufacturer's vandal resistant fasteners.
 4. Supply Pipe: 3/8" rigid riser with loose key control. By McGuire or approved equal.
 5. "P" Trap: Adjustable offset with tubing drain to wall, cleanout plug and wall escutcheon. By McGuire or approved equal.
 6. Grid drain: Perforated, chrome plated, 1-1/4" offset tailpiece. By McGuire or approved equal.
 7. Floor Mounted Carrier Arms: Josam 17100-M-628 or approved equal.
5. Double Compartment Stainless Steel Sink:
 1. (SK - 1), Lustertone, 18 gage, Type 304 stainless steel, self-rimming, double ledge.
 1. LRAD-33160 by Elkay or approved equal.
 2. Fitting: Single control faucet with vandal resistant aerator.
 1. 4205.001 by American Standard or approved equal.
 3. Tailpiece: Offset with grid strainer, chrome plated P-trap with swivel joint, chrome plated flexible supplies with loose key stops: McGuire or approved equal.
6. Washbasins (WSHB - 1):
 1. 4 station units with cold and hot water fitting as specified in plumbing fixture schedule.
 1. Intersan 1.0-4, stainless steel or approved equal
7. Locker Room Showers:
 1. Wall Mounted Shower Heads.
 1. Vandalproof with concealed mounting screws, adjustable spray pattern by user, 30-degree spray angle, brass construction, flow not to exceed 2.5 gpm.
 2. Manufacturers:
 - 1) 1662.601 by American Standard.
 - 2) Or approved equal.
8. Electric Water Coolers (EWC - 1):
 1. Wall Mounted, 2-stream mound building projector, self-closing valve with automatic stream regulator, polished chrome plated brass bubbler, push bars in front and on both sides, for handicapped and standard use. See Drawings for mounting elevations.
 2. Manufacturers:
 1. Elkay LVRCTLSC or approved equal

3. No lead shall be allowed in the manufacture of any piece of equipment within water coolers nor in any piping joint or connection within the unit.
9. Floor Drain Reseal: VBF-72-A1 by Sloan or approved equal.

2.03 CARRIERS

- A. All carriers shall be fully bolted to floor and installed as recommended by manufacturer.
 1. Lavatory/Lavatory HC:
 1. Rectangular structural steel uprights with integral welded heavy steel foot, cast iron concealed arms. Model 17100 by Josam or approved equal.
 2. Urinal:
 1. Rectangular structural steel uprights with integral welded steel foot, hanger bracket, lower bearing plate. Model 17560 by Josam or approved equal.
 3. Water Closet:
 1. Josam 12000 Series Chase-Saver II, 4-inch pipe size, with pylon feet, adjustable, provided with vandal proof trim, supply pipe support and adjustable chase extensions or approved equal.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected.

3.02 EQUIPMENT AND FIXTURE CONNECTIONS

- A. Provide necessary material and labor to connect fixtures and equipment having plumbing connections including fixtures and equipment specified and furnished in other sections.
- B. Supply Pipe Cut-off Valves:
 1. Equip supply pipes to each item of equipment or fixture (except faucets furnished with an integral stop) with a cutoff valve to enable isolation of the item of equipment or fixture for repair and maintenance without interfering with operation of other items of equipment or fixtures.
- C. Supply Pipe Support: Anchor supply piping to all items of equipment or fixtures to prevent movement.
- D. Templates: Furnish templates and rough opening dimensions to fabricators of countertops and case work for location and sizes of openings for faucets and sink.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15457 WATER HEATERS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: A complete hot water generating system with necessary accessories as indicated on Construction Documents, as specified, and as required by code.
- B. Related Sections:
 - 1. 15410 - Piping (Plumbing).
 - 2. 15430 - Piping Specialties (Plumbing).

1.02 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.
- B. Shop Drawings:
 - 1. Water Heaters: Catalog cuts, performance characteristics.
 - 2. Pressure and Temperature Relief Valve: Catalog cuts, capacity.
 - 3. Gages: Catalog cuts.
 - 4. Recirculating Pumps: Catalog cuts and performance characteristics.

PART 2 PRODUCTS

2.01 EQUIPMENT

- 1. Electric Water Heaters:
 - 1. 18 KW, 120-gallon size, as indicated on Drawings.
 - 2. Double element, drain pan, wired for simultaneous use.
 - 3. 1-inch thick fiberglass or foamed plastic insulation jacket.
 - 4. DRE-120 by A.O. Smith or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide a gate valve and union at cold water connection to heater. A union shall be provided at hot water connection.
- B. Provide on cold water supply to heater a vacuum relief valve of sufficient size to protect tank from back pressures.
- C. Pressure relief valve and drain pan drain shall discharge to outside per code regulation or according to local ordinances.
- D. Provide thermometer on top of heater in oversized tee and nipple on outlet piping of heater.

- E. Adjust individually controlled elements to start at 5 degrees F. temperature differential for each heater element.
- F. The water heater shall fit properly in the floor space provided. Installation shall be according to local, municipal, state, and national codes.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.

END OF SECTION

SECTION 15515 VALVES, HANGERS, AND SPECIALTIES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15090 - Supports, Anchors, and Seals.
2. 15410 - Piping (Plumbing).

1.02 REFERENCES

A. The American Society of Mechanical Engineers (ASME) Publications: ASME Boiler and Pressure Vessel Code - Current edition.

1.03 SUBMITTALS: In accordance with Section 01330

A. Submit the following:

1. Pressure Relief and Reducing Valves: Catalog cuts; pressure range, and settings.
2. Air Vents: Catalog cuts.
3. Flexible Connectors: Catalog cuts.
4. All Valves: Catalog cuts, schedule of proposed installation locations, pressure ratings, and materials of construction.
5. Inserts: Catalog cuts and load tables.
6. Supports: Catalog cuts or drawings.
7. Anchors: Drawings and details of installation.
8. Water Flow Tube Station: Catalog cuts, pressure drop charts, and engineering information.
9. Shop Drawings of support equipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Valves:

1. Nibco.
2. Or approved equal

2.02 VALVES.

A. General:

1. Gate and globe valves shall not be installed with the stem pointing downwards. Valves may be installed with the stem at or above a horizontal plane. Provide adequate clearance for stem rise.
2. Check valves may be installed either in the horizontal or vertical position. Non-spring-loaded check valves shall only be installed in the vertical position when the flow is upwards.
3. Butterfly valves may be installed with the stem in any position. Whenever possible the stem shall be installed as outlined for gate and globe valves.
4. Provide all valves with a 1-1/2" diameter brass tag having 1/2" high black filled numbers and 1/4" high legend above, as manufactured by Seton or approved equal.

- a. Legend shall include abbreviations such as: PLMG, CW, HW, GAS, HVAC, etc.
 - b. Valve tag fasteners shall consist of No.6 brass beaded chain with brass "S" hooks. The use of color-coded one-piece nylon ties is acceptable instead of beaded chain fasteners. Brass "S" hooks are required with ties.
 - c. Record all valve tag numbers in project record drawings and submit before requesting final payment.
- 5. Provide ease of access to valve handwheel or lever to maintenance personnel.
 - a. Valves installed above a ceiling shall have the stem placed 15 degrees above the horizontal position whenever possible.
 - b. Provide colored thumbtack indexes at all ceiling tiles where valves are installed directly above.
 - c. Index all colored thumbtacks in the project record drawings.
- B. Check Valves:
 - 1. To 2":
 - a. Class 125 or Class 200, bronze, screwed bonnet, Y pattern, renewable Teflon discs, soldered or threaded ends.
 - b. Manufacturers:
 - 1) Nibco T/S-235-Y.
 - 2) Grinnell 3300.
 - 3) Milwaukee 590-S.
 - 4) Or approved equal.
- C. Ball Valves:
 - 1. Plumbing: Allowed only for balancing service in domestic hot water return.
 - 2. HVAC: Allowed only for shut-off, not for balancing service. Provide 3-inch stem extensions for insulated line.
 - 3. Porting: No reduced ports shall be acceptable in any ball valve.
 - 4. Up to 2":
 - a. Class 150, 400/600 psi WOG, full port, three-piece construction, blowout-proof stem, non-asbestos packing, bronze body, silicone bronze stem, bronze/ brass/chrome plated ball, Teflon resilient seat, and EPDM O ring seal.
 - b. Manufacturers:
 - 1) Nibco T/S-595-Y.
 - 2) Hammond 8604/8601.
 - 3) Milwaukee BA-300SS/350S.
 - 4) Or approved equal.

2.03 HOSE BIBBS

- A. Interior:
 - 1. Concealed Supply:

- a. Flanged, all brass, chrome plated, 3/4" angle hose valve, with vacuum breaker.
 - b. Manufacturers: No.952 by Chicago Faucet or approved equal.
 - c. Provide isolation valve in branch.
- B. Pressure Relief Valves:
 1. 3/4": Brass body, micro finished bevel for seats, cadmium plated springs, manual chilled lift ring, ASME Std. Bell and Gossett or water or approved equal.
- C. Pressure Reducing Valves:
 1. 3/4": Brass body and brass working parts with built-in strainer, 125 W.S.P. Bell and Gossett or approved equal.
- D. Pressure Gages:
 1. Standard depth, cast aluminum, black finished, chrome plated close type ring, clear glass window, bronze bourdon tube, precision movement and ± 0.5 percent accuracy.
 2. Gage shall have a minimum 4-1/2" diameter face and with the operating pressure displaying at the middle range of the scale. Bottom connection shall be at least 1/2" diameter.
 3. Manufacturers: H.O. Trerice, Marshalltown, Ashcroft, or Taylor or approved equal.
- E. Gage valves:
 1. Brass, 1/2" needle valve type.
 2. Manufacturers: H.O. Trerice, Model No.735-2 or approved equal.
 3. Provide pressure snubbers at gage cocks manufactured by H.O. Trerice, Model 872. Provide also from Marshalltown, Ashcroft, or Taylor or approved equal.
- F. Dielectric Pipe Fittings:
 1. Dielectric pipe fittings shall consist of insulators, insulating gasket, pipe connector and nut or flange as required.
 2. Pipe connectors shall be suitable for soldered, screwed, or welded joints as required.
 3. Dielectric unions shall be rated at 250 psi and cast-iron flange unions at 175 psi.
 4. Dielectric fitting shall be plated according to Federal Specifications of 0.005".
 5. Fittings shall be as manufactured by Epco or approved equal.
- G. Water Flow Sensors:
 1. As manufactured by Annubar ANR-75, stainless steel or approved equal.
 2. Instrument connections shall be No.C-22.
 3. 1/4" valves on 1-3/8" square head.
 4. Valve rating shall be maximum 5,000 psi at 100 degrees F.
 5. Flow sensor in steel pipe shall be weld nipple mounted.
 6. Flow sensor in PVC pipe shall be saddle mounted.
 7. Manufacturers: Dietrich Standard Corp or approved equal.

2.04 PIPE HANGERS AND SUPPORTS

- A. Provide hangers, supports, and supplementary steel as required for the different applications.
- B. Inserts, Hangers, Rods, and Clamps: Fig. numbers used refer to Grinnell, Fee and Mason, or Michigan Hanger

Co. An "or approved equal" can be submitted for review.

1. Inserts: (Galvanized or stainless steel except as noted.)
 - a. Universal concrete insert, Fig.282.
 - b. Wedge type concrete insert, Fig.281.
 - c. Expansion case, Fig.117.
2. Clamps:
 - a. UFS beam clamp with weldless eye nut, Fig.292, clamp size 1, rod size 3/4".
 - b. C-clamp with retaining clip, Fig.87.
 - c. 1 beam clamp, Fig.131.
 - d. Universal side 1 beam clamp, Fig.225.
 - e. C-clamp, copper finish, Fig.CT-88.
3. Hangers: Use adjustable clevis type hangers as specified. Hangers for insulated pipes shall have a diameter large enough to include insulation and a protection shield shall be installed with each hanger.
 - a. Cast iron pipe: Fig.590.
 - b. Copper tubing: Fig.CT-65.
 - c. Insulated steel pipe: Fig.300.
 - d. Uninsulated steel pipe: Fig.260.
 - e. Trapeze.
4. Rods: Continuous thread, Fig.146. Sizes shall be as specified.
5. Riser Clamps:
 - a. Black steel, Fig.261.
 - b. Plastic coated, Fig.261C.
 - c. Copper finish, Fig.CT121.

C. Horizontal Steel Piping Support Spacing and Rod Size:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 1-1/4"	3/8"	8 feet
1-1/2" & 2"	3/8"	10 feet
2-1/2" & 3"	1/2"	12 feet
4" & 5"	5/8"	12 feet
6"	3/4"	15 feet
8" & 12"	7/8"	18 feet
14" & 16"	1"	24 feet

D. Horizontal Copper Piping:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 1-1/2"	3/8"	6 feet
2"	3/8"	8 feet
2-1/2", 3", & 4"	1/2"	8 feet

- E. Insulation Protection Shield: Fig.167.
- F. Wall Access: Refer to drawings and to Section 15010 .

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide shut-off valves at inlets and outlets of equipment and branch connections to mains and as shown on Construction Documents.
- B. Final connections to apparatus, equipment, automatic control valves, and pressure reducing valves shall be made with flanges or unions between shut-off valve and connection.
- C. Connections to cooling coils and refrigeration machines shall have flanges or unions next to equipment to allow tube removal without extensive dismantling of piping.
- D. Pressure Relief Valves: Provide at cooling coil side of shut-off valves and where shown on Construction Documents.
- E. Flexible Connectors: Provide between vibrating equipment and piping.
- F. Location of Valves and Chain Operators:
 - 1. Install valves to be accessible for operation and free from interferences when operated.
 - 2. Position so leakage will not contact any electrical equipment located below.
 - 3. Provide valve chain operators for valves 4 inches and larger if the valve handle is more than 6 feet above the operating equipment room floor level.
- G. Pressure Gages: Provide as shown on Construction Documents and at following locations:
 - 1. At suction and discharge of circulating pumps.
 - 2. At inlet and outlet of evaporator and condenser.
 - 3. At makeup water inlet to expansion tanks and equipment.
- H. Pipe Hangers and Supports:
 - 1. Provide adjustable hangers, inserts, brackets, rolls, clamps, and supplementary steel as required for proper support of pipe lines.
 - 2. Design hangers to allow for expansion and contraction of pipe lines and of adequate size to allow covering to run continuously through hangers.
 - 3. Support piping independently of equipment.
 - 4. Coordinate location of hangers with light fixtures.
 - 5. Wire brush steel or iron supports and prepare surfaces under this section for painting.
 - 6. Pipes supported by trapeze hangers and not mounted on pipe rollers shall be secured to the trapeze with pipe clamps or "U" bolts.
 - 7. Hangers shall be placed at each change of direction, within 1 foot of valves and other appurtenances installed in horizontal piping and not more than 3 feet from end of each branch runout.
 - 8. Special Supports: Provide clamps, hangers, and supports according to equipment manufacturer's recommendations.

9. Supports of wire, rope, wood, chain, strap, perforated bar, or any other makeshift devices are not allowed.
 10. Where overhead construction does not allow fastening hanger rods in required locations, provide additional steel framing as required.
 11. Provide "Vibration Isolation" at supports subject to vibration.
 12. Maximum loading on inserts shall not exceed 75 percent of catalog rating.
 13. Floor supports, wall brackets, and expansion tank supports as shown on Construction Documents or as required to support equipment. Submit shop drawings.
 14. Buckling of piping due to inadequate provision for expansion shall be Contractor's responsibility. Piping shall be properly guided between expansion joints and anchor points.
- I. Water Flow Sensors: Install water flow tube stations according to manufacturer's published recommendations and as shown on Contract Documents.
- J. Dielectric Fittings: Provide dielectric fittings between piping of dissimilar metals.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15890 DUCTWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Related Sections:
 - 1. 15910 - Duct Accessories.
 - 2. 15940 - Outlets (HVAC).

1.2 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), latest edition:
 - 1. HVAC Duct Construction Standards (Metal and Flexible).
 - 2. High Velocity Duct Construction Standards.
- B. National Fire Protection Association (NFPA):
 - 1. NFPA 45 - Standard on Fire Protection for Laboratories Using Chemicals.
 - 2. NFPA 90A - Standard for the Installation of Air-conditioning and Ventilating Systems of Other than Residence Type.
 - 3. NFPA 96 - Removal of Smoke and Grease Laden Vapors from Commercial Cooking Equipment.
- C. National Electrical Code - NEC 70 (Edition applicable to the Project).
- D. American Society of Heating, Refrigerating, and Air-conditioning Engineers, Inc. (ASHRAE) 62 - Ventilation for Acceptable Indoor Air Quality.

1.3 SYSTEM DESCRIPTION

- A. All ductwork shall be sealed to comply with SMACNA:
 - 1. Seal Class A.
 - 2. Leakage Class 6 for rectangular ducts.
 - 3. Leakage Class 3 for round and oval ducts.
- B. Use of fiberglass or components containing coated or exposed fiberglass within airstreams is prohibited.

1.4 SUBMITTALS: In accordance with Section 01330

- A. Ductwork:
 - 1. Provide 1/4" scale composite Shop Drawings. Shop Drawings shall be coordinated with other trades before submitting.
 - 2. Catalog Cuts: Medium pressure ductwork, duct sealer, and turning vanes.
 - 3. Catalog Cuts, Ratings, and Performance Data: Flexible ductwork.
- B. Casings, Plenums, and Housings: Details of construction.
- C. Provide details of proposed typical ductwork fittings including:
 - 1. Seams and joints.
 - 2. Elbows, vaned and radius.
 - 3. Transitions and Offsets.

4. Taps and outlet frames.
 5. Branch connections and tees.
 6. Splitter dampers.
- D. Duct Hanger System: Catalog cuts and shop drawing.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Flexible: Genflex or Flexible Technologies or approved equal.
- B. Ductwork and Fittings:
1. Metal Aire.
 2. Semco.
 3. Spiramatic.
 4. United Sheet Metal.
 5. Or approved equal

2.2 MATERIALS

- A. Ductwork shall be fabricated and installed according to the SMACNA Standards, except as shown on drawings or specified.
- B. Ductwork shall have manufacturer's gage stamp intact.

2.3 LOW PRESSURE DUCTWORK

- A. Includes ductwork from low pressure air handlers, exhaust, and outside and return air ductwork. Velocities shall not exceed 1,300 fpm and static pressures not to exceed 2 inches WG.
- B. Provide galvanized steel ductwork, designed, constructed, installed and tested according SMACNA - "HVAC Duct Construction Standards" and as shown on drawings. Ductwork to have manufacturer's gage stamp. Provide cross-breaking or beading to prevent flexing, but do not reduce gage of metal below that required for flat ductwork sheets.
- C. Provide galvanized steel saddles at points of support of insulated piping saddles.
- D. The following ductwork and plenums shall be insulated, unless noted otherwise.
1. Return air ductwork in non-conditioned spaces, including mechanical rooms and space above ceilings.
 2. Return air transfer boots.
 3. Return/outside air plenums at air handlers.
- E. Plenums:
1. Galvanized steel with the largest dimension of 30 inches and larger shall be 18 gages.
 2. Plenums shall be constructed, designed, installed, and tested according to SMACNA as specified. Joints shall be angle reinforced pocket type. Provide fully gasketed joints between plenums and filter sections.
 3. Provide plenum access doors where indicated on drawings. Doors shall be constructed according to Figure 6-12 of SMACNA - HVAC Duct Construction Standards.
- F. Flexible Insulated Ductwork:

1. Lightweight duct, core of corrosion resistant reinforcing wire helix permanently bonded within fabric, insulated with 1-1/2" thick, 3/4 lb. density fiberglass flexible insulation and covered with a vapor barrier of aluminum metalized polyester film laminated to glass mesh, elastomer back coated. Duct shall meet NFPA 90A requirements and be listed as Class 1 Air Duct Material, UL 181.
 2. Manufacturers:
 - a. Atco Rubber Products.
 - b. Genflex.
 - c. Thermaflex II.
 - d. Venture Type VTKC.
 - e. Wiremold Co.
 - f. Or approved equal
- G. Ductwork and splitter dampers within the ductwork shall be made of the same material.
- H. Turning vanes shall be provided in square elbows and shall be of same material as the ductwork. Turning vanes shall be of airfoil type, double thickness factory fabricated.

PART 3 EXECUTION

3.1 GENERAL

- A. Install low and medium velocity ductwork as shown on drawings. 90-degree bends shall not be made in medium pressure flexible ducts.
- B. Before systems are tested and balanced, ducts shall be thoroughly cleaned and blown out.
- C. Where interferences arise during construction, make transition or division of ductwork on basis of pressure drop equivalent to original size. Obtain approval from the Engineer and EOR, as directed by the Engineer, before fabrication.

3.2 INSTALLATION

- A. Install ductwork materials and accessories according to the latest edition of SMACNA Low Velocity Duct Construction Standards as specified. These written specifications shall take precedence in case of conflict.
- B. Seal all duct joints with sealer as specified for field sealing of high-pressure ductwork according to SMACNA.

3.3 LOW PRESSURE DUCTWORK

- A. Seams and joints in ductwork shall be made airtight. Make exhaust ducts passing through return air chases airtight.
- B. Install flexible ductwork shall be installed in sizes to match diffuser necks as indicated on drawings schedules. Duct length shall be not less than 5 feet and no longer than 7 feet. Duct shall be adequately supported to prevent kinks and sharp bends. Install according to manufacturer's recommendations and as shown on drawings.

3.4 DUCTWORK SUPPORTS AND HANGERS

- A. Provide support and hangers according to SMACNA HVAC Duct Construction Standards.

- B. Hangers shall be galvanized steel hung from inserts or clip angles secured to structure with expansion bolts in shear or tension as follows:
1. Roof Slab: In tension.
 2. Structural Beams: In shear, 12 inches minimum from bottom of beam.
 3. Joists: Use existing forming bolts openings only. Hangers shall be bent under ductwork at least 2 inches. Hangers for ducts over 48 inches wide shall be secured to bottom and sides of duct.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15910 DUCT ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. 15890 - Ductwork.
 - 2. 15940 - Outlets (HVAC).

1.02 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): Low and High Velocity Duct Manuals.
- B. National Fire Protection Association (NFPA) 90-A Standard for the Installation of Air-conditioning and Ventilating Systems of Other Than Residential Type.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Volume Dampers: Shop drawings.
- B. Low Pressure Ductwork Round Fittings: Shop Drawings or catalog cuts.
- C. Flexible Connections: Catalog cuts.
- D. Test Holes: Pipe couplings, catalog cuts, and proposed installation locations.

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Volume Dampers:
 - 1. Dampers shall be manual or automatic as indicated on drawings. Dampers furnished with automatic actuators shall be installed under this section.
 - 2. Volume dampers shall have opposed blades.
 - 3. Volume dampers shall be 2 gages heavier than the installed duct and shall be reinforced to prevent vibration and noise.
 - a. Dampers shall be according to SMACNA "Low Velocity Manual", as referred to in "Ductwork". Dampers shall have an indicating device with lock to hold damper in position for proper setting.
 - b. Splitter dampers shall be double thickness at the leading edges.
 - c. Volume dampers shall be fabricated according to Figure 2-12 of SMACNA Low Pressure Manual.
 - 4. Bridge lock type quadrant operators of dampers shall mount flush with surface of duct insulation.

- B. Flexible Connectors: Size flexible connections at a minimum of 4 inches between connected items. Provide 30-ounce glass fabric fire retardant and airtight, coated with neoprene on both sides. Ventglass by Ventfabrics, Inc. or Neoprene Fabriduct by Elgen or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Flexible connections shall be provided as shown on drawings. Lengths shall be between 3 feet and 8 feet.
- B. Low pressure ductwork round fittings shall be installed as shown on drawings and according to manufacturers recommendations.
- C. Provide test holes at mains and main branches and as required by test and balance contractor.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15940 OUTLETS (HVAC)

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15890 - Ductwork.
2. 15910 - Duct Accessories.

1.02 SUBMITTALS: In accordance with Section 01330

- A. Outlets: Catalog cuts and schedules of installation and performance data at noted capacities.
- B. Outlet Accessories: Plaster frames, opposed blade dampers, and square to round neck adapter catalog cuts.
- C. Samples: Submit color chips for manufacturer's standard baked enamel colors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Air Outlets:

1. Air Guide
2. Price
3. Grille Tech
4. Or approved equal

2.02 MATERIALS

- A. Plaster frames shall be provided for plaster and dry wall ceiling and wall installations.
- B. Finishes shall be as follows:
1. Devices installed on surfaces to be painted shall match surface color. Factory prime coat.
 2. All Other Areas: Factory applied baked enamel. Color to match color chip furnished by the Engineer.
 3. Aluminum Devices: Satin aluminum baked enamel, except as specified.
- C. Provide a synthetic sponge rubber gasket between each frame and mounting surface forming an airtight seal.
- D. Manufacturer's published performance data shall be obtained from testing performed in a laboratory certified by the Air Diffusion Council. Testing shall be according to ADC Test Code 1062R4.
- E. Air diffusers shall be provided with opposed blade volume dampers adjustable from diffuser

face, blanking for proper coverage, and blow without producing objectionable noise or air motion at occupied level.

1. Diffusers in the same room shall be the same size and type, except as otherwise noted.
2. Diffusers shall be suitable for operation at 5 percent excess and 25 percent less than noted capacities.
3. Louvered face ceiling diffusers shall be of square, round, or rectangular face patterns. Provide:
 - a. Removable central core, snap-in type.
 - b. Flat flanged frame.
 - c. Welded aluminum construction.
 - d. White baked enamel finish.
4. Perforated ceiling diffusers are not allowed.

F. Grilles and Registers.

1. Ceiling return and exhaust registers shall be 1/2" x 1/2" x 1/2" grid type with opposed blade dampers and aluminum construction with white baked enamel finish. Frame shall be suitable for plaster frame mounting where required.
2. Sidewall return and exhaust registers shall be aluminum flange frame with fixed 45 degrees louvers spaced 3/4" with an opposed blade damper. Louvers shall be parallel to the long dimension.
3. Grilles shall be as specified for registers except dampers are not required. Perforated ceiling return grilles shall be of the lay-in type to match perforated ceiling diffusers.

G. Sidewall supply grilles and registers shall be aluminum flange framed, with 2 sets of adjustable vanes parallel to the long and the short sides and an opposed blade damper.

H. Supply and return, registers, diffusers, and grilles shall be provided with frames and finishes suitable for wall or ceiling finish and construction where installed. Coordinate with Construction Documents for ceiling types and locations.

I. Air outlets shall be provided as indicated on drawings. If outlet type is not indicated on the drawings, provide type used in similar areas elsewhere in the building.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Manufacturer of air distribution devices shall be responsible for examining application of each diffuser, grille, and register and guaranteeing each will provide comfort space conditions without drafts and excessive noise at noted capacity.

3.02 INSTALLATION

- A. Install and connect all light troffer diffusers as required by the construction documents.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 16023 CODES AND STANDARDS

PART 1 GENERAL

1.01 REFERENCES

- A. Comply with the following:
 - 1. Florida Building Code (FBC).
 - 2. National Electrical Code - 1999 (NEC), (NFPA 70).
 - 3. Florida Fire Prevention Code - 2014

1.02 QUALITY ASSURANCE

- A. Where materials and equipment are available under the continuing inspection and listing service of Underwriters Laboratories (UL), furnish materials and equipment so listed.

PART 2 NOT USED

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16100 BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 SUMMARY

A. Coordination with Other Trades:

1. Examine drawings and specifications. Visit site to determine work to be performed by Electrical, Mechanical, HVAC, and other trades.
2. Provide required electrical materials and equipment to put work into operation, completely wired, tested, and ready for use including raceways, conductors, disconnects, starters/contactors, or other devices for proper operation and sequences of electrical, mechanical, or other systems or equipment.
3. Unless otherwise noted, conduit, wire for controls, and devices, both line and low voltage, shall be provided and installed as described in this or other parts of the Construction Documents.
 - a. Install boxes or housings necessary for conduit and wire to controls, excluding items to be installed in piping, ducts, tanks, machinery, solenoid valves, pressure switches, aquastats, or similar devices.
 - b. These items are specified for installation in other sections. Connecting wiring is specified in this Division.
4. Control wiring in separate conduit between HVAC sensing devices and control panels or motors, shall be installed under this Division after verification from approved shop drawings of the required locations and connections.
5. Connect electrical equipment and devices as parts of the equipment or furniture furnished under other sections.

1.02 SUBMITTALS: In accordance with Section 01330

A. Manufacturers Data:

1. Complete list of materials to be furnished under this section.
2. Manufacturers' specifications and other data required to assure specification compliance.
3. Catalog cuts, clearly marked for identification of items to be provided, including disconnects, breakers, fuses, starters, lighting fixtures, transformers, or other materials not requiring specially prepared Shop Drawings.

B. Shop Drawings for nonstandard items, including but not limited to panelboards, switchboards, control centers, anchoring layouts and details, lighting fixtures, or similar products.

C. Contract Closeout Submittals:

1. Project Record Drawings.
2. Warranties.
3. Operating Instructions, maintenance manuals, and parts lists.
4. Point-to-point wiring diagrams.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage:

1. Deliver materials to jobsite in their original unopened containers with labels and certifications intact and clearly legible at time of use.
2. Store materials according to manufacturers' recommendations and as approved by the Engineer.

B. Replacement: In case of damage, pilferage, or other loss, make immediate repair or replacement of materials necessary to obtain approvals of the Engineer, without cost to the DTPW.

C. Protection: Use necessary means to protect materials of this section before, during, and after installation, including protection of installed work and materials of other trades.

PART 2 NOT USED

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16112 RACEWAYS AND CONDUIT

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16120 - Wire and Cable.

1.02 SYSTEM DESCRIPTION

- ##### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Product Data: Manufacturer's literature including printed installation instructions and recommendations before starting work. Submit samples if requested.

1.04 QUALITY ASSURANCE

- ##### A. Electrical Component Standard: Components and installation shall comply with NFPA 70 - National Electrical Code - 2014 (NEC).

PART 2 PRODUCTS

2.01 EQUIPMENT

- ##### A. Conduit shall be sized according to NEC, unless otherwise noted. Feeders and home runs shall not be less than 3/4" diameter.

B. Electrical Metallic Tubing (EMT):

1. Galvanized steel tubing with smooth interior coat of lacquer enamel or zinc coat.
2. Comply with ANSI C80.3-1983, and UL 797, and Article 348 of the NEC.

C. Flexible Metal Conduit:

1. Steel: Flexible galvanized steel conduit (Greenfield) complying with UL 1 and Article 350 of the NEC.
2. Liquid Tight: Flexible galvanized steel conduit with oil and water-resistant overall plastic sheath, complying with UL 1, and Article 351 of the NEC.
3. Minimum size for flexible metal conduit 1/2" except 3/8" where allowed by Section 349 of the NEC for connections to lighting fixtures.

D. Conduit Fittings:

1. EMT fittings: Zinc or cadmium plated steel or malleable iron of the compression type or stainless-steel multiple point locking (set screw) type. Connectors shall have insulated throats. Fittings shall comply with ANSI C80.3-1983. Die cast zinc alloy fittings are not allowed.
2. Flexible metal conduit fittings: Steel or malleable iron only with insulated throat,

- complying with Fed. Spec. W-F-406B. Die cast zinc alloy fittings are not allowed.
3. Bushings and connectors shall incorporate an insulating insert of at least 150 degrees C. rated plastic or 105 degrees C. rated nylon. Conduit bushings made entirely of nonmetallic material are not allowed. Grounding and bonding bushings shall have clamp type terminal for copper conductor.
 4. Expansion Fittings and Sealing Fittings: UL listed with ground continuity means.

E. Conduit Supports:

1. Straps: Formed zinc coated steel or malleable iron one-hole pipe straps or conduit clamps sized for conduits or tubing.
2. Fastenings: Zinc coated, or cadmium plated steel screws, bolts, toggles, and expansion anchors as required.
3. Electrical steel channels shall be Unistrut P-3000 Series or approved equal. Provide trapeze, clamps, supports, concrete inserts, galvanized steel or plated steel with galvanized conduit clamps, and threaded 1/4" diameter minimum suspension rods.
4. For individual branch circuit EMT or flexible metal conduit concealed above accessible hung ceilings only, "caddy clips" spring steel conduit clamps.

F. Wireways and Auxiliary Gutters:

1. Hot dip galvanized code gage sheet steel, complete with knockouts, enclosures, and removable covers unless indicated as hinged.
 - a. Manufacturers:
 - 1) Hoffman.
 - 2) Lee Products.
 - 3) Keystone.
 - 4) Square D.
 - 5) Or approved equal
2. Exterior locations shall have weathertight gasketed covers, joints, and drip-proof rain shields. Paint after installation with exterior enamel paint.
3. Wireways and gutters shall comply with Articles 362 and 374 of the NEC.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not proceed with the work of this Section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Provide where indicated and where required, ducts, conduits, tubing, wireways, and gutters to form a complete and integrally grounded raceway system. The system shall be installed according to NEC and local code requirements. Components of the system shall be of sufficient size, strength, and capacity to allow for placements, pulling-in, or other installation of conductors, wires, cables, splices, taps, and terminations whether included in this Contract or for future use without strain or injury to those items being installed.
- B. Provide pull wires in empty raceways where no conductors are installed in this Contract. Allow 10 inches minimum slack at each end of pull wire and securely caulk in place. Provide marking

tags showing opposite destination noting building and closet number at each end.

- C. The minimum size of, EMT, and flexible metallic conduit shall be according to NEC except as follows:
1. Unless otherwise specified under "Products" or shown on the Drawings.
 2. Unless otherwise shown on the Drawings, telephone conduits shall be not less than 1-inch trade size.
 3. Feeders and homeruns shall not be less than 3/4" diameter.
- D. Check sizes of raceways to determine the green equipment ground conductor specified, shown, or required can be installed in the same raceway with phase and neutral conductors according to the percentage of fill requirements of NEC. If necessary, increase the duct, conduit, tubing, or raceway sizes shown or specified to accommodate conductors without additional cost to the DTPW.
- E. Raceway and Conduit Locations: Unless indicated otherwise, conduit types specified shall be used in the following locations. Any deviation from this schedule shall be submitted for approval with corresponding price adjustments before installation. Any conduit installed and not of the specified type shall be removed and replaced with the specified type at no additional cost to the DTPW.
1. Interior Raceways:
 - a. Embedded in Concrete Walls or Floors Above Grade:
 - 1) EMT with concrete tight steel fittings.
 - b. Concealed in Masonry Walls:
 - 1) EMT with concrete tight fittings.
 - c. Concealed in dry wall construction, or in suspended ceilings: EMT or flexible metal conduit with steel fittings.
 - d. Interior Exposed:

EMT with steel fittings.
 2. PVC conduit shall not be used indoors either exposed or concealed.
- F. Raceway and Conduit Installation:
1. Conduit Routing:
 - a. Route feeders, homeruns, and conduits as indicated, except for minor deviations as accepted.
 - b. Maintain a minimum separation of 12 inches between conduits containing emergency feeders and conduits containing normal feeders.
 - c. The routing of conduit, as shown on the plans, is general.
 - d. Before installing any work, examine the working layouts of all other trades to determine exact locations and clearances.
 - e. Where equipment is installed by other trades requiring connection as specified in this section, determine exact conduit entry locations from the approved shop drawings.

- f. Modifications to conduit runs shown on the electrical drawings, based on this section, shall be made without additional cost to the DTPW, and shall be subject to Engineer approval.
 - g. In determining clearances, conduit shall not be run within 6 inches of any heated pipe or duct, or if unavoidable, the conduit must be kept at least 1 inch from the outer covering.
2. Conduits in Finished Spaces:
- a. Conduits, fittings, outlet boxes, and pull boxes shall be concealed in ceilings, floor slabs, walls, or partitions of the buildings.
 - b. Provide sufficient space at concealed conduits over conduit and coupling for the applications of finished floor, walls, and ceilings.
 - c. Examine the Drawings, and if necessary, confer with the Engineer to determine the type of construction containing the concealed conduits and the space available for such conduits.
3. Conduit Bending, Cutting, and Placement:
- a. Conduit bends and offsets shall be avoided where possible.
 - b. Required bends shall be made with standard benders designed for the purpose and with a minimum radius of 6 times the internal conduit diameter.
 - c. Make conduit bends according to the NEC unless otherwise shown on the contract Drawings. Use of a pipe tee or vise for bending conduit is not allowed.
 - d. Conduit crushed or deformed shall not be installed.
 - e. Bends shall be free from dents or flattening. Bends more than 360 degrees are not allowed in conduit between any 2 terminations of pull boxes.
 - f. Make no bend in surface raceways. Use factory formed fittings for surface raceways.
 - g. Raceways shall not contain more than two 90-degree bends or equivalent. Provide additional junction or pull boxes to meet this requirement.
 - h. The ends of conduit shall be carefully reamed out free from burrs before installation and after threading.
 - 1) Cuts shall be made square.
 - 2) Coupling of conduits by means of running threads is not allowed.
 - 3) Where it is impossible to run the conduit and coupling sections together, an Erickson coupling or an approved equal combination coupling shall be used.
 - 4) Joints shall be made up tight.
 - 5) Joints in conduits concealed in slab, floor fill, earth, etc., shall be made using approved silicone paint on threads.
 - i. Prevent lodgment of plaster, dirt, or trash in raceways, boxes, fittings, and equipment during course of construction. Clogged raceways shall be entirely freed of obstructions or replaced.
 - j. During installation of conduit, unfinished runs and terminations in pull boxes, cabinets, etc., shall be capped until conductors are installed.
 - k. Plastic caps designed for this specific purpose shall be used to cover and align conduits before concrete pours and shall remain on conduit stub-ups until conduit is extended. Caps shall have self-aligning, interlocking male or female wings molded on each side. Duct or electrical tape and wire are unacceptable.
4. Conduit Connections:

- a. Conduit and EMT runs shall be mechanically and electrically continuous from service entrance to outlets. Unless otherwise specified, each conduit shall enter and be securely connected to a cabinet, junction box, pull box or outlet box by means of a locknut on the outside and a bushing on the inside or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter. Where nominal circuit voltage exceeds 250 volts:
 - 1) In EMT or flexible metal conduit, the 1 locknut shall be made wrench-tight.
 - 2) Locknuts shall be the bonding type with sharp edges for digging into the metal wall of an enclosure and shall be installed to provide a locking installation.
 - 3) Locknuts and bushings or self-locking adapters will not be required where conduits are screwed into tapped connections.
 - 4) Protect vertical runs of conduit or EMT terminating in the bottoms of wall boxes or cabinets, etc., from the entrance of foreign material before the installation of conductors.
 - b. The end of each conduit one inch and smaller shall be provided where it enters a junction box, outlet box, cabinet, etc., with the locknut and bushing. For conduits 1-1/4" and larger, use insulated bushings with ground stud. If insulated bushings are of the fully insulated type, use additional locknuts inside the junction box or cabinet before installing the bushing. Provide conduit entering main distribution switchboard feeder pull boxes with insulated bushing with ground stud regardless of size.
 - c. Install the conduit system complete before any conductors are drawn in. Each run of conduit shall be blown through and swabbed after plaster is finished and dry, and before conductors are installed.
 - d. Install conduit to drain any moisture, collecting in the conduit, to the nearest outlet or pull box, where possible.
 - e. Where metallic conduit is exposed to different temperatures, seal the conduit to prevent condensation and passage of air from one area to the other.
 - f. Light and power conduit shall run from a permanent and continuous ground return back to the service ground connection point. Conduits used on systems entirely isolated from the light and power distribution system shall be electrically continuous and grounded in an approved manner.
5. Conduit Penetrations and Supports:
- a. Sleeves, conduits, or other pipes passing through floor slabs, beams, or walls shall be located to not impair the strength of the structure.
 - b. Conduits penetrating the walls or smoke partitions shall be fire stopped (sealed). Filling materials for openings in floors shall be fire-resistive, and finished to prevent passage of water, smoke and fumes. Filling material for openings in walls shall be fire-resistive where it occurs in fire walls and shall be installed to prevent the passage of air, smoke or fumes. Where conduit and wiring pass through fire walls or floor slabs, the Contractor shall fill the opening with fireproof sealant.
 - c. Where conduits passing through the openings are exposed in finished rooms, the finishes of the filling materials shall match and be flush with the adjoining floor, ceiling, or wall finishes.
 - d. Where unused sleeves or slots are provided for future installation of conduit, etc., they shall be suitably identified if not readily recognizable.
 - e. EMT and conduits not embedded in concrete or masonry shall be securely and independently supported so that no strain will be transmitted to outlet box and

- pull box supports, etc. Supports shall be rigid enough to prevent distortion of conduits during wire pulling.
- f. Run conduits exposed in unfinished spaces, mechanical equipment spaces, where specifically indicated on the Drawings, or with the expressed permission of the Engineer.
- 1) Feeder conduits shall be run exposed or in hung ceilings, except as noted.
 - 2) Where exposed conduits are installed, they shall be run parallel to the building walls or partitions, using approved conduit fittings.
 - 3) Exposed conduits shall be securely supported with malleable iron pipe straps, angle iron pipe straps, angle iron or steel channel racks or other approved means as required for clearance of other piping or ductwork.
 - 4) Spacing of conduit supports shall not exceed 7 feet.
 - 5) Horizontal feeder conduit banks shall have their hangers fastened to the building structure by approved means.
 - 6) Hangers for banks consisting of 1 or 2 conduits may be fastened from inserts in the slab.
 - 7) Auxiliary steel for fastening shall be furnished and installed under this section.
- g. Support individual conduits not larger than 1-1/2" diameter by means of one-hole pipe straps or individual pipe hangers. Support individual horizontal conduits larger than 1-1/2" diameter by individual pipe hangers.
- h. Conduit located in hung ceilings shall be supported in approved manner similar to exposed conduits.
- i. Branch circuit conduits above suspended ceilings may be supported from the floor construction above or from the main ceiling support members, however, the finished installation shall not interfere with the removability of ceiling panels. Individual branch conduits above suspended ceilings with removable panels may be supported from the ceiling suspension wires provided the load imposed on any individual wire is not greater than 64 pounds, including the ceiling weight.
- j. Unsupported vertical drops over 10 feet from bus ducts or at motors shall be in rigid steel conduit. For vertical drops of less than 10 feet EMT may be used. Brace conduit to prevent swaying.
- k. Space conduits installed against concrete or masonry surfaces away from the surface by clamp backs or other approved means.
- l. In dry locations, spring steel fasteners, clips, or clamps specifically designed for supporting exposed single conduits may be used instead of pipe straps or pipe hangers.
- 1) Hanger rods used with spring steel fasteners shall be not less than 1/4" diameter steel with corrosion resistant finish.
 - 2) Spring steel fasteners shall be specifically designed for supporting single conduits or EMT
 - 3) Type, size and spacing of spring steel fasteners with accessories shall be approved by the Engineer.
 - 4) Submit applicable load and rating data for approval.
 - 5) Wire shall not be used for support.
 - 6) Nails are not allowed for the support of conduit.
- m. Where 2 or more horizontal conduits or EMT run parallel and at the same elevation, they shall be supported on multiple trapeze pipe hangers. Each conduit or EMT shall be secured to the horizontal hanger member by a U-bolt,

- one-hole strap, or other suitably designed and approved fastener.
- n. U-bolts, clamps, attachments, and other hardware necessary for hanger assembly, and for securing hanger rods and conduits shall be provided. Each multiple hanger shall be designed to support a load equal to or greater than the sum of the weights of the conduits, wires, hanger, plus 200 pounds. Hardware shall be hot-dip galvanized after fabrication.
6. Conduit Fastening: Fasten raceways as follows:
- a. To Hollow Masonry: Toggle bolts or expansion bolts as required. Holes not used to be filled.
 - b. To Concrete or Solid Brick Masonry: By expansion bolts. Holes drilled to a depth of more than 1-1/2".
 - c. To Steel Work: Machine screws, welded threaded studs, or spring-tension clamps. Raceways or pipe straps shall not be welded to steel structures.
 - d. To Light Steel Construction Partitions: Sheet metal screws. Bar hangers may be attached with saddle ties of 16 gage double strand zinc-coated steel wire.
 - e. Nail-type nylon anchors with lock washers and nuts may be used instead of expansion bolts or machine screws.
 - f. Explosive charge setting devices are not allowed for any type of fastening on the project.
 - g. Conduits, tubing, or raceways shall be continuous from outlet to outlet, cabinet, junction box, or pull box.
 - h. Surface Wireways and Auxiliary Gutters: Fasten according to manufacturer's directions with fastenings appropriate for surface as specified.
 - i. Cable Supports in Vertical Raceways: According to NEC Article 300-19.
7. Flexible Conduit:
- a. Flexible conduits shall be used for connections to motors and other electrical equipment when it is subject to movement, vibration, misalignment, cramped quarters, or where noise transmission is to be eliminated or reduced. Flexible conduit used to meet the above requirements shall be of the liquid-tight type when installed under any of the following conditions:
 - 1) Moisture or humidity laden atmosphere where it is possible for condensation to accumulate.
 - 2) Corrosive atmospheres.
 - 3) Where water or spray due to wash-down operations is frequent or possible.
 - 4) Wherever there is a possibility of seepage, dripping, etc., of oil, grease, or water.
 - b. Flexible conduit shall be used for short connections to control devices, recessed fixtures, and similar items with enough slack to avoid tension. Connection between structure and first point of attachment to vibrating equipment shall be flexible.
8. Empty Conduits: Where empty conduit or tubing is indicated for wiring to be installed in future by utility company or by separate contract, install conduit or tubing according to previous requirements for conduit and tubing with following additional requirements:
- a. No length of run shall exceed 75 feet for 3/4" size and 150 feet for 1 inch or larger sizes.

- b. Raceways shall not contain more than two 90-degree bends or equivalent.
 - c. Install additional pull or junction boxes to comply with above limitations, whether or not indicated.
 - d. Inside radii of bends in conduits of 1 inch or larger shall be not less than 10 times nominal diameter.
 - e. Provide pull wire in empty raceways.
9. Painting: Paint exposed conduit to match the surrounding wall or ceiling it is mounted against.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16120 WIRE AND CABLE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16112 - Raceways and Conduit.

1.02 SYSTEM DESCRIPTION

- ##### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Submit product data and descriptive literature before starting work.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Wire and Cable:

1. Wire and cable shall be soft annealed 98 percent conductivity copper with 600-volt A.C. thermoplastic insulation unless otherwise noted.
2. Wire and cable shall be new and manufactured not more than 12 months before installation.
3. Each coil or reel shall bear UL label and wire marked with AWG or circular mil wire size, voltage rating, insulation type, type stranding, and the manufacturer's name.
4. Unmarked wire found installed shall be replaced at no additional cost to the DTPW.
5. Wiring shall comply with NEMA WC-5, NEMA WC-7, IPCEA S-61-402 and IPCEA S-66-524.

B. Light and Power Wiring Circuit Conductors:

1. Light and power wiring circuit conductors shall be stranded in all sizes, and concentric strand Class B for conductors No.8 AWG and larger.

C. Wiring Insulation shall be as follows:

1. For Feeders and Motor and Equipment Power Circuits: *Type THWN-75 degrees C. in wet or dry locations, and THHN-90 degrees C. only at dry locations.*
2. For Branch Circuit Wiring for Lighting and Power Circuits: *Type THWN-75 degrees C. in wet or dry locations, and THHN-90 degrees C. only at dry locations.*
3. For Wiring Through Fluorescent Fixtures Where Fixture Is Used as Wireway: *Type THHN-90 degrees C.*

D. Color Coding:

1. Wire of Size No.8 and smaller shall be factory color coded 600 volt, THWN, or THHN. Sizes larger than No.8 may be factory color coded or color coded with 3M tape or

approved equal. Should tape be used, it shall cover not less than 6 inches of cable within enclosure.

2. Colors to be used in coding shall be:

120/208 Volt System

Neutral - White
Phase A - Black
Phase B - Red
Phase C - Blue
Ground - Green

277/480 Volt System

Neutral - Gray
Phase A - Brown
Phase B - Orange
Phase C - Yellow
Ground - Green

3. All other colors (violet, traced, etc.) shall only be used for switch legs, control, or communication circuits.
4. Conductors for control wiring shall be color coded, using different color coding than the energy conductor coding specified above. Control wires shall be numbered.

- E. Minimum Wire Size: Use No.12 AWG for control over 200 feet, unless otherwise noted. Control wiring may be No.14 AWG if distance is less than 200 feet.

1. Fire alarms, CCTV, intercoms, and intrusion systems shall have cable and wiring according to manufacturer's specifications or as specified.

- F. Wire and Cable Connectors and Terminations:

1. For splices in branch circuit conductors solid or stranded size No.10 AWG and smaller, use UL listed soft plastic wire nut with sharp self-cutting interior threads, 3M Scotchlok, Ideal Supernut, or T&B Piggy or approved equal, of the size to match the wire.
2. For terminations of stranded or solid wire in size No.10 AWG and smaller at equipment terminals, use UL listed, tin-plated copper, 600-volt vinyl insulated compression type ring or fork type equivalent to T&B "Sta-Kon" or Burndy "Vinylug" or approved equal.
3. For No.8 AWG and Larger: T&B "Locktite" connectors, Burndy "Versitap" connectors, or OZ-Gedney or approved equal, solderless connectors, with insulating covers, tape or heat shrink insulation system.
 - a. Terminations and splices in feeders may be made with solderless pressure type connectors complete with composition insulating covers, field insulating tape, or heat shrink insulation system.
 - b. Connectors and lugs for 250 mcm cable and larger shall be of the 2-hole type and for compression type shall have at least 2 indents.
 - c. Compression lugs and connectors shall be tin plated wrought copper, of size to match the cable.
4. Splices in underground exterior wiring shall be made fully waterproof by potting or encapsulating.
5. Insulating tapes shall be of a type approved for the application and shall be flame retardant. Tapes shall be as manufactured by 3M or Bishop Electric or approved equal.
6. Cable Ties: T&B "Ty-Rap" or Burndy "Unirap" or approved equal.
7. Cable Identification: Branch circuits wire markers 3M "Scotch Code" or approved equal. For feeder sizes, non-ferrous metal stencil tags.
8. Thermal Fusion Connections: "Catalytic thermal weld" by Cadweld or approved equal.

PART 3

EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Wire and Cable Installation:

1. Wire and cable shall be suitably protected from weather or damage during storage and handling and shall be in first-class condition when installed.
2. Conductors shall not be pulled into conduit until raceway system is substantially complete. Wiring shall be continuous within conduit runs. Splices will be allowed only at outlet and junction boxes. Joints shall be mechanically and electrically secure.
3. Pulling lubricants, if used, shall comply with UL requirements for the type of conduit material and cable insulation being used.
4. Care shall be taken to prevent cutting and abrasion of cable insulation during the pulling of feeders.
 - a. Ropes used for pulling of feeders shall be made of polyethylene or other suitable nonmetallic material.
 - b. Pulling lines shall be attached to conductor cables by means of either woven basket grips or pulling eyes attached directly to the conductors.
 - c. Rope hitches shall not be used.
 - d. Cables to be installed in a single conduit shall be pulled in together.
 - e. Where polyethylene insulation is used, and a pulling lubricant is required, the lubricant shall be certified by the manufacturer to be noninjurious to such insulation.
5. Do not bend cables during installation, either permanently or temporarily, to radii less than 12 times the outer diameters, except where conditions make the specified radius impracticable and shorter radii are allowed by the NEC and NEMA Standards.
6. Neatly and securely bundle conductors located in branch circuit panelboards, cabinets, control boards, switchboards, and motor control centers. Use nylon bundling straps.
7. Provide suitable installation equipment to prevent cutting or distortion of conduits during the pulling of feeders. Use masking or other means to prevent obliteration of cable identification when solid color coating or colored tracers are used.
8. Control wiring color codes shall be of type as required by its equipment manufacturer. Interconnections of control wiring shall be on numbered terminal strips.
9. Where 2 neutrals are installed in same conduit, their sets of wiring shall be grouped and clearly identified by permanent tags or other means.
10. At each outlet, a loop or end of wire not less than 9 inches long shall be left for connection to lead.
11. Leading end of each conductor pulled shall be carefully examined for damage to jacket. If damage is evident, cable shall be extended and further checked for damage, with good cable only to remain.
12. Cables in junction and pull boxes shall be properly trained and racked.
13. Branch circuit wiring in panelboard gutters shall be installed vertically in the gutter with a 90-degree bend at the supply circuit breaker, wire shall enter the circuit breaker lug horizontally.
14. Install cable supports and boxes at vertical feeders and according to the schedule in the NEC. Boxes shall be built of heavy steel plates not less than No.10 USS gage fastened to an angle iron frame with removable covers secured by brass machine screws. The cable support shall be of the split wedge type that clamps each conductor

firmly and tightens due to the weight of the conductor.

B. Wire and Cable Splicing and Terminations:

1. Splices and terminations of conductors shall be made using specified materials and methods installed according to the manufacturer's recommendations.
2. Splices in branch circuit wiring shall be made by stripping conductor insulation, twisting conductors until mechanically secure, and installing a self-threading insulated type connector. Splices are not allowed within panelboards.
3. Conductors shall be squarely cut and fully inserted into the lug barrel or connector. Insulation shall be stripped without cutting the conductor or removing strands, exposing the conductor for the minimum distance required for connection. Splice connectors shall be of a type and be so installed that the conductor is fully insulated by a skirt of such design or taped so cold flow of the conductor insulation will not be induced when the conductor is positioned in its final operating position.
4. Do not combine conductors under the same lug. Provide individual lugs for individual conductors. Re-tighten bolt type connectors 24 to 48 hours after initial installation and before taping.
5. Connectors shall be insulated by approved type, integral or separate cover, or by means of taping with approved plastic or rubber and friction tapes to provide insulating value equal to that of the conductors being joined. The number and size and combinations of conductors allowed by UL as listed on manufacturers' packaging of connector shall be strictly complied with.
6. Terminations at equipment terminal blocks shall be made using compression type connectors suitable to match terminal type.
7. Continuity of neutral on multi-wire branch circuits shall not be made on any device at terminal blocks, but shall be spliced and a tap brought out, thereby assuring no openings of the neutral in the replacement of a device.
8. Feeders shall be identified by means of nonferrous tags or pressure-sensitive labels securely fastened to all cables, feeders, and power circuits in vaults, pull boxes, manholes, switchboard rooms, terminations of cables, etc. Tags or labels shall be stamped or printed to include the feeder number, source and equipment supplied. If suspended type tags are provided, they shall be attached by nylon cables ties or other nonconductive permanent means.
9. Branch circuit conductors shall be identified at supply circuit breakers, with the circuit number using pressure sensitive adhesive wire markers.
10. Branch circuit wiring for lighting and other single phase 277 volt or 120-volt applications shall be multi-wired utilizing common neutrals. Under no circumstances shall any switch break a neutral conductor. Branch circuit wiring extending more than 100 feet to the nearest outlet from a panel shall be No.10.
11. Circuiting work shall comply with the following:
 - a. Loads on panel busses shall be balanced on phases as evenly as possible.
 - b. No neutral conductor shall be common to more than 1 circuit conductor connected to the same phase leg of the supply system.
 - c. Circuiting of panelboards shall allow breakers to be grouped logically by functions.

C. Voltage Drops at New Construction:

1. Total Allowable Drop for Service Source to Load: Limit to a maximum drop of 5 percent. Increase wire size, where necessary, to comply with this requirement.
 - a. Branch Circuits: Limit to a maximum drop of 3 percent.

- b. Service Source to Individual Panelboards: Limit to a maximum drop of 2 percent.
- D. Voltage Drops at Existing Construction:
 - 1. Total Allowable Drop for Service Source to Load: Limit to a maximum drop of 5 percent. Increase wire size, where necessary, to comply with this requirement.
 - a. Branch Circuits: Limit to a maximum drop of 3 percent.
 - b. Service Source to Individual Panelboards: Limit to a maximum drop of 3 percent.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16131 OUTLET, PULL, AND JUNCTION BOXES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16112 - Raceways and Conduits.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Materials shall bear Underwriters Laboratories (UL) labels.
2. Box size shall comply with NEC for number and size of conductors in boxes.
3. Box size shall comply with NEC for number and size of conduits entering and exiting each box.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Submit manufacturer's literature and technical data before starting work.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Outlet Boxes:

1. Provide outlet boxes at required locations, where shown on the drawings, and as specified.
 - a. Fixture studs shall be securely fastened in an acceptable manner.
 - b. Plaster covers shall have depths suitable to the finish being applied to the walls.
 - c. Sheet steel boxes shall be properly drilled and tapped.
 - d. There shall be not more holes in any of the outlet boxes than are required for the entering conduits.
 - e. Depth of boxes shall allow for easy wire pulling and proper installation of wiring devices.
2. Outlet boxes shall be galvanized steel or rust resistant malleable iron alloy and comply with ANSI C33.65.
3. Outlet Boxes shall be as follows:
 - a. For Recessed Ceiling Fixtures:
 - 1) 4-inch square sheet steel box with blank cover and suitable hanger bar-box to be fastened to ceiling suspension members in an acceptable manner not more than 1 foot from fixture opening.
 - b. For Surface or Stem Mounted Ceiling Fixtures from Slab with Concealed Conduit:
 - 1) 4-inch sheet steel octagon concrete ring of a depth suitable to the construction and furnished with top cover having a 3/8" fixture stud.

- c. For Ceiling and Wall Bracket Outlets on Exposed Conduit in Dry Locations:
 - 1) 4-inch octagon sheet steel box with 3/8" fixture stud.
- d. For Surface Mounted Ceiling Fixture or Hung Ceilings:
 - 1) 4-inch octagon sheet steel hung ceiling box with suitable hanger bars and 3/8" fixture stud. Box to be fastened to ceiling suspension in an acceptable manner.
- e. For Surface Mounted Wall Bracket Fixtures with Concealed Conduit:
 - 1) 4-inch square sheet box with round opening plaster cover and 3/8" fixture stud.
- f. For Ceiling and Wall Bracket Outlets on Exposed Conduit at Damp or Wet Locations:
 - 1) 4-inch cast iron.
- g. For Switches and Receptacles in Tile, Plastered, or Gypsum Board Walls:
 - 1) 4-inch square sheet steel box or multi-gang box with proper plaster covers as required. Two gangs may be provided by means of a 4-inch square box with two gang plaster cover.
- h. For Switches and Receptacles in Enameled or Face Brick walls, Unfinished Walls, and Woodwork:
 - 1) Single or multi-gang sheet steel utility boxes as required.
- i. For Switches and Receptacles on Exposed Exterior Conduit Work:
 - 1) Type FS or FD conduit.
- j. For Telephone or Computer Outlets:
 - 1) 4-11/16" square X 2-1/2" deep.
- 4. Boxes for fire alarm or signal systems, clocks, pilot lights, and other specialty equipment shall be by the manufacturer of the enclosed equipment.
- 5. Wet/Damp Locations:
 - a. Provide gasketed, weathertight, screw covers, code gage galvanized steel pull boxes with weatherproof conduit hubs, Myers Scru-Hub or approved equal, for pull boxes with multiple conduit entries.
 - b. Provide cast metal hub type, dipped in rust inhibitor and with gaskets for individual conduit runs.
- 6. Extension Rings: Do not use to increase the volume of boxes, except where necessary due to multiple conduit run conflicts.
 - a. Where such conflicts occur, an extension ring may be allowed for changes in direction of conduit to make necessary clearances.

- 1) Not more than one extension ring may be used for each box where necessary.

B. Pull and Junction Boxes:

1. Where indicated in the plans and specifications or where necessary for compliance with code requirements for cable installation, install junction and pull boxes of the proper size for conduits over 1-inch trade size. Pull and junction boxes shall be of adequate size to accommodate installation of conductors without excessive bending of conductors that could damage insulation.
2. Pull and junction boxes shall comply with Fed. Spec. WJ-800 and be of all steel construction, spot or seam welded at joints, and hot dip galvanized after fabrication.
3. Boxes shall be drip proof with screw attached covers. Each box shall have a turned-in lip welded at joint to develop full strength. Lip shall be drilled and tapped for 1/8" or 3/16" round head screws, symmetrically placed. To provide adequate length of thread, nuts shall be tack welded on inside of lip, or lip shall be made double thickness.
4. Pull and junction boxes shall be sufficiently rigid to withstand moderate twisting strains. Steel boxes shall comply with the following:
 - a. 100 cubic inches or less shall be of No.14 gage steel.
 - b. Between 101 and 8500 cubic inches shall be No.12 gage steel.
 - c. Larger boxes shall be No.10 gage steel.
 - d. Barriers and reinforcing angles shall be supplied as required.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work or this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Locations of outlets on electrical drawings are approximate only.
1. Do not scale drawings.
 2. Consult architectural plans, sections, elevations, and details for exact locations of outlets and equipment and rooms and spaces having furring or hung ceilings.
 3. Verify door swings on architectural drawings for properly locating light switches.
- B. Determine the proper position of outlets and receptacles. Relocate any outlet or receptacle without additional cost to the DTPW if improperly located.
- C. The Engineer reserves the right to change the location of any outlet, apparatus, or equipment up to the time of roughing in without additional cost to the DTPW, provided conduit runs are not substantially increased.
- D. Fasten and secure boxes to the building structure independent of the conduit. Provide acceptable plaster stops for boxes to be set in plastered walls and ceilings.
- E. Boxes and supports shall be fastened as follows:
1. To concrete or brick: Bolts and expansion shields.
 2. To hollow masonry: Toggle bolts, or bolts and expansion shields.
 3. To steel work: Machine screws or welded studs.
 4. Explosive charge setting devices are not allowed.

- F. Recessed wall outlets shall be flush with the wall surface. Install box in wall with cover to allow block or wall surface to fit tight against lip of cover.
- G. Where shown together on the plans, switches shall be ganged in one outlet.
 - 1. Switches and receptacles shall be ganged together only where plans specifically indicate such combinations.
- H. Outlets for duplex receptacles shall be arranged for vertical mounting of the receptacles except as specifically indicated on plans.
- I. Barriers shall be provided as necessary to isolate voltage classes.
- J. Under no circumstances shall outlet boxes for adjoining spaces be placed back to back in partition walls.
- K. Circuit breakers and switches shall not be grouped or ganged in outlet boxes unless they can be arranged where the voltage between exposed live metal parts of adjacent switches does not exceed 300 volts. Provide barriers between 120- and 277-volt switches where ganged together.
- L. Align rows of outlet boxes for ceiling lights.
- M. Unless noted, specified, or directed otherwise, wall outlets shall be centered above finished floor as follows:
 - 1. Convenience outlets: 18 inches to bottom of box.
 - 2. Utility outlets: 18 inches to bottom of box.
 - 3. Clock outlets: 90 inches to center.
 - 4. Exit lights: 6 inches over doorway.
 - 5. Switch outlets: 46 inches to bottom of box.
 - 6. Special purpose outlets: as directed.
 - 7. Telephone outlets: 18 inches to bottom of box.
 - 8. Fire alarm visuals with or without horns: 78 inches to bottom of box.
 - 9. Fire alarm horns: 6" minimum below adjacent surface, but not less than 8'6" or greater than 10'0" above finish floor.
 - 10. Fire alarm pull station: 46 inches to bottom of box.

Refer to Architectural drawings for additional mounting heights.
- N. Pull and junction boxes shall be provided at locations required to reduce length of cable pull or reduce number of elbows between outlets.
- O. Provide blank covers for outlet boxes when devices or wiring has been removed or not installed.
- P. Paint exposed boxes to match the color of the wall or ceiling to which they are mounted.
- Q. Where several feeders pass through a common pull box, tag each feeder to clearly indicate electrical characteristics, circuit number, and panel designation.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16140 WIRING DEVICES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. Division 16 - Electrical.

1.02 SUBMITTALS: In accordance with Section 01330

A. Submit properly identified manufacturer's literature and data before starting work.

1.03 QUALITY ASSURANCE

A. Comply with Florida Building Code (FBC).

1. Convenience outlets installed within 6 feet of water supplies, wet locations, and toilet rooms shall have a ground fault circuit interrupt (GFI) protection device.
2. Use of isolated ground receptacles is prohibited.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wiring devices shall be as manufactured by Hubbell (basis of design) or approved equal.

2.02 COMPONENTS

A. Wiring Devices: Comply with NEMA Wd6 and NEC (NFPA 70).

1. Switches:
 - a. Rated at 20 amps, 277 volts AC, horsepower rated for 1HP at 120 volts.
 - b. Provide for back (not push-in) or side wiring.
 - c. Key type switches shall be keyed identically.
 - d. Manufacturers: Hubbell CSB 120 Series.
2. Duplex Convenience Receptacles:
 - a. Comply with NEMA 5-20R as applicable, be of specification grade, back (not push-in) and side wired, U-slotted grounding type, 3-wire, rated 20 amp, 125 volts AC.
 - b. Double Duplex: Consist of 2 receptacles under a common plate. Single receptacles shall be similar to duplex receptacles.
 - c. Manufacturers: Hubbell CR20L.
3. Ground Fault Receptacles:
 - a. NEMA 5-20R type, rated at 20 amps, 120 volts with 5 ± 1 mA trip threshold, and UL nominal trip time of 0.025 sec.
 - b. Manufacturers: Hubbell GF5352.
4. Special Purposes Receptacles:
 - a. Comply with NEMA 5-20R, of specification grade, back (not push-in) or side wired.
 - b. Provide ratings and type as indicated on Drawings.

5. Wiring devices shall be ivory color unless noted otherwise.
- B. Lighting and Exhaust Fan Switch at Single Use Toilet Rooms: Switch with built-in time delay.
 1. Fan and light operate together when control is in "on" position.
 2. Fan continues to operate for a minimum of 5 minutes after light is turned off.
 3. 120V, 60 Hz, 4-amp capacity for each light circuit and fan circuit, ivory.
 4. No.5C209 by Broan or approved equal.
- C. Cover Plates:
 1. Outlets in shall have brushed stainless steel plates.
 2. Provide ganged switches to a maximum of three. If more are required on Drawings, provide in multiples of two or three.
 3. Provide weatherproof receptacles with cast aluminum, spring loaded dock-type gasketed wet location cover.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install wiring devices according to manufacturer's recommendations.
- B. Verify location of wiring devices before rough-in of outlet boxes and conduit with Architectural Drawings for door swings and furniture details. Duplex receptacles in finished areas shall be vertically mounted.
- C. Boxes mounted back-to-back are not allowed.
- D. Install devices tightly within box with screws provided. Do not rely upon plate for device alignment and support to assure devices are grounded to box. In receptacles, use self-grounding screws, separate ground conductor or bond wire to box.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16440 DISCONNECT SWITCHES

PART 1 GENERAL

1.01 SUMMARY

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels. Label for "SERVICE ENTRANCE" where so applied.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit manufacturer's literature and technical data before starting work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Disconnect Switches:
1. G.E.
 2. Siemens.
 3. Square D.
 4. Eaton
 5. Or approved equal

2.02 EQUIPMENT

- A. Disconnect switches shall comply NEMA KSI-1975 for type HD and shall be of heavy-duty type, enclosed, of quick-make, quick-break construction. Rating shall be as indicated on drawings. Switches shall be horsepower and I2t rated, UL labeled.
- B. Disconnect Switch Enclosure:
1. NEMA 1 for indoor use.
 2. NEMA 3R for outdoor use.
- C. Disconnect switch operating handle shall be of insulated box mounted type that directly drives switch mechanism suitable for padlocking in "OFF" position.
- D. Defeatable, front accessible, "coin-proof" interlocks shall be provided to prevent opening of cover when switch is in "ON" position and prevent turning switch ON when door is open. Securely fastened metallic nameplate shall include highly visible "ON-OFF" indication.
- E. Motor Disconnect Means: Provide each motor with an in-sight disconnect means, when required by NEC, and where shown on the drawings.
- F. Provide fuses for disconnect switches so indicated. Fuses shall be dual element type. See Section 16475.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install the disconnect switches vertically with top not more than 6 feet above the floor, and rigidly and securely attached to the building. Disconnect switches shall not depend upon conduit for support.
- B. Where used as service entrance main disconnects, switches shall be permanently labeled "MAIN SWITCH 1 of 4", "MAIN SWITCH 2 of 4", etc.
- C. Optional Mounting:
 - 1. Plywood Panel: Mount panelboards on backboard of 3/4" exterior grade plywood, finished one side, primed all surfaces, painted with one coat gray of fire-retardant enamel (finished side) and secure to wall with approved shields or screws as directed by the Engineer.
 - 2. Unistrut: Mount disconnect switches on Unistrut P-3000 mounting channels at top and bottom, secured similarly to wall.
- D. Label switch covers in 1-inch high stenciled letters showing equipment served.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16460 DRY-TYPE TRANSFORMERS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16120 - Wires and Cables.

1.02 SYSTEM DESCRIPTION

- ##### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Submit manufacturer's catalog cuts and technical data before starting work.
- ##### B. Submit test data for transformers as requested.

1.04 QUALITY ASSURANCE

- ##### A. Dry type transformer installation shall comply with NFPA 70 National Electrical Code - 1999 (NEC).

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Dry Type Transformers:

1. General Electric Corp.
2. Siemens
3. Square D.
4. Eaton
5. Or approved equal

2.02 EQUIPMENT

A. Rating:

1. Transformers shall be ventilated dry type, 3 phase, 60 Hertz, 480 volts delta primary and 208Y/120 volts secondary, with four 2-1/2 percent FCBN taps and two 2-1/2 percent FCAN taps. KVA rating shall be as shown on drawings.
2. Transformer insulation shall be Class "H", 220 degrees Centigrade insulation systems and shall be rated for operation (150 degrees C. rise above 40 degrees C. ambient). Insulating materials shall be according to NEMA ST20 standards.
3. Transformer sound level shall not exceed following values when measured according to ANSI C89.2-1974: 9 KVA to 45 KVA-45 DB, 50 to 150 KVA-50 DB, 150 to 300 KVA-55 DB.

2.03 DESIGN AND CONSTRUCTION

- A. Core and coil assembly shall be vacuum impregnated for maximum resistance to moisture and shall be mounted on vibration isolation pads.
 - 1. Transformers shall be provided with a drip-proof, rodent-proof, enclosure, having a durable finish and a rustproof diagrammatic nameplate.
 - 2. Wiring compartments shall have adequate space for terminating cables and shall be front connected for easy accessibility.
 - 3. Where transformers are exposed to the weather, provide weather shields.
- B. Core of the transformer shall be of high quality, cold-rolled, grain-oriented steel, annealed by manufacturer for low loss and exciting current.
 - 1. Laminations shall be formed to eliminate burrs and annealed to reduce losses to a minimum.
 - 2. Winding conductors shall be annealed and insulated by transformer manufacturer.
 - 3. Conductor surfaces shall be free from slivers, burrs, and other irregularities.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Dry type transformers shall be installed by Contractor according to manufacturer's instructions in rooms assigned for the installation of equipment.
- B. Transformer enclosures and secondary neutral shall be securely grounded to a cold-water pipe, 3/4" diameter by 10 feet long buried in direct contact with the earth, with a copper conductor sized according to NEC Table 250-94.
- C. Dry type transformers shall be floor mounted or bracket mounted as shown on drawings. Transformers shall be bolted to floor if floor mounted and shall be bolted to steel angles if bracket mounted, or as shown on drawings. Provide a 3-inch-high concrete pad under floor mounted transformers.
- D. Transformers shall be vibrationally isolated from the building structure by means of double neoprene pads (DNP), in addition to the vibration isolation built into the transformer. Neoprene shall be similar to Mason Industries Type W, or approved equal, 40 durometers minimum or sized for proper weight load.
- E. Conduit connections to the equipment shall be made with flexible conduit, loosely installed.
- F. Dry type transformers shall be installed with wiring compartment to front to allow removal.
- G. Maintain manufacturers recommended clearness from walls or surfaces to allow adequate ventilation. In no case shall the transformers be installed less than 6 inches from any wall.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16470 PANELBOARDS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide a complete Distribution Panelboard system as indicated on the drawings, and as specified herein.
- B. All materials shall be listed by an OSHA approved Nationally Recognized Testing Laboratory (NRTL).
- C. Related Sections:
 - 1. 16120 - Wire and Cable.

1.2 SYSTEM DESCRIPTION

- A. Panelboards used as service entrance equipment shall be NRTL labeled as service entrance equipment.

1.3 SUBMITTALS: In accordance with Section 01330

- A. Submit shop drawings, manufacturer's literature, and technical data before starting work.
- B. All switchboards and panelboards submitted shall be designed and manufactured according to the latest revisions of the following specifications:
 - 1. UL 50, UL 67, UL 89, UI489, UI 891, UL 1283, UL 1449
 - 2. Nema AB-1, PB1, PB1.1, PB2, PB2.1 PB 2.2
 - 3. NFPA 70
 - 4. Federal Specifications: W-C-375B, W-P-115C

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Panelboards:
 - 1. General Electric.
 - 2. Siemens.
 - 3. Square D.
 - 4. Eaton
 - 5. Or approved equal

2.2 EQUIPMENT

- A. Distribution and Power Panelboards:
 - 1. Interior: Provide fully rated plated copper bus. Plating shall run the entire length of the bus bar. Solid neutral and ground bar shall be copper. Maximum rating: 1200 amp.

2. Main breaker shall be horizontally mounted. Main breakers shall have conspicuous marking labels.
3. Trims shall have door with keyed lock. All locks shall be keyed the same.
4. Provide directory holder and typed directory for all circuits.
5. Enclosure shall be galvanized galvanneal steel constructed in accordance with UL50 and NEMA 250. Box end walls shall be blank.
6. Short circuit current ratings shall be equal to or greater than available fault current at point of application. NRTL listed series ratings may be utilized, where not in violation of NEC 240.86. Provide documentation of NRTL listed series rating used.
7. Surge Protective Devices (SPD) shall be provided when specified in the design and associated electrical plans, with optional peak surge current of 260kA.
8. Distribution panels for use at 120/208 volts shall be NRTL listed with minimum integrated assembly rating of 22K AIC.
9. Distribution panelboards, 400 amperes and over, shall be provided with molded case circuit breakers tested and labeled according to UL 489.

B. Lighting, Receptacle and Power Panelboards

1. Interior: Provide fully rated plated copper bus. Plating shall run the entire length of the bus bar. Solid neutral and ground bar to be copper. Maximum rating: 600amp.
2. Main breaker shall be vertically or horizontally located and have conspicuous marking labels.
3. Trims shall have door with keyed lock. All locks to be keyed the same. Provide trims with concealed door hinges and trim screws for panels 600 amps or less.
4. Provide directory holder and typed directory for all circuits.
5. Enclosure shall be galvanized steel constructed in accordance with UL50. Box end walls shall be blank.
6. Short circuit current ratings shall be equal to or greater than available fault current at point of application. NRTL listed series ratings may be utilized, where not in violation of NEC 240.86. Provide documentation of NRTL listed series rating used.
7. Provide SPD's when specified in the design and associated electrical plans, with optional peak surge current of 100kA.
8. Minimum rating of breakers shall be as follows:
 - a. Lighting and power panels for use at 120/208 volts: 225 amp maximum with circuit breakers rated at 10K AIC symmetrical at 240 volts.
 - b. Lighting and power panels for use at 480/277 volts: 225 amp maximum with circuit breakers rated at 14K AIC symmetrical at 480 volts.
9. Interiors shall be factory assembled and designed to allow switching and protective devices to be replaced without disturbing adjacent units, without removing the main bus connectors, and allowing circuits to change without machining, drilling or tapping.
10. Branch circuits shall be arranged using double row construction unless narrow column panels are indicated. A nameplate shall be provided listing panel type and ratings. Circuit breakers shall be bolt-on type.
11. Unless otherwise noted, full size insulated neutral bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral bussing shall have a suitable lug for each outgoing feeder requiring a neutral connection. A ground bus shall be provided in all panels.

C. Boxes and Trims shall meet the following criteria:

1. Boxes shall be at least 20 inches wide made from code gage galvanized sheet steel.
 - a. Provide minimum gutter space according to NEC requirements.

- b. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional required wiring space.
 - c. At least 4 interior mounting studs with adjustable nuts shall be provided.
 - 2. Switching device handles shall be accessible.
 - a. Doors and panelboard trims shall not uncover any live parts.
 - b. Doors shall have flush chrome plated handle with cylinder lock and catch, except doors over 48 inches in height shall have auxiliary fasteners top and bottom of door in addition to the flush type cylinder lock and catch.
 - c. Panelboard switching devices with individual dead front doors shall be acceptable instead of standard door in trim design.
 - d. Panelboard trim clamps shall be of the indicating type.
 - 3. Exterior and interior steel surfaces of the trim shall be properly cleaned, primed with rust inhibiting phosphatic coating, and finished with manufacturer's standard gray paint.
 - a. Trims for flush panels shall overlap the box for at least 3/4" all around.
 - b. Surface trims shall have the same width and height as the box.
 - c. Trims shall be mountable by a screwdriver without the need for special tools.
 - d. After installation, trim clamps shall not be accessible when the panel door is closed and locked.
 - 4. Panelboards exposed to the weather shall have NEMA type 3R raintight enclosure or NEMA 4X in corrosive environments.
- D. Electrical Components:
- 1. Main bus bars shall be fully rated copper bus bars, with plating shall running the entire length of the bus bar and shall be sized according to NRTL standards to limit the temperature rise on any current carrying part to a maximum of 50 degrees C. above an ambient of 40 degrees C. maximum. Provide main circuit breakers, main lugs, or sub-feed lugs as required.
 - 2. Each panelboard shall incorporate breakers as shown with AIC or higher, at the application voltage, than the available fault at its location along the electrical distribution system, as determined by the short circuit study. Minimum rating of breakers shall be:
 - a. Lighting and power panels for use at 120/208 volts: 225 amp maximum with circuit breakers rated at 10K AIC symmetrical at 240 volts.
 - b. Lighting and power panels for use at 480/277 volts: 225 amp maximum with circuit breakers rated at 14K AIC symmetrical at 480 volts.
 - c. Distribution panels for use at 120/208 volts: UL listed with minimum integrated assembly rating of 22K AIC.
 - 3. Panels tested and listed according to UL 67 and bearing an integrated short circuit rating shall be determined by the short circuit study on the electrical system with 10,000 AIC minimum.
 - 4. Any 2 single pole circuit breakers shall be replaceable by 1 two-pole circuit breaker and any 3 single-pole breakers shall be replaceable by 1 three-pole circuit breaker.
 - 5. Where new circuit breakers are specified to be installed within existing panelboards, they shall be compatible in terms of manufacture, type, and AIC.
 - 6. Breakers 100 ampere through 400 ampere frame sizes shall be thermal-magnetic trip with inverse time current characteristics, unless otherwise noted.
 - 7. Provide ground fault circuit interrupter circuit breakers where indicated.

8. Emergency Panelboards Identification: Paint door red and stencil in 1-inch high yellow letters "EMERGENCY PANEL" in addition to appropriate individual panel identification as shown on drawings.

PART 3 EXECUTION

3.1 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.2 INSTALLATION

- A. Panelboards shall be installed where indicated and with top of cabinet 6'-6" above floor and shall be rigidly and securely attached to building construction and shall not depend upon conduit for support. Allow at least 1/2" air space behind wall mounted panelboards.
- B. Install panelboards according to manufacturer's recommended data. Maintain clearances required by the National Electrical Code, with particular attention to working space around panelboards. Maintain clear space above panelboards, coordinate with other trades to avoid placement of panelboards below piping, ductwork, or other foreign appurtenances. Relocate panels at no additional cost should such interferences occur.
- C. Supply panelboards with phenolic nameplate 1-inch x 3 inch on exterior of panels and engraved with panel designation and voltage rating. Lighting and power panelboard shall be provided with a clear plastic enclosed typewritten directory inside. Circuit identification shall include load type (lighting, receptacles, etc.) and rooms served.
- D. Where flush type panelboards are indicated, provide one 3/4" empty conduit terminated in accessible ceiling above for each 3 spare circuit breakers provided in the panelboard.
- E. Install circuit breakers in existing panelboards according to manufacturer's recommendation. Verify tightness of connections including mains. Identify new circuits on the panel directory. If none exists, provide one.
- F. Clean and touch up panelboard as required at completion of the project.
- G. Support surface mounted panelboards for other than masonry walls, from floor slab secured "Kindorf" or "Unistrut" or approved equal channels. Mount those installed on masonry walls to back boards secured to walls, and according to manufacturer's recommendations and applicable codes and regulations. Contractor shall coordinate manufacturer's actual panelboard dimensions with room clearances to conform with NEC requirements.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16475 OVERCURRENT PROTECTIVE DEVICES

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections
 - 1. 16440 - Disconnect Switches.

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature and technical data before starting work.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Fuses shall comply with NEMA FUI and ANSI C33.42.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Circuit Breakers:
 - 1. GE.
 - 2. Siemens.
 - 3. Square D.
 - 4. Or approved equal.
- B. Fuses:
 - 1. Bussman.
 - 2. Cefco.
 - 3. Little fuse, Inc.
 - 4. Or approved equal

2.02 EQUIPMENT

- A. Circuit Breakers:
 - 1. Circuit breakers shall be a circuit interrupting device operating both manually for normal switching functions and automatically under overload and short circuit conditions, while providing circuit and self protection when applied in its ratings. Provide at voltage, phase, and amps indicated, with symmetrical amperes interrupting rating to be equal or larger than that shown on drawings. Control and signaling function may be incorporated by use of accessories.
 - 2. Operating mechanism shall be entirely trip-free so contacts cannot be held close against an abnormal over-current or short circuit condition.

3. Operating handle of circuit breaker shall open and close all poles of a multi-pole breaker simultaneously. Circuit breakers shall meet applicable NEMA AB-1 and have UL label. Each circuit breaker shall have a trip unit to provide overload and short circuit protection. Trip element shall operate a common trip bar that shall open all poles in case of an overload or short circuit through any 1 pole.
4. Ampere rating shall be clearly visible. Contacts shall be of non-welding silver alloy. Circuit breakers to be used in switch boards, lighting and power panel boards, distribution panel boards and individually enclosed shall be 1, 2, or 3 poles as indicated on drawings.

B. Molded Case:

1. Molded case circuit breakers shall be bolt-on type, mounted in lighting and power panel boards and individually enclosed units.
2. Molded case circuit breakers shall be quick-make, quick-break action.
3. Molded case circuit breakers for panel boards shall have the following minimum symmetrical ampere interrupting capacities (RMS):
 - a. 120 volts: 10,000 SAIC power panel boards.
 - b. 277 volts: 14,000 SAIC lighting panel boards.
 - c. 277/480 volts: Up to 50,000 SAIC distribution panel boards, or as shown on drawings.
4. Each molded case circuit breaker shall have a thermal magnetic trip device with trip ratings as shown on drawings.

C. Combination Molded Case and Current Limiting Fuse:

1. Bolt-on type mounted in switch boards.
2. Circuit breaker section shall be molded case and shall have the features previously mentioned for molded case breakers.
3. Fuse compartment located within molded case enclosure with accessibility for fuse replacing.
4. Unit circuit breaker shall trip as any of its fuses blows.
5. Unit shall be rated at 100,000 AIC RMS minimum.
6. Current limiting fuses provided as specified in this section.

D. Fuses:

1. Provide fuses for fusible equipment.
2. The time-current characteristic and ratings shall assure positive selective coordination.
3. Fuses, 601 amperes and larger, shall comply with UL Class L standard and be Shawmut Form 480 "Amp-Trap" or Bussman "Hi Cap".
4. Fuses, 600 amperes and lower, where applied to general feeder and branch circuit protection, shall comply with UL Class RKI standards and be Shawmut dual element "Amp- Trap" or Bussman "Low Peak" Limitron.
5. Dual element fuses shall have low resistance and relatively low operating temperatures. Fuses shall be provided with thermal protection against damage from poor contact. Fuse shall open when temperature at thermal cutout reaches 280 degrees F., preventing damage to clips and switches before fuse opens. They shall combine high interrupting capacity (200,000 ampere RMS symmetrical) with time delay, holding 500 percent load for a minimum of 10 seconds.
6. Current limiting fuses shall be designed to provide high interrupting capacity (200,000 AIC SYM RMS) plus fast clearing time restricting let-thru current and energy to very low values. Clearing time on a severe short circuit shall be limited to less than 1/4 cycle.
7. Individual motor circuit fuses shall be sized at approximately 150 percent of motor full load current. Fuses, below 600 amperes shall comply with UL Class RK5 standards and be Shawmut dual element "Amp-Trap" or Bussman Fusetron. Fuses or approved equal, 601 amperes and larger, shall comply

- with UL Class L standards and be Shawmut Form 480 "Amp-Trap" or Bussman "Hi Cap" KTU or approved equal.
8. Fuses, where required for circuit breaker backup protection shall comply with UL Class RK1 standards and be Chase-Shawmut Class RK1 "Amp-Trap" or Bussman "Limitron" or approved equal.
 9. Provide 10 percent spares (minimum of three) of each size and type of fuses furnished. Spare fuses shall be placed in a wall-mounted cabinet located in the main electric room.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install according to manufacturer's recommendations applicable codes and regulations and accepted submittals.
- B. Two and three pole breakers must be true two and three pole breakers.
 1. Do not combine single pole breakers with common handle connection to meet multiple pole breaker requirements.
- C. Label circuit breaker enclosures with 1-inch high stenciled letters showing equipment served.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16511 LIGHTING FIXTURES AND LAMPS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. 16112 - Raceways and Conduits.
 - 2. 16120 - Wire and Cable.

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.
- B. Explosion-proof, shielded, and vapor tight and wet location fixtures shall bear UL labels appropriate for the type of application.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit manufacturer's literature and technical data before starting work.
- B. Furnish certified photometric data for fixtures.
- C. Upon request, a sample of each fixture proposed for use and specified unit shall be submitted to the Engineer for review.
- D. Provide lighting calculations to comply with Florida Building Code (FBC) and IES minimum foot-candle level when required.

1.04 QUALITY ASSURANCE

- A. Comply with Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Lighting Fixtures:
 - 1. Provide lighting fixtures as indicated on the drawings and as specified.
 - 2. The schedule and details of lighting fixtures, appearing on the drawings, indicate the type, construction, appearance, quality, and performance of the fixtures required.
 - a. Any proposed deviation from the fixtures specified shall equal or be superior to the item specified under these headings.
 - b. Proposed substitute lighting fixtures will be judged on overall quality on construction.
 - c. Provide 120V working sample of proposed substitution with cord, plug, and lamp.
 - d. The fixture manufacturers products scheduled are considered acceptable, based on the equivalency of individual units as determined by the Engineer.

3. Materials used in the manufacture of fixtures shall be new and the best of their respective kind, and shall be formed and assembled in a neat, accurate, and professional manner.
 - a. Sheet metal shall be of sufficient thickness or shall be ribbed, flanged, or otherwise reinforced so that lighting fixtures and their component parts will withstand the stresses of normal handling and installation and service without undue distortion of shape.
 - b. Plastering or other installation procedures shall not be relied on to reinforce lighting fixtures or their component parts.
 - c. Fixture bases shall be metal and fastened to mounting location with metal components.
4. Finishes:
 - a. Painted steel sheet shall be processed with Bonderize or equal phosphate treatment or shall be Paintlok or Galvanneal or approved equal.
 - b. Unpainted sheet steel shall be Galvanneal, by Republic Steel or approved equal.
 - c. Springs shall be of full hard temper stainless steel.
 - d. Fasteners of ferrous metal shall be cadmium plated or zinc plated with chromate.
 - e. Screws mounting fixture housing in plaster ring shall be minimum #8, pointed to facilitate installation.
 - f. Plaster frame rings shall be of sufficient strength to withstand deformation during installation, and of suitable materials or finish to prevent corrosion from ceiling plasters and mortars.
 - 1) The contractor shall furnish the fixture manufacturer a complete list of fixtures that will be installed in acoustical plaster ceilings with types and quantities.
 - g. Painted finishes shall be baked epoxy, polyester powder coated, acrylic or approved equal finish suitable for the service required including temperature and accepted by the Engineer. Finish shall be applied after fabrication.
5. Fixtures shall be complete with canopies, suspensions of proper lengths, hickeys, casing, sockets, holders, reflectors, hardware, and shall be completely wired and assembled. Each troffer shall have 2 earthquake clips minimum, positive enclosed spring-loaded catches, and safety hinges.
6. Furnish suitable plaster rings or plaster stops for fixtures set in plaster ceilings. Consult the "Finish Schedules" on drawings for locations and extent of plaster ceilings

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install fixtures according to manufacturer's recommendations.
- B. Install "Lay-In" type fixtures with 6-foot lengths of flexible conduit to enable fixture relocation with minimum inconvenience. Fixture to be securely fastened to ceiling frame members by

mechanical means as per the NEC.

C. Exit lights:

1. Install wall or ceiling mounted as shown on drawings.
2. Provide directional arrows required to show correct path to exit.
3. Install exit lights at a location and height to assure a clear line of sight from the egress passageway.
4. Relocate exit lights that are not readily visible at no additional cost to the owner.
5. Internally illuminated exit signs shall have LED light source on normal power.

D. Fixture Supports:

1. Support each fixture securely.
2. Each recessed light fixture shall be lay-in type supported by ceiling suspension system. Provide at least 2 earthquake clips.
3. Where pendant fixtures are mounted in continuous rows, the number of hangers shall equal the number of 4-foot lengths, plus 1.
4. Do not support fixtures to plaster or gypsum board ceilings.
5. Furnish and install steel members and supports to fasten and suspend fixtures.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

**REPORT OF PRE-RENOVATION SURVEY,
INVASIVE SAMPLING AND ANALYSIS FOR
ASBESTOS-CONTAINING MATERIALS**

**TRI-RAIL METRORAIL STATION
RESTROOM AND JANITOR CLOSET
2601 EAST 11 AVENUE
HIALEAH, FLORIDA 33013
EBS PROJECT NO.820-2302252.01
January 24, 2023**



PREPARED FOR

**MIAMI-DADE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
6600 NW 72 AVENUE
MIAMI, FLORIDA 33166**

PREPARED BY

**EBS ENGINEERING, INC.
4715 NW 157 ST. STE. 202
MIAMI, FLORIDA 33014
Tel. 305-625-5252 • Fax 305-625-7110**

January 24, 2023

Mr. Angel L. Martinez
Miami-Dade County Department of Transportation and Public Works
Facilities Maintenance, Plumbing Superintendent
6600 NW 72 Avenue
Miami, Florida 33166

Subject: Report for Pre-Renovation Asbestos Survey, Invasive Sampling and
Analysis for Asbestos-Containing Materials
Tri-Rail Metrorail Station – Restroom and Janitor Closet
2601 East 11 Avenue
Hialeah, Florida 33013
EBS Engineering Project No. 820-2302252.01

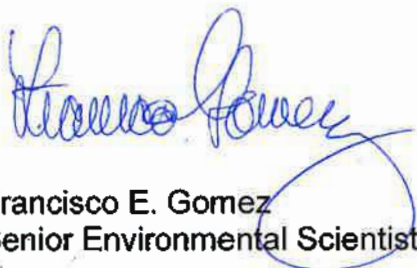
Dear Mr. Martinez,

EBS Engineering, Inc. (EBS) has completed the pre-renovation survey, invasive sampling and analysis of suspect asbestos-containing materials (ACMs) of the restrooms located at the Tri-Rail Metrorail Station located at 2601 East 11 Avenue in Hialeah, Florida. The field sampling was performed on January 19, 2023, by Mr. Benjamin Essien of EBS. Authorization for our services was provided by you on December 12, 2022. This report presents the project information, bulk sampling procedures, the analytical results with recommendations for the removal of any ACMs identified, if any.

EBS appreciates the opportunity to be of service to you and looks forward to our continued association. If you should have any questions concerning this report, please contact us at your convenience.

Sincerely,

EBS ENGINEERING, INC.
Business License # ZA -0000069



Francisco E. Gomez
Senior Environmental Scientist

EBS\820-2302252.01.REPORT



Benjamin S. Essien, P.E.
Florida Asbestos Consultant
License Number EA0000079

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I. BACKGROUND INFORMATION

EBS Engineering, Inc. was contacted by Mr. Angel L. Martinez of Miami-Dade County Department of Transportation and Public Works, concerning the pre-renovation survey, invasive sampling and analysis of suspect asbestos-containing building materials in the restrooms located at Tri-Rail Metrorail Station located at 2601 East 11 Avenue in Hialeah, Florida. It is our understanding that this sampling is necessary prior to the planned renovation of the restroom and janitor closet and for permitting purposes.

The purpose of the invasive sampling was to locate and identify asbestos-containing building materials in the restrooms prior to any renovation or demolition activities which may disturb them. The sampling of the roof, other interior or exterior areas of the station was not included in the scope of this survey.

II. FACILITY DESCRIPTION

The subject facility is the restroom and janitor closet located at Tri-Rail Metrorail Station located at 2601 East 11 Avenue in Hialeah, Florida. The restroom and janitor closet encompass approximately 150 square feet of floor area. The finishes in the restroom and janitor closet include; concrete block, ceramic tile, caulking and plaster on the interior partition walls, ceramic tile and concrete slab on the floor and plaster ceilings.

III. SURVEY PROCEDURES

General

The invasive survey was performed by observing accessible building materials in the restroom and janitor closet. The primary purpose of the survey was to locate, identify and assess pipe insulation materials which were suspected to contain asbestiform minerals. Friable and non-friable asbestos-containing materials (ACMs) encountered during the survey are addressed in this report. Friable materials, when dry, will crumble and release fibers under normal hand pressure, whereas non-friable materials will not.

The sampling protocol used in this asbestos survey is in general accordance with Title 40, Code of Federal Regulations (CFR), Part 763.86 and State of Florida Statutes.

Bulk Sampling Procedures

The bulk sampling procedures used for the collection of suspect materials first required the establishment of homogenous sampling areas, which are defined as areas of materials of the same type and applied during the same general time period. The homogenous sampling areas were then examined and representative samples of suspect materials were obtained from these areas. The U.S. Environmental Protection Agency (EPA) has published guidelines and recommendations for obtaining samples of asbestos-containing materials. These guidelines were followed during our survey, where

appropriate. Additionally, samples of these materials were obtained at the discretion of our personnel based on past experience.

Bulk samples collected during the site survey were analyzed by Polarized Light Microscopy (PLM) coupled with dispersion staining. PLM is an analytical method for asbestos identification which depends on the unique optical properties of mineral forms in the samples and specifically identifies the various asbestos types. The optical properties are a result of the mineral's chemical composition, physical atomic structure, and visual morphology. This is the recommended method of analysis by EPA for asbestos identification in bulk samples. EMSL Analytical, Inc. the laboratory that analyzed the samples has attained National Institute of Standards and Technology (NIST) accreditation through participation in the National Voluntary Laboratory Accreditation Program (NVLAP). Percentages of the identified types of asbestos are determined by visual estimation. Any material containing more than one percent (1%) of asbestos is considered by EPA and Occupational Safety and Health Administration (OSHA) to be ACM.

The following suspect materials were sampled on the restroom and janitor closet during our survey:

1. White Ceiling Plaster
2. Gray Wall Tile
3. Gray Floor Tile
4. Brown Wall Plaster
5. Gray Concrete Floor Slab
6. Gray Plaster Base
7. Brown Floor Tile
8. Gray/White Fixture Caulking

IV. RESULTS OF LABORATORY ANALYSIS

Laboratory results of the sampling revealed that **no asbestos was detected in the 24 samples obtained from the restroom and janitor closet during our survey.** Asbestos concentrations expressed within the laboratory results are based on visual estimation. The point counting method of quantification is recommended for asbestos concentration below ten percent. The results of the 24 samples are summarized in Table 1. The PLM results of each sample obtained during the survey is included in Appendix A.

TABLE 1 - SUMMARY OF ANALYTICAL RESULTS
Tri-Rail Metrorail Station – Restroom and Janitor Closet
2601 East 11 Avenue
Hialeah, Florida

SEQUENTIAL NUMBER	SAMPLE NUMBER	HOMOGENOUS AREA	SAMPLE DESCRIPTION	SAMPLE LOCATION	RESULTS OF PLM ANALYSIS
01	01	HA-1	White Plaster Ceiling	Restroom Ceiling, East	No Asbestos Detected
02	02	HA-1	White Plaster Ceiling	Restroom Ceiling, West	No Asbestos Detected
03	03	HA-1	White Plaster Ceiling	Janitors Closet Ceiling	No Asbestos Detected
04	04	HA-2	Gray Wall Tile	Restroom Wall, East	No Asbestos Detected
05	05	HA-2	Gray Wall Tile	Restroom Wall, South	No Asbestos Detected
06	06	HA-2	Gray Wall Tile	Restroom Wall, West	No Asbestos Detected
07	07	HA-3	Gray Floor Tile	Restroom Floor, East	No Asbestos Detected
08	08	HA-3	Gray Floor Tile	Restroom Floor, West	No Asbestos Detected
09	09	HA-3	Gray Floor Tile	Restroom Floor, North	No Asbestos Detected
10	10	HA-4	Brown Wall Plaster	Janitor Closet, West	No Asbestos Detected
11	11	HA-4	Brown Wall Plaster	Janitor Closet, North	No Asbestos Detected
12	12	HA-4	Brown Wall Plaster	Outside Restroom	No Asbestos Detected
13	13	HA-5	Gray Concrete Slab	Restroom Entrance	No Asbestos Detected
14	14	HA-5	Gray Concrete Slab	Janitor Closet, East	No Asbestos Detected
15	15	HA-5	Gray Concrete Slab	Janitor Closet, West	No Asbestos Detected
16	16	HA-6	Gray Plaster Base	Janitor Closet, East Wall	No Asbestos Detected
17	17	HA-6	Gray Plaster Base	Janitor Closet, North Wall	No Asbestos Detected
18	18	HA-6	Gray Plaster Base	Janitor Closet, West Wall	No Asbestos Detected
19	19	HA-7	Brown Floor Tile	Restroom Entrance	No Asbestos Detected
20	20	HA-7	Brown Floor Tile	Janitor Closet, Exterior	No Asbestos Detected
21	21	HA-7	Brown Floor Tile	Janitor Closet, Exterior	No Asbestos Detected
22	22	HA-8	White Fixture Caulking	Restroom Urinal	No Asbestos Detected
23	23	HA-9	Gray Fixture Caulking	Restroom Urinal	No Asbestos Detected
24	24	HA-9	Gray Fixture Caulking	Restroom Urinal	No Asbestos Detected

V. FINDINGS AND RECOMMENDATIONS

Laboratory results of the invasive sampling revealed that **no asbestos and janitor closet was detected in the 24 building materials samples obtained from the restrooms during our survey.** The PLM results of each sample obtained during the survey is included in Appendix A.

VI. QUALIFICATIONS

EBS observed the existing conditions on the restrooms of the Tri-Rail Metrorail Station located at 2601 East 11 Avenue in Hialeah, Florida using generally accepted procedures. However, there is always the possibility that some areas containing asbestos were not observed, inaccessible, or different from those at specific sample locations. Therefore, conditions at every location may not be as anticipated and as summarized in this report. In addition, renovation or demolition may uncover altered or differing conditions. We recommend that you notify EBS if any changed conditions are encountered so that we can assess the situation and its impact on this report.

APPENDIX A

LABORATORY ANALYTICAL RESULTS



EMSL Analytical, Inc.

19501 NE 10th Ave. Bay A N. Miami Beach, FL 33179

Tel/Fax: (305) 650-0577 / (305) 650-0578

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EMSL Order: 172300267

Customer ID: EBSE50

Customer PO:

Project ID:

Attention: Francisco Gomez

EBS Engineering, Inc.

4715 NW 157th St. Ste 202

Miami, FL 33014

Phone: (305) 625-5252

Fax: (305) 625-7110

Received Date: 01/20/2023 8:00 AM

Analysis Date: 01/20/2023

Collected Date: 01/19/2023

Project: Trirail Metrorail Station Restroom - 820-2302252.01

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos % Type
			% Fibrous	% Non-Fibrous	
01 172300267-0001	Plaster Ceiling	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02 172300267-0002	Plaster Ceiling	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
03 172300267-0003	Plaster Ceiling	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
04 172300267-0004	Wall Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
05 172300267-0005	Wall Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
06 172300267-0006	Wall Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
07 172300267-0007	Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
08 172300267-0008	Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
09 172300267-0009	Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10 172300267-0010	Plaster Wall	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
11 172300267-0011	Plaster Wall	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
12 172300267-0012	Plaster Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
13 172300267-0013	Concrete Floor Slab	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
14 172300267-0014	Concrete Floor Slab	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
15 172300267-0015	Concrete Floor Slab	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
16 172300267-0016	Plaster Base	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 01/20/2023 11:48:07



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EMSL Order: 172300267

Customer ID: EBSE50

Customer PO:

Project ID:

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
17 172300267-0017	Plaster Base	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
18 172300267-0018	Plaster Base	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
19 172300267-0019	Floor Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20 172300267-0020	Floor Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
21 172300267-0021	Floor Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
22 172300267-0022	Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
23 172300267-0023	Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
24 172300267-0024	Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Edgar Rodriguez (6)

Mary Hamel (18)

Kimberly Wallace, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from: 01/20/2023 11:48:07

**TECHNICAL SPECIFICATIONS:
SPECIAL TERMS & CONDITIONS**

PALMETTO STATION



RPQ NO. TP-0000027284



**MIAMI DADE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS**

**METRORAIL BATHROOM
RENOVATION TO:**

PALMETTO

DTPW PROJECT NO. IRP215R2

**BID DOCUMENTS
TECHNICAL SPECIFICATIONS**

MARCH 30, 2023

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SECTION 01030 ALTERNATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for alternates.

1.03 DEFINITIONS

- A. Additive Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to the Base Bid amount if DTPW decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost for each alternate is the net addition to the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.04 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether indicated as part of alternate or not.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section. The requirements for materials necessary to achieve the work described under each alternate are included in these Technical Specifications. Refer to the appropriate section based on the work involved in each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES: See Section 01110 for complimentary information.

END OF SECTION

SECTION 01110 SUMMARY OF WORK

1.0 BASIC DESCRIPTION OF FACILITY AND OTHER INFORMATION

- A. The facility is located at 7701 NW 79 Avenue, Medley, Florida, 33166. The Scope of Work is identified in the drawings and summarized above.
 - 1. Intended use of the area of work—bathroom and janitor closet repairs
 - 2. Type of construction—Level I interior alteration only
 - 3. General Systems contained in work—Architecture, Structural, HVAC, Electrical, Plumbing, Fire Alarm, and Building Technology.
- B. References used herein:
 - 1. Owner—Miami-Dade County Department of Transportation and Public Works (DTPW)
 - 2. User—Miami-Dade County Dept. of Transportation and Public Works – Transit Dept. (Transit)
 - 3. Engineer—The designated representative of DTPW in charge of the construction, a/k/a the DTPW Project Manager.
 - 4. General Contractor: The Company under contract with the Owner to do the construction work.
 - 5. A/E / Project Consultant / EOR—The Design Team composed of Architects and Engineers and other sub-consultants under contract with the Owner to design the Work and who signed / sealed the permit set drawings.

1.1 GENERAL SCOPE OF WORK: BASE BID

- A. Contractor shall remove and reset existing restroom fixtures and finishes. Repair existing restroom to comply with FBC 7th edition FBC 2020 accessibility.
- B. Remove and replace all finishes and fixtures with new walls, floor, and ceiling coverings, fixtures, appurtenances, plumbing, electrical, mechanical, communications, P/A speaker and speaker grill, hand free telephone, building systems, and all hardware, equipment and components associated thereto for the complete repairs of Metrorail station bathrooms.
- C. Remove and replace with new cast-iron and copper all existing sanitary drains, waste and vent systems.
- D. Remove and completely re-pipe with new L-type copper all existing water pipe, including trap primers, control valves, and supports for all plumbing fixtures.
- E. Provide new plumbing fixtures "institutional type" ADA compliant.
- F. Provide to all plumbing fixtures acorn duran-ware 16-gauge, type 304 stainless steel rated steel rated for 1000 lbs. with all mounting screws concealed.
- G. Restrooms shall be equipped with as required per DTPW toilet accessories specifications.
- H. All bathroom walls shall be tile from floor to ceiling with ceramic tile of a 6"X6" dimensions.
- I. Bathroom floors shall be anti-slip ceramic tile of a 12"X12".
- J. Provide new mechanical soffit and rigid ceiling with fire alarm and lighting.
- K. Install doors type 316 stainless steel with a min. of a 1.5 hour fire rating.
- L. Provide light fixtures per specification in day brite LED with emergency battery back-up shall be 227V, 2 lamp recessed to match existing.
- M. Furnish and install a new UL listed weather resistance wall mounted hand-free telephone to replace existing one.
- N. Furnish and install one exhaust ventilator with duct and wiring in each restroom.
- O. The smoke detector inside the bathroom must be removed at the beginning of the construction and reinstall before opening the bathroom to the public.
- P. The P/A speaker, speaker enclosure, and grill shall be replace with a new atlas sound speakers to be compatible with existing P/A system.
- Q. Remove and replace cracked lath and plaster ceiling and high hats above drinking fountain vestibule.

1.5 SCHEDULING AND CONCURRENT WORK

- A. Phasing of the Work: There is no phasing of work in this project.
- B. Staging Area: See drawings.
- C. Demolition: All fixtures, components and wall finishes. Entire ground floor slab as required for the installation of the underground sanitary lines. All existing utility connections in Area
 - 1. The allowed schedule for carrying out any demolition work and debris removal is as follows:
 - a. Weekdays (M-Th): Starting at 6:00pm and ending at 6:00am the following day.
 - b. Weekends: Anytime starting at 6:00pm on Friday and ending at 6:00am on Monday

Safety of Occupants and Public: Provide a "safety plan" which delineates areas of construction and construction traffic during the project, maintains required exits, and provides for barriers to separate construction areas from staff. The plan must provide for maintaining fire detection and warning systems in use while the building is occupied. Provide and maintain safety signage barriers, and construction aids. Maintain the safety of the facility and its occupants.

D DELIVERY AND STORAGE

The times of delivery and storage of construction products and equipment shall be coordinated with, the DTPW Site Supervisor and Engineer.

The storage of construction products and equipment fit within the confines of the property and the area is indicated in the drawings.

1.6

- A Parking of workers' vehicles shall be as designated by the DTPW in the pre-construction meeting.

1.7 SITE CONDITIONS

- A. Contractor's Use of Premises:
 - 1. The project site will be made available for general construction activities during normal business hours, Monday through Friday between the hours of 7:00am and 4:30pm. Availability of site for after-hours and / or weekend and Holiday work, for general construction work will have to be coordinated through the Engineer. The project site will be made available for demolition activities only during those periods when the general building operation functions in areas outside the limits of construction on the first floor and on the entire second floor of the building are inactive as indicated in Article 1.5.C above. Coordinate the demolition work schedule with the Engineer.
 - 2. The drawings designate a staging area on-site or for Contractor's use. Keep the area clean, secure, and organized. Do not block the buildings means of egress on the north wall. Work force parking and all access to the site, building and project location within the building to be coordinated with the Engineer.
 - 3. It is important that that the Contractor or any of the sub-contractors / vendors, or any deliveries do not interfere with the DTPW or User operations.
 - 4. Where construction impacts existing parking entrances / exits, areas, exits, staff and public circulation, submit plans showing temporary (for the duration of the work) pedestrian and vehicular traffic circulation for the

- impacted areas. Include barricades and signing necessary during the entire construction period, to direct the public and the vehicles through the construction zone in the submittal.
5. Handle waste and clean areas affected by the work.
 6. Remove debris such as construction material, debris, and spills from site each day. Dispose of lawfully using covered rubbish containers, recycling where possible.
 7. Provide security for products and equipment stored on-site. Maintain the safety of persons in and surrounding the project site.
 8. Provide devices and methods to maintain proper Indoor Air Quality (IAQ), protect other parts of the building outside the limits of construction, from damage including the migration of dust, fumes, smell or other debris. This applies to both horizontal and vertical space adjacencies.
 9. Refer to the latest edition of DTPW Adjacent Construction Safety Manual, made a part of the construction contract, for work restrictions and safety standards, guidelines and requirements.
 10. Before date of Substantial Completion, repair and return all area(s) affected by the construction to the original condition or as needed for the new use, to the satisfaction of DTPW. When work is performed subsequent to Substantial Completion, immediately at the completion of such work, repair and return the affected areas to the original condition or as needed for the new use, to the satisfaction of DTPW.

1.8 UNIT PRICES: Not Applicable in this contract.

1.9 BUY AMERICAN:

This project is designated as a "BUY AMERICAN" job. Do not provide any products, assemblies, or other components not designated as "AMERICAN MADE OR MANUFACTURED" for installation as a part of the work. Should an installed product be found to not be "AMERICAN MADE OR MANUFACTURED" it shall be promptly removed and replaced along with any other component damaged during the process and all at no cost to the Owner. Insure, before submitting for approval or delivering to the project, that the product or system or component complies with the "BUY AMERICAN" requirements of this project.

1.10 CONSTRUCTION DOCUMENT DRAWINGS

A. The Drawings listed in the following Index of Drawings are a part of the Construction Documents:

<u>Sheet #</u>	<u>Drawing #</u>	<u>Drawing Sheet Title</u>
1 of 18	A000	Cover sheet, project team, index
2 of 18	A100	Site Plan, scope of work & selective demolition plan
3 of 18	A101	Floor plans and elevations
4 of 18	A102	Equipment cut sheets
5 of 18	A103	Equipment cut sheets
6 of 18	A104	Equipment cut sheets
7 of 18	S001	General structural notes
8 of 18	S100	Floor plan
9 of 18	S500	Typical details
10 of 18	M001	General notes and legend
11 of 18	M100	Floor plans
12 of 18	M500	Details and schedules
13 of 18	E000	General notes and legend
14 of 18	E100	Floor plan
15 of 18	P001	General notes and legend
16 of 18	P100	Floor plans
17 of 18	P500	Details and schedules
18 of 18	FP100	Fire protection plan

END OF SECTION

SECTION 01297
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Specification establishes the requirements for breakdown of Payment Items.

1.02 SUBMITTAL REQUIREMENTS

- A. Submit to the DTPW a Preliminary Schedule of Values to include all portions of the work within 15 days after NTP.
- B. Submit to the DTPW a Baseline Schedule of Values within 15 days after receipt of DTPW comments on the Preliminary Schedule of Values. The Baseline Schedule of Values shall incorporate all comments associated with Contractor's Preliminary Schedule of Values submittals.
- C. Submit Documentation to support the values with data which will substantiate their accuracy.
- D. Upon acceptance by the DTPW, the Schedule of Values shall be used as the only basis for the Contractor's Applications for Payment. Acceptance of the Contractor's Preliminary/Baseline Schedule of Values is a condition precedent to processing all applications for payment other than payment for start-up costs during the first two months.
- E. The Schedule of Values shall correspond to each of the Payment Items. The breakdown of the progress payment for each Item shall be in accordance with the approved Work Breakdown Structure and each line item shall correspond with an activity in the Construction Schedule.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. The Schedule of Values shall be labeled with identifying information such as: title of contract and location, contract number, name and contact information of Contractor, and date of submission.
- B. The Schedule of Values shall list the installed value of the component parts of the WORK in sufficient detail to serve as the basis for computing values for progress payments during construction.
- C. Identify and list the title and number of the Specifications Section that is associated with the work.
- D. Deviations from the Schedule of Values form and content must be submitted and approved by the DTPW.
- E. Progress payment Items:
 - 1. Payments for progress payment activities will be based upon physical progress (percent complete) for each related activity in the Progress Schedule.
 - 2. The dollar value allocated to progress payment activities shall be representative of the Contractor's actual costs for performing the work including overhead and profit

and shall be balanced to ensure that sufficient funds are allocated for each portion of the work and shall be subject to acceptance by the DTPW.

3. In the case of a disagreement between DTPW and Contractor's, the DTPW shall have the right to make final determination of activity dollar amounts contained in the Schedule of Values.
- F. Each Payment Item shall include a directly proportional amount of the Contractor's overhead and profit.
- G. A new Payment Item will be added to the Schedule of Values for approved Change Order Work. For payment for Time & Materials Change Order Work, the Contractor shall hold a Pre-Work Change Order Meeting with the DTPW, prior to executing the Work.
- H. The sum of all Payment Items listed in the Schedule of Values shall equal the total Contract Price.

1.04 SUB-ACCOUNTS

- A. Include a breakdown of major Payment Items into sub-accounts on which progress payments will be requested. The sub-account breakdown shall include elements for Payment Items as appropriate and show the weight of the sub-accounts equal to 100 percent of major account (Payment Item).
- B. Contractor's Schedule of Values shall list the delivered value of the products, manuals, and services provided under the various Specification Sections. The lists shall be sufficiently detailed to serve as a basis for computing values for progress payments during the construction period.
- C. Copies of paid invoices for component material shall be included with the payment request in which the material first appears.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract Lump Sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01311

PROJECT MEETINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section includes specifications for project meetings. The Contractor, along with Contractor's superintendent, project manager, superintendents of major subcontractors, as a minimum, shall attend meetings scheduled by the Engineer (DTPW) and shall:
1. Collect and disseminate information related to the Contract.
 2. Advise about Contract-related Safety information, Safety meetings, and Safety-related issues.

- 1.02 **SPECIAL MEETINGS:** Special meetings between the Engineer and the Contractor will be scheduled and conducted by the Engineer throughout the course of construction as the Engineer deems necessary.

1.03 PRECONSTRUCTION MEETING

- A. A pre-construction meeting will be scheduled and conducted by DTPW not more than 15 working days after the effective date of the Notice of Contract Award. Contractor's project manager and superintendent shall attend along with the superintendent of the major subcontractors. DTPW will provide Contractor written notice of this meeting not less than five working days or one calendar week prior to the date of the meeting.
- B. DTPW will discuss the following at this meeting:
1. Introduce representatives of DTPW, the User, and the Project Design Team.
 2. Explain and discuss the responsibilities and authorities of the Engineer (DTPW).
 3. Discuss Equal Employment Opportunity (EEO), Disadvantaged Business Enterprise (DBE), and affirmative action requirements.
 4. Define and establish requirements for safety, first-aid, emergency actions, and security.
 5. Explain and discuss selected laws, codes, and permit requirements of public agencies and their regulations.
 6. Discuss procedures for processing change notices, change orders, correspondence, RFIs, shop drawings, submittals, product data, and samples.
 7. Discuss monthly progress payments.
 8. Discuss final payments.
 9. Discuss project schedule
- C. The Contractor shall discuss the following at this meeting:
1. Introduce Contractor's representatives, and briefly describe each person's responsibilities.
 2. Distribute and discuss the list identifying major Small Business and Disadvantaged Business Enterprises (SBE and DBE) subcontractors including their areas of responsibility.
 3. Discuss use of office, haul routes, storage areas, staging areas, and construction areas.
 4. Define housekeeping procedures.
 5. Discuss construction means and methods.

6. Discuss coordination and notifications required for utility work and services.
7. Discuss deliveries and priorities.
8. Discuss breakdown of schedule of values lump sum items.
9. Discuss construction progress schedule.

1.04 CONSTRUCTION PROGRESS MEETINGS

- A. Construction progress meetings will be scheduled by DTPW, conducted by the Engineer and held as required but not more often than semi-monthly during the period of performance of the Contract. Progress meetings shall include representatives of subcontractors who are or will be performing Work during the current and following month.
- B. The Contractor shall distribute notices of these meetings before such meetings to subcontractors.
- C. The agenda for construction progress meetings will be prepared by the Engineer and will generally include the following:
 1. Introduce new attendees and areas of responsibility.
 2. Review minutes of previous meetings amend minutes if necessary and accept minutes.
 3. At the first meeting of each month, analyze Work accomplished since previous meeting, offsite fabrication problems, product delivery problems, submitted schedule slippages, proposed changes, and circumstances that might affect progress of work.
 4. At each meeting, display and discuss the status of the Critical Path activities. If they are behind schedule describe the methods intended to be used to bring these activities back on schedule. Discuss corrective measures to maintain progress.
 5. Discuss the Two-Week Look-Ahead Schedule submitted as specified in Section 01321 Construction Contract Schedules, and last Work plan for the previous period showing activities accomplished and those not completed in accordance with the prior submittal. Discuss the reasons for failure to complete the Work as shown in the schedule and the methods to be implemented to complete the unfinished activities.
 6. Discuss Work quality observations, problems, and employee Work standards.
 7. Discuss coordination of utility work.
 8. Discuss Work by outside parties.
 9. Discuss changed conditions, time extensions, and other relevant subjects as they affect the progress of the work.
 10. Discuss the status of Contract changes: new changes, status of negotiations and completed changes.
 11. Discuss SBE/DBE, and any Apprenticeship Program issues.
- D. Each of the Contractor's inquiries, requests for information (RFI) or requests for solutions of problems presented during such meetings shall be answered, when possible, during the meeting; those not answered during the meeting will be answered, the answer documented and presented by the Contractor at the next meeting. Answers provided orally at the meetings shall be recorded in the minutes.
- E. Review the minutes of the meeting prepared and submit any requested corrections. Minutes will be prepared in action-item format with named responsible parties and dates for completion indicated for each item.

1.05 PROGRESS PAYMENT MEETINGS: The Contractor and the Engineer shall meet to discuss the monthly progress payment.

1.06 CHANGE ORDER MEETINGS: As necessary the Contractor and the Engineer shall meet to review change orders.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01321

PROJECT SCHEDULE

PART 1: GENERAL

1.01 DESCRIPTION

- A. This section covers the preparation of a schedule in the form of a bar chart. (The Contractor will be allowed to use his preferred scheduling system, if approved by the DTPW. If the Contractor wishes to propose his own system, he shall so request prior to the required submittal timetables listed in this section.)
- B. Final Schedule:
 - 1. A bar chart schedule shall be used by the Contractor to control the progress and time fixed for completion of this project. This system shall be implemented by the Contractor. Prior to approval of the final construction schedule, the Contractor shall provide DTPW with letters from all his subcontractors and suppliers indicating that they have reviewed the Contractor's schedule and concur with the sequence of events, activity durations and rates of production implied therein.
 - 2. All work shall be done in accordance with the schedule and all costs incurred by the Contractor to correctly implement the schedule shall be borne by the Contractor and are a part of his contract.
 - 3. The schedule must be updated monthly and submitted with the Contractor's pay request. No payment will be made to the Contractor unless this monthly updated schedule and progress report is submitted with the Contractor's pay request. Even if no invoice is submitted in a particular month, the Contractor shall submit monthly schedule updates and progress reports to the satisfaction of the Engineer.
 - 4. This schedule shall consider the work restrictions indicated in Section 01110, Article 1.7.A., and demonstrate the sequencing of the Work so as to not impact the contract duration.

PART 2: PREPARATION

2.01 PREPARATION OF FINAL SCHEDULE:

- A. Preparation:
 - 1. Within 7 days after the date of Notice to Proceed (NTP), the Contractor shall develop and submit a comprehensive and detailed Final Schedule, hereinafter referred to as the final schedule. Work performed prior to NTP shall not be allowed under this Contract.
 - 2. When completed, the bar chart diagram shall represent the Contractor's own plan for the project as well as the sequence of each operation and all the

involved parties. The schedule shall also identify the project's critical path. It shall be the responsibility of the Contractor to ensure that all of this work is described by the diagram and that the diagram does correctly represent the sequence in which he plans to do his work and the time in which he expects to do it.

3. As a minimum, the final schedule will cover the following areas:
 - Shop drawing preparation, review and approval
 - Procurement of major equipment or material
 - Permit acquisition activities
 - Material samples
 - Material delivery
 - All major work elements
 - Punch list activities
 - Rates of Production
4. The final schedule will be printed on a 11" x 17" sheet suitable for reproduction. The Contractor will submit 3 copies of this schedule.
5. A written narrative on separate 8 1/2" x 11" sheets will be included with the contractor's final schedule. This narrative will describe the contractor's general approach for performing the work and any additional or unusual requirements not clearly represented in the schedule including, but not limited to, equipment to be used and the time equipment is to be on-site, anticipated delivery dates for material and/or equipment, crews and crew sizes, estimated quantities and rates of production. The narrative shall explain the basis for the contractor's determination of durations for major work items and describe his approach for meeting the interim and final completion dates in his schedule. The narrative shall also address workdays per week, hours per shift, rain days, holidays or any other non-work periods that the contractor is assuming in the planning of the work. Activities which may be expedited by the use of overtime or additional shifts shall be identified. Sequencing and other restraints such as manpower, material or equipment shall be identified and explained. A form to be used by the Contractor to prepare his baseline narrative shall be requested from DTPW at time of award of contract.
6. When completed, the final schedule shall be submitted to the Engineer for approval. The Contractor shall incorporate the Engineer schedule review comments within 10 days after receipt. The Engineer shall be the final authority in deciding the acceptability of the schedule. Upon approval by the Engineer, this shall become the Final Schedule for the contract. No deviations from the final schedule will be allowed without the approval of DTPW.
7. The Contractor shall identify all available float or slack time in his schedule in a format suitable to the DTPW. Float or slack time is not for the exclusive use or benefit of either the Contractor or DTPW. Float or slack time is considered project float as it is for the benefit of both parties. As such, it is not to be used exclusively by either party but is to be used by the party that needs it first. No more than 15% to 25% of the activities in the contractor's schedule may be on or near the critical path. ("Near the critical path" is defined as any activity having float of 10 days or less)

2.02 MONTHLY SCHEDULE UPDATES

1. The Contractor shall submit monthly schedule updates to show progress, as applicable, on all activities in progress. Such progress shall be shown in a format suitable to the Engineer. Three 11" x 17" copies of the updated schedule shall be submitted by the Contractor.
2. The Contractor shall submit an updated narrative in the form of monthly progress reports in a format acceptable to the Engineer. Such reports shall include sections for describing "progress this period", "planned progress for next period", "problems and solutions" (including a listing of all delayed activities, the reasons for delay and proposed recovery actions) and "changes since last period". Any special concerns and or questions regarding the schedule should also be included in the progress report. As applicable, signed material delivery tickets indicating when material was delivered on-site or to the fabrication plant will be provided with the narrative on a monthly basis. A form to be used by the Contractor to prepare his monthly update narrative is to be requested from the Engineer prior to use for the first time.
3. The Contractor shall submit on a bi-weekly basis a simplified two-week look-ahead bar chart schedule showing all anticipated work scheduled to take place during the next 14 calendar days. This two-week look-ahead schedule shall be based on the approved baseline schedule.

PART 3: PAYMENT

3.01 PAY REQUESTS

1. The Contractor's pay request shall include an update of the final schedule. The contractor will not be eligible to receive payment until his contract baseline schedule and schedule of values is approved and no payment will be made to the Contractor unless this schedule update and schedule of values is submitted with the pay request.
2. 5% of each Contractor's pay request amount will be retained in accordance with Section 3.8 of the Special Requirements.
3. All Contractor pay requests will be submitted in a form suitable to DTPW based on a County approved schedule of values.

3.02 FINAL PAYMENT

Final payment shall be made in accordance with Article the terms and conditions of the Miscellaneous Construction Contract.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01325
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This Section specifies the maintaining, marking, recording and submitting of project record documents.
- B. DEFINITIONS:
 - 1. Conformed Contractor Contract Documents: The conformed documents provided to the Contractor Firm at the time the Contractor contract was executed, prior to the start of the Contractor Contract. This set is separate and apart of the Permit set.
 - 2. Contractor Document Transmittal (CDT): Reviewed and approved drawings, catalog cuts, samples or other documents submitted by the Contractor Firm for review showing in detail how the Contractor proposes to carry out the work.
 - 3. Project Record Documents (As-Built): During construction, a set of released-for-construction drawings and specifications, shall be kept current by marking in red all "as-built" construction conditions and changes arising out of RFIs, clarifications, directed field changes and sketches, etc. At the end of construction activities, the information contained in these drawings and specifications shall be submitted to the Engineer for incorporating into Compact Disks (CD / DVD) containing the latest conformed drawings including revisions to the contract documents made during construction. (Changes to specifications are typically only affected through change orders. However, in some occasions clarifications may require a modification to the specifications). The revised CADD drawings, which include the information incorporated from the drawings and specifications, become The Project Record Documents.
 - 4. Shop Drawings: Final CAD files to be provided in Autocad as well as 11x17 PDF's. See Contractor Firm Document Transmittals.

1.02 SUBMITTALS

- A. Upon completion of the work, the Contractor Firm shall submit the As-Built to the Engineer in time to be used for the final inspection and acceptance and for verification. Availability of As-Built shall be prerequisite to scheduling a final inspection of this Contractor Contract. Non-availability of As-Built or inaccuracies therein may be grounds for cancellation and postponement of any scheduled final inspection by the Engineer until such time as the discrepancy has been corrected. Upon completion of the work, the As-Built shall become the property of DTPW. The Contractor Firm will transmit the As-Built to the Engineer with an attached Project Records "As-Built" Drawings Index Form uniquely identifying and describing each document.
- B. The Contractor shall sign each red line drawing certifying the accuracy and validity of the as-built information contained therein

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 MAINTENANCE OF DOCUMENTS:

- A. The Contractor shall maintain one copy of each of the following:
- B. Contractor Contract Documents
 - 1. Conformed Contractor Contract Drawings and Conformed Specifications.
 - 2. Construction Safety Manual.
 - 3. Change Orders, Change Notices and other modifications to the Contractor Contract.
 - 4. Engineer Field Order or written instruction.
 - 5. Approved shop drawings, product data and samples.
 - 6. Field test reports/records.
 - 7. Updated set of Construction Documents (Drawings and Technical Specifications) marked in red to show field changes.
 - 8. Request for information (RFI).
 - 9. All directed Field Changes and sketches.
- C. Equal Employment and Affirmative Action Records.

3.02 RECORDING "AS-BUILT" DRAWINGS

- A. Record information concurrently with construction progress on The Construction Documents (Drawings and Technical Specifications). During construction, this set is known as "As-Built" documents.
- B. Do not conceal any work until the required information is recorded.
- C. Drawings: legibly mark in red to record actual construction depicting the as-constructed configurations resulting from field and/or design changes:
 - 1. Location of internal utilities, electrical conduits and appurtenances, referenced by dimensions to permanent, visible and accessible features of the structure.
 - 2. Field changes of dimension and detail.
 - 3. Details not on original Contractor Documents.
 - 4. Changes made by Change Notice or by Change Order.
- D. Legibly mark up each section of specifications to record:
 - 1. Manufacturer, trade name, catalogue number, and supplier of each product and item of equipment actually installed.
 - 2. Changes made by Change Notice or by Change Order.
- E. Any changes due to RFIs, clarifications and field sketches shall be incorporated into the record drawings by affixing sketches and other 8 1/2" x 11" sheets to the Contract Documents.
- F. Do not use the record drawing set for construction progress purposes.

3.03 DOCUMENT MAINTENANCE:

- A. Provide for storage of documents to maintain in clean, dry and legible condition.
- B. Make documents available for inspection by the Engineer.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01330 SUBMITTALS

1.01 DESCRIPTION:

- A. This section includes specifications for the general requirements and procedures for preparing and submitting design and construction information and data for information and review. Other requirements for submittals are specified under applicable sections of the Contract Documents.

2.01 SUBMITTAL REQUIREMENTS:

- A. Schedule of Submittals: Within fifteen (15) days after the effective date of Notice to Proceed (NTP), the Contractor shall submit a completed submittal schedule and list of products for all items requiring the Engineer's review, as follows:
 - 1. Design Drawings and Project (Specifications) Manual
 - 2. Submittal Schedule
 - 3. Shop Drawings, including description of the items and name of manufacturers, trade names, and model numbers
 - 4. Contract Project (Specification) Manual Section Reference
 - 5. Intended Submission & Resubmission Date(s)
 - 6. Order Release Dates
 - 7. Lead Times to Delivery and Anticipated Delivery Date(s)
 - 8. Highlight items that require expedited review to meet the project schedule, and are within the critical path of the schedule
- B. The Engineer will withhold acceptance of submittals which depend on other submittals not yet submitted or not yet reached a status of "No Exceptions Taken".
- C. These schedules shall be presented in a form that is readily reproducible and shall be updated and sent to the Engineer on a monthly basis. Identify all submittals that are required by the Contract Documents and determine the date on which each submittal will be submitted in conformance with the schedules specified under this contract.
- D. Provide a title block for drawings containing the following information:
 - 1. Date and Revision Date(s)
 - 2. Contract Title and Number
 - 3. The names of the Contractor, Sub-Contractors, Suppliers, and Manufacturers as applicable.
 - 4. Identification of product by description, model number, style number, serial number, or lot number
 - 5. Subject identification by Contract Drawing or Specification Reference.
- E. Professional Engineer's Seal Required:

Submittals involving delegated engineering expertise, such as excavation support structures, framework for concrete, civil and structural designs, load calculations and operating systems engineering final design shall be sealed and signed by a professional engineer, currently registered in the State of Florida, for the discipline involved and in accordance with Florida law.

F. Submittal Stamps and Action Block Space:

Include a 5-inch square blank space, in the lower right corner, just above the title block, in which the Engineer may indicate the action taken. Please note that the Engineer may opt to issue a separate “Submittal Review” document indicating all comments. This Submittal Review document shall be affixed by the GC to the submittal documents.

G. Review Period:

1. Prepare submittals sufficiently in advance so that review may be given before commencement of related work.
2. Allow thirty (30) calendar days after receipt by the Engineer for review of each submittal.
3. The Contractor shall be responsible for determining whether or not certain governmental entities and utility companies will require longer review periods. The Engineer will assist in this effort. Where longer review periods are required, the Contractor shall schedule the work accordingly, so that the work and construction schedules are not adversely impacted.

H. Submittal Delivery:

Ship submittals prepaid (FedEX, etc...) or deliver by hand directly to the DTPW Engineer's office.

I. Transmittal Form:

Accompany all submittals with a transmittal form, including a brief description of the items that have been included.

J. Changes in Reviewed Submittals:

Changes in reviewed submittals will not be permitted unless those approved submittals with changes have been resubmitted and reviewed, in the same manner as the original submittal.

K. Supplemental Submittals:

Supplemental submittals initiated by the Contractor for consideration of corrective procedures shall contain sufficient data for review. Make supplemental submittals in the same manner as initial submittals.

L. Incomplete submittal packages will be returned without review

3.01 CONTRACTOR'S RESPONSIBILITIES:

A. Contractor's Review:

1. Each submittal shall be reviewed, stamped, and signed as reviewed and approved by the Contractor before submission.
2. If the submittal is designated to be sent to the Engineer for information, approval by the designated approval authority shall take place before submission to the Engineer.
3. The Contractor shall coordinate each submittal with the requirements of the work, placing particular emphasis upon ensuring that each submittal of one trade is compatible with other submittals of that trade and with the submittals of other trades. Ensure submittal is complete with all relevant data required for review.
4. Review of drawings and associated information as deemed appropriate by the Engineer shall not relieve the Contractor from the responsibility for errors or omissions in the drawings and associated information, or from deviations from the Contract Documents, unless submittals containing such deviations were submitted to the Engineer and the deviations were specifically called to the attention of the Engineer in the letter of transmittal, and recommended by the Engineer as a Contract Change.
5. The Contractor's liability to work, in case of deviations in the submittals from the requirements of the Contract Documents, is not relieved by the Engineer's review of submittals containing deviations, unless the Engineer expressly recommends acceptance of the deviations to the DTPW and the issuing of a Contract Change Order.
6. The Contractor shall be responsible for the correctness of the drawings, for shop fits and field connections, and for the results obtained by the use of such drawings.

B. Submittal Quantities:

Unless noted otherwise, Contractor shall submit seven (7) copies of all submittals and electronic files in a form acceptable to the Engineer. Where permits and licenses and other such documents are obtained in DTPW's name, submit the original and six (6) copies.

C. Distribution of Submittals after Review:

Distribute prints or copies of reviewed submittals, bearing the Engineer's or designated approval authority's stamp and signature, to affect and concerned sub-contractors,

suppliers, and fabricators; and to affected and concerned members of the Contractor's workforce.

- D. Maintain at the job site a complete up-to-date, organized file of all past and current submittals including an index and locating system which identifies the status of each submittal:
1. Assign a sequential number to each submittal, which shall indicate the applicable specification section for which the submittal is required.
 2. Assign a revision number, using an alphanumeric sequence (i.e., 15, 15A, 15B, etc.) to all submittals.

4.01 PROJECT CONSULTANTS REVIEW:

- A. Submittals will be reviewed for conformance with requirements of the Contract Documents. Review of a separate item will not constitute review of an assembly in which the item functions. Review will not relieve the Contractor from Contractor's responsibility for accuracy of submittals, for conformity of submittals to requirements of Contract Documents, for compatibility of described product with contiguous products and the rest of the system, or for prosecution and completion of the Contract in accordance with the Contract Documents.
- B. The Engineer will indicate in its reviews of submittals and the action taken by means of the submittal stamp or a separate Submittal Review document. If a submittal stamp is used it will be affixed by the Engineer within the action block and the stamp will be signed and dated.
- C. The submittal stamp action block marks will have the following general meanings: Please note that different professionals may use a slightly different version of each of these generalized statements in their stamps or in their Submittal Review document.
1. The mark "NO EXCEPTIONS TAKEN" means that every illustration and description appears to conform to the respective requirements of the Contract Documents; that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed; and that the submittal need not be resubmitted.
 2. The mark "NOTE COMMENTS" means that every illustration and description appears to conform to the respective requirements of the Contract Documents upon incorporation of the reviewer's corrections, and that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed. Submittals so marked need not be resubmitted unless the Contractor challenges the review/s exception.
 3. The mark "MAKE CORRECTIONS NOTED" means that every illustration and description appears to conform to the respective requirements of the Contract Documents, and that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed after incorporation of the reviewers corrections and verification by the

Engineer that the reviewer's corrections have been properly incorporated in the submittal.

4. The mark "REVISE AND RESUBMIT" means that no every illustration and description appears to conform to the respective requirements of the Contract documents, and that fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may not proceed until incorporation of the reviewers corrections and re-submittal for re-review. Resubmission is also required if the Contractor challenges the reviewer's corrections.
5. The mark "REJECTED" means that the submittal is deficient to the degree that the reviewer cannot correct the submittal with a reasonable degree of effort, has not made a thorough review of the submittal, and that the submittal needs revision and is to be corrected and resubmitted.

- D. Review stamps or other approval methods of the various designated approval authorities may not be the same as those described herein. The Contractor shall coordinate (through the Engineer) with the various designated approval authorities and shall obtain approvals in the clearest and most straight forward manner possible.
- E. Contractor shall attend meetings as requested by the Engineer to address issues related to the review of submittals.
- F. The Engineer will return submittals to the Contractor within thirty (30) calendar days after submittals have been received.
- G. Contractor shall include at least thirty (30) days in the project schedule for the Engineer to review submittals.
- H. Allow thirty (30) days for review by the Engineer of all re-submittals.

5.01 MEASUREMENT AND PAYMENT

A. MEASUREMENT

Work under this Section will not be separately measured for payment.

B. PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01620

SUBSTITUTIONS AND PRODUCT OPTIONS

1.01 DESCRIPTION:

- A. This Section specifies the procedures to be followed for preparing, submitting, amending and updating of lists of products proposed to be incorporated in the work.

2.01 SELECTED PRODUCTS:

- A. Within ten (10) days after the effective date of NTP, submit five (5) copies of the list of selected products. Arrange the list in the order of each Section's appearance in the specification.
 - 1. For products specified only by reference standards, any product satisfying those standards may be selected. Show name and address of manufacturer; trade name, model number or catalog designation of the product; manufacturer's reference standards and pertinent performance and test data.
 - 2. For products specified by naming one product or by naming several products, this establishes a product standard. Any other product, which is equal in the opinion of DTPW and EOR may be furnished. A request must be submitted to the DTPW as required for substitutions, for acceptance of products not specifically named.
 - 3. **Equal:** Where named products or sources listings are accompanied by the term "or equal" or "or approved equal" or other language of similar effect, provide one of the specified products, or submit a request for substitution for a product not named, in accordance with the requirements of this Section, which the Contractor judges to be of equal or better quality.
 - 4. Amend and update list as changes concerning the information become known.

3.01 LIST OF SUBSTITUTE PRODUCTS AND METHODS:

- A. Formal requests from the Contractor will be considered by DTPW and EOR for substitution of products and methods in place of those specified, but only if these requests are submitted within ten (10) days after effective date of NTP. No substitutions request will be considered after ten (10) days. Acceptance of substitute products and methods shall be only for the characteristics and use named in the acceptance and shall be interpreted neither as a modification to the Specification and Drawing requirements nor to establish acceptance of products and methods for other portions of the Transit System. DTPW and the EOR shall judge the quality and suitability of the substitute product and method and his decision shall be final. Where use of a substitute product and method involves redesign of other parts of the

work, the cost and time required to affect that redesign will be considered in evaluating the suitability of the substitute product and method.

B. Submit five (5) copies of list of substitute products and methods, including the following information:

1. Complete data substantiating compliance of the proposed substitution with the requirements of the Specifications (Technical Specifications) and Drawings.
2. For products:
 - a. Product identification, including manufacturer's name and address
 - b. Manufacturer's literature, including product description, performance and test data and pertinent reference standards
3. For construction methods:
 - a. Detailed description of proposed method
 - b. Working drawings illustrating methods
4. Itemized comparison of proposed substitution with product specified. Comparison shall include cost, differences in estimated life, estimated maintenance, availability of spare parts and repair services, energy consumption, performance capacity, salvage-ability, manufacturer's warranties and other material differences.
5. Data relating to changes in construction schedule.
6. Accurate cost data on proposed substitution in comparison with product and method specified except that cost data will not be required on substitutes proposed as equal, equivalent or superior to specified brand names and for which no request is made for price adjustment to the sub-contract.
7. Equitable adjustment and credit that the Contractor proposes to offer work if the substitutions are not equal, equivalent or superior to specified brand names.

C. In making request for substitution, Contractor shall verify:

1. That he has personally investigated the proposed product and method and that to the best of his knowledge, information and belief, the product and method is either equivalent or superior to that product and method specified and that he will update information as new or different data become known to him.
2. That he will furnish the same guarantee for substitution as he would for the product and method specified.

3. That he will coordinate installation of the accepted substitution into the work and will make those changes required for the work to be complete and operable.
 4. That cost data is complete and includes related costs and excludes cost of engineering redesign.
 5. That he waives claims for additional time and costs related to the substitution, which become apparent.
- D. Amend and update list as changes concerning information on the list become known to him.
- E. Substitutions will not be considered, if indicated or implied on Shop Drawings or Product Data Submittals for which no formal request for substitution has been submitted. Requests for substitutions will not be considered if acceptance will require substantial revisions of drawings and specifications or both.

4.01 MEASUREMENT

Work under this Section will not be separately measured for payment.

5.01 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01732 CUTTING AND PATCHING

PART 1: GENERAL

1.01 REQUIREMENTS INCLUDED:

- A. Contractor responsibility: All cutting, fitting and patching, including attendant excavation and backfill required to complete the work to:
 - 1. Make its several parts fit together properly.
 - 2. Uncover portions for the work to provide for the installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to requirements of Contract Documents.
 - 5. Remove samples of installed work as specified for testing.
 - 6. Remove routine penetrations of non-structural surfaces for installation of piping and electrical conduits.

1.02 SUBMITALS: In accordance with Section 01330

- A. Submit a written request to the Engineer well in advance of executing any cutting or alteration which affects:
 - 1. Work of the DTPW or any separate contractor.
 - 2. Structural value or integrity of any element of the Project.
 - 3. Integrity or effectiveness of weather-exposed or moisture resistant elements or systems.
 - 4. Efficiency, operational life, maintenance or safety of operational elements.
 - 5. Visual qualities of sight-exposed elements.
- B. Include with each request:
 - 1. Identification of the Project.
 - 2. Description of affected work
 - 3. The necessity for cutting alteration or excavation.
 - 4. Effect on work of DTPW or any separate contractor, or on structural or weatherproof integrity of Project.
 - 5. Description of proposed work:
 - a. Scope of cutting, patching, alteration, or excavation.
 - b. Trades who will execute the work
 - c. Products proposed to be used
 - d. Extent of refinishing to be done.
 - 6. Alternatives to cutting and patching.
 - 7. Cost proposal, when applicable.
 - 8. Written permission of any separate contractor whose work will be affected.

- C. Should conditions of Work or the schedule indicate a change of Products from original installation, submit request for substitution.
- D. Submit written notice to the Engineer designating of the date and time the work will be uncovered.

PART 2: PRODUCTS

2.01 MATERIALS:

- A. Comply with specifications and standards for each specific product involved.

PART 3: EXECUTION

3.01 INSPECTION:

- A. Inspect existing conditions of Project, including elements subject to damage or movement during cutting or patching.
- B. After uncovering work, inspect conditions affecting installation of Products, or performance of work.
- C. Report unsatisfactory or questionable conditions to the Engineer in writing; do not proceed with work until the Engineer has provided further instruction.

3.02 PREPARATION:

- A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.
- B. Provide devices and methods to protect other portions of Project and the rest of the building from damage including the migration of dust, fumes or other debris from the limits of construction area.
- C. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching work and maintain excavations far from water.

3.05 PERFORMANCE:

- A. Execute cutting and demolition by methods which will prevent damage to other work, and which will provide proper surfaces to receive installation of repairs.
- B. Execute cutting and demolition only during allowed periods as indicated in Section 01110, Article 1.7.A. Restriction of hours for this type of work will be strictly enforced by the DTPW and User.

- C. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.
- D. Employ original Installer or Fabricator to perform cutting and patching for:
 - 1. Weather-exposed or moisture-resistant elements.
 - 2. Sight-exposed finished surfaces.
- E. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- F. Restore work which has been cut or removed, install new products to provide complete work in accord with requirements of Contract Documents.
- G. Fit work airtight to pipes, sleeves, ducts, conduit and other penetration through surfaces.
- H. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
 - 1. For continuous surfaces, refinish to nearest intersection.
 - 2. For an assembly, refinish entire unit.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will not be separately measured for payment

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 01740 CLEANING

PART 1: GENERAL

1.01 DESCRIPTION:

This Section specifies the maintenance of the work site in a clean, orderly hazard-free condition.

1.02 QUALITY ASSURANCE:

- A. Conduct cleaning and disposal operations in accordance with local ordinances and anti-pollution laws. Rubbish, volatile wastes, and other construction wastes shall be neither burned nor buried on the work site, and shall not be disposed of into storm drains, sanitary drains, streams or other waterways.
- B. Final cleaning shall be accomplished either by workmen experienced in cleaning operations or by professional cleansers.

PART 2: PRODUCTS

2.01 CLEANING MATERIALS:

Cleaning materials shall be as recommended by the manufacturer of the surface to be cleaned.

PART 3: EXECUTION

3.01 SAFETY REQUIREMENTS:

- A. Maintain work site in accordance with local ordinances and anti-pollution laws applicable to work site cleanliness, and in a neat, orderly and hazard-free condition until final acceptance of the work. Work site sidewalks and walkways adjacent to the work site shall be kept free from hazards caused by construction activities.
- B. No volatile substances are to be used on the job site.
- C. Prevent accumulation of waste, which creates hazardous conditions.
- D. Artificially ventilate indoor spaces, which are not naturally ventilated, and which have the HVAC systems shut off, when construction dust exists, or noxious substances are being used and until all is completely cleaned (See Article 3.03).

3.02 INTERIM CLEANING:

- A. Perform cleaning every workday for duration of the work. All areas of the work site and public and private properties shall be maintained free from accumulations of

waste materials and rubbish caused by construction operations on the work site. Waste material will be removed from the work site or put in a waste container.

- B. Remove or secure loose material on open decks and on other exposed surfaces at end of each day's work or more often to maintain work site in hazard-free condition. Prevent dislodgment of materials due to wind and other forces.
- C. Empty on-site waste containers whenever necessary so that trash overflow does not occur. Legally dispose of contents at either public or private dumping areas.
- D. Control the handling of materials, debris and rubbish; do not drop or throw from heights.
- E. Immediately remove spillages of construction-related materials from hauling routes.
- F. Perform cleaning operations such that dust and other contaminants resulting from cleaning processes will not fall on structures or pedestrian traffic below.

3.03 FINAL CLEANING:

- A. In preparation for substantial completion, conduct final inspection of exposed interior and exterior surfaces and of concealed spaces.
- B. Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials from finished surfaces.
- C. Maintain cleaning operations until project has been finally accepted.

3.04 DAMAGE TO EXISTING FINISHES:

- A. Repair any existing (or newly installed) finish that has been damaged by construction activity.
- B. Repaint to match existing areas of damaged paint due to Contractors operation.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will not be separately measured for payment

4.02 PAYMENT

Work under this section will be paid for as part of the Contract lump sum price for Pay Item #1, General Requirements.

END OF SECTION

SECTION 02221
EXCAVATING, BACKFILLING, AND COMPACTION FOR UTILITIES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. Division 15 - Mechanical Work.
2. Division 16 - Electrical Work.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D1556-90(96) Test Method for Density of Soil in Place by the Sand-Cone Method.
2. D1557-91 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort
3. D2487-93 Classification of Soils for Engineering Purposes (Unified Soil Classification System).

B. Occupational Safety and Health Administration (OSHA): Trench Safety Act.

1.03 DEFINITIONS

- A. "Satisfactory Fill Material" includes materials classified in ASTM D2487 as GW and SW, properly worked by Contractor to obtain optimum moisture and compaction.

1.04 SUBMITTALS: In accordance with Section 01330.

- A. Submit copies of tests and records performed as specified to the Engineer for review before starting work.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with OSHA, Trench Safety Act, Standard 29 C.F.R.s., Chapter XVII, Subpart P (para. 1926.650 thru 1926.653).

1.06 PROJECT CONDITIONS

- A. Excavation, filling, and backfilling for utilities complete for underground utility

lines and structures as specified and as shown on the drawings.

B. Existing Utilities:

1. Protect existing utilities from movement, settlement, or other damages according to Instructions to Bidders and General Conditions.

C. Trench Safety Act: Provide trench safety systems at all trench excavations where workers may be exposed to moving ground or cave-ins regardless of depth of trench. All trenches more than 5 feet in depth shall comply with OSHA "Trench Safety Act".

PART 2 PRODUCTS

2.01 MATERIALS

- A. Trench Backfill Materials: Either satisfactory excavated material or fill materials as specified.
- B. Pipe Bedding Material: Bedding material shall be selected or satisfactory backfill material and free of any rocks or stones larger than 2 inches in diameter for sanitary pipe. Limerock screenings or sand shall be used for copper or other metal tubing. (Underground copper lines are 3-inch diameter or less.)

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 EXCAVATION

- A. General:
1. Perform excavating of every description and of whatever substance encountered to depths indicated or specified.
 2. Pile materials suitable for backfilling a sufficient distance from banks of trenches to prevent slides or cave-ins.
 3. Remove excavated materials not required nor suitable for backfill from site.

4. Excavating shall be by open cut.

B. Trench Excavations:

1. Make trench of necessary width and depth for proper laying of pipe, with bank as vertical as practical.
2. Coordinate trench excavation to avoid open trenches for prolonged periods.
3. Grade bottom of trenches accurately to provide uniform bearing and support for each section of pipe on undisturbed soil at every point along their entire length, except portions of pipe sections where it is necessary to excavate for couplings and for proper making of pipe joints or where unsatisfactory materials incapable of properly supporting pipe and utility structures are encountered at bottom of trench.
4. Dig holes and depressions for joints after trench bottom has been graded of length, depth, and width required for properly making the particular type of joint.
5. When unsatisfactory soil, incapable of properly supporting pipe, is encountered at the bottom of the trench, remove such soil to a minimum depth of 12 inches, or 1/4 of the pipe diameter, whichever is greater, below the bottom of pipe and backfill material specified.
6. Over-depths in unstable soil excavation and unauthorized over-depths shall be at the expense of Contractor.

C. Special requirements relating to specific utilities are as follows:

1. Sanitary Sewers:
 - a. Where shown on drawings, make width of trench at and below top of pipe adequate to allow space for workers to place and properly joint pipe.
 - b. Clear space between the barrel of the pipe and trench wall shall not exceed 8 inches on either side of the pipe.
 - c. Width of the trench above the level may be as wide as necessary for proper performance of the work.
 - d. Round the bottom of the trench so at least the bottom quadrant of the pipe shall rest firmly on undisturbed soil or select bedding for as nearly the full length of the barrel as proper joining operations will allow.
 - e. Perform this part of the excavation manually a few feet ahead of the pipe laying operation by workers skilled in this type of work.

2. Water Lines:

- a. Where shown on drawings, make depth of trench to allow a minimum of 24 inches of cover over the top of the pipe / tubing from finished grade unless otherwise indicated or required by local utility.
- b. Avoid interference of water lines with other utilities, grade water lines to avoid air pockets.

3. Electrical Conduit or Cables:

- a. Trenches for plastic conduits shall be a depth providing not less than 12 inches or greater of cover from underside of slabs to accommodate bending radii, unless otherwise indicated. Install warning tape 8 inches below finish grade or underside of slab.
- b. Trenches for plastic conduit and cables shall be cut to an over-depth of not less than 3 inches and a cushion of rock free soil or coarse sand used for not less than 3 inches bedding and 3 inches backfill over the plastic conduit and cable.

3.03 PROTECTION OR REMOVAL OF UTILITY LINES

A. Protection:

1. Protect existing utility lines indicated on drawings (or the locations of which are made known to Contractor before excavating and trenching) specified to remain, including utility lines constructed during trenching operations, from damage during trenching, backfilling, and compacting operations.
 - a. If such new or existing utility lines are damaged during trenching, backfilling, and compacting operations, repair or replace at no cost to Owner.
2. When utility lines specified to be removed or replaced are encountered within the area of operations, issue notices in ample time for measures to be taken to coordinate necessary interruption of services.

B. Repair of Damage to Unknown Existing Utility Lines:

1. Existing utility lines not shown on drawings (or the location of which is not known to Contractor in time to avoid damage) damaged during trenching operations shall be repaired by Contractor and an adjustment to the Contract Price will be made according to Instructions to Bidders and

General Conditions.

3.04 BACKFILLING

A. General:

1. Coordinate backfilling with testing of utilities.
2. Carefully backfill trenches with satisfactory specified materials.
3. Bring backfill up evenly in 9-inch maximum layers, loose depth, and thoroughly and carefully compact with mechanical or hand tampers until pipe has a minimum cover of one foot. Take care not to damage the pipe.
4. Deposit remainder on the satisfactory backfill material in the trench 6-inch layers and compact by mechanical means to percentages as specified.
5. Keep excavations free of water until backfilling operation is complete.

B. Compaction:

1. Material may be compacted by a hand tamper, a powered hand tamper, a vibrating tamper, or mechanized power tamper provided such compaction percentages meet the required density as specified below.
2. Backfilling and compacting by means of hydraulic methods will not be allowed.
 - a. Compact each layer to not less than the percentage of maximum density specified below, determined according to ASTM D1557, Method D:

<u>FILLS AND BACKFILL</u>	<u>COHESIONLESS SOIL</u>
Under slabs	95%
Under walk areas, top 12 inches	95%
Under walk areas, below top 12 inches	90%
Under landscape areas	85%
Under other areas noted on Site Plan	85%

3.05 TESTING

- A. Notify the Engineer of the contracted Testing Laboratory to perform specified tests at Contractor's expense.
- B. Tests of Materials shall be as follows:
 1. Laboratory Tests for Moisture Content and Density:

- a. According to ASTM D1557, one test for each material encountered or proposed to be used.
- 2. Field Tests for Moisture Content and density:
 - a. According to ASTM D1556, one test per layer per 100 linear feet of ditch.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 2 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 2 Work.

END OF SECTION

SECTION 03200 CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 QUALITY ASSURANCE

- A. Codes and Standards: Comply with the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. Wire Reinforcement Institute, Manual Standard Practice, 1979.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A82-95a Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - 2. A185-94 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
 - 3. A496-95a Specification for Steel Wire, Deformed, for Concrete Reinforcement.
 - 4. A497-95 Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.

1.03 SUBMITTALS

- A. General:
 - 1. Submit shop drawings for fabrication and placement of reinforcement.
- B. Accessories: Show accessories, supports, chairs, bolsters, and spacers necessary to complete the installation.

PART 2 PRODUCTS

2.01 REINFORCING MATERIALS

- A. Comply with ACI 301.
- B. Welded Wire Fabric Reinforcing:
 - 1. Unless indicated otherwise the minimum concrete protective cover specified in ACI 301 is the specified cover for this project unless indicated otherwise.
- C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening welded wire fabric in place. Use wire bar type supports complying with CRSI Class C or Class A as required acceptable.

PART 3 EXECUTION

3.01 PLACING REINFORCEMENT

- A. Clean reinforcement of loose rust and mill scale, dirt, and other materials that reduce or destroy bond with concrete.
- B. Accurately position, support, and secure reinforcement against displacement by concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers as required.
- C. Place reinforcement to obtain at least minimum coverages for concrete protection.
 - 1. Arrange, space, and securely tie to hold reinforcement in position during concrete placement operations.
 - 2. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 3 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 3 Work.

END OF SECTION

SECTION 03300 CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03200 - Concrete Reinforcement
2. 07900 - Joint Sealers.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

- | | | |
|----|----------------|---|
| 1. | A615/A-96a | Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement. |
| 2. | C150-96 | Specification for Portland Cement. |
| 3. | C260-95 | Specification for Air-Entraining Admixtures for Concrete. |
| 4. | C309-97 | Specification for Liquid Membrane-Forming Compounds for Curing Concrete. |
| 5. | C494-92 | Specification for Chemical Admixtures for Concrete. |
| 6. | D1751-83(1991) | Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types). |

1.03 SUBMITTALS: In accordance with Section 01330

A. Submit shop drawings for reinforcement and accessories:

1. Show slab reinforcing in plan view, not scheduled, and drawn to a minimum scale of 1/8" = 1'-0". Show reinforcing on the plan view along with size, quantity, marks, and spacing.
2. Other items may be detailed as needed.
3. Engineer will not accept drawing submitted not complying with these requirements. verify detailing proceeds as specified to avoid untimely reinforcing arrival.

B. Materials and methods of curing.

C. Concrete materials and mix designs.

D. Certifications required for admixtures (chloride and solids).

E. Chlorides in concrete.

F. Test reports.

G. Waterstops and premolded joint fillers.

H. Curing compounds.

1.04 STANDARDS

- A. Concrete work shall comply with requirements of ACI 301 - Specifications for Structural Concrete for Buildings, except as specified.
- B. The Contractor shall familiarize himself with the requirements of ACI 301 and this specification.
- C. The requirements that follow are listed in the sequence of chapter numbers of ACI 301 for ready reference purposes.
- D. Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 MATERIALS

- A. Comply with Chapter 1 of ACI 301.

2.02 MATERIALS FOR CONCRETE

- A. Comply with Chapter 2 of ACI 301 and the following:
 - 1. Cement: Type I or III complying with ASTM C150.
 - 2. Admixtures:
 - a. Water Reducing Admixture: The admixture shall comply with ASTM C494, Type A, and not contain more chloride ions that are present in municipal drinking water.
 - 1) Eucon WR-75 by Euclid Chemical Co.
 - 2) Pozzolith 200N by Master Builders.
 - 3) Plastocrete 160 by Sika Chemical Corp.
 - 4) Or approved equal
 - b. Water Reducing, Retarding Admixture: The admixture shall comply with ASTM C494, Type D, and not contain more chloride ions that are present in municipal drinking water.
 - 1) Eucon Retarder-75 by Euclid Chemical Co.
 - 2) Pozzolith 100XR by Master Builders.
 - 3) Plastiment by Sika Chemical Corp.
 - 4) Or approved equal
 - c. High Range Reducing Admixture (Superplasticizer): The admixture shall comply with ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water.
 - 1) Eucon 37 by Euclid Chemical Co.
 - 2) Sikament by Sika Chemical Corp.
 - 3) Or approved equal
 - d. Non-Chloride Accelerator: The admixture shall comply with ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water.
 - 1) Accelguard 80 by Euclid Chemical Co.
 - 2) Darex Set Accelerator by W.R. Grace.
 - 3) Or approved equal.

3. Air Entraining Admixture: Complying with ASTM C260.
 4. Calcium Chloride: Calcium chloride or admixture containing more than 0.1 percent chloride ions are not allowed.
- B. Certification: Written compliance to above-mentioned requirements and the chloride ion content will be required from the admixture manufacturer (include admixtures) before mix design review by the Engineer.

2.03 PROPORTIONING

- A. Comply with Chapter 3 of ACI 301 and the following:
1. Strength: Normal weight concrete - see drawings.
 - a. Concrete slab: 28-day compressive strength not less than 4,000 psi and a flexural strength (modulus of rupture) of not less than 650 psi when tested according to "Method of Test for Flexural Strength of concrete (using simple beam with third point loading)", ASTM C78. Include curb or curb and gutters.
 2. Durability:
 - a. Pumped Concrete:
 - 1) Testing shall be completed at the final discharge location after pumping.
 - 2) Testing shall be completed at the truck before pumping.
 - 3) Samples shall include samples for both slump and strength tests.
 - 4) Adding of water to transit mixers/agitators.
 - a) Contractor shall maintain a maximum time limit of 90 minutes on the introduction of water into the cement.
 - b) Only 1 addition of water on the site to bring the mix to the producer's mix slump criteria is allowed.
 - b. Design Mixes:
 - 1) Design mixes for concrete intended to be placed as-is from the truck shall be designed as such.
 - 2) Design mixes for concrete intended to be pumped shall be made on one of the following bases:
 - a) The mix shall be designed as a truly plastic mix by proper proportioning. See ACI 304.2R - Placing Concrete by Pumping Methods for guidelines for a pumpable plastic workable mix. Trial batches shall be made, and without a device to test pumping ability, results of field trials shall be used.
 - b) Water shall not be added at the pump. One addition of water at the truck to meet the design slump (at the truck) is allowed.
 - c) A super plasticizer may be used.
 - c. Concrete required to be air entraining shall contain the "Air Entraining Admixture", and air content shall comply with table 3.4.1 of ACI 301.
 - d. Pumped concrete and concrete with a water/cement ratio less than 0.50 shall contain the "High Range Water Reducing Admixture".
 - e. The "Water Reducing", Type A, or "Water Reducing and Retarding", Type D admixtures complying with ASTM C494 may be used at the option of the Contractor.

- f. Concrete containing the "High Range Water Reducing Admixture" (superplasticizer) shall have a maximum slump of 8 inches unless otherwise directed by the Engineer. The concrete shall be proportioned for a slump of 2 to 3 inches, be verified, then the high range water reducing admixture added to increase the slump to the approved level.
 - g. All other concrete shall be proportioned to have a maximum slump of 5 inches.
- 3. Normal weight concrete shall be air-entrained per ACI.

2.04 FORM WORK – Not Applicable

2.05 REINFORCEMENT

- A. Comply with ACI 301 and Section 03200 - Concrete Reinforcement for the required welded wire fabric.

2.06 JOINTS AND EMBEDDED ITEMS

- A. Comply with ACI 301 and the following:
 - 1. Expansion Joints:
 - a. Premolded joint fillers shall be preformed bituminous type, ASTM D1751 for joints without sealant.
 - b. Premolded joint fillers for joints with sealant and where indicated shall be non-extruding and resilient type of ASTM D1752, compatible with urethane joint sealant compounds.

2.07 PRODUCTION OF CONCRETE

- A. Comply with Chapter 7 of ACI 301 and following:
 - 1. Ready-Mixed Concrete:
 - a. Provide copies of each delivery ticket to the Engineer. Include mix designation on delivery ticket.
 - b. Do not place concrete over 90 minutes old from the time it was batched.

2.08 PLACING

- A. Comply with ACI 301:

2.09 SLABS

- A. Comply with ACI 301 and the following:
 - 1. Finishes: Finishes shall be according to Paragraph 11.8 of ACI 301 except as specified.
 - 2. Maximum allowable tolerances for floor slab.

2.010 CURING AND PROTECTION

- A. Comply with ACI 301 and the following:
 - 1. Preservation of moisture.
 - 2. Curing and Sealing Compound: Super Floor Coat or Super Pliocure by the Euclid Chemical Company or Masterseal 66 by Master Builders or approved equal. The compound shall comply with ASTM C309, Type 1 or Type 1D, 30 percent solids content minimum, and have test data from an

- independent laboratory indicating a maximum moisture loss of 0.030 grams per sq.cm. when applied at a coverage rate of 300 sq.ft. per gallon. Manufacturers certification required.
3. Curing and Hardening Compound: "Eucosil" by the Euclid Chemical Company or "Curetox" by Toch Brothers or approved equal. The compound shall be sodium silicate type.
 4. Apply compounds according to manufacturer's directions.
 5. Submit manufacturer's data.
 6. Application of Curing and Sealing and Curing and Hardening Compound: Apply compound to concrete slabs according to manufacturer's directions and as follows:
 - a. After fresh placed concrete surface has been finished and will not be marred by application, uniformly apply undiluted compound by spray, brush or squeegee without allowing compound to collect in low spots.
 - b. Keep traffic off surface for 24 hours or until surface is completely dry.
 - c. Within 1 week of a date set by the Engineer, thoroughly clean and wash exposed concrete interior floors, then apply a second uniformly applied coat of the specified Curing and Sealing Compound without allowing compound to collect in low spots. Keep traffic off surface for 24-hours following the second coat, or until surface is completely dry.

2.011 TESTING

- A. Comply with ACI 301 and the following:
 1. Testing Agencies: The cost of all concrete cylinder testing services will be by the Contractor
- B. Testing Services:
 1. For strength test of concrete, mold, cure, and test 5 specimens. Test 1 at 3 days, 1 at 7 days, and 3 at 28 days.
 2. Make 1 strength test for each 50 cubic yards or fraction thereof placed in any 1 day.

2.012 EVALUATION AND ACCEPTANCE OF CONCRETE

- A. Comply with ACI 301.

PART 3 - NOT USED.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 3 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 3 Work.

END OF SECTION

SECTION 07900 JOINT SEALERS

PART 1 GENERAL

1.01 SUMMARY

- A. System Description: Joint sealers, fillers, and other related materials compatible with one another, with joint substrate, and other adjacent materials including finishes.

1.02 SUBMITTALS: In accordance with Section 01330.

- A. Shop Drawings: Detail proper joint sealer and backing for the following joints:
1. Vertical and horizontal surfaces at interior locations.

1.03 QUALITY ASSURANCE

- A. Provide single source responsibility for each type of joint materials.

1.04 WARRANTY

- A. Manufacturer shall provide warranties covering joint sealers for 10 years from date of Substantial Completion.
- B. Contractor shall furnish the Board a 2-year written warranty covering quality of construction from applicator.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Joint Sealers:
1. Sika Chemical Corp.
 2. Sonneborn Building Products.
 3. Thiokol/Speciality Chemical Division.
 4. Thoro Systems Products.
 5. Tremco Manufacturing Co.
 6. Or approved equal

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 7 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay item for Division 7 Work.
- C. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 7 Work.

END OF SECTION

SECTION 08110 STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Steel doors and frames including necessary accessories.
- B. Related Sections:
 - 1. 07900 - Joint Sealers.
 - 2. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
 - 3. 09900 - Painting.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A366-96 Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
 - 2. A653/A-96 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 3. A924/A-96a Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- B. Factory Mutual (FM), latest edition.
- C. National Builders Hardware Association - "Recommended Locations for Builders", latest edition.
- D. Steel Door Institute (SDI), latest editions.
 - 1. SDI 100 Standard Steel Doors and Frames, latest edition.
 - 2. SDI 105 Recommended Erection Instructions for Steel Frames.
 - 3. SDI 107 Hardware on Steel Doors (reinforcement application).
- E. Underwriters Laboratories (UL), latest edition.
- F. National Fire Protection Association (NFPA)
 - 1. NFPA 101 Life Safety Code.
- G. Florida Building Code (FBC).
- H. Americans with Disabilities Act and Accessibility Guidelines (ADA).
- I. American National Standards Institute (ANSI):
 - 1. A250.4-1994 Test Procedure and acceptance criteria for physical endurance, steel doors and frames.
 - 2. A224.1-1980 Test Procedure and acceptance criteria for prime painted steel surfaces for steel doors and frames.
- J. Warnock Hersey International (WHI), Division of Inchcape Testing Services.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified product data including manufacturer's specifications and installation instructions before starting work, and any information necessary to indicate compliance to these specifications.
- B. Shop Drawings:
 - 1. Indicate manufacturer's model number, door and frame elevations and sections, materials, gauges and finishes, fabrication and erection details, as well as location of finish hardware by dimension. Do not proceed with any fabrication until all details are approved.
- C. Upon request, submit nonreturnable samples necessary to be evaluated for construction compliance.

1.04 QUALITY ASSURANCE

- A. Provide doors and frames complying with SDI 100 and as specified.
- B. The DTPW reserves the right to cut open, at no additional cost, a random door to verify construction and reinforcements for compliance with accepted manufacturer's shop drawings. Non-Compliance will be grounds for removal and replacement of installed door at no expense to the DTPW.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver steel doors and frames cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.
- B. Inspect steel doors and frames upon delivery for damage. Minor damage may be repaired if refinished items are equal in all respects to new work and acceptable to the Engineer. Remove and replace damaged items as directed.
- C. Store doors and frames under cover. Place units on minimum 4-inch-high wood blocking. Avoid use of non-vented plastic or canvas shelters that could create a humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.
- D. Deliver all doors and frames to the jobsite in a timely manner to not delay progress of other trades.

1.06 WARRANTY

- A. Hollow metal doors and frames shall be supplied with a one-year warranty against defects in materials and construction.
- B. Warranty shall begin on date of substantial completion of the project.

1.07 DEFINITIONS

- A. Areas subject to wet mopping include assembly rooms where food may be consumed, restroom areas (toilets, locker/showers), custodial, and other similar spaces with hard or resilient flooring.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Steel Doors and Frames:

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1. Ceco Corporation, Door Division, Carol Stream, IL.
2. Curries Company, Mason City, IA.
3. Firedoor Corporation, Miami, FL.
4. Quality Engineered Products Co., Inc., Tampa, FL.
5. Republic Builders Products, Pembroke Park, FL.
6. Or approved equal

2.02 DOOR FRAMES

- A. Fabricate interior frames to profiles indicated of 16 gage hot-dip zinc-iron alloy coated sheet steel, A366, with A60 coating designation according to ASTM A924 and ASTM A653 0.50 oz. zinc per sq.ft. total both sides. Steel shall be of commercial quality, stretcher leveled flatness.
- B. Frames: Fully welded with mitered or butted head and jamb members with integral stops and with combination buck and trim as shown.
 1. Corners shall have continuous flush and smooth welds without dishing.
 2. Sanitary or hospital type stops shall have 6-inch-high cutoffs with 45-degree caps.
- C. Hardware Reinforcements and Preparations:
 1. Frames shall be mortised, reinforced, and drilled/ tapped for mortised hardware according to approved finish hardware schedule and templates by hardware supplier.
 - a. Drilling and tapping for surface applied hardware shall be done in the field.
 - b. Locate finish hardware according to "Recommended Locations for Builder's Hardware" published by National Builders Hardware Association, or as otherwise directed by the Engineer.
 2. Butt (Hinge) Reinforcing:
 - a. Steel plate 3/16" thick by 1-1/4" minimum to 1-1/2" maximum by 10 inches long, offset as required to have faces of butts flush with doorframe edge and secured by not less than 6 spot welds.
 3. Strike Reinforcement: Offset clips of 12 gage steel, 1-1/4" x 4-7/8" long.
 4. Closer Shoe Reinforcing for Parallel Arm:
 - a. 12 gage steel plates (minimum 20" long x 1-3/4" wide) at bottom of doorstop located next to door rabbet on hinge.
 - b. Provide styrofoam or treated wood over plates to allow closer foot screws to seat without interference from grout fill.
- D. Silencer (Mute) Provisions: Punch frames to receive silencers on strike jamb.
- E. Center Hardware Mullions, Removable: Grout filled and fabricated with only one thickness of metal occurring at point of silencer punch-outs, 2" x 3", 11 gage hardware mullions by exit device manufacturer.
- F. Grout:

1. Grout Guards:
 - a. Provide 26 gage sheet metal covers welded to the back of frames at hinges, lock, bolts, tapped reinforcements at hardware and silencer locations.
 - b. At Silencer locations, furnish suitable removable plugs in holes to keep grout free.
2. Coatings:
 - a. Provide full coverage at frame interior before grouting with corrosion inhibiting bituminous coating.
3. Grout at Frames:
 - a. Grout fill doorframes at metal stud walls.
 - b. Grout shall be a mortar mix complying with ASTM C270, Type S-1800 psi minimum.
- G. Jamb Anchors: Provide according to frame manufacturer's recommendations for attachment to metal stud system as shown on drawings to allow grout fill.
- H. Floor Anchors: Provide 14 gage galvanized sheet steel angle shaped anchors for each jamb extending to the floor, punched for not less than two 1/4" diameter bolts.
- I. Spreaders: Provide frames with temporary steel spreader bars tack welded to jambs to maintain full rigidity and proper alignment during installation.

2.03 HOLLOW METAL DOORS

- A. Fabricate interior doors to profiles indicated of 16 gage hot-dip zinc-iron alloy coated sheet steel, A366, with A60 coating designation according to ASTM A924 and ASTM A653 0.50 oz. zinc per sq. ft. total both sides. Steel shall be of commercial quality, stretcher leveled flatness.
- B. Types: Flush, seamless hollow construction with louvers or vision cutouts as shown or specified.
- C. Sizes and Thickness: Sizes shall be as indicated and with 1-3/4" thickness unless otherwise specified or shown.
 1. Provide undercuts where indicated for ventilation.
- D. Door Perimeters:
 1. Stile Edges: Bevel for single acting doors shall be 1/8" in 2 inches.
 2. Reinforcing: Refer to the Drawings
 3. Top and Bottom Channels.
 - a. Not less than 16 gage A60 zinc coated steel channels-flush or inverted.
 - b. Welded to the face sheets.
- E. Doors:
 1. Classification: SDI Grade III - Model 2, 16-gage, seamless, and steel stiffened with required reinforcement and as shown on Drawings.
 2. Doors shall have minimum 20-gage, continuous one-piece, vertical steel stiffeners spaced not to exceed 6 inches apart and welded at 6 inches on center to face skin.

3. Lock Rail shall be one-piece, full height minimum 16-gage channel.
 4. Hinge Rail Reinforcement Manufacturer's Option:
 - a. One-piece, full height, 12-gage channel formed, and tapped for hinges.
 - b. One-piece, full height, minimum 16-gage channel formed and with minimum 3/16" thick steel by minimum 8" long at each hinge.
 5. Cylindrical Lock Reinforcement: Minimum 16-gage standard hardware lock box.
 6. All spaces between stiffeners shall be insulated with fiberglass or mineral insulation.
 7. Door closer reinforcement shall be minimum 12-gage channel or box, welded to top channel. Bottom of reinforcement shall be a minimum of 5-3/4" from top of door, by width of door.
 8. Astragals: Flat security type or "Z" as indicated in drawings or specifications.
 9. All doors shall comply with ANSI A250.4-1994 Level "A" criteria and be tested to 1,000,000 operating cycles and 23 twist tests.
 - a. Certification of Level "A" doors shall be submitted with approval drawings by the distributor.
 - b. Do not bid or supply any type or gage of door not having been tested and passed this criterion.
- F. Core material.
1. Stiffeners: Provide vertical members spaced not more than 6 inches o.c. with shape standard to manufacturer.
 2. Core Fill: Provide fiberglass or mineral standard to manufacturer.
- G. Hardware Reinforcements and Preparation:
1. Hardware Reinforcement: Comply with manufacturer's drawings.
 2. Hardware preparation.
 - a. Drill for hardware according to accepted finish hardware schedule and templates furnished by hardware supplier.
 - b. Drilling and tapping for surface applied hardware shall be done in the field.
 - c. Locate finish hardware according to recommended locations for hardware as shown on drawings.
 - d. Through bolts for exit devices and locksets shall be by manufacturer.
 - e. Lock reinforcement shall be located as height required for standard and disabled users as shown on drawings and as specified.

2.04 FINISHING AND SHOP PAINT

- A. After Fabrication: Grind exposed weld marks smooth and flush, clean and degrease surfaces, apply metallic filler, sand smooth, and apply shop coat of manufacturer's standard rust-inhibitive metal primer baked on.
- B. Prime Coat: Thoroughly cover all surfaces to provide uniform dry film thickness of not less than 1.0 mil without runs, smears, or bare spots.
- C. Primer Coat: Use manufacturer's standard rust inhibiting primer complying with ANSI A-224.1-1990.

PART 3 EXECUTION

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3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Frames:
 - 1. Install plumb, level, and true to line, secured in openings.
 - 2. Install frames according to accepted shop drawings, manufacturer's printed instructions.
 - 3. Grout fill doorframes at metal stud walls.
- B. Doors:
 - 1. Install in openings plumb, level, and true to line.
 - 2. Apply hardware and adjust to achieve smooth and quiet operation.
 - 3. Apply all door accessories plumb, level and true to line at locations indicated in the drawings.

3.03 ADJUST AND CLEAN

- A. Prime Coat Touch-Up: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective plastic wrappings from prefinished doors.
- C. Fill all dents, holes, etc. with metal filler and sand smooth flush with adjacent surfaces-paint to match.
- D. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition. Provide final adjustment as follows:
 - 1. Door Contact with Silencers: Doors shall strike a minimum of two silencers without binding lock or latch bolts in the strike plate.
 - 2. Head, Strike, and Hinge Jamb Margin: 1/8".
 - 3. Meeting Edge Clearance, Pairs of Doors: $\pm 1/16$ ".
 - 4. Bolts and Screws: Leave tight and firmly seated.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 8 Work.

- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 8 Work.

END OF SECTION

SECTION 09200
METAL STUDS, SUSPENSION CEILINGS, AND PLASTER

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Non-load bearing steel studs.
2. Ceiling suspension system.
3. Portland cement plaster.

B. Related Sections:

1. 08110 - Steel Doors and Frames.
2. 09280 - Cementitious Board
3. 09310 - Floor and Wall Tile
4. 09510 - Acoustical Ceilings
5. 09900 - Painting.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A641-92 Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
2. A653/A-96 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. A924/A-96a Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
4. C150-96 Specification for Portland Cement.
5. C645-96a Specification for Nonstructural Steel Framing Members.
6. C754-96 Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
7. C897-96 Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters.
8. C926-95a Specification for Application of Portland Cement-Based Plaster.

1.03 SUBMITTALS: In accordance with Section 01330

A. Product Data: Submit manufacturer's product data for cementitious materials, lath, metal support components, and accessories.

B. Material Certificates:

1. Submit producer's certificate for each kind of plaster aggregate indicated materials comply with requirements.

1.04 QUALITY ASSURANCE

A. Design Criteria:

1. Coordinate layout and installation of suspension system components for suspended ceilings with other work supported by or penetrating through ceiling.
2. Clear bonding agents are not allowed.
3. Metal corner beads are not allowed. Use plastic trim accessories.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Supports:

1. Dale/Incor.
2. Dietrich.
3. Gold Bond Building Products Division.
4. Unimast Inc. (USG Co.)
5. Or approved equal

B. Accessories:

1. Dietrich.
2. Gold Bond Building Products Div.
3. United States Gypsum Co.
4. Vinyl Corp., Miami, FL.
5. Or approved equal

C. Portland Cement Plaster/Stucco:

1. Rinker Materials Corp.
2. United States Gypsum Co.
3. Or approved equal

D. One Coat Veneer Plaster Over Cement Board: 3/32" Imperial Finish over 5/8" Durock cement board by US Gypsum Co. or approved equal over 20ga. metal framing at 16 inches o.c. maximum or accepted equivalent. UL U407 for 1-hour rating.

2.02 MATERIALS

A. Metal Supports - Suspended and Furred Ceilings:

1. Portland Cement Plaster/Stucco Installation: ASTM C926.
2. Wire for Hangers and Ties: ASTM A641, 16 gage monel.
3. Rod Hangers: Mild steel, zinc, or cadmium coated.
4. Flat Hangers: Mild steel, zinc, or cadmium coated or protected with rust inhibitive paint.
5. Channels:
 - a. Cold-rolled steel, minimum 0.0598" thickness of uncoated base metal, allowable bending stress of 18,000 psi. Protect with rust inhibitive paint or galvanizing complying with ASTM A924 for G60 coating designation.
 - b. Carrying Channels: 1-1/2" deep x 7/16" wide flanges, 475 lbs. per 1,000 feet painted, 508 lbs. per 1,000 feet galvanized.
 - c. Furring Channels: 3/4" deep x 7/16" wide flanges, 300 lbs. per 1,000 feet painted, 316 lbs. per 1,000 feet galvanized.
6. Hanger Anchorage Devices:
 - a. Screws, cast-in-place concrete inserts, or other devices appropriate for anchorage to the form of structural framing indicated and whose suitability for use intended has been proven through standard construction practices or certified test data.
 - b. Size devices to develop full strength of hanger

minimum 3 times calculated hanger loading, except size direct pullout concrete inserts for 5 x calculated hanger loading.

B. Steel Studs and Runners/Tracks:

1. Non-Load (Axial) Bearing Studs and Runners:

- a. ASTM C645 and complying with following requirements for minimum thickness of uncoated base metal and other characteristics:
- b. Stud Thickness: 0.0359" (20 ga.), unless otherwise indicated.
- c. Stud Depth: As indicated on the drawings.

C. Vertical Metal Furring:

1. Channel Furring and Braces:

- a. Cold-rolled steel, minimum 0.0598" thickness of uncoated base metal.
- b. Allowable Bending Stress: 18,000 psi.
- c. Protected with rust inhibitive paint finish or galvanizing.
- d. 3/4" deep x 7/16" wide flanges.
- e. 300 lbs. per 1,000 feet with painted finish.
- f. 316 lbs. per 1,000 feet with galvanized finish.

2. Z-Furring Member:

- a. Manufacturer's standard screw-type zee-shaped furring members formed from zinc-coated steel sheet.
- b. Minimum 0.0179" uncoated base metal thickness, complying with ASTM A924, Coating G60.
- c. Design for mechanical attachment of insulation boards or blankets to monolithic concrete and masonry walls.

3. Furring Brackets: Serrated-arm type, minimum 0.0329" thickness of base (uncoated) metal, adjustable from 1/4" to 2-1/4" wall clearance for channel furring.

D. Portland Cement Plaster Materials:

1. Base (Skim) Coat Cements: Portland Cement, ASTM C150, Type I or III.
2. Sand Aggregate - Base Coats: ASTM C897.
3. Fiber - Base Coat:
 - a. Alkaline-resistant glass fibers, 1/2" long, free of contaminants, manufactured for use in Portland cement plaster.
 - b. Product: Dur-O-Fiber AR Glass by Dur-O-Wal, Inc. or approved equal.

E. Miscellaneous Materials:

1. Water for Mixing and Finishing Plaster: potable, free of substances capable of affecting plaster set or of damaging plaster, or accessories.
2. Bonding Agent - Portland cement: ASTM C932.

2.03 MIXES

A. Portland Cement Plaster Mixes and Compositions - Base (Skim) Coat:

1. Comply with ASTM C926.
2. Base Coat:
 - a. Proportion materials for respective base coats in parts by volume for cementitious materials and in parts by volume per sum of cementitious materials for aggregates.
 - b. Adjust mix proportions below within limits specified to attain workability.
 - c. 1-part Portland cement, 2-1/2 to 4 parts sand.

B. Mixing: Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Ceiling Suspension Systems:

1. Preparation and Coordination:

- a. Coordinate installation of ceiling suspension system with existing overhead structural systems to ensure structural anchorage provisions have been installed to receive ceiling hangers to allow development of their full strength and at spacings required to support ceiling.
- b. Powder activated fasteners are not allowed during normal business work hours of the facility.

2. Hanger: Attach hangers to structure above ceiling to comply with Metal Lath/Steel Framing Association (ML/SFA) Specifications for Metal Lath and Furring and with referenced standards.

3. Ceiling Suspension System:

- a. Install components of sizes and spacings indicated but not in smaller sizes or greater spacings than required by installation standards.
- b. Wire Hangers: Space maximum 48 inches o.c. parallel with, and maximum 36 inches perpendicular to, direction of carrying channels, unless otherwise indicated, and within 6 inches of carrying channel ends.
- c. Carrying Channels: Space carrying channels maximum 36 inches o.c. with 48 inches o.c. hanger spacing.

B. Steel Stud Wall/Partition Support System:

1. Install components for steel stud wall/partition support systems to comply with directions of steel stud manufacturer for application indicated.
2. Non-Load (axial) Bearing Stud Systems: Comply with ASTM C754.
3. Extend studs to structure above and attach to existing structural components.

C. Portland Cement Plaster Application:

1. Apply Portland cement plaster materials, compositions, and mixes to comply with ASTM C926.
2. Skim Coat: Floated finish unless otherwise indicated.
3. Moist cure Portland cement plaster skim coat to comply with ASTM C926.
4. Sequence plaster application with installation and protection of other work, so neither will be damaged by installation of other.

3.02 ADJUSTING, CLEANING, AND PROTECTION

A. Cutting and Patching:

1. Cut, patch, point-up, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections.
2. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dryouts, efflorescence, sweat-out and similar defect, and where bond to substrate has failed.

B. Cleaning:

1. Remove temporary protection and enclosure of other work.
2. Promptly remove plaster from door frames, windows, and other surfaces that are not to be plastered.
3. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering work.
4. When plastering is completed, remove unused materials, containers, and equipment, and clean floors of plaster debris.

- C. Protection: Provide final protection and maintain conditions, in manner suitable to Installer, that ensures plaster work being without damage or deterioration at time of Substantial Completion.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract lump sum price under Alternate #2-Pay Item for Division 9 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09280 CEMENTITIOUS BOARD

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 09200 -Metal Studs, Lath, Suspension Ceiling, and Plaster.
2. 09310 – Floor and Wall Tile.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C 473 Test Methods for Physical Testing of Cement Panel Products.
2. C 1325 Specification for Fiber-Mat Reinforced Non-Asbestos Cement Interior Substrate Sheets.
3. C 1002 Specification for Steel Drill screws for the Application of Cement Panel Products or Metal Plaster Bases.

1.03 SUBMITTALS

- A. Before starting work, provide product data and samples as directed by the Engineer.

1.04 QUALITY ASSURANCE

- A. Finish work shall be subject to inspection using a lighting level of not less than 50-foot candles at the surface of the cement board. Surfaces judged to be unsuitable for finishing, even if finish has been applied, shall be rejected.
- B. The Engineer will direct repair or replacement of rejected work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in original unopened packages. Provide protection from damage and exposure to the elements.
- B. Prevent damage to edges and surfaces. Do not bend or damage metal corner beads and trim.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements: Proceed with installation of cement board materials only if building is weather tight.
1. Maintain temperature in areas receiving cement board materials between 55 degrees and 90 degrees F. during and after installation and provide adequate ventilation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Cement board:
 - 1. National Gypsum Company-Permabase.
 - 2. United States Cement Company (USG)-Durock.
 - 3. Or approved equal
- B. Accessories shall be by cement board manufacturer.

2.02 MATERIALS

- A. Cement board:
 - 1. Cement Board: ASTM C36, tapered edge, 5/8" thick x 48 inches wide x longest stock length, with vinyl-coated woven glass fiber embedded on both surfaces, both edges wrapped.
 - 2. Compressive strength: ASTM D2394-min. 2,250psi.
 - 3. Water absorption: ASTM C473-max 8% after 24hrs of testing
- B. Fasteners: Drill point screws (No. 8), wafer or bugle head, corrosion resistant, or accepted equivalent, with lengths as specified by manufacturer.
- C. Joint Treatment: Reinforcing tape, taping, or embedding and topping materials as recommended and manufactured by cement board manufacturer.
- D. Joint Reinforcement, Fasteners, Adhesives, and Grout: According to manufacturer's recommendation.
- E. Accessories:
 - 1. Use internal and external corner beads, casing beads, and control joints, to provide a finished job with true, straight edges against adjoining work.
 - 2. Provide expansion joints as required for conditions and according to manufacturer's recommendations.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Place panels with long dimension parallel to the framing members and abutting edges occurring over stud flanges.
 - 1. Fit ends and edges closely (maximum 1/16" between boards), but not forced together.
 - 2. Stagger end joints in successive courses. Place end or edge joints on opposite sides of framing in different locations to avoid creating joints of panels ending on the same stud.
 - 3. Panel edge above floor shall be 1/2" clear.
- B. Panel Attachment:
 - 1. Drive fasteners in field of panel first, working toward ends and edges.
 - 2. Hold panel in firm contact with framing while driving fasteners.

3. Install perimeter fasteners at 3/8" from ends or edges and spaced a maximum of 8 inches on center.
 4. Attach cement panels in field of panel with fasteners spaced a maximum of 12 inches on center.
- C. Accessories: Apply accessories according to manufacturer's instructions. Sand after application of final joint treatment coat and leave surface smooth and ready for work by other trades.
1. Treat metal accessories with not less than 2 coats of joint compound in the same manner as joints. Feather joint compound out from 8 to 10 inches on both sides of corners.
 2. Apply metal trim at intersections where cement board abuts other materials, unless detailed otherwise, and at all other locations indicated. Neatly fit and secure corner beads over external corners.
 3. Install expansion joints where detailed or per manufacturer recommendation.
 4. Install control joints where detailed or per manufacturer recommendation.
- D. Joint Treatment Application:
1. Taping and Embedding:
 - a. Apply taping or embedding compound in a thin, uniform layer to joints and angles.
 - b. Immediately apply reinforcing tape centered over joint or angle and firmly seat into compound. Sufficient compound (approximately 1/64" to 1/32") shall remain under tape to provide proper bond.
 - c. Immediately follow with a thin skim coat to embed tape but not to function as a second coat.
 - d. Fold and embed tape properly at interior angles to provide a true angle.
 - e. Tape or embedding coat shall be thoroughly dry before application of second coat.
 2. Second Coat Embedding:
 - a. Apply a second coat of joint compound over embedding coat, filling panel taper flush with surface.
 - b. Cover tape and feather out at least 2 inches on each side beyond first coat.
 - c. On joints with no taper, cover tape and feather out at least 4 inches on either side of tape.
 - d. Allow second coat to dry thoroughly before application of finish coat.
 3. Topping:
 - a. Spread a finish coat evenly over and extend at least 2 inches on each side beyond second coat on joints and feather to a smooth uniform finish.
 - b. Over tapered edges, do not allow finished joint to protrude beyond plane of surface.
 - c. Apply finish coat to cover tape and taping compound at taped angles and provide a true angle.
 - d. Where necessary, sand between coats and following final application of compound to provide a smooth surface ready for painting.
- E. Finishing Fasteners:
1. Apply a taping or all-purpose type compound to fastener depressions as the first coat.
 2. Follow with minimum of 2 additional coats of topping compound, leaving depressions level with plane of surface.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09310 FLOOR AND WALL TILE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03300 -Cast-In-Place Concrete.
2. 07900 -Joint Sealers.
3. 09200 -Metal Studs, Lath, Suspension Ceiling, and Plaster.
4. 09280 -Cementitious Board.
5. 15421 -Drains and Cleanouts.
6. 15440 -Plumbing Fixtures, Trim, and Supports.

1.02 REFERENCES

A. American National Standards Institute (ANSI) latest edition:

1. A108.1 Installation of Glazed Wall Tile, Ceramic Mosaic Tile, Quarry and Paver Tile with Portland Cement Mortar.
2. A108.5-85 Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
3. A108.10-85 Installation of Grout in Tilework.
4. A118.1-85 Dry-Set Portland Cement Mortar.
5. A118.6-85 Ceramic Tile Grouts.
6. A137.1-80 Specifications for Ceramic Tile.

1.03 SUBMITTALS: In accordance with Section 01330.

A. Product Data: Submit material specifications, printed installation and mixing instructions, and maintenance recommendations for ceramic tile and accessories.

B. Samples: Submit the following:

1. Panels: 12 inches square, of each type, color, and pattern of tile required.
2. Tile manufacturer's full color and pattern range for each type of tile required.
3. Grout manufacturer's full color range samples.
4. Each type of trim shape and special shape required, if requested.

1.04 QUALITY ASSURANCE

A. Tile shall conform to requirements of TCA 137.1, Standard Grade.

1.05 MAINTENANCE

A. Maintenance Materials: At the job site, provide 2 unopened boxes of each color and type of tile installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Porcelain Tile:
 - 1. Everstone International Company (Durastone), distributed by Dal-Tile (Porcelain tile Basis of Design).
 - 2. Or approved equal.

2.02 MATERIALS

- A. Slip-Resistant Porcelain Mosaic Floor Tile (Showers): 2 inches x 2 inches x 1/4" thick, unglazed, plain face, cushioned edges, having a minimum Dynamic Coefficient of Friction of 0.67, attained without use of abrasive impregnation.
- B. Porcelain Floor and Wall Tile:
 - 1. Floor Tile: Nominal 12" x 12" x 5/16" thick, matte, cushioned edges having a minimum Dynamic Coefficient of Friction of 0.42, attained without use of abrasive impregnation.
 - 2. Wall Tile: Nominal 12" x 24" x 5/16" thick (24" dimension in horizontal plane), matte, cushioned edges having a minimum Dynamic Coefficient of Friction of 0.42, attained without use of abrasive impregnation

Color and Pattern:

 - 3. As shown on the drawings (colors and patterns)
 - 4. Where colors or patterns are not shown, tile equivalent in cost to standard solid colors shall be bid upon, assuming not more than 10 colors.
 - 5. Engineer's range of color selection shall not be limited to colors stocked locally but by entire color line of specific manufacturer.
- C. Trim and Special Shapes: Provide the following trim units and special shapes of same material and finish as the wall tile:
 - 1. Base: Cove base units, width and height to match wall tile.
 - 2. External Corners: Bullnose shapes with round out base and top trim special shapes.
 - 3. Internal Corners: Field-buttet square with square in-corner base and top trim special shapes.
- D. Setting Materials: Dry-Set pre-sanded mortar according to ANSI A118.1-1985 and by manufacturer licensed by the Tile Council of America.
- E. Mortar Additive: Laticrete 3701 latex additive or approved equal.
- F. Grout: Certified by the tile manufacturer as suitable for type of tile and application.
 - 1. Dry-Set Grout: A mixture of Portland cement and additives furnished by a firm licensed to manufacture products and tested and approved by the Tile Council of America. Colors as selected by the Engineer.
 - 2. Commercial Latex-Portland Cement Grout: A mixture of Portland cement and mortar additive conforming to ANSI A118.6.
 - a. Color: Natural mortar color.
- G. Tile Cleaner: Biscayne Chemical Laboratories, Inc., "Blue Boy" or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Tile Setting Requirements:

1. Examine surfaces for foreign matter, unevenness, flatness, plumb planes, and damage. Make repairs if necessary to substrate to be in the proper condition to receive tile. Verify waterproofing at shower receptors will not affect tile installation adversely.
2. Construct sloped mortar beds using mortar consisting of 1-part Portland cement, 4 parts damp sand by volume, and gauged with mortar additive according to ANSI A108.5.
3. Secure tile firmly in place with uniform joints well filled and lines straight and true.
 - a. Bring finished surfaces to true and flat planes, plumb on walls.
 - b. Completed work shall be free of cracked or broken tiles.
4. Form intersections and returns perfectly and perform cutting and drilling of tile neatly without marring tile face.
 - a. Carefully grind and joint cut edges of tile against any trim, finish, and built-in fixtures.
 - b. Fit tile close around plumbing pipes, fixtures and fittings so usual plates, collars, or coverings will overlap tile.
5. Where borders, lines, patterns, panels, or other effects are a part of the work, properly space tiles and accurately reproduce required designs.
6. Where acoustic lay-in tile ceilings occur, install wall tile to a line 2 to 4 inches above plane of exposed surface of ceiling.
7. Layout tile work on floors or walls so, wherever possible, no tiles less than half full size will occur unless indicated.
8. Movement Joints:
 - a. Provide control, isolation, expansion, and contraction joints according to movement joint designs and install according the TCA Handbook for Ceramic or Porcelain Tile Installation.
 - b. Locate movement joints:
 - 1) At 24 to 36 feet in each direction.
 - 2) At tile abutting perimeter walls, dissimilar floors, pipes, and columns.
 - 3) Over cold joints and saw-cuts in the slab.
 - c. Extend joints through the setting bed to the concrete substrate equal in width to the tile grout joints.
 - d. Provide approved solid neoprene filler and approved polysulfide caulking.
9. Where tile abuts restraining surfaces, cut tile to match contour of that surface.
10. At shower receptors continue slip-resistant mosaic floor tile up and over curbs to meet floor tile in adjoining areas using special shapes where necessary.
11. At floor drains, slope floor tile from high points at walls around perimeter of rooms down to floor drains.

B. Setting Tile with Dry-Set Mortar:

1. Concrete Substrate:

- a. Set tile according to applicable requirements of ANSI A108.5.
 - b. Set tile with dry-set mortar, 3/32" to 1/8" thick.
 - c. Provide latex mortar additive in setting mortar per manufacturer's directions.
- C. Grouting: Comply with ANSI A108.10.
 - 1. Porcelain mosaic floor tile: Use commercial latex Portland cement grout.
 - 2. Porcelain floor and wall tile: Use dry-set grout.
 - 3. Force grout into joints to fill solid.
 - a. Remove and re-grout discolored joints. Fill voids in joint grout.
- D. Thresholds: Set where indicated or at dissimilar floor finishes with the same material used for setting mosaic floor tile or as indicated in the drawings.
- E. Tolerances: Finished installation shall be trued to a tolerance of $\pm 1/8"$ in a 10-foot radius and $+1/16"$ within any given running foot.

3.02 CLEANING

- A. Apply tile cleaner according to cleaner manufacturer's printed instructions.
- B. Leave finished installation clean and free of cracked, chipped, broken, and unbonded or otherwise defective tile.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- C. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09510 ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
1. 09200 -Metal Studs, Suspension Ceilings and Plaster.
 2. 09310 – Floor and Wall Tile.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. A653-96 Standard Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-iron Alloy-coated (Galvannealed) by the Hot-dip Process.
 2. C635-95 Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 3. C636-96 Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 4. E1264-96 Classification for Acoustical Ceiling Products.
- B. Ceiling and Interior Systems Contractors Association (CISCA) publication (current edition): Acoustical Ceilings - Use and Practice.
- C. Underwriters Laboratories (UL) fire rating listings and classifications.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified product data, including properties of lay-in panels, fire tests, details of suspension grid system, and installation instructions for review before starting work.
- B. Shop Drawings: As may be required by the Engineer. Coordinate grid erection drawings with lighting fixtures, air-conditioning outlets / inlets, access panels, sound system, and other openings and irregularities.
- C. Samples: Submit identified samples of each of the following for review and selection:
1. Exposed grid suspension system with angle.
 2. Acoustical lay-in panel, 12 inches square piece.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Acoustical Lay-in Panels, Mineral Fiber Type:
1. 24 inches x 24 inches.
 2. Complying with ASTM E1264, Class A, Type 3, Form 2, square edged.
 3. Nominal Thickness: 5/8".
 4. Finish: Factory applied, washable white. At no additional cost to the Owner, up to two (2) alternate

- colors (to use as accent tiles) may be selected by the Engineer.
5. Manufacturers:
- a. Directional Panels:
 - 1) Armstrong: Fissured #705 lay-in panels, angled tegular.
 - 2) Equivalent from Celotex.
 - 3) Equivalent from USG Interiors.
 - 4) Or approved equal
 - b. Non-directional Panels:
 - 1) Armstrong: Cortega #770 Fissured lay-in panels, angled tegular
 - 2) Equivalent from Celotex.
 - 3) Equivalent from USG Interiors.
 - 4) Or approved equal
- B. Hangers: 12 gage (0.109" diameter) annealed steel wire, galvanized.
- C. Exposed Suspension Grids for Acoustical Lay-in Panels:
- 1. 2 feet x 2 feet grid pattern with steel caps for exposed 15/16" grid tee and angle members complying with ASTM C635, zinc-coated or hot-dipped galvanized complying with A653, factory painted steel parts with factory applied white baked enamel or polyester finish. At no additional cost to the Owner, up to two (2) alternate colors may be selected by the Engineer.
 - 2. Manufacturers:
 - a. Armstrong.
 - b. Celotex.
 - c. USG Interiors, Inc. (Donn).
 - d. Or approved equal

PART 3 EXECUTION

3.01 INSTALLATION

- A. Powder activated fasteners are not allowed during normal business hours of the building.
- 1. Coordinate and provide inserts, anchors, bolts, hangers, or other means to support ceilings suspended from structure.
- B. Install specified suspension system and acoustical lay-in panels according to ASTM C636 and Cisca Publication "Acoustical Ceilings - Use and Practice", and applicable manufacturer's printed instructions.
- 1. Complete partitions indicated to be extended to overhead construction with finishes applied before installation of ceilings abutting such partitions.
 - 2. Provide one hanger minimum for each 16 square feet of ceiling.
 - a. Locate hanger wire not more than 1 foot away from main runners resting on wall trim.

C. Acoustical Lay-in Panels:

1. Fit acoustical lay-in panels to grid accurately, without dented, broken, cracked, chipped, or soiled surfaces.
2. A cut panel shall be a size that will not expose an edge when the panel is slid to the opposite side.

D. Light Fixtures:

1. Fit acoustical lay-in panels accurately around surface mounted and stem mounted electrical fixture outlets.
2. Adequately support tees supporting light fixtures by hanger wires so grid is level after light fixture installation.
 - a. Provide a hanger wire within 3 inches of each recessed lay-in light fixture corner.

E. Alignment:

1. Align suspension members for true level surfaces and straight lines. Run joints and exposed grid members parallel to the room axis in both directions.
2. Install exposed suspension grids per installers accepted grid layout drawings, properly coordinated with air conditioning and electrical trades.

F. Border Balance:

1. Balance border areas to avoid acoustical units less than 1/2 unit wide.

3.02 ADJUSTING AND CLEANING

- A. Replace dirty or discolored acoustical panel surfaces following erection and leave free from defects.
- B. Remove damaged or improperly installed acoustical panels and replace.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- B. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 9 Work.

END OF SECTION

SECTION 09900 PAINTING OF UNPAINTED SURFACES

PART 1 GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Field painting of exposed and covered pipes, ducts (including color coding), hangers, and walls as indicated in the drawings.
 - 2. Six-year warranty for labor and materials from the paint manufacturer.
- B. Related Section:
 - 1. 07900 - Joint Sealers.
 - 2. 09901 – Painting of Previously Painted Surfaces

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. D3359-95a Test Methods for Measuring Adhesion by Tape Test.
 - 2. D3927-87 Standard Guide for State and Institutional Purchasing of Paint.
 - 3. D4262-83(88) pH of Chemically Cleaned or Etched Concrete Surfaces.
- B. OSHA Workers Environmental Conditions.
- C. National Fire Protection Association (NFPA): NFPA 30 - Flammable and Combustible Liquids Code.

1.03 DEFINITIONS

- A. Alkyd: Oil-based paint.
- B. Latex: Water-based paint.
- C. New Work: Surface or area of a surface not previously painted, including areas patched, replaced, or sandblasted causing a painted or unpainted surface or part of a painted or unpainted surface to exist.
- D. Old Work: Surface that has been previously painted (See Section 09901).
- E. Paint: All coating systems materials, including primers, emulsions, enamels, stains, varnishes, sealers and fillers, and other applied materials used as prime, intermediate, or finish coats.
- F. Smooth: A surface free from roughness, ridges, and projections.

1.04 SUBMITTALS: In accordance with Section 01330.

- A. Product Data: Submit Manufacturer Safety Data Sheet (MSDS), manufacturer's technical information, including paint label analysis and application instructions for each material proposed for use.
- B. Samples:

1. Color Chips:
 - a. Before starting work, furnish color chips for surfaces to be painted to the Engineer. Color chips shall comply with approved colors as selected by Engineer.
 - b. Use representative colors when preparing samples for review.
 2. Representative Samples:
 - a. Submit representative samples for review of color and texture only.
 - b. Provide listing of material and application for each coat of each finish sample.
 - c. Provide three samples of each color and material on min. 6" x 6" panels with texture simulating actual finish. Label and identify each by location.
 - d. Resubmit samples as requested by Engineer until acceptable sheen, color, and texture are achieved.
 3. Paint Sample: Provide 4-one-quart containers of each color or type. Label each container with the facility name, project number, name of the Contractor, name of the supplier, designated use, and type of paint in the container.
- C. Warranty:
1. Submit paint manufacturer's proposed 6-year warranty document.
 2. Submit paint manufacturer's proposed program of inspection and approval before and during the Work as required by paint manufacturer to implement the submitted 6-year warranty.
 3. At the end of the paint work, provide to the DTPW, from the authorized paint manufacturer representative, a signed and notarized letter stating that the surfaces painted have met all the conditions for paint adhesion.

1.05 QUALITY ASSURANCE

- A. Qualifications: Paint applicator shall be licensed in the State of Florida or in Miami-Dade County and use state or county-certified journeymen. Provide a legible copy of license and, when applicable, a journeyman's certification attesting to required qualifications.
- B. Certifications:
1. Paint applicator shall provide a certification attesting to having worked on projects similar in scope to this project. Paint applicator not providing such documentation or not having the required experience will be removed from the project and replaced by the Contractor.
- C. Quality assurance issues, including but not limited to, material selection, surface integrity and other tests, surface preparation, painting procedures, workmanship, and warrantability require review and acceptance by Engineer.
- D. Pre-Construction Meeting: At this meeting, the following will be discussed. Attendance by the paint applicator and manufacturer representative is encouraged:
1. Review of proposed materials and compliance with specifications.
 2. Procedures to be followed and methods to be used in painting of new work and repainting of existing surfaces, with special emphasis on testing, repair, and preparation of existing surfaces.
 - a. Discuss and agree to modifications to the procedures established in Part 3 of this section required by the paint manufacturer to uphold the required 6-year warranty. Modifications, if

any, are to be noted in writing by the manufacturer. Provide signed and notarized copies to Engineer and to all other parties present at the preconstruction meeting.

3. Coordination of any mockup requirements of this section and of other related sections.
4. Review of extent, procedures, and schedules for on-site tests, observation, and supervision by Materials Manufacturer's Representative according to requirements of this section and to enable the manufacturer to issue the required guarantees.
5. Review of warranties and guarantees required by the various parties, as specified in this section, in addition to the general guarantee required by Instructions to Bidders and General Conditions and statement by all parties concerned of their agreement or objection to the terms. Such statements shall be recorded in writing as part of the minutes of the meeting, with action suggested or taken to comply with contract requirements.

E. Coordination of Work:

1. Review other sections of the specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates.
2. Upon request from other trades, furnish information or characteristics of finish materials to be provided, to ensure compatible prime coats are used.
3. Phase projects to allow a minimum of 28 days for plaster to cure properly. If painting begins before the 28-day curing period, then a moisture and pH test shall be made according to ASTM D4262 and ASTM D4263. Provide a written record of such test and receive written approval from the Engineer and paint manufacturer.

F. Mockups:

1. Provide an in-place mockup of each wall surface condition, allowing space for a minimum of 50 sq. Ft. for each color of paint to be used for project wall surfaces. Construct and cure, for a minimum of 28 days, the mockup walls in the same manner as required for the permanent walls.
2. After coordinating and receiving approval for application onto designated mockup sample walls, apply the approved paint samples.
3. Duplicate painted finishes of prepared samples on actual interior wall surfaces.
4. Provide full coat finish samples on at least 50 sq. Ft. of surface, as directed, until required sheen, color, and texture are obtained. Simulate finished lighting conditions for review of in-place Work.
 - a. Final acceptance of colors will be from samples applied on mockup.
5. Engineer may test the mockup sample or selected painted surface according to ASTM D3359. If test fails, retesting shall be at the Contractor's expense.

G. Surfaces to be Painted:

1. Except where natural finish of material is specifically noted as surface not to be painted, paint exposed surfaces with colors as selected by the Engineer.
2. Where items or surfaces are not specifically mentioned, paint same as similar adjacent materials or areas.
3. If color or finish is not designated, coordinate with the Engineer for selection.
4. Paint (red), using stencils, identifications and warnings, following text specified in other sections.
5. Paint (yellow), door-swing arcs and warning lines where required.

H. The following categories of Work are not included as part of field-applied finish work, unless otherwise specified:

1. Pre-Finished Items: Do not include painting of factory-finished or installer-finished specified items

such as, but not limited to, pre-finished partition systems, acoustic materials, architectural woodwork and casework, attached signs, finished mechanical, electrical equipment, light fixtures and building systems components (Fire Alarm, Security, Wifi, etc.).

2. Concealed Surfaces: Painting is not required, unless noted otherwise on the Drawings, of surfaces such as walls or ceilings in concealed and areas of limited access.
 3. Finished Metal Surfaces: Painting is not required at metal surfaces of anodized or enameled aluminum, stainless steel, chromium plate, bare copper, bare bronze, and metals of similar finish. Paint visible galvanized steel and mill-finish aluminum surfaces.
 4. Operating Parts: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts are not required to be painted.
- I. Do not paint over code-required labels such as Underwriters Laboratories (UL) and Factory Mutual (FM), name, equipment identification, performance rating, or nomenclature plates, or at piping or circuit identifiers.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in original, new, and unopened packages and containers bearing manufacturer's name and label, and following information:
1. Name or title of material.
 2. Federal Specification number.
 3. Manufacturer's stock number and date of manufacture.
 4. Manufacturer's name.
 5. Contents by volume, for major pigment and vehicle constituents.
 6. Application instructions.
 7. Color name and number.
- B. Storage:
1. Store materials not in actual use in tightly covered containers.
 2. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
 3. Protect from freezing or extreme heat, 95 degrees F. or above.
 4. Keep storage area neat and orderly.
 5. Remove from the project site contaminated products from oil-based products and their by-products by the end of each working day.

1.07 PROJECT CONDITIONS

- A. Environmental Requirements:
1. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50- and 90-degrees F., unless otherwise allowed by paint manufacturer's printed instructions.
 2. Do not apply paint when relative humidity exceeds 85 percent, or to damp or wet surfaces, unless otherwise allowed by paint manufacturer's printed instructions.
 3. Do not apply paint in areas that are not broom clean and free of dust and debris.
 4. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.
- B. Workers Environmental Conditions:
1. Comply with the standards established in OSHA Workers Environmental Conditions.

2. Take precautions to ensure that personnel and work areas are adequately protected from fire and health hazards resulting from handling, mixing, and application of paints.
3. Illumination: Provide lighting equal to the permanent lighting planned for designated space.
4. Ventilation: Provide adequate ventilation to prevent buildup of fumes.

1.08 SEQUENCING AND SCHEDULING

- A. Phase projects to allow a minimum of 28 days to properly cure plaster surfaces before the application of paint.
- B. Phase the project to allow reasonable time for the inspection and written approval at each phase of the work by the Paint Manufacturer's Representative.

1.09 WARRANTY

- A. Provide a written guarantee, co-signed jointly and severally by the Painting Subcontractor and Materials Manufacturers, against cracking, peeling, flaking, chalking, and mildew on interior painted surfaces, and additionally against erosion and unreasonable fading on exterior surfaces, for 6 years; agreeing to repair and repaint surfaces affected by such defects, at no cost to the DTPW including necessary removal or protection of other work, without limit, within 30 days after notification by the DTPW, and to perform such work based on the provisions of this section, including extension of the guarantee to cover new work.

1.010 MAINTENANCE

- A. Provide two 5-gallon containers, properly labeled and sealed, of each type and color of finished paint used on the project. If less than 10 gallons of a particular type and color was used, then provide 1 one-gallon container.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Benjamin Moore
- B. Sherwin-Williams
- C. PPG
- D. Or approved equal

2.02 MATERIALS

- A. Use Latex-based materials for painting of interior finishes.
- B. Primers, Undercoats, Split and Finish Coats: Use materials from same manufacturer when such materials are applied on same surface.
- C. Paints for interior use shall be factory tinted with each stage of coating application (primer, first coat, and finish coat) to be visually distinguishable from the preceding coat until the final coat. The final coat shall match the selected color.
 1. Label each container indicating whether it is primer, first coat, or finish coat.
 2. Label each container with the name and number of the color.
 3. Label each container indicating if it is intended for exterior or interior usage.
- D. Color Selection:

1. Engineer will select colors from samples and materials submitted under Article 1.04.
2. If color is not listed for a specific area or item, Contractor is not relieved of responsibility for providing colors subsequently selected.
3. Color selection made by Engineer is to determine basic color required for surface.
4. Colors with same designation but produced from two or more sources shall match when viewed from distance of 24 inches or more.
5. Final application of colors shall match prepared samples approved by the Engineer.

2.03 INSPECTION

- A. Pre-Construction Inspection: In conjunction with the meeting required in Part 1 of this section, the Painting Subcontractor and the Materials Manufacturer Representative shall conduct on-site inspections and perform tests to determine
 1. Whether the corrective and preparatory work specified below is adequate, excessive, or insufficient to obtain the required performance criteria required in this section and the guarantee.
- B. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- C. Start of painting operations implies contractor's acceptance of the surface conditions and responsibility for required standards of quality and appearance.

2.04 PREPARATORY WORK

- A. Remove electrical outlet and switch cover plates, finish hardware escutcheons and cover plates, air-conditioning registers, and other finished items installed on surfaces to be painted and replace afterwards or provide protection as approved by Engineer. Protect items and surfaces that cannot be removed or that do not interfere with the painting and leave clean and completely free of paint.
- B. Clean surfaces of all dirt, dust, or other contaminants that affect adhesion of paint or appearance of paint. Clean grease and oil from metal surfaces with turpentine or mineral spirits and wipe dry before priming. Wire brush or sand metal surfaces to remove rust and scale. Touch-up factory primed surfaces with compatible factory primers. Schedule the cleaning so that contaminants from the cleaning process will not fall onto the wet painted surfaces.
- C. Fill nail holes, cracks, open joints, and other defects after priming or first coat is dry and before second coat is applied.
- D. Allow all coats to dry thoroughly before applying succeeding coats. Comply with paint manufacturer's recommendations.
- E. Prime finished work, not shop coated, when delivered to the job or as soon as possible after delivery.
- F. Clean and sand surfaces between coats with 150 Fine sandpaper or as recommended by the paint manufacturer.

2.05 APPLICATION

- A. General:
 1. Perform work in a thorough and professional manner in conformance with accepted good practices and requirements of authorities having jurisdiction.
 2. Protect finished materials and areas not to be painted by using drop cloths, masking, or other

- accepted methods.
 - 3. Provide adequate ventilation for proper drying of surfaces before and after painting.
 - 4. Drying Period: Allow each coat to dry thoroughly before succeeding coats are applied. Minimum drying time shall be according to manufacturer's recommendations.
 - 5. Paint Shading: Each coat of paint shall vary sufficiently to easily distinguish it from previous coats of paint, both interior and exterior applications.
 - 6. Observation and Acceptance: As required by paint manufacturer between coats before application of next coat of paint materials.
- B. Apply materials, as they come from manufacturer, to dry surfaces according to manufacturer's directions as printed on container. Any mixing on site requires specific and special approval of the Engineer.
 - C. Apply paint materials to give an even, solid color with each coat. For deep tone finish colors, use deep base primers recommended by manufacturer.
 - D. Apply paint materials by brush, roller, or spray method.
 - 1. Select method best suited to profile, texture, and finish of existing surface, subject to suitability regarding safety and conditions in existing or occupied areas, and subject to approval by paint manufacturer and Engineer.
 - 2. Apply materials evenly, smoothly flowed on and cut in neatly, without runs, sags, wrinkles, shiners, streaks, and brush marks; drying uniformly to color and sheen selected. Make dividing lines that separate colors straight and clean cut.
 - E. Dry Film Thickness:
 - 1. Comply with manufacturer's specifications.
 - 2. Minimum Dry Film Thickness: 5 mils (unless otherwise recommended by paint manufacturer), total finished application. Reduction of minimum thickness due to special coating characteristics or application procedures requires written approval for each case.

2.06 FIELD QUALITY CONTROL

- A. Notify Engineer and material manufacturers' representatives when critical points in the painting and repainting work are reached, to allow timely inspection and approvals. Critical points include during and after the operation, plus other points designated by the Engineer, or material manufacturer representatives:
 - 1. Surface patching and preparation.
 - 2. Sealing of surfaces.
 - 3. Application of primer and transition coats. Adhesion testing of transition coats may be required.
 - 4. Intermediate and finish coats.

2.07 ADJUSTING AND CLEANING

- A. Remove construction debris, material containers, equipment, and other trash resulting from work of project.
- B. Upon completion of work, remove stains and paint spots from floors, wall, woodwork, electric trim, hardware, fixtures, and other items of the work areas.
- C. Dispose oil-based products, their by-products, and waste contaminated by them, in a manner acceptable to DERM (RER).

D. INTERIOR SPACES PAINT SCHEDULE

1. Walls:

1st Coat	Acrylic latex wall primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

2. Walls (Veneer Plaster only)

1st Coat	Alkyd-based penetrating chalky wall primer/sealer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

3. Metal Doors:

1st Coat	Field applied rust inhibitive primer over shop primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

4. Ceilings Not Acoustically Treated:

1st Coat	Acrylic latex primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

E. INTERIOR METALS PAINT SCHEDULE

1. Galvanized Metal: Apply neutralizer and allow to dry thoroughly.

1st Coat	Galvanized metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

2. Metal Sash - Doors and Frames:

1st Coat	Metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

3. Exposed Ferrous Metal:

1st Coat	Rust inhibitive primer.
2nd Coat	Acrylic latex enamel.
3rd Coat	Acrylic latex enamel.

4. Other Metals Not Previously Mentioned:

1st Coat	Rust inhibitive metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).

3rd Coat Acrylic latex enamel (or aluminum paint).

PART 3 MEASUREMENT AND PAYMENT

3.01 MEASUREMENT:

Work under this Section will be separately measured for payment

3.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 09901

PAINTING OF PREVIOUSLY PAINTED SURFACES

PART 1 GENERAL

1.01 SUMMARY:

- A. Section Includes:
 - 1. Repainting existing interior surfaces.
 - 2. Six-year warranty for labor and materials from the paint manufacturer.
- B. Related Section:
 - 1. 07900 - Joint Sealers.
 - 2. 09900 – Painting of Unpainted Surfaces

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. D3359-95a Test Methods for Measuring Adhesion by Tape Test.
 - 2. D3927-87 Standard Guide for State and Institutional Purchasing of Paint.
 - 3. D4262-83(88) pH of Chemically Cleaned or Etched Concrete Surfaces.
 - 4. D4263-83(93) Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- B. OSHA Workers Environmental Conditions.
- C. National Fire Protection Association (NFPA): NFPA 30 - Flammable and Combustible Liquids Code.

1.03 DEFINITIONS

- A. Alkyd: Oil-based paint.
- B. Latex: Water-based paint.
- C. New Work: Surface or area of a surface not previously painted, including areas patched, replaced, or sandblasted causing a painted or unpainted surface or part of a painted or unpainted surface to exist.
- D. Old Work: Surface that has been previously painted.
- E. Paint: All coating systems materials, including primers, emulsions, enamels, stains, varnishes, sealers and fillers, and other applied materials used as prime, intermediate, or finish coats.
- F. Smooth: A surface free from roughness, ridges, and projections.

1.04 SUBMITTALS: In accordance with Section 01330

- A. Product Data: Submit Manufacturer Safety Data Sheet (MSDS), manufacturer's technical information, including paint label analysis and application instructions for each material proposed for use.
- B. Samples:

1. Color Chips:
 - a. Before starting work, furnish color chips for surfaces to be painted to the Engineer. Color chips shall conform to approved colors as selected by the Engineer and from DTPW Colors.
 - b. Use representative colors when preparing samples for review.
 2. Representative Samples:
 - a. Submit representative samples for review of color and texture only.
 - b. Provide listing of material and application for each coat of each finish sample.
 - c. Provide three samples of each color and material on 6" x 18" panels with texture to simulate actual finish. Label and identify each by location.
 - d. Resubmit samples as requested by Engineer until acceptable sheen, color, and texture are achieved.
 3. Paint Sample: Provide 4-one-quart containers of each color or type. Label each container with the school name, project number, name of the Contractor, name of the supplier, designated use, and type of paint in the container.
- C. Warranty:
1. Submit paint manufacturer's proposed 6-year warranty document.
 2. Submit paint manufacturer's proposed program of inspection and approval before and during the Work as required by paint manufacturer to implement the submitted 6-year warranty.
 3. At the end of the paint work, provide to the DTPW, from the authorized paint manufacturer representative, a signed and notarized letter stating that the surfaces painted have met all the conditions for paint adhesion.

1.05 QUALITY ASSURANCE

- A. Qualifications: Paint applicator shall be licensed in the State of Florida or in Miami-Dade County and use state or county certified journeymen. Provide a legible copy of license and, when applicable, a journeyman's certification attesting to qualification requirements.
- B. Certifications:
1. Paint applicator shall provide a certification attesting to having worked on projects similar in scope to this project. Paint applicator not providing such documentation or not having the required experience will be removed from the project and replaced by the Contractor.
- C. Quality assurance issues, including but not limited to, material selection, surface integrity and other tests, surface preparation, painting procedures, workmanship, and warrantability require review and acceptance by Engineer.
- D. Pre-Construction Meeting: At this meeting, the following will be discussed. Attendance by the paint applicator and manufacturer representative is encouraged:
1. Review of proposed materials and compliance with specifications.
 2. Procedures to be followed and methods to be used in painting of new work and repainting of existing surfaces, with special emphasis on testing, repair, and preparation of existing surfaces.

- a. Discuss and agree to modifications to the procedures established in Part 3 of this section required by the paint manufacturer in order to uphold the required 6-year warranty. Modifications, if any, are to be noted in writing by the manufacturer. Provide signed and notarized copies to Engineer and to all other parties present at the preconstruction meeting.
 - b. Review of improved or alternate methods suggested to prepare existing surfaces for repainting, based on on-site surveys and tests made by the parties present.
 3. Coordination of the mockup requirements of this section and of other related sections.
 4. Review of extent, procedures, and schedules for on-site tests, observation, and supervision by Materials Manufacturer's Representative according to requirements of this section and to enable the manufacturer to issue the required guarantees.
 5. Review of warranties and guarantees required by the various parties, as specified in this section, in addition to the general guarantee required by Instructions to Bidders and General Conditions; and statement by all parties concerned of their agreement or objection to the terms. Such statements shall be recorded in writing as part of the minutes of the meeting, with action suggested or taken to comply with contract requirements.
- E. Coordination of Work:
1. Review other sections of the specifications in which paint primers are provided to ensure compatibility of total coatings system for various substrates.
 2. Upon request from other trades, furnish information or characteristics of finish materials to be provided, to ensure compatible prime coats are used.
 3. Phase projects to allow a minimum of 28 days for stucco and plaster to cure properly. If painting begins before the 28-day curing period, then a moisture and pH test shall be made according to ASTM D4262 and ASTM D4263. Provide a written record of such test and receive written approval from the Engineer and paint manufacturer.
- F. Mockups:
1. Provide an in-place mockup of each wall surface condition, allowing space for a minimum of 50 sq.ft. for each color of paint to be used for project wall surfaces. Construct and cure, for a minimum of 28 days, the mockup walls in the same manner as required for the permanent walls.
 2. After coordinating and receiving approval for application onto designated mockup sample walls, apply the approved paint samples.
 3. Duplicate painted finishes on actual interior wall surfaces.
 4. Provide full coat finish samples on at least 50 sq. Ft. of surface, as directed, until required sheen, color, and texture are obtained. Simulate finished lighting conditions for review of in-place Work.
 - a. Final acceptance of colors will be from samples applied on mockup.
 5. Engineer may test the mockup sample or selected painted surface according to ASTM D3359. If test fails, retesting shall be at the Contractor's expense.
- G. Surfaces to be Painted:
1. Except where natural finish of material is specifically noted as surface not to be painted, paint exposed surfaces with colors as selected by the Engineer.
 2. Where items or surfaces are not specifically mentioned, paint same as similar adjacent materials or areas.
 3. Any existing wall surface which abuts a new construction surface to be painted under Section 09900, is to be painted in its entirety from corner to corner to match the new work's paint.
 4. If color or finish is not designated, coordinate with Engineer for selection.

- H. The following categories of Work are not included as part of field-applied finish work, unless otherwise specified:
1. Pre-Finished Items: Do not include painting of factory-finished or installer-finished specified items such as, but not limited to, pre-finished partition systems, acoustic materials, architectural woodwork and casework, attached signs, finished mechanical and electrical equipment, light fixtures and building systems components (Fire Alarm, Security, Wifi, etc.)
 2. Concealed Surfaces: Painting is not required, unless noted otherwise on the Drawings, of surfaces such as walls or ceilings in concealed and areas of limited access.
 3. Finished Metal Surfaces: Painting is not required at metal surfaces of anodized or enameled aluminum, stainless steel, chromium plate, bare copper, bare bronze, and metals of similar finish. Paint visible galvanized steel and mill-finish aluminum surfaces.
 4. Operating Parts: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts are not required to be painted.
- I. Do not paint over code-required labels such as Underwriters Laboratories (UL) and Factory Mutual (FM), name, equipment identification, performance rating, or nomenclature plates.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in original, new, and unopened packages and containers bearing manufacturer's name and label, and following information:
1. Name or title of material.
 2. Federal Specification number.
 3. Manufacturer's stock number and date of manufacture.
 4. Manufacturer's name.
 5. Contents by volume, for major pigment and vehicle constituents.
 6. Application instructions.
 7. Color name and number.
 8. Indicate if paint is for interior or exterior use.
- B. Storage:
1. Store materials not in actual use in tightly covered containers.
 2. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
 3. Protect from freezing or extreme heat, 95 degrees F. or above.
 4. Keep storage area neat and orderly.
 5. Remove from the project site contaminated products from oil-based products and their by-products, by the end of each working day.

1.07 PROJECT CONDITIONS

- A. Environmental Requirements:
1. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50- and 90-degrees F., unless otherwise allowed by paint manufacturer's printed instructions.
 2. Do not apply paint when relative humidity exceeds 85 percent, or to damp or wet surfaces, unless otherwise allowed by paint manufacturer's printed instructions.
 3. Do not apply paint in areas that are not broom clean and free of dust and debris.

4. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

B. Workers Environmental Conditions:

1. Comply with the standards established in OSHA Workers Environmental Conditions.
2. Take precautions to ensure that personnel and work areas are adequately protected from fire and health hazards resulting from handling, mixing and application of paints.
3. Illumination: Provide lighting equal to the permanent lighting planned for designated space.
4. Ventilation: Provide adequate ventilation to prevent buildup of fumes.
5. Contain and prevent vapors or dust generated by the Work from polluting adjacent occupied spaces.

1.08 SEQUENCING AND SCHEDULING

- A. Phase projects to allow a minimum of 28 days to properly cure plaster surfaces before the application of paint.
- B. Phase the project to allow reasonable time for the inspection and written approval at each phase of the work by the Paint Manufacturer's Representative.

1.09 WARRANTY

- A. Provide a written guarantee, co-signed jointly and severally by the Painting Subcontractor and Materials Manufacturers, against cracking, peeling, flaking, chalking and mildew on interior painted surfaces, and additionally against erosion and unreasonable fading on exterior surfaces, for six years; agreeing to repair and repaint surfaces affected by such defects, at no cost to the DTPW including necessary removal or protection of other work, without limit, within 30 days after notification by the DTPW, and to perform such work based on the provisions of this section, including extension of the guarantee to cover new work.

1.010 MAINTENANCE

- A. Provide 2 five-gallon containers, properly labeled and sealed, of each type and color of finished paint used on the project. If less than 10 gallons of a particular type and color was used, then provide 1 one-gallon container.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Benjamin Moore
- B. Sherwin-Williams
- C. PPG
- D. Or approved equal

2.02 MATERIALS

- A. Use Latex-based materials for painting of interior surfaces.
- B. Primers, Undercoats, Split and Finish Coats: Use materials from same manufacturer when such materials are applied on same surface.
- C. Paints for interior use shall be factory tinted with each stage of coating application (primer, first coat, and finish coat) to be visually distinguishable from the preceding coat until the final coat. The final coat shall match the selected color.

1. Label each container indicating whether it is primer, first coat, or finish coat.
 2. Label each container with the name and number of the color.
 3. Label each container indicating if it is intended for exterior or interior usage.
- D. Color Selection:
1. Engineer will select colors from samples and materials submitted under Article 1.04.
 2. If color is not listed for a specific area or item, Contractor is not relieved of responsibility for providing colors subsequently selected.
 3. Color selection made by Engineer is to determine basic color required for surface.
 4. Colors with same designation but produced from two or more sources shall match when viewed from distance of 24 inches or more.
 5. Final application of colors shall match prepared samples approved by Engineer.
- E. Storage Cabinets and Disposal Containers for Flammable Materials:
1. Meet the requirements of NFPA 30.
 2. Contain Factory Mutual (FM) label and Underwriters Laboratories label.

PART 3 EXECUTION

3.01 INSPECTION

- A. Pre-Construction Inspection: In conjunction with the meeting required in Part 1 of this section, the Painting Subcontractor and the Materials Manufacturer Representative shall conduct on-site inspections and perform tests to determine:
1. Condition of existing paint finishes.
 2. Suitability for receiving the new specified repainting materials.
 3. Whether the corrective and preparatory work specified below is adequate, excessive, or insufficient to obtain the required performance criteria required in this section and the guarantee.
- B. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- C. Start of painting operations implies acceptance of the surface conditions and responsibility for required standards of quality and appearance.

3.02 PREPARATORY WORK

- A. Remove electrical outlet and switch cover plates, finish hardware escutcheons and cover plates, air-conditioning registers, and other finished items installed on surfaces to be painted and replace afterwards or provide protection as approved by Engineer. Protect items and surfaces that cannot be removed or that do not interfere with the painting and leave clean and completely free of paint.
- B. Clean surfaces of all dirt, dust, or other contaminants that affect adhesion of paint or appearance of paint. Clean grease and oil from metal surfaces with turpentine or mineral spirits and wipe dry before priming. Wire brush or sand metal surfaces to remove rust and scale. Touch-up factory primed surfaces with compatible factory primers. Schedule the cleaning so that contaminants from the cleaning process will not fall onto the wet painted surfaces.
- C. Fill nail holes, cracks, open joints, and other defects after priming or first coat is dry and before second coat is

applied.

- D. Allow all coats to dry thoroughly before applying succeeding coats. Comply with paint manufacturer's recommendations.
- E. Prime finished work, not shop coated, when delivered to the job or as soon as possible after delivery.
- F. Clean and sand surfaces between coats with 150 Fine sandpaper or as recommended by the paint manufacturer.
- G. Special Preparatory and Corrective Work on Previously Painted Surfaces: As a minimum, in addition to the general requirements specified above, perform the following work on existing painted surfaces before starting application of new materials:
 - 1. Interior: Remove loose, peeling, or flaking paint, chalking, and mildew. Sand surfaces to produce a smooth, even surface, free of sharp edges where paint has been partially removed, with an even texture and uniform absorptive quality. Provide additional partial or total priming coats if required to obtain uniform finish in color and sheen.
 - a. Mildew Removal: Prepare a diluted bleach solution with one volume of fresh household bleach to three volumes of water. Add to each gallon of diluted bleach two-thirds cup of trisodium phosphate (Solilax or equivalent) and one-third cup of detergent (Tide or equivalent). Allow to stand for 45 minutes. Clean thoroughly with high-pressure water and allow to dry completely before starting painting operations. Repeat treatment in areas that show signs of mildew after surface is dry.
 - 1) Workers shall wear proper safety clothing and necessary accessories, such as goggles.
 - 2) Protect adjacent surfaces that will be affected by the application of the mildew removal solution.
 - b. Preparation for Latex-Based Coating Over Oil-Based Coating: Prepare existing oil-based coating according to latex-based coating manufacturer's recommendations.

3.03 APPLICATION

- A. General:
 - 1. Perform work in a thorough and professional manner in conformance with accepted good practices and requirements of authorities having jurisdiction.
 - 2. Protect finished materials and areas not to be painted by using drop cloths, masking, or other accepted methods.
 - 3. Provide adequate ventilation for proper drying of surfaces before and after painting.
 - 4. Drying Period: Allow each coat to dry thoroughly before succeeding coats are applied. Minimum drying time shall be according to manufacturer's recommendations.
 - 5. Paint Shading: Each coat of paint shall vary sufficiently to easily distinguish it from previous coats of paint, both interior and exterior applications.
 - 6. Observation and Acceptance: As required by paint manufacturer between coats before application of next coat of paint materials.
- B. Apply materials, as they come from manufacturer, to dry surfaces according to manufacturer's directions as

printed on container. Any mixing on site requires specific and special approval of the Engineer.

- C. Apply paint materials to give an even, solid color with each coat. For deep tone finish colors, use Deep Base Primers recommended by manufacturer.
- D. Apply paint materials by brush, roller, or spray method.
 - 1. Select method best suited to profile, texture, and finish of existing surface, subject to suitability regarding safety and conditions in existing or occupied areas, and subject to approval by paint manufacturer and Engineer.
 - 2. Apply materials evenly, smoothly flowed on and cut in neatly, without runs, sags, wrinkles, shiners, streaks and brush marks; drying uniformly to color and sheen selected. Make dividing lines that separate colors straight and clean cut.
- E. Dry Film Thickness:
 - 1. Comply with manufacturer's specifications.
 - 2. Minimum Dry Film Thickness: 5 mils (unless otherwise recommended by paint manufacturer), total finished application. Reduction of minimum thickness due to special coating characteristics or application procedures requires written approval for each case.

3.04 FIELD QUALITY CONTROL

- A. Paint Adhesion Test:
 - 1. Prepare two representative areas in Area 3 for testing adhesion of new paint to existing surfaces. Each area shall be a minimum of 9 square feet (3'-0" x 3'-0").
 - 2. Allow newly painted test area to dry within the manufacturer's recommended drying time.
 - 3. Engineer will test the selected painted surface according to ASTM D3359. If test fails, retesting shall be at the Contractor's expense.
- B. Notify Engineer and material manufacturers' representatives, when critical points in the painting and repainting work are reached, to allow timely inspection and approvals. Critical points include during and after the operation, plus other points designated by the Engineer, or material manufacturer representatives:
 - 1. Removal of existing paint.
 - 2. Surface patching and preparation.
 - 3. Sealing of surfaces.
 - 4. Application of primer and transition coats. Adhesion testing of primer and topcoats may be required.
 - 5. Intermediate and finish coats.

3.05 ADJUSTING AND CLEANING

- A. Remove construction debris, material containers, equipment, and other trash resulting from work of project.
- B. Upon completion of work, remove stains and paint spots from floors, wall, woodwork, electric trim, hardware, fixtures, and other items of the DTPW's property.
- C. Dispose oil-based products, their by-products, and waste contaminated by them, in a manner acceptable to DERM (RER).
- D. INTERIOR SPACES PAINT SCHEDULE
 - 1. Walls and Ceilings not Acoustically Treated: Convert from oil to latex all previously painted surfaces.

This conversion requires the use of an oil-based transition primer/sealer.

1st Coat	Acrylic latex wall primer or oil-based transition primer sealer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

2. Other Interior Ceilings Not Covered:

1st Coat	Acrylic latex primer.
2nd Coat	Acrylic latex semi-gloss.
3rd Coat	Acrylic latex semi-gloss.

3. Metal Doors:

1st Coat	Field applied rust inhibitive primer over shop primer.
2nd Coat	Acrylic latex semi-gloss undercoat.
3rd Coat	Acrylic latex semi-gloss.

E. INTERIOR METALS PAINT SCHEDULE

1. Galvanized Metal: Apply neutralizer and allow to dry thoroughly.

1st Coat	Galvanized metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

2. Metal Sash - Doors and Frames:

1st Coat	Metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

3. Exposed Ferrous Metal:

1st Coat	Rust inhibitive primer.
2nd Coat	Acrylic latex enamel.
3rd Coat	Acrylic latex enamel.

4. Other Metals Not Previously Mentioned:

1st Coat	Rust inhibitive metal primer.
2nd Coat	Acrylic latex enamel (or aluminum paint).
3rd Coat	Acrylic latex enamel (or aluminum paint).

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 9 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 9 Work.
- C. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 9 Work.

END OF SECTION

SECTION 10170

Stainless Steel Partitions Floor- to- Ceiling Anchored

Part 1 - General

1.01 Work Included

- A. The toilet partitions shall be stainless steel with floor-to-ceiling mounting style as manufactured by ASI Accurate Partitions, Burr Ridge, Illinois.
- B. Furnish all labor and materials necessary for completion of work in this section as shown in the approved drawings and specified herein.

1.02 Related Work – Specified elsewhere shall include accessories and anchorage/blocking for attachment of partitions.

Part 2 - Product

- 2.01 Door, Panels, and Urinal Screens – Shall be 1" thick and fabricated from tension leveled 22-gauge, type 304 stainless steel with a #4 finish bonded to sound deadening honeycomb core.
- 2.02 Pilasters – Shall be 1-¼" thick and fabricated from tension leveled 22-gauge, type 304 stainless steel with a #4 finish bonded to sound deadening honeycomb core.
- 2.03 Material - Doors, panels, pilasters, and urinal screens shall be manufactured with a resin impregnated honeycomb core that is bonded under pressure to the stainless steel with a non-toxic adhesive to ensure solid construction and sound attenuation. All the stainless steel components shall be assembled with a continuous roll-formed interlocking, 22-gauge stainless steel crown molding welded and ground smooth at the corners.
- 2.04 Finish – All components shall be type 304 stainless steel with a #4 finish and include a PVC film for protection during shipment and installation.
- 2.05 Door Hardware – Shall be Accurate gravity actuated, cam-action hinges that permit door to remain at desired position when not in use. Hinges, one-piece strike and keeper and coat hook shall be chromium plated Zamac to resist corrosion. Hinges, strike and keeper shall be attached with tamper resistant barrel nuts and shoulder screws. Concealed latch assembly will allow for emergency access. Doors for handicapped compartments shall be supplied with Accurate ADA paddle handles.
- 2.06 Mounting Hardware – Chrome plated Zamac stirrup brackets shall be used to mount panels and pilasters. Mounting hardware shall be secured with tamper resistant screws.
- 2.07 Construction Design - Partitions shall be anchored to the floor and overhead structural member. The pilaster is secured to zinc plated, 15 gauge mounting channels that have been anchored to

the floor and overhead structural member. The mounting system at the top and bottom of the pilaster shall be concealed by type 304 stainless steel trim shoes with a #4 finish.

Part 3 - Execution

3.01 Installation – Shall be installed in accordance to the Accurate installation instructions with partitions rigid, straight and plumb. Doors and panels shall be mounted 12” above the finished floor.

3.02 Warranty – ASI Accurate Partitions guarantees its stainless steel partitions, properly maintained, against corrosion or discoloration for 5 YEARS from the date of receipt by the customer. If material is found defective during that period, the material shall be replaced free of charge. No credits or allowances shall be issued for any labor or expenses relating to the replacement of components covered under the warranty plan.

END OF SECTION

SECTION 15010 GENERAL PROVISIONS

PART 1 GENERAL

1.01 SUMMARY

A. Substitutions and Product Options:

1. Products List: in accordance with Section 01330, submit list of major products proposed to be used with names of manufacturers and installing subcontractors.
2. Contractor's Options:
 - a. For products specified only by standard, select any product meeting standard.
 - b. For products specified by naming 1 or more products by manufacturer's name and catalog number, select any 1 of the products or manufacturers named.
3. Substitutions: Contractor may submit a request for substitution for any product or manufacturer not specifically named, in accordance with Section 01620.

1.02 SUBMITTALS: In accordance with Section 01330

A. Submit shop and detail drawings, factory certified prints, brochures, and materials lists for items specified in accordance with Section 01330.

B. Substantial Completion Submittal Requirements:

1. Operating and Maintenance Manuals and Charts: Provide 3 complete sets of operating and maintenance instructions, literature, and information concerning equipment under this Division, including, but not limited to HVAC systems, indexed and bound in accepted loose leaf binders.
2. Record Prints (Project Record Documents): In accordance with Section 01325

1.03 QUALITY ASSURANCE

A. Qualifications: Perform work by workers skilled in their respective trades and install specified materials and equipment according to manufacturer's recommendations.

B. Where special qualifications are required, i.e., for welders or brazers, a currently active certificate of qualification from a recognized testing laboratory and dated within 12 months before performance of work will be required.

1. If quality of work of any such specially qualified worker creates reasonable doubt as to skill, ENGINEER may require worker to be removed and replaced.

C. Tradesperson Qualifications and verification:

1. Comply with Miami-Dade County Code-Chapter 10 and the DTPW General Conditions

1.04 WARRANTY

A. Furnish copies to DTPW of guarantees for equipment or materials per the DTPW General Conditions.

B. Inspections at End of Warranty:

1. At the end of the 1-year warranty period, DTPW will decide if the warranty items cited during the course of the warranty period have been completed to the satisfaction of DTPW.
2. Meet on-site with Engineer before the end of the 1-year warranty period and address unresolved warranty items to the satisfaction of DTPW.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide new materials, free from defects, of domestic manufacture unless otherwise noted.

2.02 EQUIPMENT

- A. Use equipment scheduled in the Construction Documents to determine space and service requirements.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Clean surfaces free of grease, scale, rust, and other foreign matter and leave ready for painting.
- B. Field paint exposed piping, ducts, hangers, and supports as specified in Section 09900 or 09901.
 - 1. Touch-up factory finishes marred in construction with factory touch-up kits.
- C. Electrical items furnished shall conform to the requirements of Division 16.

3.02 FIELD SUPERVISION

- A. Verify measurements at building site before starting work. Submit discrepancies and differences to Engineer for consideration and decision before proceeding with work.
- B. Obtain full information regarding:
 - 1. Peculiarities and limitations of space available for installation of equipment.
 - 2. Materials under contract.
 - 3. Accessibility required to dampers, valves, and other apparatus, including any part of any system needing maintenance or operation.
- C. Provide accurate layout, grades, and elevations. Set sleeves and openings in ample time for other trades to proceed in a timely manner. Take proper precautions to protect work and equipment from damage.
- D. Cut openings and chases required to accommodate the Work and repair floors, walls, and ceilings damaged by such cuttings.
- E. Perform required tests in the presence of Engineer and authorities having jurisdiction. Give 48-hour notice before tests.
- F. Insure compliance with safety codes and other codes and ordinances applicable to the performance of work under this Division.

3.03 FIELD QUALITY CONTROL

- A. Work will be inspected by Engineer and/or EOR (as instructed by Engineer) during construction.
- B. Existing HVAC systems shall be operational in the areas of work for a period of at least 3 days (72 hours) before installation of specified interior finishes and until interior finish installations are completed and accepted by DTPW. Exterior openings shall be kept closed during these periods by using temporary or permanent barriers.
- C. Maintain a repair log of equipment before substantial completion.
- D. Prerequisites to substantial completion inspection shall be completed construction, testing, adjustments, repair

logs, balancing, start-up, and required instruction periods on specified mechanical equipment and systems.

1. Air-conditioning:

- a. Ductwork shall be installed complete with required dampers, deflectors, hangers, and insulation.
- b. Control system components shall be installed and tested for function.
- c. System testing and balancing shall be completed.

3.04 DEMONSTRATION

- A. As a condition for substantial completion and after systems have been tested and checked as complete and operational, instruct DTPW's staff in the operation of any air-conditioning, air circulation system and valve component and control.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15023 CODES AND STANDARDS

PART 1 GENERAL

1.01 REFERENCES

A. Comply with the following:

1. Florida Building Code (FBC).
2. Florida Building Code (FMC) - Mechanical.
3. Florida Building Code (FPC) - Plumbing.
4. National Electrical Code - 1999 (NFPA 70).
5. National Fire Protection Association - 1997 (NFPA). NFPA 101 and other NFPA codes as applicable, except NFPA 101 10-2.2.7 and 10.2.2.7 Exit Passageways.
6. American National Standards Institute (ANSI) A117.1, 1995.
7. American Society of Civil Engineers (ASCE) 7-98.

1.02 QUALITY ASSURANCE

- A. Where materials and equipment are available under the continuing inspection and listing service of Underwriters Laboratories (UL) and National Electrical Manufacturer's Association (NEMA), furnish materials and equipment so listed.

PART 2 NOT USED

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will not be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15044 GENERAL COMPLETION

PART 1 NOT USED

PART 2 NOT USED

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Construction, satisfactory testing, adjustments, balancing, start-up, and required instruction shall have been completed on specified mechanical equipment and systems before substantial completion inspection. All safety equipment shall be in place and operational. There shall be no undue equipment noises, leaks, or misalignment.
1. Air-conditioning:
 - a. Ductwork: Installed complete, including required dampers, deflectors, hangers, and insulation.
 - b. Insulation: Installed with no condensation leaks.
 - c. Control System Components: Installed and tested for function.
 - d. Safety Equipment: Installed and tested.
 - e. System Testing and Balancing: Completed for the areas of work under this contract only.
 2. Plumbing:
 - a. Piping: Pressure testing complete. System free flowing.
 - b. Plumbing Fixtures: Unchipped, leveled, clean, and handicapped accessible. Grouting completed.
 - c. Toilet Room Accessories. Installed and secured.
 - d. Insulation: Installed.
 - e. Domestic water: Permanent connection with backflow preventers in place.
 - f. Safety Equipment: Installed and tested.
 - g. Valving: Open.
 3. Fire Protection: There is no fire protection sprinkler system scope of work.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.

- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15047 IDENTIFICATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Identification including necessary accessories indicated on Construction Documents and specified in this section or as required for proper identification of equipment and piping.
- B. Related Sections:
 - 1. 02221 -Excavating, Backfilling, and Compaction for Utilities.
 - 2. 15410 - Piping (Plumbing).

1.02 SUBMITTALS: in accordance with Section 01330

- A. Submit properly identified product and technical data including printed installation instructions before starting work.

1.03 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Color Coding: ANSI Z535.1 (latest edition) shall take precedence over any discrepancies in determining proper color code identification.
 - 2. Conform to the standards established in ANSI A13.
 - 3. Comply with OSHA standards.

PART 2 PRODUCTS

2.01 EQUIPMENT IDENTIFICATION

- A. Identify equipment served by piping systems by number or legend as shown on Construction Documents.
- B. Engraved Plastic Name Plates: Provide engraved laminated plastic name plates with 1-inch high letters on equipment cabinets.
- C. Brass Tags: Provide appropriately sized brass tags on equipment where cabinets do not exist.
- D. Piping Identification:
 - 1. Color Coding: Identify piping with markers and directional arrows according to the following color-coding system:

<u>Description</u>	<u>Background</u>	<u>Letters</u>
Hot Water	Yellow	Black
Cold Water	Green	White
Fire	Red	White
 - 2. Piping Identification Materials:
 - a. Identify contents and flow direction of piping or pipes wrapped with insulation by using:

- 1) Brady B-946 self-sticking vinyl.
- 2) Champion America Inc., pressure sensitive vinyl.
- 3) Seton Opti-Code.
- 4) Ready Made adhesive pipe markers.
- 5) Or approved equal

3. Valve Identification:

- a. Identify location and system under valve control with a color-coded thumb tack under valve and lay-in ceiling tile. Use other methods (paint or adhered colored material) in access panel doors.

E. Underground Tapes:

1. Electrical Warning Tape: 6 mil, 3 inches wide polyethylene.

- a. BURIED ELECTRICAL LINE BELOW - No.37236 by Seton or approved equal.

2. 2" Metallic Detection Tapes:

- a. BURIED SEWER LINE BELOW - No.37220 by Seton or approved equal.
- b. BURIED WATER LINE BELOW - No.37222 by Seton or approved equal.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- B. Verify surfaces are clean and dry before application of identification signage.

3.02 INSTALLATION

A. Brass Tags or Engraved Plastic Name Plates:

1. Install brass tags or engraved plastic name plates according to manufacturer's instructions.
 - a. Place brass tags or name plates in locations easily visible within the space at normal eye level or as otherwise directed by Project Engineer.

B. Piping Markers and Directional arrows:

1. Location:
 - a. Pipes Passing Through Walls: Provide pipe markers and directional arrows on the pipe on each side of the wall.
 - b. Pipes Behind Access Doors/Panels: Provide pipe markers and directional arrows within view.
 - c. Continuous Run Pipe Lines: Provide pipe markers and directional arrows at intervals not exceeding 50 feet.
 - d. Risers and Joints: Provide pipe markers and directional arrows at each riser and joint.
 - e. Vertical and Horizontal Change of Direction: Provide pipe markers and directional arrows at

each vertical and horizontal change of direction.

2. Special Requirements:

a. Directional Arrows: When identifying by directional arrows, point arrowhead away from pipe markers and in the direction of flow.

1) Direction of Flow: If the flow can be in both directions, identify by using double-headed directional arrows.

b. Thin Film Pipe Markers and Thin Film Directional Arrows: When using both thin film pipe markers and thin film directional arrows on soft insulation, provide a spiral wrap of accepted pipe banding tape around the pipe as foundation for both markers and directional arrows.

C. Underground Tapes: There are no exterior electrical, plumbing or air-conditioning lines in the scope of work.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.

B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15090 SUPPORTS, ANCHORS, AND SEALS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
1. 15410 - Piping (Plumbing).
 2. 15430 - Piping Specialties (Plumbing).
 3. 15515 - Valves, Hangers, and Specialties.

1.02 REFERENCES

- A. Pipe Supports: ANSI B31.1, Power Piping.

1.03 SUBMITTALS: in accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Inserts:
1. Malleable iron case of galvanized steel shell expander plugs for threaded connection with lateral adjustment, top slot for reinforcing rods, and lugs for attaching to forms.
 2. Size insert to suit threaded hanger rods.
 3. Wall Support:
 - a. Pipe Sizes to 3 Inches: Cast iron hook.
 - b. Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamps.
 4. Vertical Support: Steel riser clamp.
 5. Provide copper plated supports for copper piping or provide sheet lead packing between support and piping.
- B. Hanger Rods: Provide steel hanger rods, threaded both ends, threaded one end, or continuous threaded.
- C. Sleeves:
1. Pipe Through Floors: Form from 18 gage galvanized sheet metal.
 2. Pipes Through Beams, Walls, Fireproofing, Footings, Potentially Wet Floor: Form from steel plate or 18 gage galvanized sheet metal.
 3. Size large enough to allow for movement due to expansion.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Supports:
 - 1. Support riser piping independently of connected horizontal piping where practical.
- B. Priming: Prime coat exposed steel (not galvanized) supports.
- C. Sleeves: Where piping passes through floor, ceiling, or wall, close space between pipe or duct and construction with noncombustible insulation. Provide tight fitting metal caps on both sides and caulk.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15180 MECHANICAL SYSTEMS INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15410 - Piping (Plumbing).
2. 15515 - Valves, Hangers, and Specialties.
3. 15890 - Ductwork.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C534-94 Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
2. C547-95 Specification for Mineral Fiber Pipe Insulation.
3. C552-91 Specification for Cellular Glass Thermal Insulation.
4. C553-92 Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
5. C585-90 Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).
6. C612-93 Specification for Mineral Fiber Block and Board Thermal Insulation.
7. D1056-91 Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
8. D1668-95 Specification for Glass Fabrics (Woven and Treated) for Roofing and Waterproofing.
9. E84-96a Test Method for Surface Burning characteristics of Building Materials.
10. E96-95 Test Methods for Water Vapor Transmission of Materials.

B. National Bureau of Standards (NBS).

C. National Fire Protection Institute: NFPA 90A.

D. Underwriters Laboratories (UL) - 723.

E. Insulation Contractor's Association of South Florida Inc.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's catalog cuts, performance curves, and procedures before starting work.

1.04 DELIVERY AND STORAGE

- A. Protect materials from the weather during storage and installation.

1.05 QUALITY ASSURANCE

- A. Materials shall be labeled, listed, or have certified test reports submitted from testing laboratory

accepted by the DTPW.

- B. Comply with the most stringent requirements between the Insulation Contractors Association of South Florida Inc. and as specified.
- C. There shall be no fiberglass in contact with the HVAC airstream anywhere in the system whether protected by encapsulation or not.
- D. Foam plastic insulation shall be certified, by an independent third-party national recognized laboratory, that the product emits less than 1 part per million formaldehyde out gassing after 24 hours.

1.06 FIRE HAZARD RATING

- A. Fire hazard rated materials shall be UL labeled or a certified test report by a DTPW accepted testing laboratory shall be submitted indicating compliance with specified fire hazard requirements.
- B. Insulation (including adhesives) shall be fire retardant or self-extinguishing. Finishing jackets, insulation, and adhesives shall have composite fire and smoke ratings complying with ASTM E84, NFPA 255, and UL 723, as plain or on a composite basis.
- C. When insulation, vapor barrier covering, wrapping materials, and adhesives are applied separately in field, each item shall be tested individually.
- D. When insulation, vapor barrier covering, wrapping materials, and adhesives are factory composite systems, they shall be tested as an assembly.
- E. Insulation materials, adhesives, coatings, and other accessories shall have a fire hazard rating not more than 25 for flame developed and not more than 50 for fuel contributed and smoke developed, except as follows:
 - 1. Flexible unicellular insulation.
 - 2. Nylon anchors for securing insulation to ducts or equipment.
 - 3. Factory premolded 1-piece PVC fitting and valve covers
- F. Flame resistance treatments subject to deterioration due to effects of moisture or high humidity are not acceptable.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Insulation:
 - 1. Armaflex.
 - 2. Armstrong.
 - 3. Certain-Teed.
 - 4. Cell-U-Foam.
 - 5. Foamglas.
 - 6. Manville.
 - 7. Owens-Corning.
 - 8. Pittsburgh Corning.
 - 9. Or approved equal

B. Insulating Cement:

1. Keene Powerhouse.
2. Benjamin Foster.
3. Fibrex FBX fast set.
4. Or approved equal

2.02 MATERIALS

A. Insulation: Type and thickness as specified.

1. Provide fire retardant or self-extinguishing insulation, including adhesives.
2. Finishing jackets, insulation, and adhesives shall have composite fire and smoke ratings per ASTM E84, NFPA 255, and UL 723.

B. Domestic Hot Water Supply Piping Insulation:

1. 1" thick molded fiberglass insulation with pre-sized factory applied FRJ jacket of glass cloth with longitudinal lap and butt joint strips with self-sealing adhesive.
2. Insulation may be 1/2" insulation for vertical branches to individual fixtures.
3. Minimum density of 7-1/4 pounds per cubic foot, maximum thermal conductivity factor of 0.26K at 75 degrees F. mean temperature, and alkalinity of 0.696.
4. Flame Spread: 25 or less.
5. Smoke Developed: 50 or less.
6. Accessories: Adhesives, mastics, cements, tapes for fittings, and related materials shall have the same composite ratings as listed above.

C. Cold Drainage Piping and Electric Water Cooler Drain Piping Insulation:

1. Elastomeric (foam plastic) thermal insulation 1 inch thick with built-in vapor barrier rated self-extinguishing ASTM D1056.
2. Maximum thermal conductivity factor of 0.26K at 70 degrees F. mean temperature, density of 5-6 pounds per cubic foot, and a water vapor transmission of 0.1 perms.

D. Tape: As recommended by the insulation manufacturer or 3M adhesive EC-1329 or approved equal.

E. Insulating Cement: All-purpose mineral wool cement.

F. Flexible Fiberglass Duct wrap Blanket Insulation:

1. 2.2/2.3 inches thick, 3/4" pcf density fiberglass blanket with UL approved aluminum foil vapor seal facing reinforced with fiberglass scrim, laminated to 30 lb. kraft paper, R = 6.5.
2. Comply with ASTM C553, TYPE I, Class B-4.
3. Maximum Thermal Conductivity: 0.24K factor at 75 degrees F.

G. Accessories:

1. The following accessories shall be used in the application of thermal insulation:
 - a. PVC fittings cover and PVC jacketing:

- 1) Certain-Teed "Snap Form".
 - 2) Manville Corp. "Zeston".
 - 3) Proto.
 - 4) Or approved equal
- b. Vapor Seal Mastic:
- 1) Benjamin Foster 30-86 or 30-25.
 - 2) Childers CP-30.
 - 3) Or approved equal
- c. Lagging Adhesive:
- 1) Benjamin Foster 81-42W.
 - 2) Childers CP-50.
 - 3) Or approved equal
- d. Breather Mastic:
- 1) Benjamin Foster 45-00 or 30-86.
 - 2) Childers CP-10.
 - 3) Or approved equal
- e. Insulation Bonding Adhesive (to metal):
- 1) Benjamin Foster 85-20, or 85-15.
 - 2) Childers CP-82.
 - 3) Or approved equal
- f. Insulating and Finishing Cement:
- 1) Fibrex Inc. FBX Super Blend Cement.
 - 2) Manville Corp. No.375 Insulating and Finishing Cement.
 - 3) Keene Corp. Super Powerhouse.
 - 4) Or approved equal
- g. Coatings: Sealfas G-P-M mastic or approved equal.
- h. Fire Resistive Mastic: As manufactured by Benjamin Foster or approved equal.
- i. Sealants: 81-33 as manufactured by Benjamin Foster or approved equal.
- j. Staples: Type 304 or 316 stainless steel outward clinching type.
- k. Wire: 16 gage, copper weld wire.
- l. Bands: 3/4 by 0.015" thick galvanized steel.
- m. Glass Fabric:
- 1) Woven open mesh type glass fabric conforming to ASTM D1668.
 - 2) Type I asphalt treated for below ground use.
 - 3) Type III light color organic resin treated for aboveground or below ground use.
- n. Insulation Jackets:
- 1) Jackets inside building shall comply with fire hazard classifications as specified. Insulation jackets shall not support mold growth.

2) Vapor Barrier Jackets:

- a) For Cold Pipelines (-30 degrees F. to 60 degrees F.): Perm rating not more than 0.05, ASTM E96 Procedure A. Puncture resistance not less than 50 beach units.
- b) For Air-conditioning Ducts: Perm rating not more than 0.05, ASTM E96, Procedure A. Puncture resistance not less than 25 beach units.

2.03 SYSTEMS INSULATION BY TYPE

- A. Interior Domestic Hot Water Supply/Return Piping Insulation:
 - 1. Molded Fiberglass Pipe Insulation: 1 inch thick with pre-sized factory applied FRJ jacket of glass cloth with longitudinal lap and butt joint strips with self-sealing adhesive.
 - 2. Contractor's Option: Foamed plastic insulation, 1 inch thick.
- B. Electric Water Cooler Drain, Cold Drainage Piping Refrigerant Suction Piping, and Interior Condensate Drain Piping Insulation:
 - 1. Foamed Plastic Insulation: 1 inch thick with field applied vapor barrier mastic at joints.
- C. Interior Concealed Ductwork Insulation:
 - 1. Flexible fiberglass Duct wrap Blanket Insulation:
 - a. 2.2 inches thick, 3/4 pcf density.
 - b. 2.0 inches thick, 1-1/2 pcf density.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install insulation according to applicable codes and regulations.
- B. Except as specified, install materials according to manufacturer's recommendations and specifications for obtaining conformance to construction documents.
- C. Packages or standard containers of insulation, jacket material, cements, adhesives, and coatings delivered for use and samples required for acceptance shall have manufacturer's stamp or label attached listing manufacturer, brand name, and a description of material.
- D. Provide allowances for expansion/contraction, and wall and manhole penetrations.
- E. Run continuous through wall, floor, and ceiling penetrations.
- F. Insulation materials shall not be applied until:
 - 1. Test results specified in other sections of these specifications are completed and accepted.
 - 2. Rust, scale, dirt, and any other foreign material have been removed.
 - 3. Ductwork or piping material are clean, dry, joints firmly butted together, and tightly sealed at all joints, seams, and fittings.

- G. Wrap butt joints with a 3-inch-wide strip of the same material as the jacket.
- H. Provide aluminum jackets over the insulation where sealant is required.
- I. Insulation shall be kept clean and dry at all times.
- J. Duct Materials:
 - 1. Internal duct lining is not allowed.
 - 2. Duct materials solid exposed to the airflow shall be noncombustible metal.
 - 3. Duct insulation for thermal or acoustical purposes shall be separated from airflows by solid metal.
 - 4. Provide natural noise attenuation procedures, as recommended in ASHRAE, Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), and industry good engineering practices.
 - 5. Fiberglass ducts or duct boards shall not be used to convey air.
- K. Protection Shield: Where pipe or tubing insulation pass through hangers, provide:
 - 1. For Piping 4 inches and smaller: A protection shield, 180-degree arc, 16 gage galvanized sheet metal covering, minimum 12 inches long.
 - 2. For Piping Larger than 4-inch diameter: A protection shield, 180-degree arc, 16 gage galvanized sheet metal covering, minimum 18 inches long.
 - 3. Hangers not exceeding maximum spacing distances recommended by insulation manufacturer to prevent crushing or compressing insulation.
- L. Ductwork sizes shown on drawings are actual internal "air side" dimensions.
- M. Flanges, Fittings, and Valves on Insulated Piping:
 - 1. Provide pre-molded glass fiber fittings wired or taped on and adhered with canvas jacket.
 - 2. Terminate insulation and jacket neatly and finish with insulating cement troweled to a bevel and of the same thickness as adjoining insulation.
 - 3. Vapor seal insulation on cold systems.
- N. Vapor Barriers:
 - 1. Intact and continuous.
 - 2. Do not install with staples.
- O. Omit Pipe Insulation from the Following:
 - 1. Screwed unions, except at "cold drains" and air- conditioning wastes. Terminate insulation neatly at both sides of unions with insulation cement.
 - 2. Discharge lines from safety and relief valves.
 - 3. Nickel or chrome plated piping.
- P. All ductwork shall be insulated, except as noted below:
 - 1. Outside air intake ductwork.
 - 2. Exhaust air ductwork.
 - 3. Supply air ductwork exposed in air-conditioned spaces. (Note: Ceiling plenums, and mechanical equipment rooms are not to be considered air-conditioned spaces.)

- Q. Ceiling supply air registers located on perimeter rooms and corridors shall be field insulated with flexible fiberglass duct wrap insulation as specified. Insulation shall cover the upper body and installation flanges.
- R. All appurtenances subject to condensation shall be protected as necessary and covered with vapor seal mastic.

3.02 APPLICATIONS

- A. Molded Fiberglass Pipe Insulation Installation (Hot Water Supply/Return):
 - 1. Tightly butt together sections of insulation on pipe runs sealing longitudinal seams of jacket with self-sealing laps. Position longitudinal seam so seam is on bottom to prevent dirt and moisture infiltration. Seal end joints with 3-inch-wide straps of vapor barrier tape. Seal ends of insulation with vapor seal mastic at valves, fittings and flanges.
 - 2. Cover valves, fittings, and flanges with insulation similar to adjacent pipe covering, or one-piece PVC cover sections as specified.
- B. Foamed Plastic Insulation Installation (Return Suction Piping, Interior Condensate Drains, and Electric Water Cooler Drains):
 - 1. Insulation shall be slipped on pipe without slitting. Butt joints shall be sealed with the manufacturer's recommended adhesive.
 - 2. Where slip-on techniques are not possible, the insulation shall be carefully slit and applied to the pipe. Seal joints with the manufacturer's recommended adhesive.
 - 3. Insulate valves and fittings with fabricated foamed plastic insulation, or one-piece PVC cover sections as specified.
 - 4. Provide mastic vapor barrier for chilled water service insulation for areas subject to conditions of 90 degrees F or 85 percent relative humidity or higher.
- C. Flexible Fiberglass Duct wrap Blanket Insulation Installation:
 - 1. Apply insulation to duct with joints tightly butted. Prepare stretch-out dimensions and cut out insulation so a 2-inch minimum overlap is created that will overlap the facing and insulation at the other end, and the adjoining seam. Install so insulation is not excessively compressed at duct edges. Foil face shall be on outside. Seams shall be stapled approximately at 6 inches on center with outward clinching staples.
 - 2. On ductwork having a 24 inch or larger dimension, insulation shall be secured to the bottom of the duct with mechanical fasteners spaced at not more than 18 inches on center. and held in place with washers or clips. Cut off protruding pin after clips are secured.
 - 3. Seal all insulation joints, pinheads, tears, punctures, washers, clips, and staples with 2 coats of a vapor barrier mastic type sealant, reinforced with 1 layer of 4-inch woven glass fabric.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15410 PIPING (PLUMBING)

PART 1 GENERAL

1.1 SUMMARY

- A. Related Sections:
 - 1. 15440 - Plumbing Fixtures, Trim and Supports.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A53-96 - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. A74-96 - Specification for Cast Iron Soil Pipe and Fittings.
 - 3. A106-95 - Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
 - 4. B32-96 - Specification for Solder Metal.
 - 5. B88-96 - Specification for Seamless Copper Water-Tube.
 - 6. B306-96 - Specification for Copper Drainage Tube (DWV).
 - 7. C564-95a - Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
 - 8. D312-95a - Specification for Asphalt Used in Roofing.

1.3 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.
- B. Shop Drawings:
 - 1. Pipe and Fittings: Manufacturer's name and mill reports.
 - 2. Expansion Joints: Catalog cuts.
 - 3. Dielectric Unions: Catalog cuts.

PART 2 PRODUCTS

2.1 MATERIALS:

- A. Materials shall be new, unused, and best of their respective kinds, free from defects in labor quality, complying with latest publications in effect at time of bidding, and according to Construction Documents. Be aware that though indicated herein all of the materials listed are not necessarily included in the project at bid time. As such, information is listed in case it applies to changes to the work.
- B. Cast Iron Drainage Pipe and Fittings:
 - 1. Hub and Spigot: Service weight centrifugally spun cast iron, hub and spigot, tar coated inside and out, ASTM A74.
 - 2. No-Hub: Service weight centrifugally spun cast iron, no-hub, tar coated inside and out, CISPI 310.
- C. Galvanizing: By hot process on both inside and outside of pipe with zinc coating averaging at least 2 ounces per square foot and free from defects.
- D. Copper Tubing:
 - 1. Type K or L: Seamless hard drawn or annealed, ASTM B88.
 - 2. Type DWV: Seamless hard drawn, ASTM B306.
- E. Ductile Iron Pipe: ANSI/AWWA C151/A21.51.

- F. Cast Iron No-Hub Pipe Joint:
 - 1. Cast Iron: ASTM A888.
 - 2. Neoprene Gaskets: ASTM C564.
 - 3. Aboveground: Stainless Steel Clamp and Shield Assembly: 300 Series, CISPI 301-69T or approved equal.
 - 4. Underground: ASTM C1277, cast iron couplings with neoprene compression gasket and stainless-steel bolts.
- G. Cast Iron Fittings and Flanges:
 - 1. Standard Weight: ANSI B16.1, unless otherwise noted.
 - 2. Extra Heavy: ANSI B16.2.
- H. Brass Fittings:
 - 1. Copper Tubing Solder Drainage Fittings: Wrought copper, ANSI B16.22.
 - 2. Copper Tubing Solder Fittings: Wrought copper, ANSI B16.22.
 - 3. Threaded: Standard weight, banded, ANSI B16.15.
- I. Press Fittings for Copper: Type K copper and bronze, ASME B16.18 or ASME B16.22. O-rings for copper press fittings shall be EPDM.
 - 1. Viega, Lakewood, OH.
 - 2. Ridge Tool Co., Elyria, OH.
 - 3. Or Approved equal.
- J. Compression Gaskets, Cast Iron Soil Pipe: ASTM C564.
- K. Solder Metal:
 - 1. Similar to silver-tin-copper alloy ASTM B32.
 - 2. All solder shall be certified no-lead.
- L. Joint Compound: Tite-Seal or approved equal.
- M. Unions: As specified in Section 15430.
- N. Protective Coating: Cabot's Flexi-Black or approved equal.

PART 3 EXECUTION

3.1 MATERIALS

- A. Run piping as indicated in Construction Documents subject to modifications as required to suit field conditions, to avoid interference with other trades, and for proper, convenient, and accessible locations to parts of the piping system.
- B. Run piping in wall chases, recesses, pipe shafts, and hung ceilings where provided.
 - 1. Do not run gas or water piping in floor fill.
 - 2. Run piping as high as possible under building, above ceilings, and close to slabs.
 - 3. Do not permanently close, furr in, or cover piping before examination and final tests.
- C. Run piping straight and where concealed as direct as possible with risers erected plumb and true.
 - 1. Install piping with minimum 1-inch clearance between finished pipe coverings and adjacent work.
 - 2. Support piping from structure above, maintaining maximum headroom available.

- D. Do not run piping in telephone rooms, electrical equipment rooms/closets, transformer vaults or rooms containing related equipment, or close to or above control panels, switch boards and electric motors except required branch piping to pumps. If pipes are installed in these rooms, they shall be relocated at no extra cost to the DTPW.
- E. Provide control valves where noted or required for complete regulating control of systems, plumbing fixtures, and equipment. Provide valves in accessible locations or accessible through access panels.
- F. Coat Underground metal piping, except cast iron, with 1/16" thick black bituminous protective coating.
- G. Fittings, Valves, and Hangers on Chrome Plated Piping: Chrome plated finish to match.
- H. Provide reducing fittings for changes in pipe sizes. Bushings will not be allowed.
- I. Provide extra heavy pipe for nipples where unthreaded pipe is less than 1-1/2".
 - 1. Do not use close nipples. Use saddle nipples.
 - 2. Provide galvanized iron sleeves for pipes passing through roof slabs, interior floors, ceilings, walls, or partitions.
- J. Expansion Swings:
 - 1. Make adequate provisions for proper expansion and contraction of piping and for piping passing through building expansion joints.
 - 2. Make branch connections from risers with ample swing or offset to avoid strain on fittings or short pipe lengths. Anchor horizontal runs of pipe over 50 feet in length to walls or supporting structure about midway of run to allow expansion evenly divided toward ends.
 - 3. Provide sufficient number of elbow swings or accepted expansion joints to allow proper expansion and contraction of mains and risers.
- K. Pipe Slopes:
 - 1. Lay horizontal soil and waste pipes, unless otherwise noted on drawings, to:
 - a. 1/8" per foot minimum for pipe 3 inches and larger
 - b. 1/4" per foot minimum for pipe less than 3 inches
 - c. Horizontal vent lines shall have a minimum grade back to the stacks or vertical lines and shall run as direct and free from bends as possible.
- L. Piping Materials by System:
 - 1. Sanitary Soil, Waste, and Vent Piping:
 - a. Aboveground: Service weight no-hub cast iron pipe and fittings.
 - b. Under Ground Floor Slabs:
 - 1) Cast iron hub push joint with neoprene compression gaskets.
 - 2. Vandalproof Vent Caps:
 - a. Install according to manufacturer's printed instructions.
 - 3. Domestic Water Supply Piping: Drilling tubes for field manufactured fittings is not allowed.
 - a. Aboveground Interior:
 - 1) Copper Tubing Type L:
 - a) Wrought copper solder joint fitting without the use of lead components. Tubing used with this type shall not be soft drawn.
 - b) Bending of tubing having a radius of not less than 4 tube diameters without deformation may be used for tubing diameters not exceeding 1 inch. Copper tubing used for this type connection shall be bending temper.
 - c) Victaulic copper connection system with Style 606 couplings. Tubing used with this type connection shall be drawn temper.

- b. Optional Press Connections for Aboveground Interior Copper Tubing Type L and Underground Exterior Copper Tubing Type K:
 - 1) Press fittings shall be made according to the manufacturer's installation instructions.
 - 2) The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting.
 - 3) The fitting alignment shall be checked against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting.
 - 4) The joints shall be pressed using the tool approved by the manufacturer.
- M. Joints and Methods of Connections:
 - 1. Cast Iron Pipe:
 - a. Aboveground: No-Hub Joint with neoprene rubber sleeve and stainless-steel ring clamp according to manufacturer's instructions.
 - b. Underground: Under slab, hub push Joint with neoprene compression gaskets.
- N. Pipe Cleaning Systems:
 - 1. Domestic Water Piping: Entire domestic water distribution systems shall be flushed clean after the permanent water meter has been installed and before the bacteria testing is conducted.

3.2 TESTS

- A. Furnish necessary instruments, test equipment, and personnel required to perform tests and remove test equipment and drain pipes after tests have been made and accepted.
- B. After portions of mechanical work are completed and ready for testing, given 48 hours' notice to Engineer and perform tests in Engineer's and EOR's presence (as directed by the Engineer).
- C. Tests may be made of isolated portions of piping to facilitate the general progress of installation.
 - 1. Revisions subsequently made in piping system shall require retesting of such affected portions of piping systems.
 - 2. Subject piping and connections to a hydrostatic or pneumatic pressure test before painting, installation of insulation or concealment.
 - 3. Sanitary, Storm, and Acid Waste Drainage Systems:
 - a. Apply a water test to all parts of drainage systems before pipes are concealed or fixtures set in place.
 - b. Close openings of each system to be tested tightly except highest openings above roof and fill entire system with water up to overflow point of highest opening.
 - c. Subject systems to not less than 10 feet of hydrostatic head, except uppermost 10 feet of piping directly below opening.
 - 1) Water shall remain in the systems for not less than 60 minutes after which time no leaks occur at any point and no lowering of water level at overflow point is visible.
 - 4. Water Supply Piping:
 - a. Apply a pressure test to water system before piping is concealed or insulated and before fixtures and equipment are connected.
 - b. Apply a hydrostatic pressure of not less than 200 psig for 2 hours, with no leaks occurring in the system.
 - 1) Water used for tests shall be obtained from a potable source of supply.

3.3 CLEANING AND ADJUSTING

- A. Clean fixtures, equipment, piping, and exposed work.
 - 1. Show traps, wastes, and supplies free and unobstructed.
 - 2. Plated, polished bronze, or painted surfaces bright and clean.

- B. After installation, adjust valves, faucets, and automatic control devices for quiet operation. Balance system as required for proper operation.
- C. Disinfection: After cleaning and testing domestic water system, disinfect by introducing a solution of calcium hypochlorite with 50 parts per million of chlorine.
 - 1. Open and close all valves while system is being chlorinated. After disinfecting agent has been applied for 24 hours, test for residual chlorine at ends of pipe.
 - 2. If less than 5 ppm is indicated, repeat process until it is equal to or greater than 5 ppm or according to AWWA C601 Standards.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15421 DRAINS AND CLEANOUTS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. 15410 - Piping (Plumbing).

1.02 SUBMITTALS: In accordance with Section 01330

- A. Product Data: Submit properly identified manufacturer's literature before starting work.
- B. Submit Shop Drawings/Catalog cuts on the following:
 - 1. Drains.
 - 2. Cleanouts.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Model numbers are taken from Josam (basis of design).
 - 1. Accepted equivalents:
 - a. Jay R. Smith Mfg. Co.
 - b. Blucher-Josam.
 - c. Wade.
 - d. Zurn.
 - 2. Or Approved equal

2.02 MATERIALS

- A. Drains:
 - 1. Shower Stall:
 - a. Coated cast iron floor drain, 2-piece body, double drainage flange, invertible non-puncturing flashing collar, weepholes, bottom outlet, inside caulk connection, and adjustable satin Nikaloy 6" X 6" super-flo strainer.
 - b. Josam No.30000-6S-X.
 - 2. Toilet Room:
 - a. Same as Shower Stall above except for primer trap.
 - b. Josam No.30000-6S-50-X by Josam.

B. Cleanouts and Cleanout Access Covers:

1. Floor, Interior Finished Rooms:
 - a. Cast iron, adjustable inside caulk outlet, brass internal plug, Nikaloy scoriated cover plate secured by countersunk plug.
 - b. No.56020-88-15 by Josam.
2. Stack Base for Use in Block Walls:
 - a. Cast iron "T" branch tee with plated cast iron countersunk plug, lead seal, satin stainless-steel round access cover plate secured with countersunk screw.
 - b. No.58790-15 by Josam.
3. Stack Base for Use in Plaster Walls:
 - a. Cast iron "T" branch tee coated cast iron countersunk plug, lead seal, cast brass round access cover with anchor lugs, satin stainless-steel cover secured with countersunk screw.
 - b. No.58750-15 by Josam.
4. Stack Base for Use in Tile Walls:
 - a. Cast iron "T" branch with brass countersunk plug, cast brass square access cover with satin top, anchor lugs, cover plate secured with 4 screws.
 - b. No.58770-15 by Josam.
5. Exterior, Heavy Duty:
 - a. Cast iron, inside caulk outlet bronze internal plug, ductile iron scoriated heavy duty cover.
 - b. No. 56040-15 by Josam.
6. Cleanout Sizes:
 - a. Full pipe size up through 4 inches, pipe cleanouts with bodies of standard pipe size and caulking ferrules conforming to thickness required for pipe and fittings of same metal.
7. Removable Cleanout Plugs:
 - a. Cast bronze with screw threads and recessed bronze socket. No.58540 by Josam.

C. Wall Access:

1. Cast bronze, polished chrome plated square frame and cover, 12" X 12" minimum opening or larger, as required.
2. No.58640 by Josam.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide drains and cleanouts as scheduled on drawings.
- B. Cleanouts:
 - 1. Place pipe cleanouts at the foot of each soil and waste stack in sanitary system and place pipe cleanouts in horizontal runs not to exceed 50 foot spacing.
 - 2. Install access covers as specified.
- C. Interior Flush Cleanouts:
 - 1. Flush cleanouts with recessed sockets (without access covers) may be used in non-finished areas such as equipment rooms, storage rooms, and the like, if top of hub is installed in level position and top of clean out plug is flush with the concrete floor.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15430 PIPING SPECIALTIES (PLUMBING)

PART 1 GENERAL

1.01 SUMMARY

- A. Related Section:
 - 1. 15410 - Piping (Plumbing).

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A126-95 Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.
- B. Submit Shop Drawings/catalog cuts for the following:
 - 1. Shock Absorbers.
 - 2. Unions and Flanges.
 - 3. Hangers and Inserts.
 - 4. Trap Resealers.
 - 5. Vacuum Breakers.
 - 6. Gages and Thermometers.
 - 7. Firestop Devices.
 - 8. Water Hammer Arrestors.

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Trap Resealers:
 - 1. Water Closet Valve: Chrome plated with tubing to wall and wall flange. Water closet shall be no more than 20 feet from floor drain. No.F-72-A1 by Sloan Valve Co. or approved equal.
 - 2. Lavatory or Sink: Cast brass chrome plated with 1/2" female union connection and 1/2" female outlets, integral vacuum breaker.
 - a. Manufacturers:
 - 1) Josam, No.88250.
 - 2) Chicago Faucet Co., No.447.
 - 3) Zurn Industries, Inc., No.Z-1022.
 - 4) Or approved equal
 - 3. Remote Location:

- a. Machined brass valve with integral vacuum breaker, pressure adjustment and distribution units with visual operations inspection cover where required for multiple connections.
 - b. By Precision Plumbing Products Model P.1 or P.2 as applicable, or approved equal.
- B. Shock Absorbers:
 - 1. Stainless steel shell, elastomeric bellows, pressurized argon charge, sized per PDI-WH 201 at each branch of cold and hot water supplies, group toilets, and as shown on Construction Documents.
 - a. Zurn Industries, Inc., No.Z-1700.
 - b. Josam, No.75000.
 - c. Or approved equal
 - 2. Copper shell at individual toilet rooms and isolated fixtures. By Josam 75000-S or approved equal.
- C. Water Hammer Arrestors:
 - 1. Sioux Chief Mfg. or approved equal.
- D. Vacuum Breakers:
 - 1. Hose Bibb Vacuum Breaker: Non-removable. No 8A by Watts Regulator Co. or approved equal.
 - 2. Atmospheric Type: No.288A by Watts Regulator Co. or approved equal.
 - 3. For Plumbing Fixtures: see Section 15440.
- E. Unions and Flanges:
 - 1. Steel Pipe 2" and Smaller: Malleable iron unions with brass seat. Galvanized pipe requires galvanized unions.
 - 2. Steel Pipe 2-1/2" and Larger: Bronze flanged connections 150-pound Class. Galvanized pipe requires galvanized unions.
 - 3. Copper Pipe 2" and Smaller: Bronze unions.
 - 4. Copper Pipe 2-1/2" and Larger: Bronze flanged connections 150-pound Class.
 - 5. Dielectric Unions or Flanges:
 - a. Meet dimensional requirements and tensile strength of pipe unions or flanges according to Fed. Spec. WW-U-531D.
 - b. Suitable for required operating pressures and temperature conditions.
 - c. Provide metal connections on both ends. Ends shall be threaded or soldered to match adjacent piping.
 - d. Separate metal parts at union to prevent current flow between dissimilar metals.
- F. Escutcheons:
 - 1. Provide escutcheons securely in place on exposed pipes passing through walls, partitions, floors, and ceilings of finished areas unless otherwise noted on Construction Documents.
 - 2. Provide escutcheons with sufficient outside diameter to adequately cover sleeved openings.
 - 3. Interior Walls, Partitions, and Ceilings: Solid or stamped chrome plated brass or stainless steel, one piece or split pattern.
 - 4. Floors and Exterior: Solid cast brass, rough chrome plated or cast nickel bronze alloy, one piece or split pattern.
- G. Pressure Gages:

1. Cast aluminum alloy case, face diameter minimum 3-1/2", range selected so operating pressure is at middle of range.
 2. Accuracy: ANSI Grade A maximum of 1.5 percent error at any reading on scale.
 3. Manufacturers:
 - a. Ashcroft.
 - b. Marshalltown.
 - c. Taylor Instrument Company.
 - d. Or approved equal
- H. Thermometers:
1. Straight type mercury filled, 9-inch scale, □V□ shaped adjustable angle separable socket well.
 2. Accuracy to 1 percent of scale range.
 3. Manufacturers:
 - a. Ashcroft.
 - b. Marshalltown.
 - c. Taylor Instrument Company.
 - d. Or approved equal
- I. Thermometer Wells:
1. Brass construction with extension neck (2 inches minimum) with brass cap and chain.
 2. Manufacturers:
 - a. Ashcroft.
 - b. Marshalltown.
 - c. Taylor Instrument Company.
 - d. Or approved equal
- J. Pressure Reducing Valves:
1. 25 to 75 psi range, union connection, built-in bypass, all bronze, monel screen.
 - a. 1/2" through 2": 600 Series by Wilkins or approved equal.
 - b. 1/2" through 3": for higher flow capacities, 500 Series by Wilkins or approved equal.
 - c. 1/2" to 1": for lower flow capacities, 70 Series by Wilkins or approved equal.
- K. Pipe Hangers and Supports:
1. Provide hangers, supports, and supplementary steel as specified for different applications.
 2. Insert, Hangers, Rods, and Clamps: Figure numbers used refer to Grinnell. You can provide also from Fee and Mason or Elcen Metal Products or approved equal.
 - a. Inserts:
 - 1) Universal Concrete Insert: Fig.282.
 - 2) CB Junior Concrete Insert: Fig.279.
 - 3) Wedge Type Concrete Insert: Fig.281.
 - 4) Expansion Case: Fig.117.
 - b. Hangers: Adjustable clevis type.

- 1) Cast Iron Pipe: Fig.590.
- 2) Copper Tubing: Fig.CT-65.
- 3) Insulated Steel Pipe: Fig.300.
- 4) Uninsulated Steel Pipe: Fig.146.

c. Clamps:

- 1) V.F.S. beam clamp with weldless eyenut, Fig.292, clamp size 1, rod size 3/4".
- 2) C-clamp with retaining clip, Fig.87.
- 3) I-beam clamp, Fig.131.
- 4) Universal side I beam clamp, Fig.225.
- 5) C-clamp, copper finish, Fig.CT88.

d. Rods: Galvanized with continuous thread, Fig.146.

e. Riser Clamps:

- 1) Black Steel, Fig.261.
- 2) Plastic coated, Fig.261C
- 3) Copper finish, Fig.CT121.

3. Horizontal Copper Piping:

<u>Pipe</u>	<u>Rod Diameter</u>	<u>Clamp or Hanger Maximum Spacing</u>
Up to 1-inch	3/8"	6 feet
1-1/4 and 1-1/2"	3/8"	6 feet
2 inches	3/8"	8 feet
2-1/2"	1/2"	8 feet
3 and 4 inches	1/2"	8 feet

4. Horizontal Cast Iron Piping:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 4 inches	1/2"	5 feet
4 inches	5/8"	5 feet
6 inches and larger	3/4"	5 feet

5. Wall Support:

- a. U-clamps as accepted.
- b. Unistrut supports.

6. Vertical Support: Steel riser clamps.

L. Insulation Protection Shield: Fig.167.

M. Access Panels (Wall or Ceiling): As indicated in drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Inserts:

1. Use inserts for suspending hangers from reinforced concrete slabs or beams when possible.

2. Provide flush inserts at concrete to be a finished surface.
- B. Sleeves:
1. Seal space between pipe or duct and surrounding floor, wall, or ceiling construction with noncombustible insulation and tight-fitting metal caps on both sides with caulking.
 - a. Pipe Through Floors: Form from 18 gage galvanized sheet metal.
 - b. Pipes Through Beams, Walls, Fireproofing, Footings, and Potentially Wet Floors: Form from steel plate or 18 gage galvanized sheet metal.
 2. Size sleeves to allow movement caused by expansion.
 3. Seal and fireproof penetrations.
- C. Pipe Hangers and Supports: Also see Sections 15090 and 15515 for complimentary information.
1. Provide adjustable hangers, inserts, brackets, rolls, clamps, and supplementary steel as required for proper support of pipelines.
 - a. Design hangers to allow for expansion and contraction of pipelines. Size to allow pipe covering to run continuously through hangers. Allow for proper anchoring and movement of all hot lines.
 - b. Install hangers to allow 1/2" minimum clear space between finished covering and adjacent work.
 - c. Place a hanger within 1 foot of each horizontal elbow.
 - d. Use hangers with 1-1/2" minimum vertical adjustment after piping is erected.
 - e. Provide multiple or trapeze hangers if several pipes can be installed in parallel and at the same elevation.
 - f. Support riser piping independently of connected horizontal piping when practical.
 - g. Piping shall not be supported by equipment.
 - h. Coordinate location of hangers with light fixtures.
 - i. Wire brush steel or iron supports and prepare surfaces ready for painting specified under Sections 09900 and 09901. Prime coat exposed non galvanized hangers and supports.
 - j. Provide copper plated hangers and supports for copper piping or provide sheet lead packing between hanger or support and piping. Dissimilar metal contact is not allowed.
 2. Horizontal Cast Iron Pipe: Place hangers within 18 inches of hub or joint.
 3. Hubless Joints: Provide support at every other joint. Support each joint when length between supports exceeds 4 feet.
 4. Trapeze Clamp or Hangers:
 - a. Secure pipes supported by trapeze clamp or hangers and not mounted on pipe rolls to trapeze with pipe clamps or "U" bolts.
 - b. Place clamp or hangers at each change of direction.
 - c. Place clamp or hangers within 1 foot of valves and other appurtenances in horizontal piping.
 - d. Place clamp or hangers maximum 3 feet from end of each branch runout.
 5. Insulated Pipes:
 - a. Provide hangers with a diameter large enough to include insulation.
 - b. Install a protection shield with each hanger. 180-degree arc, 16 gage galvanized sheet metal covering, minimum 12 inches long.
 - c. Provide support saddles for insulated piping over 2 inches in diameter.

6. Special Supports: Clamps, hangers, and supports required by equipment manufacturers shall be installed according to equipment manufacturer's recommendations.
 7. Plumbers tape, straps, chain, wire hangers, or perforated bar are not allowed for hanging pipe.
- D. Water Hammer Arresters:
1. Supply Piping: Provide a water hammer arrester for each fixture supply including hot and cold water. Do not provide air chambers where water hammer arresters are installed.
- E. Unions and Flanges: Provide at connections of equipment and at strainers and control valves.
- F. Escutcheons: Fit and firmly secure escutcheons to pipes passing through finished floors, ceilings and walls.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15440

PLUMBING FIXTURES, TRIM, AND SUPPORTS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15410 - Piping (Plumbing).
2. 15430 - Piping Specialties (Plumbing).

1.02 SUBMITTALS: In accordance with Section 01330.

A. Submit Shop Drawings for the following:

1. Fixtures: Catalog cuts with rough-in dimensions identified as designated in fixture schedule, riser diagrams, and as specified.
2. Faucets: Catalog cuts and templates for drilled openings.
3. Fixture Trim: Catalog cuts.
4. Carriers: Catalog cuts.

1.03 QUALITY ASSURANCE

- A. Certification: Submit a letter, signed jointly by the manufacturer of the product and the installer of the product, attesting that no lead is contained in any piece of equipment or in the piping connections that could contaminate water, drinks, or food by contact.
- B. Comply with Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fixtures: As indicated in Plumbing Fixture Schedule.

2.02 FIXTURES

1. Water Closets:

1. Wall Hung Water Closet (WC - 1):

1. White, top spud, siphon jet flush action, 1.28 gpf, elongated bowl.
 - 1) Aftwall – 2856.128 by American Standard or approved equal.
2. Flush Valve: Sloan Royal 111 or approved equal
3. Seat: Elongated, heavy duty, open front less cover.

2. Wall Hung Water Closet, HC Accessible (WC - 2):

1. White, top spud, siphon jet flush action, 1.28 gpf, and elongated bowl.

- 1) Aftwall ADA - 2856.128 by American Standard or approved equal.
 2. Flush Valve: Sloan Royal 111 or approved equal
 3. Seat: Elongated, heavy duty, open front less cover.
3. Floor Mounted Water Closet, HC Accessible (WC - 3):
 1. White, top spud, siphon jet flush action, 1.28 gpf, and elongated bowl.
 - 1) Madera 17 inches high, 1.28/FV 10 inch rough – 2854.128 by American Standard or approved equal.
 2. Bolt Caps: 481310-100 by American Standard or approved equal.
 3. Flush Valve: Sloan Royal 111 or approved equal.
 4. Seat: Elongated, open front less cover.
2. Urinal (UR - 1):
 1. Siphon Jet Flush Action: Wall hung, 0.125 gpf, vitreous china, 3/4" top inlet spud.
 1. Wash brook Flowise High Efficiency 6590.001 by American Standard or approved equal.
 2. Flush Valve: Oscillating non-hold open handle. 186-0.125 by Sloan Royal or approved equal,
3. Mop Receptor (MSK - 1):
 1. Molded resin, 24 inches x 24 inches x 10 inches, rim guards, center drain.
 1. Model MSR-2424 by Florestone or approved equal.
 2. Fitting: Exposed yoke, wall mounted, vacuum breaker, top brace, stops in shanks.
 1. Heritage 8354.111 by American Standard or approved equal.
4. Lavatories:
 1. Wall Hung LAV/HC Lav (L -1):
 1. Enameled cast iron, 20 inches x 18 inches, single hole, with lug holes for concealed carrier arms.
 - 1) Lucerne 0356.421 by American Standard or approved equal.
 2. Hot and Cold Water Fitting, accessible: Selectronic integrated electronic proximity lavatory faucet with thermostatic mixing valve and power kit.
 - 1) 705B.105 by American Standard or approved equal.
 3. HC Hot Water Guard:

- 1) Manufacturers:
 - 1) Handi Lav-Guard Insulation Kit 102/105 - white, by Truebro or approved equal.
 - 2) Use manufacturer's vandal resistant fasteners.
 4. Supply Pipe: 3/8" rigid riser with loose key control. By McGuire or approved equal.
 5. "P" Trap: Adjustable offset with tubing drain to wall, cleanout plug and wall escutcheon. By McGuire or approved equal.
 6. Grid drain: Perforated, chrome plated, 1-1/4" offset tailpiece. By McGuire or approved equal.
 7. Floor Mounted Carrier Arms: Josam 17100-M-628 or approved equal.
5. Double Compartment Stainless Steel Sink:
 1. (SK - 1), Lustertone, 18 gage, Type 304 stainless steel, self-rimming, double ledge.
 1. LRAD-33160 by Elkay or approved equal.
 2. Fitting: Single control faucet with vandal resistant aerator.
 1. 4205.001 by American Standard or approved equal.
 3. Tailpiece: Offset with grid strainer, chrome plated P-trap with swivel joint, chrome plated flexible supplies with loose key stops: McGuire or approved equal.
6. Washbasins (WSHB - 1):
 1. 4 station units with cold and hot water fitting as specified in plumbing fixture schedule.
 1. Intersan 1.0-4, stainless steel or approved equal
7. Locker Room Showers:
 1. Wall Mounted Shower Heads.
 1. Vandalproof with concealed mounting screws, adjustable spray pattern by user, 30-degree spray angle, brass construction, flow not to exceed 2.5 gpm.
 2. Manufacturers:
 - 1) 1662.601 by American Standard.
 - 2) Or approved equal.
8. Electric Water Coolers (EWC - 1):
 1. Wall Mounted, 2-stream mound building projector, self-closing valve with automatic stream regulator, polished chrome plated brass bubbler, push bars in front and on both sides, for handicapped and standard use. See Drawings for mounting elevations.
 2. Manufacturers:
 1. Elkay LVRCTLSC or approved equal

3. No lead shall be allowed in the manufacture of any piece of equipment within water coolers nor in any piping joint or connection within the unit.
9. Floor Drain Reseal: VBF-72-A1 by Sloan or approved equal.

2.03 CARRIERS

- A. All carriers shall be fully bolted to floor and installed as recommended by manufacturer.
 1. Lavatory/Lavatory HC:
 1. Rectangular structural steel uprights with integral welded heavy steel foot, cast iron concealed arms. Model 17100 by Josam or approved equal.
 2. Urinal:
 1. Rectangular structural steel uprights with integral welded steel foot, hanger bracket, lower bearing plate. Model 17560 by Josam or approved equal.
 3. Water Closet:
 1. Josam 12000 Series Chase-Saver II, 4-inch pipe size, with pylon feet, adjustable, provided with vandal proof trim, supply pipe support and adjustable chase extensions or approved equal.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected.

3.02 EQUIPMENT AND FIXTURE CONNECTIONS

- A. Provide necessary material and labor to connect fixtures and equipment having plumbing connections including fixtures and equipment specified and furnished in other sections.
- B. Supply Pipe Cut-off Valves:
 1. Equip supply pipes to each item of equipment or fixture (except faucets furnished with an integral stop) with a cutoff valve to enable isolation of the item of equipment or fixture for repair and maintenance without interfering with operation of other items of equipment or fixtures.
- C. Supply Pipe Support: Anchor supply piping to all items of equipment or fixtures to prevent movement.
- D. Templates: Furnish templates and rough opening dimensions to fabricators of countertops and case work for location and sizes of openings for faucets and sink.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15457 WATER HEATERS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: A complete hot water generating system with necessary accessories as indicated on Construction Documents, as specified, and as required by code.
- B. Related Sections:
 - 1. 15410 - Piping (Plumbing).
 - 2. 15430 - Piping Specialties (Plumbing).

1.02 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature before starting work.
- B. Shop Drawings:
 - 1. Water Heaters: Catalog cuts, performance characteristics.
 - 2. Pressure and Temperature Relief Valve: Catalog cuts, capacity.
 - 3. Gages: Catalog cuts.
 - 4. Recirculating Pumps: Catalog cuts and performance characteristics.

PART 2 PRODUCTS

2.01 EQUIPMENT

- 1. Electric Water Heaters:
 - 1. 18 KW, 120-gallon size, as indicated on Drawings.
 - 2. Double element, drain pan, wired for simultaneous use.
 - 3. 1-inch thick fiberglass or foamed plastic insulation jacket.
 - 4. DRE-120 by A.O. Smith or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide a gate valve and union at cold water connection to heater. A union shall be provided at hot water connection.
- B. Provide on cold water supply to heater a vacuum relief valve of sufficient size to protect tank from back pressures.
- C. Pressure relief valve and drain pan drain shall discharge to outside per code regulation or according to local ordinances.
- D. Provide thermometer on top of heater in oversized tee and nipple on outlet piping of heater.

- E. Adjust individually controlled elements to start at 5 degrees F. temperature differential for each heater element.
- F. The water heater shall fit properly in the floor space provided. Installation shall be according to local, municipal, state, and national codes.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.

END OF SECTION

SECTION 15515 VALVES, HANGERS, AND SPECIALTIES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15090 - Supports, Anchors, and Seals.
2. 15410 - Piping (Plumbing).

1.02 REFERENCES

A. The American Society of Mechanical Engineers (ASME) Publications: ASME Boiler and Pressure Vessel Code - Current edition.

1.03 SUBMITTALS: In accordance with Section 01330

A. Submit the following:

1. Pressure Relief and Reducing Valves: Catalog cuts; pressure range, and settings.
2. Air Vents: Catalog cuts.
3. Flexible Connectors: Catalog cuts.
4. All Valves: Catalog cuts, schedule of proposed installation locations, pressure ratings, and materials of construction.
5. Inserts: Catalog cuts and load tables.
6. Supports: Catalog cuts or drawings.
7. Anchors: Drawings and details of installation.
8. Water Flow Tube Station: Catalog cuts, pressure drop charts, and engineering information.
9. Shop Drawings of support equipment.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Valves:

1. Nibco.
2. Or approved equal

2.02 VALVES.

A. General:

1. Gate and globe valves shall not be installed with the stem pointing downwards. Valves may be installed with the stem at or above a horizontal plane. Provide adequate clearance for stem rise.
2. Check valves may be installed either in the horizontal or vertical position. Non-spring-loaded check valves shall only be installed in the vertical position when the flow is upwards.
3. Butterfly valves may be installed with the stem in any position. Whenever possible the stem shall be installed as outlined for gate and globe valves.
4. Provide all valves with a 1-1/2" diameter brass tag having 1/2" high black filled numbers and 1/4" high legend above, as manufactured by Seton or approved equal.

- a. Legend shall include abbreviations such as: PLMG, CW, HW, GAS, HVAC, etc.
 - b. Valve tag fasteners shall consist of No.6 brass beaded chain with brass "S" hooks. The use of color-coded one-piece nylon ties is acceptable instead of beaded chain fasteners. Brass "S" hooks are required with ties.
 - c. Record all valve tag numbers in project record drawings and submit before requesting final payment.
- 5. Provide ease of access to valve handwheel or lever to maintenance personnel.
 - a. Valves installed above a ceiling shall have the stem placed 15 degrees above the horizontal position whenever possible.
 - b. Provide colored thumbtack indexes at all ceiling tiles where valves are installed directly above.
 - c. Index all colored thumbtacks in the project record drawings.
- B. Check Valves:
 - 1. To 2":
 - a. Class 125 or Class 200, bronze, screwed bonnet, Y pattern, renewable Teflon discs, soldered or threaded ends.
 - b. Manufacturers:
 - 1) Nibco T/S-235-Y.
 - 2) Grinnell 3300.
 - 3) Milwaukee 590-S.
 - 4) Or approved equal.
- C. Ball Valves:
 - 1. Plumbing: Allowed only for balancing service in domestic hot water return.
 - 2. HVAC: Allowed only for shut-off, not for balancing service. Provide 3-inch stem extensions for insulated line.
 - 3. Porting: No reduced ports shall be acceptable in any ball valve.
 - 4. Up to 2":
 - a. Class 150, 400/600 psi WOG, full port, three-piece construction, blowout-proof stem, non-asbestos packing, bronze body, silicone bronze stem, bronze/ brass/chrome plated ball, Teflon resilient seat, and EPDM O ring seal.
 - b. Manufacturers:
 - 1) Nibco T/S-595-Y.
 - 2) Hammond 8604/8601.
 - 3) Milwaukee BA-300SS/350S.
 - 4) Or approved equal.

2.03 HOSE BIBBS

- A. Interior:
 - 1. Concealed Supply:

- a. Flanged, all brass, chrome plated, 3/4" angle hose valve, with vacuum breaker.
 - b. Manufacturers: No.952 by Chicago Faucet or approved equal.
 - c. Provide isolation valve in branch.
- B. Pressure Relief Valves:
 1. 3/4": Brass body, micro finished bevel for seats, cadmium plated springs, manual chilled lift ring, ASME Std. Bell and Gossett or water or approved equal.
- C. Pressure Reducing Valves:
 1. 3/4": Brass body and brass working parts with built-in strainer, 125 W.S.P. Bell and Gossett or approved equal.
- D. Pressure Gages:
 1. Standard depth, cast aluminum, black finished, chrome plated close type ring, clear glass window, bronze bourdon tube, precision movement and ± 0.5 percent accuracy.
 2. Gage shall have a minimum 4-1/2" diameter face and with the operating pressure displaying at the middle range of the scale. Bottom connection shall be at least 1/2" diameter.
 3. Manufacturers: H.O. Trerice, Marshalltown, Ashcroft, or Taylor or approved equal.
- E. Gage valves:
 1. Brass, 1/2" needle valve type.
 2. Manufacturers: H.O. Trerice, Model No.735-2 or approved equal.
 3. Provide pressure snubbers at gage cocks manufactured by H.O. Trerice, Model 872. Provide also from Marshalltown, Ashcroft, or Taylor or approved equal.
- F. Dielectric Pipe Fittings:
 1. Dielectric pipe fittings shall consist of insulators, insulating gasket, pipe connector and nut or flange as required.
 2. Pipe connectors shall be suitable for soldered, screwed, or welded joints as required.
 3. Dielectric unions shall be rated at 250 psi and cast-iron flange unions at 175 psi.
 4. Dielectric fitting shall be plated according to Federal Specifications of 0.005".
 5. Fittings shall be as manufactured by Epco or approved equal.
- G. Water Flow Sensors:
 1. As manufactured by Annubar ANR-75, stainless steel or approved equal.
 2. Instrument connections shall be No.C-22.
 3. 1/4" valves on 1-3/8" square head.
 4. Valve rating shall be maximum 5,000 psi at 100 degrees F.
 5. Flow sensor in steel pipe shall be weld nipple mounted.
 6. Flow sensor in PVC pipe shall be saddle mounted.
 7. Manufacturers: Dietrich Standard Corp or approved equal.

2.04 PIPE HANGERS AND SUPPORTS

- A. Provide hangers, supports, and supplementary steel as required for the different applications.
- B. Inserts, Hangers, Rods, and Clamps: Fig. numbers used refer to Grinnell, Fee and Mason, or Michigan Hanger

Co. An "or approved equal" can be submitted for review.

1. Inserts: (Galvanized or stainless steel except as noted.)
 - a. Universal concrete insert, Fig.282.
 - b. Wedge type concrete insert, Fig.281.
 - c. Expansion case, Fig.117.
2. Clamps:
 - a. UFS beam clamp with weldless eye nut, Fig.292, clamp size 1, rod size 3/4".
 - b. C-clamp with retaining clip, Fig.87.
 - c. 1 beam clamp, Fig.131.
 - d. Universal side 1 beam clamp, Fig.225.
 - e. C-clamp, copper finish, Fig.CT-88.
3. Hangers: Use adjustable clevis type hangers as specified. Hangers for insulated pipes shall have a diameter large enough to include insulation and a protection shield shall be installed with each hanger.
 - a. Cast iron pipe: Fig.590.
 - b. Copper tubing: Fig.CT-65.
 - c. Insulated steel pipe: Fig.300.
 - d. Uninsulated steel pipe: Fig.260.
 - e. Trapeze.
4. Rods: Continuous thread, Fig.146. Sizes shall be as specified.
5. Riser Clamps:
 - a. Black steel, Fig.261.
 - b. Plastic coated, Fig.261C.
 - c. Copper finish, Fig.CT121.

C. Horizontal Steel Piping Support Spacing and Rod Size:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 1-1/4"	3/8"	8 feet
1-1/2" & 2"	3/8"	10 feet
2-1/2" & 3"	1/2"	12 feet
4" & 5"	5/8"	12 feet
6"	3/4"	15 feet
8" & 12"	7/8"	18 feet
14" & 16"	1"	24 feet

D. Horizontal Copper Piping:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 1-1/2"	3/8"	6 feet
2"	3/8"	8 feet
2-1/2", 3", & 4"	1/2"	8 feet

- E. Insulation Protection Shield: Fig.167.
- F. Wall Access: Refer to drawings and to Section 15010 .

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide shut-off valves at inlets and outlets of equipment and branch connections to mains and as shown on Construction Documents.
- B. Final connections to apparatus, equipment, automatic control valves, and pressure reducing valves shall be made with flanges or unions between shut-off valve and connection.
- C. Connections to cooling coils and refrigeration machines shall have flanges or unions next to equipment to allow tube removal without extensive dismantling of piping.
- D. Pressure Relief Valves: Provide at cooling coil side of shut-off valves and where shown on Construction Documents.
- E. Flexible Connectors: Provide between vibrating equipment and piping.
- F. Location of Valves and Chain Operators:
 - 1. Install valves to be accessible for operation and free from interferences when operated.
 - 2. Position so leakage will not contact any electrical equipment located below.
 - 3. Provide valve chain operators for valves 4 inches and larger if the valve handle is more than 6 feet above the operating equipment room floor level.
- G. Pressure Gages: Provide as shown on Construction Documents and at following locations:
 - 1. At suction and discharge of circulating pumps.
 - 2. At inlet and outlet of evaporator and condenser.
 - 3. At makeup water inlet to expansion tanks and equipment.
- H. Pipe Hangers and Supports:
 - 1. Provide adjustable hangers, inserts, brackets, rolls, clamps, and supplementary steel as required for proper support of pipe lines.
 - 2. Design hangers to allow for expansion and contraction of pipe lines and of adequate size to allow covering to run continuously through hangers.
 - 3. Support piping independently of equipment.
 - 4. Coordinate location of hangers with light fixtures.
 - 5. Wire brush steel or iron supports and prepare surfaces under this section for painting.
 - 6. Pipes supported by trapeze hangers and not mounted on pipe rollers shall be secured to the trapeze with pipe clamps or "U" bolts.
 - 7. Hangers shall be placed at each change of direction, within 1 foot of valves and other appurtenances installed in horizontal piping and not more than 3 feet from end of each branch runout.
 - 8. Special Supports: Provide clamps, hangers, and supports according to equipment manufacturer's recommendations.

9. Supports of wire, rope, wood, chain, strap, perforated bar, or any other makeshift devices are not allowed.
 10. Where overhead construction does not allow fastening hanger rods in required locations, provide additional steel framing as required.
 11. Provide "Vibration Isolation" at supports subject to vibration.
 12. Maximum loading on inserts shall not exceed 75 percent of catalog rating.
 13. Floor supports, wall brackets, and expansion tank supports as shown on Construction Documents or as required to support equipment. Submit shop drawings.
 14. Buckling of piping due to inadequate provision for expansion shall be Contractor's responsibility. Piping shall be properly guided between expansion joints and anchor points.
- I. Water Flow Sensors: Install water flow tube stations according to manufacturer's published recommendations and as shown on Contract Documents.
- J. Dielectric Fittings: Provide dielectric fittings between piping of dissimilar metals.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15890 DUCTWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Related Sections:
 - 1. 15910 - Duct Accessories.
 - 2. 15940 - Outlets (HVAC).

1.2 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), latest edition:
 - 1. HVAC Duct Construction Standards (Metal and Flexible).
 - 2. High Velocity Duct Construction Standards.
- B. National Fire Protection Association (NFPA):
 - 1. NFPA 45 - Standard on Fire Protection for Laboratories Using Chemicals.
 - 2. NFPA 90A - Standard for the Installation of Air-conditioning and Ventilating Systems of Other than Residence Type.
 - 3. NFPA 96 - Removal of Smoke and Grease Laden Vapors from Commercial Cooking Equipment.
- C. National Electrical Code - NEC 70 (Edition applicable to the Project).
- D. American Society of Heating, Refrigerating, and Air-conditioning Engineers, Inc. (ASHRAE) 62 - Ventilation for Acceptable Indoor Air Quality.

1.3 SYSTEM DESCRIPTION

- A. All ductwork shall be sealed to comply with SMACNA:
 - 1. Seal Class A.
 - 2. Leakage Class 6 for rectangular ducts.
 - 3. Leakage Class 3 for round and oval ducts.
- B. Use of fiberglass or components containing coated or exposed fiberglass within airstreams is prohibited.

1.4 SUBMITTALS: In accordance with Section 01330

- A. Ductwork:
 - 1. Provide 1/4" scale composite Shop Drawings. Shop Drawings shall be coordinated with other trades before submitting.
 - 2. Catalog Cuts: Medium pressure ductwork, duct sealer, and turning vanes.
 - 3. Catalog Cuts, Ratings, and Performance Data: Flexible ductwork.
- B. Casings, Plenums, and Housings: Details of construction.
- C. Provide details of proposed typical ductwork fittings including:
 - 1. Seams and joints.
 - 2. Elbows, vaned and radius.
 - 3. Transitions and Offsets.

4. Taps and outlet frames.
 5. Branch connections and tees.
 6. Splitter dampers.
- D. Duct Hanger System: Catalog cuts and shop drawing.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Flexible: Genflex or Flexible Technologies or approved equal.
- B. Ductwork and Fittings:
1. Metal Aire.
 2. Semco.
 3. Spiramatic.
 4. United Sheet Metal.
 5. Or approved equal

2.2 MATERIALS

- A. Ductwork shall be fabricated and installed according to the SMACNA Standards, except as shown on drawings or specified.
- B. Ductwork shall have manufacturer's gage stamp intact.

2.3 LOW PRESSURE DUCTWORK

- A. Includes ductwork from low pressure air handlers, exhaust, and outside and return air ductwork. Velocities shall not exceed 1,300 fpm and static pressures not to exceed 2 inches WG.
- B. Provide galvanized steel ductwork, designed, constructed, installed and tested according SMACNA - "HVAC Duct Construction Standards" and as shown on drawings. Ductwork to have manufacturer's gage stamp. Provide cross-breaking or beading to prevent flexing, but do not reduce gage of metal below that required for flat ductwork sheets.
- C. Provide galvanized steel saddles at points of support of insulated piping saddles.
- D. The following ductwork and plenums shall be insulated, unless noted otherwise.
1. Return air ductwork in non-conditioned spaces, including mechanical rooms and space above ceilings.
 2. Return air transfer boots.
 3. Return/outside air plenums at air handlers.
- E. Plenums:
1. Galvanized steel with the largest dimension of 30 inches and larger shall be 18 gages.
 2. Plenums shall be constructed, designed, installed, and tested according to SMACNA as specified. Joints shall be angle reinforced pocket type. Provide fully gasketed joints between plenums and filter sections.
 3. Provide plenum access doors where indicated on drawings. Doors shall be constructed according to Figure 6-12 of SMACNA - HVAC Duct Construction Standards.
- F. Flexible Insulated Ductwork:

1. Lightweight duct, core of corrosion resistant reinforcing wire helix permanently bonded within fabric, insulated with 1-1/2" thick, 3/4 lb. density fiberglass flexible insulation and covered with a vapor barrier of aluminum metalized polyester film laminated to glass mesh, elastomer back coated. Duct shall meet NFPA 90A requirements and be listed as Class 1 Air Duct Material, UL 181.
 2. Manufacturers:
 - a. Atco Rubber Products.
 - b. Genflex.
 - c. Thermaflex II.
 - d. Venture Type VTKC.
 - e. Wiremold Co.
 - f. Or approved equal
- G. Ductwork and splitter dampers within the ductwork shall be made of the same material.
- H. Turning vanes shall be provided in square elbows and shall be of same material as the ductwork. Turning vanes shall be of airfoil type, double thickness factory fabricated.

PART 3 EXECUTION

3.1 GENERAL

- A. Install low and medium velocity ductwork as shown on drawings. 90-degree bends shall not be made in medium pressure flexible ducts.
- B. Before systems are tested and balanced, ducts shall be thoroughly cleaned and blown out.
- C. Where interferences arise during construction, make transition or division of ductwork on basis of pressure drop equivalent to original size. Obtain approval from the Engineer and EOR, as directed by the Engineer, before fabrication.

3.2 INSTALLATION

- A. Install ductwork materials and accessories according to the latest edition of SMACNA Low Velocity Duct Construction Standards as specified. These written specifications shall take precedence in case of conflict.
- B. Seal all duct joints with sealer as specified for field sealing of high-pressure ductwork according to SMACNA.

3.3 LOW PRESSURE DUCTWORK

- A. Seams and joints in ductwork shall be made airtight. Make exhaust ducts passing through return air chases airtight.
- B. Install flexible ductwork shall be installed in sizes to match diffuser necks as indicated on drawings schedules. Duct length shall be not less than 5 feet and no longer than 7 feet. Duct shall be adequately supported to prevent kinks and sharp bends. Install according to manufacturer's recommendations and as shown on drawings.

3.4 DUCTWORK SUPPORTS AND HANGERS

- A. Provide support and hangers according to SMACNA HVAC Duct Construction Standards.

- B. Hangers shall be galvanized steel hung from inserts or clip angles secured to structure with expansion bolts in shear or tension as follows:
1. Roof Slab: In tension.
 2. Structural Beams: In shear, 12 inches minimum from bottom of beam.
 3. Joists: Use existing forming bolts openings only. Hangers shall be bent under ductwork at least 2 inches. Hangers for ducts over 48 inches wide shall be secured to bottom and sides of duct.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15910 DUCT ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. 15890 - Ductwork.
 - 2. 15940 - Outlets (HVAC).

1.02 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): Low and High Velocity Duct Manuals.
- B. National Fire Protection Association (NFPA) 90-A Standard for the Installation of Air-conditioning and Ventilating Systems of Other Than Residential Type.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Volume Dampers: Shop drawings.
- B. Low Pressure Ductwork Round Fittings: Shop Drawings or catalog cuts.
- C. Flexible Connections: Catalog cuts.
- D. Test Holes: Pipe couplings, catalog cuts, and proposed installation locations.

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Volume Dampers:
 - 1. Dampers shall be manual or automatic as indicated on drawings. Dampers furnished with automatic actuators shall be installed under this section.
 - 2. Volume dampers shall have opposed blades.
 - 3. Volume dampers shall be 2 gages heavier than the installed duct and shall be reinforced to prevent vibration and noise.
 - a. Dampers shall be according to SMACNA "Low Velocity Manual", as referred to in "Ductwork". Dampers shall have an indicating device with lock to hold damper in position for proper setting.
 - b. Splitter dampers shall be double thickness at the leading edges.
 - c. Volume dampers shall be fabricated according to Figure 2-12 of SMACNA Low Pressure Manual.
 - 4. Bridge lock type quadrant operators of dampers shall mount flush with surface of duct insulation.

- B. Flexible Connectors: Size flexible connections at a minimum of 4 inches between connected items. Provide 30-ounce glass fabric fire retardant and airtight, coated with neoprene on both sides. Ventglass by Ventfabrics, Inc. or Neoprene Fabriduct by Elgen or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Flexible connections shall be provided as shown on drawings. Lengths shall be between 3 feet and 8 feet.
- B. Low pressure ductwork round fittings shall be installed as shown on drawings and according to manufacturers recommendations.
- C. Provide test holes at mains and main branches and as required by test and balance contractor.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 15940 OUTLETS (HVAC)

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15890 - Ductwork.
2. 15910 - Duct Accessories.

1.02 SUBMITTALS: In accordance with Section 01330

- A. Outlets: Catalog cuts and schedules of installation and performance data at noted capacities.
- B. Outlet Accessories: Plaster frames, opposed blade dampers, and square to round neck adapter catalog cuts.
- C. Samples: Submit color chips for manufacturer's standard baked enamel colors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Air Outlets:

1. Air Guide
2. Price
3. Grille Tech
4. Or approved equal

2.02 MATERIALS

- A. Plaster frames shall be provided for plaster and dry wall ceiling and wall installations.
- B. Finishes shall be as follows:
1. Devices installed on surfaces to be painted shall match surface color. Factory prime coat.
 2. All Other Areas: Factory applied baked enamel. Color to match color chip furnished by the Engineer.
 3. Aluminum Devices: Satin aluminum baked enamel, except as specified.
- C. Provide a synthetic sponge rubber gasket between each frame and mounting surface forming an airtight seal.
- D. Manufacturer's published performance data shall be obtained from testing performed in a laboratory certified by the Air Diffusion Council. Testing shall be according to ADC Test Code 1062R4.
- E. Air diffusers shall be provided with opposed blade volume dampers adjustable from diffuser

face, blanking for proper coverage, and blow without producing objectionable noise or air motion at occupied level.

1. Diffusers in the same room shall be the same size and type, except as otherwise noted.
2. Diffusers shall be suitable for operation at 5 percent excess and 25 percent less than noted capacities.
3. Louvered face ceiling diffusers shall be of square, round, or rectangular face patterns. Provide:
 - a. Removable central core, snap-in type.
 - b. Flat flanged frame.
 - c. Welded aluminum construction.
 - d. White baked enamel finish.
4. Perforated ceiling diffusers are not allowed.

F. Grilles and Registers.

1. Ceiling return and exhaust registers shall be 1/2" x 1/2" x 1/2" grid type with opposed blade dampers and aluminum construction with white baked enamel finish. Frame shall be suitable for plaster frame mounting where required.
2. Sidewall return and exhaust registers shall be aluminum flange frame with fixed 45 degrees louvers spaced 3/4" with an opposed blade damper. Louvers shall be parallel to the long dimension.
3. Grilles shall be as specified for registers except dampers are not required. Perforated ceiling return grilles shall be of the lay-in type to match perforated ceiling diffusers.

G. Sidewall supply grilles and registers shall be aluminum flange framed, with 2 sets of adjustable vanes parallel to the long and the short sides and an opposed blade damper.

H. Supply and return, registers, diffusers, and grilles shall be provided with frames and finishes suitable for wall or ceiling finish and construction where installed. Coordinate with Construction Documents for ceiling types and locations.

I. Air outlets shall be provided as indicated on drawings. If outlet type is not indicated on the drawings, provide type used in similar areas elsewhere in the building.

PART 3 EXECUTION

3.01 EXAMINATION

A. Manufacturer of air distribution devices shall be responsible for examining application of each diffuser, grille, and register and guaranteeing each will provide comfort space conditions without drafts and excessive noise at noted capacity.

3.02 INSTALLATION

A. Install and connect all light troffer diffusers as required by the construction documents.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 15 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 15 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 15 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 15 Work.

END OF SECTION

SECTION 16023 CODES AND STANDARDS

PART 1 GENERAL

1.01 REFERENCES

- A. Comply with the following:
 - 1. Florida Building Code (FBC).
 - 2. National Electrical Code - 1999 (NEC), (NFPA 70).
 - 3. Florida Fire Prevention Code - 2014

1.02 QUALITY ASSURANCE

- A. Where materials and equipment are available under the continuing inspection and listing service of Underwriters Laboratories (UL), furnish materials and equipment so listed.

PART 2 NOT USED

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16100 BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 SUMMARY

A. Coordination with Other Trades:

1. Examine drawings and specifications. Visit site to determine work to be performed by Electrical, Mechanical, HVAC, and other trades.
2. Provide required electrical materials and equipment to put work into operation, completely wired, tested, and ready for use including raceways, conductors, disconnects, starters/contactors, or other devices for proper operation and sequences of electrical, mechanical, or other systems or equipment.
3. Unless otherwise noted, conduit, wire for controls, and devices, both line and low voltage, shall be provided and installed as described in this or other parts of the Construction Documents.
 - a. Install boxes or housings necessary for conduit and wire to controls, excluding items to be installed in piping, ducts, tanks, machinery, solenoid valves, pressure switches, aquastats, or similar devices.
 - b. These items are specified for installation in other sections. Connecting wiring is specified in this Division.
4. Control wiring in separate conduit between HVAC sensing devices and control panels or motors, shall be installed under this Division after verification from approved shop drawings of the required locations and connections.
5. Connect electrical equipment and devices as parts of the equipment or furniture furnished under other sections.

1.02 SUBMITTALS: In accordance with Section 01330

A. Manufacturers Data:

1. Complete list of materials to be furnished under this section.
2. Manufacturers' specifications and other data required to assure specification compliance.
3. Catalog cuts, clearly marked for identification of items to be provided, including disconnects, breakers, fuses, starters, lighting fixtures, transformers, or other materials not requiring specially prepared Shop Drawings.

B. Shop Drawings for nonstandard items, including but not limited to panelboards, switchboards, control centers, anchoring layouts and details, lighting fixtures, or similar products.

C. Contract Closeout Submittals:

1. Project Record Drawings.
2. Warranties.
3. Operating Instructions, maintenance manuals, and parts lists.
4. Point-to-point wiring diagrams.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage:

1. Deliver materials to jobsite in their original unopened containers with labels and certifications intact and clearly legible at time of use.
2. Store materials according to manufacturers' recommendations and as approved by the Engineer.

B. Replacement: In case of damage, pilferage, or other loss, make immediate repair or replacement of materials necessary to obtain approvals of the Engineer, without cost to the DTPW.

C. Protection: Use necessary means to protect materials of this section before, during, and after installation, including protection of installed work and materials of other trades.

PART 2 NOT USED

PART 3 NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16112 RACEWAYS AND CONDUIT

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16120 - Wire and Cable.

1.02 SYSTEM DESCRIPTION

- ##### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Product Data: Manufacturer's literature including printed installation instructions and recommendations before starting work. Submit samples if requested.

1.04 QUALITY ASSURANCE

- ##### A. Electrical Component Standard: Components and installation shall comply with NFPA 70 - National Electrical Code - 2014 (NEC).

PART 2 PRODUCTS

2.01 EQUIPMENT

- ##### A. Conduit shall be sized according to NEC, unless otherwise noted. Feeders and home runs shall not be less than 3/4" diameter.

B. Electrical Metallic Tubing (EMT):

1. Galvanized steel tubing with smooth interior coat of lacquer enamel or zinc coat.
2. Comply with ANSI C80.3-1983, and UL 797, and Article 348 of the NEC.

C. Flexible Metal Conduit:

1. Steel: Flexible galvanized steel conduit (Greenfield) complying with UL 1 and Article 350 of the NEC.
2. Liquid Tight: Flexible galvanized steel conduit with oil and water-resistant overall plastic sheath, complying with UL 1, and Article 351 of the NEC.
3. Minimum size for flexible metal conduit 1/2" except 3/8" where allowed by Section 349 of the NEC for connections to lighting fixtures.

D. Conduit Fittings:

1. EMT fittings: Zinc or cadmium plated steel or malleable iron of the compression type or stainless-steel multiple point locking (set screw) type. Connectors shall have insulated throats. Fittings shall comply with ANSI C80.3-1983. Die cast zinc alloy fittings are not allowed.
2. Flexible metal conduit fittings: Steel or malleable iron only with insulated throat,

- complying with Fed. Spec. W-F-406B. Die cast zinc alloy fittings are not allowed.
3. Bushings and connectors shall incorporate an insulating insert of at least 150 degrees C. rated plastic or 105 degrees C. rated nylon. Conduit bushings made entirely of nonmetallic material are not allowed. Grounding and bonding bushings shall have clamp type terminal for copper conductor.
 4. Expansion Fittings and Sealing Fittings: UL listed with ground continuity means.

E. Conduit Supports:

1. Straps: Formed zinc coated steel or malleable iron one-hole pipe straps or conduit clamps sized for conduits or tubing.
2. Fastenings: Zinc coated, or cadmium plated steel screws, bolts, toggles, and expansion anchors as required.
3. Electrical steel channels shall be Unistrut P-3000 Series or approved equal. Provide trapeze, clamps, supports, concrete inserts, galvanized steel or plated steel with galvanized conduit clamps, and threaded 1/4" diameter minimum suspension rods.
4. For individual branch circuit EMT or flexible metal conduit concealed above accessible hung ceilings only, "caddy clips" spring steel conduit clamps.

F. Wireways and Auxiliary Gutters:

1. Hot dip galvanized code gage sheet steel, complete with knockouts, enclosures, and removable covers unless indicated as hinged.
 - a. Manufacturers:
 - 1) Hoffman.
 - 2) Lee Products.
 - 3) Keystone.
 - 4) Square D.
 - 5) Or approved equal
2. Exterior locations shall have weathertight gasketed covers, joints, and drip-proof rain shields. Paint after installation with exterior enamel paint.
3. Wireways and gutters shall comply with Articles 362 and 374 of the NEC.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not proceed with the work of this Section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Provide where indicated and where required, ducts, conduits, tubing, wireways, and gutters to form a complete and integrally grounded raceway system. The system shall be installed according to NEC and local code requirements. Components of the system shall be of sufficient size, strength, and capacity to allow for placements, pulling-in, or other installation of conductors, wires, cables, splices, taps, and terminations whether included in this Contract or for future use without strain or injury to those items being installed.
- B. Provide pull wires in empty raceways where no conductors are installed in this Contract. Allow 10 inches minimum slack at each end of pull wire and securely caulk in place. Provide marking

tags showing opposite destination noting building and closet number at each end.

- C. The minimum size of, EMT, and flexible metallic conduit shall be according to NEC except as follows:
1. Unless otherwise specified under "Products" or shown on the Drawings.
 2. Unless otherwise shown on the Drawings, telephone conduits shall be not less than 1-inch trade size.
 3. Feeders and homeruns shall not be less than 3/4" diameter.
- D. Check sizes of raceways to determine the green equipment ground conductor specified, shown, or required can be installed in the same raceway with phase and neutral conductors according to the percentage of fill requirements of NEC. If necessary, increase the duct, conduit, tubing, or raceway sizes shown or specified to accommodate conductors without additional cost to the DTPW.
- E. Raceway and Conduit Locations: Unless indicated otherwise, conduit types specified shall be used in the following locations. Any deviation from this schedule shall be submitted for approval with corresponding price adjustments before installation. Any conduit installed and not of the specified type shall be removed and replaced with the specified type at no additional cost to the DTPW.
1. Interior Raceways:
 - a. Embedded in Concrete Walls or Floors Above Grade:
 - 1) EMT with concrete tight steel fittings.
 - b. Concealed in Masonry Walls:
 - 1) EMT with concrete tight fittings.
 - c. Concealed in dry wall construction, or in suspended ceilings: EMT or flexible metal conduit with steel fittings.
 - d. Interior Exposed:

EMT with steel fittings.
 2. PVC conduit shall not be used indoors either exposed or concealed.
- F. Raceway and Conduit Installation:
1. Conduit Routing:
 - a. Route feeders, homeruns, and conduits as indicated, except for minor deviations as accepted.
 - b. Maintain a minimum separation of 12 inches between conduits containing emergency feeders and conduits containing normal feeders.
 - c. The routing of conduit, as shown on the plans, is general.
 - d. Before installing any work, examine the working layouts of all other trades to determine exact locations and clearances.
 - e. Where equipment is installed by other trades requiring connection as specified in this section, determine exact conduit entry locations from the approved shop drawings.

- f. Modifications to conduit runs shown on the electrical drawings, based on this section, shall be made without additional cost to the DTPW, and shall be subject to Engineer approval.
 - g. In determining clearances, conduit shall not be run within 6 inches of any heated pipe or duct, or if unavoidable, the conduit must be kept at least 1 inch from the outer covering.
2. Conduits in Finished Spaces:
- a. Conduits, fittings, outlet boxes, and pull boxes shall be concealed in ceilings, floor slabs, walls, or partitions of the buildings.
 - b. Provide sufficient space at concealed conduits over conduit and coupling for the applications of finished floor, walls, and ceilings.
 - c. Examine the Drawings, and if necessary, confer with the Engineer to determine the type of construction containing the concealed conduits and the space available for such conduits.
3. Conduit Bending, Cutting, and Placement:
- a. Conduit bends and offsets shall be avoided where possible.
 - b. Required bends shall be made with standard benders designed for the purpose and with a minimum radius of 6 times the internal conduit diameter.
 - c. Make conduit bends according to the NEC unless otherwise shown on the contract Drawings. Use of a pipe tee or vise for bending conduit is not allowed.
 - d. Conduit crushed or deformed shall not be installed.
 - e. Bends shall be free from dents or flattening. Bends more than 360 degrees are not allowed in conduit between any 2 terminations of pull boxes.
 - f. Make no bend in surface raceways. Use factory formed fittings for surface raceways.
 - g. Raceways shall not contain more than two 90-degree bends or equivalent. Provide additional junction or pull boxes to meet this requirement.
 - h. The ends of conduit shall be carefully reamed out free from burrs before installation and after threading.
 - 1) Cuts shall be made square.
 - 2) Coupling of conduits by means of running threads is not allowed.
 - 3) Where it is impossible to run the conduit and coupling sections together, an Erickson coupling or an approved equal combination coupling shall be used.
 - 4) Joints shall be made up tight.
 - 5) Joints in conduits concealed in slab, floor fill, earth, etc., shall be made using approved silicone paint on threads.
 - i. Prevent lodgment of plaster, dirt, or trash in raceways, boxes, fittings, and equipment during course of construction. Clogged raceways shall be entirely freed of obstructions or replaced.
 - j. During installation of conduit, unfinished runs and terminations in pull boxes, cabinets, etc., shall be capped until conductors are installed.
 - k. Plastic caps designed for this specific purpose shall be used to cover and align conduits before concrete pours and shall remain on conduit stub-ups until conduit is extended. Caps shall have self-aligning, interlocking male or female wings molded on each side. Duct or electrical tape and wire are unacceptable.
4. Conduit Connections:

- a. Conduit and EMT runs shall be mechanically and electrically continuous from service entrance to outlets. Unless otherwise specified, each conduit shall enter and be securely connected to a cabinet, junction box, pull box or outlet box by means of a locknut on the outside and a bushing on the inside or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter. Where nominal circuit voltage exceeds 250 volts:
 - 1) In EMT or flexible metal conduit, the 1 locknut shall be made wrench-tight.
 - 2) Locknuts shall be the bonding type with sharp edges for digging into the metal wall of an enclosure and shall be installed to provide a locking installation.
 - 3) Locknuts and bushings or self-locking adapters will not be required where conduits are screwed into tapped connections.
 - 4) Protect vertical runs of conduit or EMT terminating in the bottoms of wall boxes or cabinets, etc., from the entrance of foreign material before the installation of conductors.
 - b. The end of each conduit one inch and smaller shall be provided where it enters a junction box, outlet box, cabinet, etc., with the locknut and bushing. For conduits 1-1/4" and larger, use insulated bushings with ground stud. If insulated bushings are of the fully insulated type, use additional locknuts inside the junction box or cabinet before installing the bushing. Provide conduit entering main distribution switchboard feeder pull boxes with insulated bushing with ground stud regardless of size.
 - c. Install the conduit system complete before any conductors are drawn in. Each run of conduit shall be blown through and swabbed after plaster is finished and dry, and before conductors are installed.
 - d. Install conduit to drain any moisture, collecting in the conduit, to the nearest outlet or pull box, where possible.
 - e. Where metallic conduit is exposed to different temperatures, seal the conduit to prevent condensation and passage of air from one area to the other.
 - f. Light and power conduit shall run from a permanent and continuous ground return back to the service ground connection point. Conduits used on systems entirely isolated from the light and power distribution system shall be electrically continuous and grounded in an approved manner.
5. Conduit Penetrations and Supports:
- a. Sleeves, conduits, or other pipes passing through floor slabs, beams, or walls shall be located to not impair the strength of the structure.
 - b. Conduits penetrating the walls or smoke partitions shall be fire stopped (sealed). Filling materials for openings in floors shall be fire-resistive, and finished to prevent passage of water, smoke and fumes. Filling material for openings in walls shall be fire-resistive where it occurs in fire walls and shall be installed to prevent the passage of air, smoke or fumes. Where conduit and wiring pass through fire walls or floor slabs, the Contractor shall fill the opening with fireproof sealant.
 - c. Where conduits passing through the openings are exposed in finished rooms, the finishes of the filling materials shall match and be flush with the adjoining floor, ceiling, or wall finishes.
 - d. Where unused sleeves or slots are provided for future installation of conduit, etc., they shall be suitably identified if not readily recognizable.
 - e. EMT and conduits not embedded in concrete or masonry shall be securely and independently supported so that no strain will be transmitted to outlet box and

- pull box supports, etc. Supports shall be rigid enough to prevent distortion of conduits during wire pulling.
- f. Run conduits exposed in unfinished spaces, mechanical equipment spaces, where specifically indicated on the Drawings, or with the expressed permission of the Engineer.
 - 1) Feeder conduits shall be run exposed or in hung ceilings, except as noted.
 - 2) Where exposed conduits are installed, they shall be run parallel to the building walls or partitions, using approved conduit fittings.
 - 3) Exposed conduits shall be securely supported with malleable iron pipe straps, angle iron pipe straps, angle iron or steel channel racks or other approved means as required for clearance of other piping or ductwork.
 - 4) Spacing of conduit supports shall not exceed 7 feet.
 - 5) Horizontal feeder conduit banks shall have their hangers fastened to the building structure by approved means.
 - 6) Hangers for banks consisting of 1 or 2 conduits may be fastened from inserts in the slab.
 - 7) Auxiliary steel for fastening shall be furnished and installed under this section.
 - g. Support individual conduits not larger than 1-1/2" diameter by means of one-hole pipe straps or individual pipe hangers. Support individual horizontal conduits larger than 1-1/2" diameter by individual pipe hangers.
 - h. Conduit located in hung ceilings shall be supported in approved manner similar to exposed conduits.
 - i. Branch circuit conduits above suspended ceilings may be supported from the floor construction above or from the main ceiling support members, however, the finished installation shall not interfere with the removability of ceiling panels. Individual branch conduits above suspended ceilings with removable panels may be supported from the ceiling suspension wires provided the load imposed on any individual wire is not greater than 64 pounds, including the ceiling weight.
 - j. Unsupported vertical drops over 10 feet from bus ducts or at motors shall be in rigid steel conduit. For vertical drops of less than 10 feet EMT may be used. Brace conduit to prevent swaying.
 - k. Space conduits installed against concrete or masonry surfaces away from the surface by clamp backs or other approved means.
 - l. In dry locations, spring steel fasteners, clips, or clamps specifically designed for supporting exposed single conduits may be used instead of pipe straps or pipe hangers.
 - 1) Hanger rods used with spring steel fasteners shall be not less than 1/4" diameter steel with corrosion resistant finish.
 - 2) Spring steel fasteners shall be specifically designed for supporting single conduits or EMT
 - 3) Type, size and spacing of spring steel fasteners with accessories shall be approved by the Engineer.
 - 4) Submit applicable load and rating data for approval.
 - 5) Wire shall not be used for support.
 - 6) Nails are not allowed for the support of conduit.
 - m. Where 2 or more horizontal conduits or EMT run parallel and at the same elevation, they shall be supported on multiple trapeze pipe hangers. Each conduit or EMT shall be secured to the horizontal hanger member by a U-bolt,

- one-hole strap, or other suitably designed and approved fastener.
- n. U-bolts, clamps, attachments, and other hardware necessary for hanger assembly, and for securing hanger rods and conduits shall be provided. Each multiple hanger shall be designed to support a load equal to or greater than the sum of the weights of the conduits, wires, hanger, plus 200 pounds. Hardware shall be hot-dip galvanized after fabrication.
6. Conduit Fastening: Fasten raceways as follows:
- a. To Hollow Masonry: Toggle bolts or expansion bolts as required. Holes not used to be filled.
 - b. To Concrete or Solid Brick Masonry: By expansion bolts. Holes drilled to a depth of more than 1-1/2".
 - c. To Steel Work: Machine screws, welded threaded studs, or spring-tension clamps. Raceways or pipe straps shall not be welded to steel structures.
 - d. To Light Steel Construction Partitions: Sheet metal screws. Bar hangers may be attached with saddle ties of 16 gage double strand zinc-coated steel wire.
 - e. Nail-type nylon anchors with lock washers and nuts may be used instead of expansion bolts or machine screws.
 - f. Explosive charge setting devices are not allowed for any type of fastening on the project.
 - g. Conduits, tubing, or raceways shall be continuous from outlet to outlet, cabinet, junction box, or pull box.
 - h. Surface Wireways and Auxiliary Gutters: Fasten according to manufacturer's directions with fastenings appropriate for surface as specified.
 - i. Cable Supports in Vertical Raceways: According to NEC Article 300-19.
7. Flexible Conduit:
- a. Flexible conduits shall be used for connections to motors and other electrical equipment when it is subject to movement, vibration, misalignment, cramped quarters, or where noise transmission is to be eliminated or reduced. Flexible conduit used to meet the above requirements shall be of the liquid-tight type when installed under any of the following conditions:
 - 1) Moisture or humidity laden atmosphere where it is possible for condensation to accumulate.
 - 2) Corrosive atmospheres.
 - 3) Where water or spray due to wash-down operations is frequent or possible.
 - 4) Wherever there is a possibility of seepage, dripping, etc., of oil, grease, or water.
 - b. Flexible conduit shall be used for short connections to control devices, recessed fixtures, and similar items with enough slack to avoid tension. Connection between structure and first point of attachment to vibrating equipment shall be flexible.
8. Empty Conduits: Where empty conduit or tubing is indicated for wiring to be installed in future by utility company or by separate contract, install conduit or tubing according to previous requirements for conduit and tubing with following additional requirements:
- a. No length of run shall exceed 75 feet for 3/4" size and 150 feet for 1 inch or larger sizes.

- b. Raceways shall not contain more than two 90-degree bends or equivalent.
 - c. Install additional pull or junction boxes to comply with above limitations, whether or not indicated.
 - d. Inside radii of bends in conduits of 1 inch or larger shall be not less than 10 times nominal diameter.
 - e. Provide pull wire in empty raceways.
9. Painting: Paint exposed conduit to match the surrounding wall or ceiling it is mounted against.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16120 WIRE AND CABLE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16112 - Raceways and Conduit.

1.02 SYSTEM DESCRIPTION

- ##### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Submit product data and descriptive literature before starting work.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Wire and Cable:

1. Wire and cable shall be soft annealed 98 percent conductivity copper with 600-volt A.C. thermoplastic insulation unless otherwise noted.
2. Wire and cable shall be new and manufactured not more than 12 months before installation.
3. Each coil or reel shall bear UL label and wire marked with AWG or circular mil wire size, voltage rating, insulation type, type stranding, and the manufacturer's name.
4. Unmarked wire found installed shall be replaced at no additional cost to the DTPW.
5. Wiring shall comply with NEMA WC-5, NEMA WC-7, IPCEA S-61-402 and IPCEA S-66-524.

B. Light and Power Wiring Circuit Conductors:

1. Light and power wiring circuit conductors shall be stranded in all sizes, and concentric strand Class B for conductors No.8 AWG and larger.

C. Wiring Insulation shall be as follows:

1. For Feeders and Motor and Equipment Power Circuits: *Type THWN-75 degrees C. in wet or dry locations, and THHN-90 degrees C. only at dry locations.*
2. For Branch Circuit Wiring for Lighting and Power Circuits: *Type THWN-75 degrees C. in wet or dry locations, and THHN-90 degrees C. only at dry locations.*
3. For Wiring Through Fluorescent Fixtures Where Fixture Is Used as Wireway: *Type THHN-90 degrees C.*

D. Color Coding:

1. Wire of Size No.8 and smaller shall be factory color coded 600 volt, THWN, or THHN. Sizes larger than No.8 may be factory color coded or color coded with 3M tape or

approved equal. Should tape be used, it shall cover not less than 6 inches of cable within enclosure.

2. Colors to be used in coding shall be:

120/208 Volt System

Neutral - White
Phase A - Black
Phase B - Red
Phase C - Blue
Ground - Green

277/480 Volt System

Neutral - Gray
Phase A - Brown
Phase B - Orange
Phase C - Yellow
Ground - Green

3. All other colors (violet, traced, etc.) shall only be used for switch legs, control, or communication circuits.
4. Conductors for control wiring shall be color coded, using different color coding than the energy conductor coding specified above. Control wires shall be numbered.

- E. Minimum Wire Size: Use No.12 AWG for control over 200 feet, unless otherwise noted. Control wiring may be No.14 AWG if distance is less than 200 feet.

1. Fire alarms, CCTV, intercoms, and intrusion systems shall have cable and wiring according to manufacturer's specifications or as specified.

- F. Wire and Cable Connectors and Terminations:

1. For splices in branch circuit conductors solid or stranded size No.10 AWG and smaller, use UL listed soft plastic wire nut with sharp self-cutting interior threads, 3M Scotchlok, Ideal Supernut, or T&B Piggy or approved equal, of the size to match the wire.
2. For terminations of stranded or solid wire in size No.10 AWG and smaller at equipment terminals, use UL listed, tin-plated copper, 600-volt vinyl insulated compression type ring or fork type equivalent to T&B "Sta-Kon" or Burndy "Vinylug" or approved equal.
3. For No.8 AWG and Larger: T&B "Locktite" connectors, Burndy "Versitap" connectors, or OZ-Gedney or approved equal, solderless connectors, with insulating covers, tape or heat shrink insulation system.
 - a. Terminations and splices in feeders may be made with solderless pressure type connectors complete with composition insulating covers, field insulating tape, or heat shrink insulation system.
 - b. Connectors and lugs for 250 mcm cable and larger shall be of the 2-hole type and for compression type shall have at least 2 indents.
 - c. Compression lugs and connectors shall be tin plated wrought copper, of size to match the cable.
4. Splices in underground exterior wiring shall be made fully waterproof by potting or encapsulating.
5. Insulating tapes shall be of a type approved for the application and shall be flame retardant. Tapes shall be as manufactured by 3M or Bishop Electric or approved equal.
6. Cable Ties: T&B "Ty-Rap" or Burndy "Unirap" or approved equal.
7. Cable Identification: Branch circuits wire markers 3M "Scotch Code" or approved equal. For feeder sizes, non-ferrous metal stencil tags.
8. Thermal Fusion Connections: "Catalytic thermal weld" by Cadweld or approved equal.

PART 3

EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Wire and Cable Installation:

1. Wire and cable shall be suitably protected from weather or damage during storage and handling and shall be in first-class condition when installed.
2. Conductors shall not be pulled into conduit until raceway system is substantially complete. Wiring shall be continuous within conduit runs. Splices will be allowed only at outlet and junction boxes. Joints shall be mechanically and electrically secure.
3. Pulling lubricants, if used, shall comply with UL requirements for the type of conduit material and cable insulation being used.
4. Care shall be taken to prevent cutting and abrasion of cable insulation during the pulling of feeders.
 - a. Ropes used for pulling of feeders shall be made of polyethylene or other suitable nonmetallic material.
 - b. Pulling lines shall be attached to conductor cables by means of either woven basket grips or pulling eyes attached directly to the conductors.
 - c. Rope hitches shall not be used.
 - d. Cables to be installed in a single conduit shall be pulled in together.
 - e. Where polyethylene insulation is used, and a pulling lubricant is required, the lubricant shall be certified by the manufacturer to be noninjurious to such insulation.
5. Do not bend cables during installation, either permanently or temporarily, to radii less than 12 times the outer diameters, except where conditions make the specified radius impracticable and shorter radii are allowed by the NEC and NEMA Standards.
6. Neatly and securely bundle conductors located in branch circuit panelboards, cabinets, control boards, switchboards, and motor control centers. Use nylon bundling straps.
7. Provide suitable installation equipment to prevent cutting or distortion of conduits during the pulling of feeders. Use masking or other means to prevent obliteration of cable identification when solid color coating or colored tracers are used.
8. Control wiring color codes shall be of type as required by its equipment manufacturer. Interconnections of control wiring shall be on numbered terminal strips.
9. Where 2 neutrals are installed in same conduit, their sets of wiring shall be grouped and clearly identified by permanent tags or other means.
10. At each outlet, a loop or end of wire not less than 9 inches long shall be left for connection to lead.
11. Leading end of each conductor pulled shall be carefully examined for damage to jacket. If damage is evident, cable shall be extended and further checked for damage, with good cable only to remain.
12. Cables in junction and pull boxes shall be properly trained and racked.
13. Branch circuit wiring in panelboard gutters shall be installed vertically in the gutter with a 90-degree bend at the supply circuit breaker, wire shall enter the circuit breaker lug horizontally.
14. Install cable supports and boxes at vertical feeders and according to the schedule in the NEC. Boxes shall be built of heavy steel plates not less than No.10 USS gage fastened to an angle iron frame with removable covers secured by brass machine screws. The cable support shall be of the split wedge type that clamps each conductor

firmly and tightens due to the weight of the conductor.

B. Wire and Cable Splicing and Terminations:

1. Splices and terminations of conductors shall be made using specified materials and methods installed according to the manufacturer's recommendations.
2. Splices in branch circuit wiring shall be made by stripping conductor insulation, twisting conductors until mechanically secure, and installing a self-threading insulated type connector. Splices are not allowed within panelboards.
3. Conductors shall be squarely cut and fully inserted into the lug barrel or connector. Insulation shall be stripped without cutting the conductor or removing strands, exposing the conductor for the minimum distance required for connection. Splice connectors shall be of a type and be so installed that the conductor is fully insulated by a skirt of such design or taped so cold flow of the conductor insulation will not be induced when the conductor is positioned in its final operating position.
4. Do not combine conductors under the same lug. Provide individual lugs for individual conductors. Re-tighten bolt type connectors 24 to 48 hours after initial installation and before taping.
5. Connectors shall be insulated by approved type, integral or separate cover, or by means of taping with approved plastic or rubber and friction tapes to provide insulating value equal to that of the conductors being joined. The number and size and combinations of conductors allowed by UL as listed on manufacturers' packaging of connector shall be strictly complied with.
6. Terminations at equipment terminal blocks shall be made using compression type connectors suitable to match terminal type.
7. Continuity of neutral on multi-wire branch circuits shall not be made on any device at terminal blocks, but shall be spliced and a tap brought out, thereby assuring no openings of the neutral in the replacement of a device.
8. Feeders shall be identified by means of nonferrous tags or pressure-sensitive labels securely fastened to all cables, feeders, and power circuits in vaults, pull boxes, manholes, switchboard rooms, terminations of cables, etc. Tags or labels shall be stamped or printed to include the feeder number, source and equipment supplied. If suspended type tags are provided, they shall be attached by nylon cables ties or other nonconductive permanent means.
9. Branch circuit conductors shall be identified at supply circuit breakers, with the circuit number using pressure sensitive adhesive wire markers.
10. Branch circuit wiring for lighting and other single phase 277 volt or 120-volt applications shall be multi-wired utilizing common neutrals. Under no circumstances shall any switch break a neutral conductor. Branch circuit wiring extending more than 100 feet to the nearest outlet from a panel shall be No.10.
11. Circuiting work shall comply with the following:
 - a. Loads on panel busses shall be balanced on phases as evenly as possible.
 - b. No neutral conductor shall be common to more than 1 circuit conductor connected to the same phase leg of the supply system.
 - c. Circuiting of panelboards shall allow breakers to be grouped logically by functions.

C. Voltage Drops at New Construction:

1. Total Allowable Drop for Service Source to Load: Limit to a maximum drop of 5 percent. Increase wire size, where necessary, to comply with this requirement.
 - a. Branch Circuits: Limit to a maximum drop of 3 percent.

- b. Service Source to Individual Panelboards: Limit to a maximum drop of 2 percent.
- D. Voltage Drops at Existing Construction:
 - 1. Total Allowable Drop for Service Source to Load: Limit to a maximum drop of 5 percent. Increase wire size, where necessary, to comply with this requirement.
 - a. Branch Circuits: Limit to a maximum drop of 3 percent.
 - b. Service Source to Individual Panelboards: Limit to a maximum drop of 3 percent.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16131 OUTLET, PULL, AND JUNCTION BOXES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16112 - Raceways and Conduits.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Materials shall bear Underwriters Laboratories (UL) labels.
2. Box size shall comply with NEC for number and size of conductors in boxes.
3. Box size shall comply with NEC for number and size of conduits entering and exiting each box.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Submit manufacturer's literature and technical data before starting work.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Outlet Boxes:

1. Provide outlet boxes at required locations, where shown on the drawings, and as specified.
 - a. Fixture studs shall be securely fastened in an acceptable manner.
 - b. Plaster covers shall have depths suitable to the finish being applied to the walls.
 - c. Sheet steel boxes shall be properly drilled and tapped.
 - d. There shall be not more holes in any of the outlet boxes than are required for the entering conduits.
 - e. Depth of boxes shall allow for easy wire pulling and proper installation of wiring devices.
2. Outlet boxes shall be galvanized steel or rust resistant malleable iron alloy and comply with ANSI C33.65.
3. Outlet Boxes shall be as follows:
 - a. For Recessed Ceiling Fixtures:
 - 1) 4-inch square sheet steel box with blank cover and suitable hanger bar-box to be fastened to ceiling suspension members in an acceptable manner not more than 1 foot from fixture opening.
 - b. For Surface or Stem Mounted Ceiling Fixtures from Slab with Concealed Conduit:
 - 1) 4-inch sheet steel octagon concrete ring of a depth suitable to the construction and furnished with top cover having a 3/8" fixture stud.

- c. For Ceiling and Wall Bracket Outlets on Exposed Conduit in Dry Locations:
 - 1) 4-inch octagon sheet steel box with 3/8" fixture stud.
- d. For Surface Mounted Ceiling Fixture or Hung Ceilings:
 - 1) 4-inch octagon sheet steel hung ceiling box with suitable hanger bars and 3/8" fixture stud. Box to be fastened to ceiling suspension in an acceptable manner.
- e. For Surface Mounted Wall Bracket Fixtures with Concealed Conduit:
 - 1) 4-inch square sheet box with round opening plaster cover and 3/8" fixture stud.
- f. For Ceiling and Wall Bracket Outlets on Exposed Conduit at Damp or Wet Locations:
 - 1) 4-inch cast iron.
- g. For Switches and Receptacles in Tile, Plastered, or Gypsum Board Walls:
 - 1) 4-inch square sheet steel box or multi-gang box with proper plaster covers as required. Two gangs may be provided by means of a 4-inch square box with two gang plaster cover.
- h. For Switches and Receptacles in Enameled or Face Brick walls, Unfinished Walls, and Woodwork:
 - 1) Single or multi-gang sheet steel utility boxes as required.
- i. For Switches and Receptacles on Exposed Exterior Conduit Work:
 - 1) Type FS or FD conduit.
- j. For Telephone or Computer Outlets:
 - 1) 4-11/16" square X 2-1/2" deep.
- 4. Boxes for fire alarm or signal systems, clocks, pilot lights, and other specialty equipment shall be by the manufacturer of the enclosed equipment.
- 5. Wet/Damp Locations:
 - a. Provide gasketed, weathertight, screw covers, code gage galvanized steel pull boxes with weatherproof conduit hubs, Myers Scru-Hub or approved equal, for pull boxes with multiple conduit entries.
 - b. Provide cast metal hub type, dipped in rust inhibitor and with gaskets for individual conduit runs.
- 6. Extension Rings: Do not use to increase the volume of boxes, except where necessary due to multiple conduit run conflicts.
 - a. Where such conflicts occur, an extension ring may be allowed for changes in direction of conduit to make necessary clearances.

- 1) Not more than one extension ring may be used for each box where necessary.

B. Pull and Junction Boxes:

1. Where indicated in the plans and specifications or where necessary for compliance with code requirements for cable installation, install junction and pull boxes of the proper size for conduits over 1-inch trade size. Pull and junction boxes shall be of adequate size to accommodate installation of conductors without excessive bending of conductors that could damage insulation.
2. Pull and junction boxes shall comply with Fed. Spec. WJ-800 and be of all steel construction, spot or seam welded at joints, and hot dip galvanized after fabrication.
3. Boxes shall be drip proof with screw attached covers. Each box shall have a turned-in lip welded at joint to develop full strength. Lip shall be drilled and tapped for 1/8" or 3/16" round head screws, symmetrically placed. To provide adequate length of thread, nuts shall be tack welded on inside of lip, or lip shall be made double thickness.
4. Pull and junction boxes shall be sufficiently rigid to withstand moderate twisting strains. Steel boxes shall comply with the following:
 - a. 100 cubic inches or less shall be of No.14 gage steel.
 - b. Between 101 and 8500 cubic inches shall be No.12 gage steel.
 - c. Larger boxes shall be No.10 gage steel.
 - d. Barriers and reinforcing angles shall be supplied as required.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work or this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Locations of outlets on electrical drawings are approximate only.
1. Do not scale drawings.
 2. Consult architectural plans, sections, elevations, and details for exact locations of outlets and equipment and rooms and spaces having furring or hung ceilings.
 3. Verify door swings on architectural drawings for properly locating light switches.
- B. Determine the proper position of outlets and receptacles. Relocate any outlet or receptacle without additional cost to the DTPW if improperly located.
- C. The Engineer reserves the right to change the location of any outlet, apparatus, or equipment up to the time of roughing in without additional cost to the DTPW, provided conduit runs are not substantially increased.
- D. Fasten and secure boxes to the building structure independent of the conduit. Provide acceptable plaster stops for boxes to be set in plastered walls and ceilings.
- E. Boxes and supports shall be fastened as follows:
1. To concrete or brick: Bolts and expansion shields.
 2. To hollow masonry: Toggle bolts, or bolts and expansion shields.
 3. To steel work: Machine screws or welded studs.
 4. Explosive charge setting devices are not allowed.

- F. Recessed wall outlets shall be flush with the wall surface. Install box in wall with cover to allow block or wall surface to fit tight against lip of cover.
- G. Where shown together on the plans, switches shall be ganged in one outlet.
 - 1. Switches and receptacles shall be ganged together only where plans specifically indicate such combinations.
- H. Outlets for duplex receptacles shall be arranged for vertical mounting of the receptacles except as specifically indicated on plans.
- I. Barriers shall be provided as necessary to isolate voltage classes.
- J. Under no circumstances shall outlet boxes for adjoining spaces be placed back to back in partition walls.
- K. Circuit breakers and switches shall not be grouped or ganged in outlet boxes unless they can be arranged where the voltage between exposed live metal parts of adjacent switches does not exceed 300 volts. Provide barriers between 120- and 277-volt switches where ganged together.
- L. Align rows of outlet boxes for ceiling lights.
- M. Unless noted, specified, or directed otherwise, wall outlets shall be centered above finished floor as follows:
 - 1. Convenience outlets: 18 inches to bottom of box.
 - 2. Utility outlets: 18 inches to bottom of box.
 - 3. Clock outlets: 90 inches to center.
 - 4. Exit lights: 6 inches over doorway.
 - 5. Switch outlets: 46 inches to bottom of box.
 - 6. Special purpose outlets: as directed.
 - 7. Telephone outlets: 18 inches to bottom of box.
 - 8. Fire alarm visuals with or without horns: 78 inches to bottom of box.
 - 9. Fire alarm horns: 6" minimum below adjacent surface, but not less than 8'6" or greater than 10'0" above finish floor.
 - 10. Fire alarm pull station: 46 inches to bottom of box.

Refer to Architectural drawings for additional mounting heights.
- N. Pull and junction boxes shall be provided at locations required to reduce length of cable pull or reduce number of elbows between outlets.
- O. Provide blank covers for outlet boxes when devices or wiring has been removed or not installed.
- P. Paint exposed boxes to match the color of the wall or ceiling to which they are mounted.
- Q. Where several feeders pass through a common pull box, tag each feeder to clearly indicate electrical characteristics, circuit number, and panel designation.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16140 WIRING DEVICES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. Division 16 - Electrical.

1.02 SUBMITTALS: In accordance with Section 01330

- ##### A. Submit properly identified manufacturer's literature and data before starting work.

1.03 QUALITY ASSURANCE

- ##### A. Comply with Florida Building Code (FBC).

1. Convenience outlets installed within 6 feet of water supplies, wet locations, and toilet rooms shall have a ground fault circuit interrupt (GFI) protection device.
2. Use of isolated ground receptacles is prohibited.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- ##### A. Wiring devices shall be as manufactured by Hubbell (basis of design) or approved equal.

2.02 COMPONENTS

- ##### A. Wiring Devices: Comply with NEMA Wd6 and NEC (NFPA 70).

1. Switches:

- a. Rated at 20 amps, 277 volts AC, horsepower rated for 1HP at 120 volts.
- b. Provide for back (not push-in) or side wiring.
- c. Key type switches shall be keyed identically.
- d. Manufacturers: Hubbell CSB 120 Series.

2. Duplex Convenience Receptacles:

- a. Comply with NEMA 5-20R as applicable, be of specification grade, back (not push-in) and side wired, U-slotted grounding type, 3-wire, rated 20 amp, 125 volts AC.
- b. Double Duplex: Consist of 2 receptacles under a common plate. Single receptacles shall be similar to duplex receptacles.
- c. Manufacturers: Hubbell CR20L.

3. Ground Fault Receptacles:

- a. NEMA 5-20R type, rated at 20 amps, 120 volts with 5 ± 1 mA trip threshold, and UL nominal trip time of 0.025 sec.
- b. Manufacturers: Hubbell GF5352.

4. Special Purposes Receptacles:

- a. Comply with NEMA 5-20R, of specification grade, back (not push-in) or side wired.
- b. Provide ratings and type as indicated on Drawings.

5. Wiring devices shall be ivory color unless noted otherwise.
- B. Lighting and Exhaust Fan Switch at Single Use Toilet Rooms: Switch with built-in time delay.
 1. Fan and light operate together when control is in "on" position.
 2. Fan continues to operate for a minimum of 5 minutes after light is turned off.
 3. 120V, 60 Hz, 4-amp capacity for each light circuit and fan circuit, ivory.
 4. No.5C209 by Broan or approved equal.
- C. Cover Plates:
 1. Outlets in shall have brushed stainless steel plates.
 2. Provide ganged switches to a maximum of three. If more are required on Drawings, provide in multiples of two or three.
 3. Provide weatherproof receptacles with cast aluminum, spring loaded dock-type gasketed wet location cover.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install wiring devices according to manufacturer's recommendations.
- B. Verify location of wiring devices before rough-in of outlet boxes and conduit with Architectural Drawings for door swings and furniture details. Duplex receptacles in finished areas shall be vertically mounted.
- C. Boxes mounted back-to-back are not allowed.
- D. Install devices tightly within box with screws provided. Do not rely upon plate for device alignment and support to assure devices are grounded to box. In receptacles, use self-grounding screws, separate ground conductor or bond wire to box.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

SECTION 16440 DISCONNECT SWITCHES

PART 1 GENERAL

1.01 SUMMARY

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels. Label for "SERVICE ENTRANCE" where so applied.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit manufacturer's literature and technical data before starting work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Disconnect Switches:
 - 1. G.E.
 - 2. Siemens.
 - 3. Square D.
 - 4. Eaton
 - 5. Or approved equal

2.02 EQUIPMENT

- A. Disconnect switches shall comply NEMA KSI-1975 for type HD and shall be of heavy-duty type, enclosed, of quick-make, quick-break construction. Rating shall be as indicated on drawings. Switches shall be horsepower and I2t rated, UL labeled.
- B. Disconnect Switch Enclosure:
 - 1. NEMA 1 for indoor use.
 - 2. NEMA 3R for outdoor use.
- C. Disconnect switch operating handle shall be of insulated box mounted type that directly drives switch mechanism suitable for padlocking in "OFF" position.
- D. Defeatable, front accessible, "coin-proof" interlocks shall be provided to prevent opening of cover when switch is in "ON" position and prevent turning switch ON when door is open. Securely fastened metallic nameplate shall include highly visible "ON-OFF" indication.
- E. Motor Disconnect Means: Provide each motor with an in-sight disconnect means, when required by NEC, and where shown on the drawings.
- F. Provide fuses for disconnect switches so indicated. Fuses shall be dual element type. See Section 16475.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install the disconnect switches vertically with top not more than 6 feet above the floor, and rigidly and securely attached to the building. Disconnect switches shall not depend upon conduit for support.
- B. Where used as service entrance main disconnects, switches shall be permanently labeled "MAIN SWITCH 1 of 4", "MAIN SWITCH 2 of 4", etc.
- C. Optional Mounting:
 - 1. Plywood Panel: Mount panelboards on backboard of 3/4" exterior grade plywood, finished one side, primed all surfaces, painted with one coat gray of fire-retardant enamel (finished side) and secure to wall with approved shields or screws as directed by the Engineer.
 - 2. Unistrut: Mount disconnect switches on Unistrut P-3000 mounting channels at top and bottom, secured similarly to wall.
- D. Label switch covers in 1-inch high stenciled letters showing equipment served.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16460 DRY-TYPE TRANSFORMERS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16120 - Wires and Cables.

1.02 SYSTEM DESCRIPTION

- ##### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- ##### A. Submit manufacturer's catalog cuts and technical data before starting work.
- ##### B. Submit test data for transformers as requested.

1.04 QUALITY ASSURANCE

- ##### A. Dry type transformer installation shall comply with NFPA 70 National Electrical Code - 1999 (NEC).

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Dry Type Transformers:

1. General Electric Corp.
2. Siemens
3. Square D.
4. Eaton
5. Or approved equal

2.02 EQUIPMENT

A. Rating:

1. Transformers shall be ventilated dry type, 3 phase, 60 Hertz, 480 volts delta primary and 208Y/120 volts secondary, with four 2-1/2 percent FCBN taps and two 2-1/2 percent FCAN taps. KVA rating shall be as shown on drawings.
2. Transformer insulation shall be Class "H", 220 degrees Centigrade insulation systems and shall be rated for operation (150 degrees C. rise above 40 degrees C. ambient). Insulating materials shall be according to NEMA ST20 standards.
3. Transformer sound level shall not exceed following values when measured according to ANSI C89.2-1974: 9 KVA to 45 KVA-45 DB, 50 to 150 KVA-50 DB, 150 to 300 KVA-55 DB.

2.03 DESIGN AND CONSTRUCTION

- A. Core and coil assembly shall be vacuum impregnated for maximum resistance to moisture and shall be mounted on vibration isolation pads.
 - 1. Transformers shall be provided with a drip-proof, rodent-proof, enclosure, having a durable finish and a rustproof diagrammatic nameplate.
 - 2. Wiring compartments shall have adequate space for terminating cables and shall be front connected for easy accessibility.
 - 3. Where transformers are exposed to the weather, provide weather shields.
- B. Core of the transformer shall be of high quality, cold-rolled, grain-oriented steel, annealed by manufacturer for low loss and exciting current.
 - 1. Laminations shall be formed to eliminate burrs and annealed to reduce losses to a minimum.
 - 2. Winding conductors shall be annealed and insulated by transformer manufacturer.
 - 3. Conductor surfaces shall be free from slivers, burrs, and other irregularities.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Dry type transformers shall be installed by Contractor according to manufacturer's instructions in rooms assigned for the installation of equipment.
- B. Transformer enclosures and secondary neutral shall be securely grounded to a cold-water pipe, 3/4" diameter by 10 feet long buried in direct contact with the earth, with a copper conductor sized according to NEC Table 250-94.
- C. Dry type transformers shall be floor mounted or bracket mounted as shown on drawings. Transformers shall be bolted to floor if floor mounted and shall be bolted to steel angles if bracket mounted, or as shown on drawings. Provide a 3-inch-high concrete pad under floor mounted transformers.
- D. Transformers shall be vibrationally isolated from the building structure by means of double neoprene pads (DNP), in addition to the vibration isolation built into the transformer. Neoprene shall be similar to Mason Industries Type W, or approved equal, 40 durometers minimum or sized for proper weight load.
- E. Conduit connections to the equipment shall be made with flexible conduit, loosely installed.
- F. Dry type transformers shall be installed with wiring compartment to front to allow removal.
- G. Maintain manufacturers recommended clearness from walls or surfaces to allow adequate ventilation. In no case shall the transformers be installed less than 6 inches from any wall.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16470 PANELBOARDS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide a complete Distribution Panelboard system as indicated on the drawings, and as specified herein.
- B. All materials shall be listed by an OSHA approved Nationally Recognized Testing Laboratory (NRTL).
- C. Related Sections:
 - 1. 16120 - Wire and Cable.

1.2 SYSTEM DESCRIPTION

- A. Panelboards used as service entrance equipment shall be NRTL labeled as service entrance equipment.

1.3 SUBMITTALS: In accordance with Section 01330

- A. Submit shop drawings, manufacturer's literature, and technical data before starting work.
- B. All switchboards and panelboards submitted shall be designed and manufactured according to the latest revisions of the following specifications:
 - 1. UL 50, UL 67, UL 89, UI489, UI 891, UL 1283, UL 1449
 - 2. Nema AB-1, PB1, PB1.1, PB2, PB2.1 PB 2.2
 - 3. NFPA 70
 - 4. Federal Specifications: W-C-375B, W-P-115C

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Panelboards:
 - 1. General Electric.
 - 2. Siemens.
 - 3. Square D.
 - 4. Eaton
 - 5. Or approved equal

2.2 EQUIPMENT

- A. Distribution and Power Panelboards:
 - 1. Interior: Provide fully rated plated copper bus. Plating shall run the entire length of the bus bar. Solid neutral and ground bar shall be copper. Maximum rating: 1200 amp.

2. Main breaker shall be horizontally mounted. Main breakers shall have conspicuous marking labels.
3. Trims shall have door with keyed lock. All locks shall be keyed the same.
4. Provide directory holder and typed directory for all circuits.
5. Enclosure shall be galvanized galvanneal steel constructed in accordance with UL50 and NEMA 250. Box end walls shall be blank.
6. Short circuit current ratings shall be equal to or greater than available fault current at point of application. NRTL listed series ratings may be utilized, where not in violation of NEC 240.86. Provide documentation of NRTL listed series rating used.
7. Surge Protective Devices (SPD) shall be provided when specified in the design and associated electrical plans, with optional peak surge current of 260kA.
8. Distribution panels for use at 120/208 volts shall be NRTL listed with minimum integrated assembly rating of 22K AIC.
9. Distribution panelboards, 400 amperes and over, shall be provided with molded case circuit breakers tested and labeled according to UL 489.

B. Lighting, Receptacle and Power Panelboards

1. Interior: Provide fully rated plated copper bus. Plating shall run the entire length of the bus bar. Solid neutral and ground bar to be copper. Maximum rating: 600amp.
2. Main breaker shall be vertically or horizontally located and have conspicuous marking labels.
3. Trims shall have door with keyed lock. All locks to be keyed the same. Provide trims with concealed door hinges and trim screws for panels 600 amps or less.
4. Provide directory holder and typed directory for all circuits.
5. Enclosure shall be galvanized steel constructed in accordance with UL50. Box end walls shall be blank.
6. Short circuit current ratings shall be equal to or greater than available fault current at point of application. NRTL listed series ratings may be utilized, where not in violation of NEC 240.86. Provide documentation of NRTL listed series rating used.
7. Provide SPD's when specified in the design and associated electrical plans, with optional peak surge current of 100kA.
8. Minimum rating of breakers shall be as follows:
 - a. Lighting and power panels for use at 120/208 volts: 225 amp maximum with circuit breakers rated at 10K AIC symmetrical at 240 volts.
 - b. Lighting and power panels for use at 480/277 volts: 225 amp maximum with circuit breakers rated at 14K AIC symmetrical at 480 volts.
9. Interiors shall be factory assembled and designed to allow switching and protective devices to be replaced without disturbing adjacent units, without removing the main bus connectors, and allowing circuits to change without machining, drilling or tapping.
10. Branch circuits shall be arranged using double row construction unless narrow column panels are indicated. A nameplate shall be provided listing panel type and ratings. Circuit breakers shall be bolt-on type.
11. Unless otherwise noted, full size insulated neutral bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral bussing shall have a suitable lug for each outgoing feeder requiring a neutral connection. A ground bus shall be provided in all panels.

C. Boxes and Trims shall meet the following criteria:

1. Boxes shall be at least 20 inches wide made from code gage galvanized sheet steel.
 - a. Provide minimum gutter space according to NEC requirements.

- b. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional required wiring space.
 - c. At least 4 interior mounting studs with adjustable nuts shall be provided.
 - 2. Switching device handles shall be accessible.
 - a. Doors and panelboard trims shall not uncover any live parts.
 - b. Doors shall have flush chrome plated handle with cylinder lock and catch, except doors over 48 inches in height shall have auxiliary fasteners top and bottom of door in addition to the flush type cylinder lock and catch.
 - c. Panelboard switching devices with individual dead front doors shall be acceptable instead of standard door in trim design.
 - d. Panelboard trim clamps shall be of the indicating type.
 - 3. Exterior and interior steel surfaces of the trim shall be properly cleaned, primed with rust inhibiting phosphatic coating, and finished with manufacturer's standard gray paint.
 - a. Trims for flush panels shall overlap the box for at least 3/4" all around.
 - b. Surface trims shall have the same width and height as the box.
 - c. Trims shall be mountable by a screwdriver without the need for special tools.
 - d. After installation, trim clamps shall not be accessible when the panel door is closed and locked.
 - 4. Panelboards exposed to the weather shall have NEMA type 3R raintight enclosure or NEMA 4X in corrosive environments.
- D. Electrical Components:
- 1. Main bus bars shall be fully rated copper bus bars, with plating shall running the entire length of the bus bar and shall be sized according to NRTL standards to limit the temperature rise on any current carrying part to a maximum of 50 degrees C. above an ambient of 40 degrees C. maximum. Provide main circuit breakers, main lugs, or sub-feed lugs as required.
 - 2. Each panelboard shall incorporate breakers as shown with AIC or higher, at the application voltage, than the available fault at its location along the electrical distribution system, as determined by the short circuit study. Minimum rating of breakers shall be:
 - a. Lighting and power panels for use at 120/208 volts: 225 amp maximum with circuit breakers rated at 10K AIC symmetrical at 240 volts.
 - b. Lighting and power panels for use at 480/277 volts: 225 amp maximum with circuit breakers rated at 14K AIC symmetrical at 480 volts.
 - c. Distribution panels for use at 120/208 volts: UL listed with minimum integrated assembly rating of 22K AIC.
 - 3. Panels tested and listed according to UL 67 and bearing an integrated short circuit rating shall be determined by the short circuit study on the electrical system with 10,000 AIC minimum.
 - 4. Any 2 single pole circuit breakers shall be replaceable by 1 two-pole circuit breaker and any 3 single-pole breakers shall be replaceable by 1 three-pole circuit breaker.
 - 5. Where new circuit breakers are specified to be installed within existing panelboards, they shall be compatible in terms of manufacture, type, and AIC.
 - 6. Breakers 100 ampere through 400 ampere frame sizes shall be thermal-magnetic trip with inverse time current characteristics, unless otherwise noted.
 - 7. Provide ground fault circuit interrupter circuit breakers where indicated.

8. Emergency Panelboards Identification: Paint door red and stencil in 1-inch high yellow letters "EMERGENCY PANEL" in addition to appropriate individual panel identification as shown on drawings.

PART 3 EXECUTION

3.1 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.2 INSTALLATION

- A. Panelboards shall be installed where indicated and with top of cabinet 6'-6" above floor and shall be rigidly and securely attached to building construction and shall not depend upon conduit for support. Allow at least 1/2" air space behind wall mounted panelboards.
- B. Install panelboards according to manufacturer's recommended data. Maintain clearances required by the National Electrical Code, with particular attention to working space around panelboards. Maintain clear space above panelboards, coordinate with other trades to avoid placement of panelboards below piping, ductwork, or other foreign appurtenances. Relocate panels at no additional cost should such interferences occur.
- C. Supply panelboards with phenolic nameplate 1-inch x 3 inch on exterior of panels and engraved with panel designation and voltage rating. Lighting and power panelboard shall be provided with a clear plastic enclosed typewritten directory inside. Circuit identification shall include load type (lighting, receptacles, etc.) and rooms served.
- D. Where flush type panelboards are indicated, provide one 3/4" empty conduit terminated in accessible ceiling above for each 3 spare circuit breakers provided in the panelboard.
- E. Install circuit breakers in existing panelboards according to manufacturer's recommendation. Verify tightness of connections including mains. Identify new circuits on the panel directory. If none exists, provide one.
- F. Clean and touch up panelboard as required at completion of the project.
- G. Support surface mounted panelboards for other than masonry walls, from floor slab secured "Kindorf" or "Unistrut" or approved equal channels. Mount those installed on masonry walls to back boards secured to walls, and according to manufacturer's recommendations and applicable codes and regulations. Contractor shall coordinate manufacturer's actual panelboard dimensions with room clearances to conform with NEC requirements.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16475 OVERCURRENT PROTECTIVE DEVICES

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections
 - 1. 16440 - Disconnect Switches.

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit properly identified manufacturer's literature and technical data before starting work.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Fuses shall comply with NEMA FUI and ANSI C33.42.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Circuit Breakers:
 - 1. GE.
 - 2. Siemens.
 - 3. Square D.
 - 4. Or approved equal.
- B. Fuses:
 - 1. Bussman.
 - 2. Cefco.
 - 3. Little fuse, Inc.
 - 4. Or approved equal

2.02 EQUIPMENT

- A. Circuit Breakers:
 - 1. Circuit breakers shall be a circuit interrupting device operating both manually for normal switching functions and automatically under overload and short circuit conditions, while providing circuit and self protection when applied in its ratings. Provide at voltage, phase, and amps indicated, with symmetrical amperes interrupting rating to be equal or larger than that shown on drawings. Control and signaling function may be incorporated by use of accessories.
 - 2. Operating mechanism shall be entirely trip-free so contacts cannot be held close against an abnormal over-current or short circuit condition.

3. Operating handle of circuit breaker shall open and close all poles of a multi-pole breaker simultaneously. Circuit breakers shall meet applicable NEMA AB-1 and have UL label. Each circuit breaker shall have a trip unit to provide overload and short circuit protection. Trip element shall operate a common trip bar that shall open all poles in case of an overload or short circuit through any 1 pole.
4. Ampere rating shall be clearly visible. Contacts shall be of non-welding silver alloy. Circuit breakers to be used in switch boards, lighting and power panel boards, distribution panel boards and individually enclosed shall be 1, 2, or 3 poles as indicated on drawings.

B. Molded Case:

1. Molded case circuit breakers shall be bolt-on type, mounted in lighting and power panel boards and individually enclosed units.
2. Molded case circuit breakers shall be quick-make, quick-break action.
3. Molded case circuit breakers for panel boards shall have the following minimum symmetrical ampere interrupting capacities (RMS):
 - a. 120 volts: 10,000 SAIC power panel boards.
 - b. 277 volts: 14,000 SAIC lighting panel boards.
 - c. 277/480 volts: Up to 50,000 SAIC distribution panel boards, or as shown on drawings.
4. Each molded case circuit breaker shall have a thermal magnetic trip device with trip ratings as shown on drawings.

C. Combination Molded Case and Current Limiting Fuse:

1. Bolt-on type mounted in switch boards.
2. Circuit breaker section shall be molded case and shall have the features previously mentioned for molded case breakers.
3. Fuse compartment located within molded case enclosure with accessibility for fuse replacing.
4. Unit circuit breaker shall trip as any of its fuses blows.
5. Unit shall be rated at 100,000 AIC RMS minimum.
6. Current limiting fuses provided as specified in this section.

D. Fuses:

1. Provide fuses for fusible equipment.
2. The time-current characteristic and ratings shall assure positive selective coordination.
3. Fuses, 601 amperes and larger, shall comply with UL Class L standard and be Shawmut Form 480 "Amp-Trap" or Bussman "Hi Cap".
4. Fuses, 600 amperes and lower, where applied to general feeder and branch circuit protection, shall comply with UL Class RKI standards and be Shawmut dual element "Amp- Trap" or Bussman "Low Peak" Limitron.
5. Dual element fuses shall have low resistance and relatively low operating temperatures. Fuses shall be provided with thermal protection against damage from poor contact. Fuse shall open when temperature at thermal cutout reaches 280 degrees F., preventing damage to clips and switches before fuse opens. They shall combine high interrupting capacity (200,000 ampere RMS symmetrical) with time delay, holding 500 percent load for a minimum of 10 seconds.
6. Current limiting fuses shall be designed to provide high interrupting capacity (200,000 AIC SYM RMS) plus fast clearing time restricting let-thru current and energy to very low values. Clearing time on a severe short circuit shall be limited to less than 1/4 cycle.
7. Individual motor circuit fuses shall be sized at approximately 150 percent of motor full load current. Fuses, below 600 amperes shall comply with UL Class RK5 standards and be Shawmut dual element "Amp-Trap" or Bussman Fusetron. Fuses or approved equal, 601 amperes and larger, shall comply

- with UL Class L standards and be Shawmut Form 480 "Amp-Trap" or Bussman "Hi Cap" KTU or approved equal.
8. Fuses, where required for circuit breaker backup protection shall comply with UL Class RK1 standards and be Chase-Shawmut Class RK1 "Amp-Trap" or Bussman "Limitron" or approved equal.
 9. Provide 10 percent spares (minimum of three) of each size and type of fuses furnished. Spare fuses shall be placed in a wall-mounted cabinet located in the main electric room.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install according to manufacturer's recommendations applicable codes and regulations and accepted submittals.
- B. Two and three pole breakers must be true two and three pole breakers.
 1. Do not combine single pole breakers with common handle connection to meet multiple pole breaker requirements.
- C. Label circuit breaker enclosures with 1-inch high stenciled letters showing equipment served.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.

END OF SECTION

SECTION 16511 LIGHTING FIXTURES AND LAMPS

PART 1 GENERAL

1.01 SUMMARY

- A. Related Sections:
 - 1. 16112 - Raceways and Conduits.
 - 2. 16120 - Wire and Cable.

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.
- B. Explosion-proof, shielded, and vapor tight and wet location fixtures shall bear UL labels appropriate for the type of application.

1.03 SUBMITTALS: In accordance with Section 01330

- A. Submit manufacturer's literature and technical data before starting work.
- B. Furnish certified photometric data for fixtures.
- C. Upon request, a sample of each fixture proposed for use and specified unit shall be submitted to the Engineer for review.
- D. Provide lighting calculations to comply with Florida Building Code (FBC) and IES minimum foot-candle level when required.

1.04 QUALITY ASSURANCE

- A. Comply with Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Lighting Fixtures:
 - 1. Provide lighting fixtures as indicated on the drawings and as specified.
 - 2. The schedule and details of lighting fixtures, appearing on the drawings, indicate the type, construction, appearance, quality, and performance of the fixtures required.
 - a. Any proposed deviation from the fixtures specified shall equal or be superior to the item specified under these headings.
 - b. Proposed substitute lighting fixtures will be judged on overall quality on construction.
 - c. Provide 120V working sample of proposed substitution with cord, plug, and lamp.
 - d. The fixture manufacturers products scheduled are considered acceptable, based on the equivalency of individual units as determined by the Engineer.

3. Materials used in the manufacture of fixtures shall be new and the best of their respective kind, and shall be formed and assembled in a neat, accurate, and professional manner.
 - a. Sheet metal shall be of sufficient thickness or shall be ribbed, flanged, or otherwise reinforced so that lighting fixtures and their component parts will withstand the stresses of normal handling and installation and service without undue distortion of shape.
 - b. Plastering or other installation procedures shall not be relied on to reinforce lighting fixtures or their component parts.
 - c. Fixture bases shall be metal and fastened to mounting location with metal components.
4. Finishes:
 - a. Painted steel sheet shall be processed with Bonderize or equal phosphate treatment or shall be Paintlok or Galvanneal or approved equal.
 - b. Unpainted sheet steel shall be Galvanneal, by Republic Steel or approved equal.
 - c. Springs shall be of full hard temper stainless steel.
 - d. Fasteners of ferrous metal shall be cadmium plated or zinc plated with chromate.
 - e. Screws mounting fixture housing in plaster ring shall be minimum #8, pointed to facilitate installation.
 - f. Plaster frame rings shall be of sufficient strength to withstand deformation during installation, and of suitable materials or finish to prevent corrosion from ceiling plasters and mortars.
 - 1) The contractor shall furnish the fixture manufacturer a complete list of fixtures that will be installed in acoustical plaster ceilings with types and quantities.
 - g. Painted finishes shall be baked epoxy, polyester powder coated, acrylic or approved equal finish suitable for the service required including temperature and accepted by the Engineer. Finish shall be applied after fabrication.
5. Fixtures shall be complete with canopies, suspensions of proper lengths, hickeys, casing, sockets, holders, reflectors, hardware, and shall be completely wired and assembled. Each troffer shall have 2 earthquake clips minimum, positive enclosed spring-loaded catches, and safety hinges.
6. Furnish suitable plaster rings or plaster stops for fixtures set in plaster ceilings. Consult the "Finish Schedules" on drawings for locations and extent of plaster ceilings

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install fixtures according to manufacturer's recommendations.
- B. Install "Lay-In" type fixtures with 6-foot lengths of flexible conduit to enable fixture relocation with minimum inconvenience. Fixture to be securely fastened to ceiling frame members by

mechanical means as per the NEC.

C. Exit lights:

1. Install wall or ceiling mounted as shown on drawings.
2. Provide directional arrows required to show correct path to exit.
3. Install exit lights at a location and height to assure a clear line of sight from the egress passageway.
4. Relocate exit lights that are not readily visible at no additional cost to the owner.
5. Internally illuminated exit signs shall have LED light source on normal power.

D. Fixture Supports:

1. Support each fixture securely.
2. Each recessed light fixture shall be lay-in type supported by ceiling suspension system. Provide at least 2 earthquake clips.
3. Where pendant fixtures are mounted in continuous rows, the number of hangers shall equal the number of 4-foot lengths, plus 1.
4. Do not support fixtures to plaster or gypsum board ceilings.
5. Furnish and install steel members and supports to fasten and suspend fixtures.

PART 4 MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

Work under this Section will be separately measured for payment

4.02 PAYMENT

- A. Work under this section in Base Bid will be paid for as part of the Contract lump sum price for Pay Item for Division 16 Work.
- B. Work under this section for Alternate #1 will be paid for as part of the Contract lump sum price under Alternate #1-Pay Item for Division 16 Work.
- C. Work under this section for Alternate #2 will be paid for as part of the Contract Lump sum price under Alternate #2-Pay item for Division 16 Work.
- D. Work under this section for Alternate #3 will be paid for as part of the Contract lump sum price under Alternate #3-Pay Item for Division 16 Work.

END OF SECTION

**REPORT OF PRE-RENOVATION SURVEY,
INVASIVE SAMPLING AND ANALYSIS FOR
ASBESTOS-CONTAINING MATERIALS**

**PALMETTO METRORAIL STATION
RESTROOMS AND JANITOR CLOSET
7701 NW 79 AVENUE
MIAMI, FLORIDA 33166
EBS PROJECT NO.820-2302252.03
January 24, 2023**



PREPARED FOR

**MIAMI-DADE COUNTY
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
6600 NW 72 AVENUE
MIAMI, FLORIDA 33166**

PREPARED BY

**EBS ENGINEERING, INC.
4715 NW 157 ST. STE. 202
MIAMI, FLORIDA 33014
Tel. 305-625-5252 • Fax 305-625-7110**

January 24, 2023

Mr. Angel L. Martinez
Miami-Dade County Department of Transportation and Public Works
Facilities Maintenance, Plumbing Superintendent
6600 NW 72 Avenue
Miami, Florida 33166

Subject: Report for Pre-Renovation Asbestos Survey, Invasive Sampling and
Analysis for Asbestos-Containing Materials
Palmetto Metrorail Station – Restrooms and Janitor Closet
7701 NW 79 Avenue
Miami, Florida 33166
EBS Engineering Project No. 820-2302252.03

Dear Mr. Martinez,

EBS Engineering, Inc. (EBS) has completed the pre-renovation survey, invasive sampling and analysis of suspect asbestos-containing materials (ACMs) of the restrooms and janitor closet of the Palmetto Metrorail Station located at 7701 NW 79 Avenue in Miami, Florida. The field sampling was performed on January 19, 2023, by Mr. Benjamin Essien of EBS. Authorization for our services was provided by you on December 12, 2022. This report presents the project information, bulk sampling procedures, the analytical results with recommendations for the removal of any ACMs identified, if any.

EBS appreciates the opportunity to be of service to you and looks forward to our continued association. If you should have any questions concerning this report, please contact us at your convenience.

Sincerely,

EBS ENGINEERING, INC.
Business License # ZA -0000069



Francisco E. Gomez
Senior Environmental Scientist

EBS\820-2302252.03.REPORT



Benjamin S. Essien, P.E.
Florida Asbestos Consultant
License Number EA0000079

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I. BACKGROUND INFORMATION

EBS Engineering, Inc. was contacted by Mr. Angel L. Martinez of Miami-Dade County Department of Transportation and Public Works, concerning the pre-renovation survey, invasive sampling and analysis of suspect asbestos-containing building materials in the restrooms and janitor closet of the Palmetto Metrorail Station located at 7701 NW 79 Avenue in Miami, Florida. It is our understanding that this sampling is necessary prior to the planned renovation of the restrooms and for permitting purposes.

The purpose of the invasive sampling was to locate and identify asbestos-containing building materials in the restrooms prior to any renovation or demolition activities which may disturb them. The sampling of the roof, other interior or exterior areas of the station was not included in the scope of this survey.

II. FACILITY DESCRIPTION

The subject facility is the restrooms and janitor closet of the Palmetto Metrorail Station located at 7701 NW 79 Avenue in Miami, Florida. The restrooms and janitor closet encompass approximately 275 square feet of floor area. The finishes in the restrooms and janitor closet include; concrete block, ceramic tile, caulking and plaster on the interior partition walls, ceramic tile and concrete slab on the floor and plaster ceilings.

III. SURVEY PROCEDURES

General

The invasive survey was performed by observing accessible building materials in the restrooms and janitor closet. The primary purpose of the survey was to locate, identify and assess pipe insulation materials which were suspected to contain asbestiform minerals. Friable and non-friable asbestos-containing materials (ACMs) encountered during the survey are addressed in this report. Friable materials, when dry, will crumble and release fibers under normal hand pressure, whereas non-friable materials will not.

The sampling protocol used in this asbestos survey is in general accordance with Title 40, Code of Federal Regulations (CFR), Part 763.86 and State of Florida Statutes.

Bulk Sampling Procedures

The bulk sampling procedures used for the collection of suspect materials first required the establishment of homogenous sampling areas, which are defined as areas of materials of the same type and applied during the same general time period. The homogenous sampling areas were then examined and representative samples of suspect materials were obtained from these areas. The U.S. Environmental Protection Agency (EPA) has published guidelines and recommendations for obtaining samples of asbestos-containing materials. These guidelines were followed during our survey, where

appropriate. Additionally, samples of these materials were obtained at the discretion of our personnel based on past experience.

Bulk samples collected during the site survey were analyzed by Polarized Light Microscopy (PLM) coupled with dispersion staining. PLM is an analytical method for asbestos identification which depends on the unique optical properties of mineral forms in the samples and specifically identifies the various asbestos types. The optical properties are a result of the mineral's chemical composition, physical atomic structure, and visual morphology. This is the recommended method of analysis by EPA for asbestos identification in bulk samples. EMSL Analytical, Inc. the laboratory that analyzed the samples has attained National Institute of Standards and Technology (NIST) accreditation through participation in the National Voluntary Laboratory Accreditation Program (NVLAP). Percentages of the identified types of asbestos are determined by visual estimation. Any material containing more than one percent (1%) of asbestos is considered by EPA and Occupational Safety and Health Administration (OSHA) to be ACM.

The following suspect materials were sampled on the restrooms and janitor closet during our survey:

1. Gray Ceiling Plaster
2. Brown Wall Tile
3. Brown Floor Tile
4. Gray Concrete Block Wall
5. Gray Concrete Floor Slab
6. Brown 6"x6" Floor Tile
7. Gray Fixture Caulking

IV. RESULTS OF LABORATORY ANALYSIS

Laboratory results of the sampling revealed that **no asbestos was detected in the 23 samples obtained from the restrooms and janitor closet during our survey.** Asbestos concentrations expressed within the laboratory results are based on visual estimation. The point counting method of quantification is recommended for asbestos concentration below ten percent. The results of the 23 samples are summarized in Table 1. The PLM results of each sample obtained during the survey is included in Appendix A.

TABLE 1 - SUMMARY OF ANALYTICAL RESULTS Palmetto Metrorail Station – Restrooms and Janitor Closet 7701 NW 79 Avenue Miami, Florida 33166					
SEQUENTIAL NUMBER	SAMPLE NUMBER	HOMOGENOUS AREA	SAMPLE DESCRIPTION	SAMPLE LOCATION	RESULTS OF PLM ANALYSIS
01	01	HA-1	Gray Ceiling Plaster	Unisex Restroom	No Asbestos Detected
02	02	HA-1	Gray Ceiling Plaster	Restroom Entrance	No Asbestos Detected
03	03	HA-1	Gray Ceiling Plaster	Employee Restroom	No Asbestos Detected
04	04	HA-2	Brown Wall Tile	Unisex Restroom, North	No Asbestos Detected
05	05	HA-2	Brown Wall Tile	Employee Restroom, South	No Asbestos Detected
06	06	HA-2	Brown Wall Tile	Employee Restroom, North	No Asbestos Detected
07	07	HA-3	Brown Floor Tile	Employee Restroom, West	No Asbestos Detected
08	07	HA-4	Yellow Floor Mastic	Employee Restroom, West	No Asbestos Detected
09	08	HA-3	Brown Floor Tile	Unisex Restroom, West	No Asbestos Detected
10	08	HA-4	Yellow Floor Mastic	Unisex Restroom, West	No Asbestos Detected
11	09	HA-3	Brown Floor Tile	Unisex Restroom, East	No Asbestos Detected
12	10	HA-5	Gray Fixture Caulking	Entrance, Water Fountain	No Asbestos Detected
13	11	HA-5	Gray Fixture Caulking	Entrance, Water Fountain	No Asbestos Detected
14	12	HA-5	Gray Fixture Caulking	Entrance, Water Fountain	No Asbestos Detected
15	13	HA-6	Gray Concrete Slab	Unisex Restroom, West	No Asbestos Detected
16	14	HA-6	Gray Concrete Slab	Janitor Closet	No Asbestos Detected
17	15	HA-6	Gray Concrete Slab	Employee Restroom Entrance	No Asbestos Detected
18	16	HA-7	Brown 6"x6" Floor Tile	Employee Restroom Entrance	No Asbestos Detected
19	17	HA-7	Brown 6"x6" Floor Tile	Unisex Restroom, Entrance	No Asbestos Detected
20	18	HA-7	Brown 6"x6" Floor Tile	Unisex Restroom, Entrance	No Asbestos Detected
21	19	HA-8	Gray Concrete Block	Janitor Closet, West Wall	No Asbestos Detected
22	20	HA-8	Gray Concrete Block	Employee Restroom, West	No Asbestos Detected
23	21	HA-8	Gray Concrete Block	Unisex Restroom, Entrance	No Asbestos Detected

V. FINDINGS AND RECOMMENDATIONS

Laboratory results of the invasive sampling revealed that **no asbestos was detected in the 23 building materials samples obtained from the restrooms and janitor closet during our survey.** The PLM results of each sample obtained during the survey is included in Appendix A.

VI. QUALIFICATIONS

EBS observed the existing conditions on the restrooms and janitor closet of the Palmetto Metrorail Station located at 7701 NW 79 Avenue in Miami, Florida using generally accepted procedures. However, there is always the possibility that some areas containing asbestos were not observed, inaccessible, or different from those at specific sample locations. Therefore, conditions at every location may not be as anticipated and as summarized in this report. In addition, renovation or demolition may uncover altered or differing conditions. We recommend that you notify EBS if any changed conditions are encountered so that we can assess the situation and its impact on this report.

APPENDIX A

LABORATORY ANALYTICAL RESULTS



EMSL Analytical, Inc.

19501 NE 10th Ave. Bay A N. Miami Beach, FL 33179

Tel/Fax: (305) 650-0577 / (305) 650-0578

<http://www.EMSL.com> / miamilab@emsl.com

EMSL Order: 172300268

Customer ID: EBSE50

Customer PO:

Project ID:

Attention: Francisco Gomez

EBS Engineering, Inc.

4715 NW 157th St. Ste 202

Miami, FL 33014

Phone: (305) 625-5252

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Received Date: 01/20/2023 8:00 AM

Analysis Date: 01/20/2023

Collected Date: 01/19/2023

Project: Palmetto Metrorail Station - 820-2302252.03

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos % Type
			% Fibrous	% Non-Fibrous	
01 172300268-0001	Plaster Ceiling	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02 172300268-0002	Plaster Ceiling	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
03 172300268-0003	Plaster Ceiling	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
04 172300268-0004	Wall Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
05 172300268-0005	Wall Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
06 172300268-0006	Wall Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
07-Floor Tile 172300268-0007	Floor Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
07-Mastic 172300268-0007A	Floor Tile	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
08-Floor Tile 172300268-0008	Floor Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
08-Mastic 172300268-0008A	Floor Tile	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
09 172300268-0009	Floor Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10 172300268-0010	Caulking Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
11 172300268-0011	Caulking Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
12 172300268-0012	Caulking Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
13 172300268-0013	Concrete Slab	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
14 172300268-0014	Concrete Slab	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 01/20/2023 11:51:08



EMSL Analytical, Inc.

19501 NE 10th Ave. Bay A N. Miami Beach, FL 33179

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EMSL Order: 172300268

Customer ID: EBSE50

Customer PO:

Project ID:

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
15 172300268-0015	Concrete Slab	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
16 172300268-0016	6"x6" Floor Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17 172300268-0017	6"x6" Floor Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
18 172300268-0018	6"x6" Floor Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
19 172300268-0019	Concrete Block Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20 172300268-0020	Concrete Block Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
21 172300268-0021	Concrete Block Wall	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Mary Hamel (7)

Parker Minnich (16)

Kimberly Wallace, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from: 01/20/2023 11:51:08

**TECHNICAL SPECIFICATIONS:
SPECIAL TERMS & CONDITIONS**

MANUALS



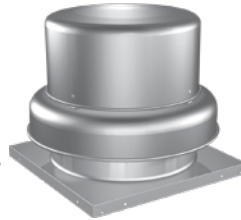
RPQ NO. TP-0000027284

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.

Direct Drive Downblast Centrifugal Exhaust

These fans are specifically designed for roof mounted applications exhausting relatively clean air. The maximum continuous operating temperature is 130°F (54°C). Direct drive models are made with nominal wheel diameter ranging from 8 to 30 inches (203 to 762 mm) (060-300 unit sizes). Each fan shall bear a permanently affixed manufacturer's embossed metal nameplate containing the model number and individual serial number. All fans are UL/cUL Listed Standard 705.



Belt Drive Downblast Centrifugal Exhaust

These fans are specifically designed for roof mounted applications exhausting relatively clean air. The maximum continuous operating temperature is 180°F (82°C). Belt drive models are made with nominal wheel diameters ranging from 11 to 54 inches (279 to 1372 mm) (097-540 unit sizes). Each fan shall bear a permanently affixed manufacturer's embossed metal nameplate containing the model number and individual serial number. All fans are UL/cUL Listed Standard 705.

General Safety Information

Only qualified personnel should install this fan. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards. Other considerations may be required if high winds or seismic activity is present. If more information is needed, contact a licensed professional engineer before moving forward.

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the National Fire Protection Agency (NFPA), where applicable. Follow the Canadian Electric Code (CEC) in Canada.
2. The rotation of the wheel is critical. It must be free to rotate without striking or rubbing any stationary objects.
3. Motor must be securely and adequately grounded.
4. Do not spin fan wheel faster than max cataloged fan RPM. Adjustments to fan speed significantly affects motor load. If the fan RPM is changed, the motor current should be checked to make sure it is not exceeding the motor nameplate amps.
5. Do not allow the power cable to kink or come in contact with oil, grease, hot surfaces or chemicals. Replace cord immediately if damaged.
6. Verify that the power source is compatible with the equipment.

7. Never open access doors to a duct while the fan is running.

DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

CAUTION

When servicing the fan, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.

CAUTION

Precaution should be taken in explosive atmospheres.

DANGER

Pour écarter les risques d'incendie, de choc électrique ou de blessure grave, veiller à toujours débrancher, verrouiller et étiqueter la source de courant avant l'installation ou l'entretien.

ATTENTION

Lors de toute intervention sur la soufflante, le moteur peut être suffisamment chaud pour provoquer une douleur voire une blessure. Laisser le moteur refroidir avant toute maintenance.

ATTENTION

Faire preuve de précaution dans les atmosphères explosives.

Receiving

Upon receiving the product, check to ensure all items are accounted for by referencing the delivery receipt or packing list. Inspect each crate or carton for shipping damage before accepting delivery. Alert the carrier of any damage detected. The customer will make notification of damage (or shortage of items) on the delivery receipt and all copies of the bill of lading which is countersigned by the delivering carrier. If damaged, immediately contact your representative. Any physical damage to the unit after acceptance is not the responsibility of the manufacturer.

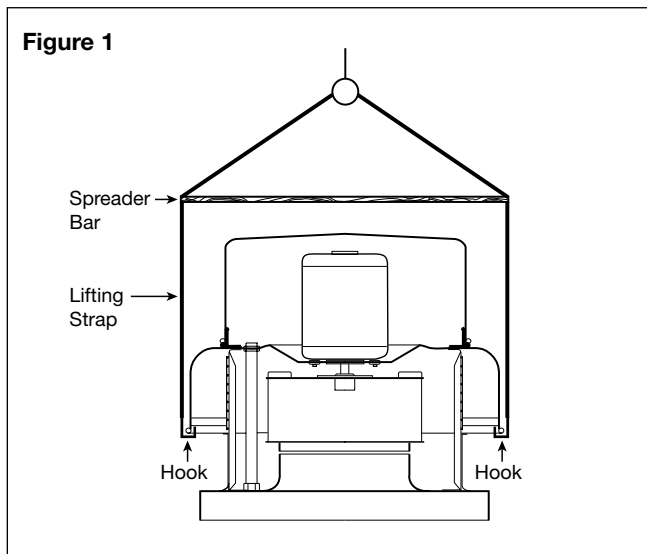
Unpacking

Verify that all required parts and the correct quantity of each item have been received. If any items are missing, report shortages to your local representative to arrange for obtaining missing parts. Sometimes it is not possible that all items for the unit be shipped together due to availability of transportation and truck space. Confirmation of shipment(s) must be limited to only items on the bill of lading.

Handling

Belt and Direct Drive Units

Lift Direct Drive unit on to the roof utilizing hooks under the lip of the shroud. Evenly space the hooks around the shroud using a minimum of four lifting straps. Use a spreader bar to ensure the straps do not come in contact with the unit (see Figure 1).



When lifting a belt drive unit on to the roof, use either the four lifting points on the drive frame or the two lifting points on the bearing plate if present (see Figure 2 for lifting points). Access to the drive frame is accomplished by removing the screws identified in Figure 3. The cover can then be removed and placed on a flat surface in an area protected from strong winds.

When direct and/or belt drive unit is on the roof, move fan to desired location using lifting points and fasten securely through mounting holes in base. Shims may be necessary depending upon roofing material thickness.

The motor amperage and voltage ratings must be checked for compatibility to supply voltage prior to final electrical connection. For direct and/or belt drive installations, the electrical supply should be routed through the conduit chase located between the curb cap and the bottom of the motor compartment. Wiring must conform to local and national codes.

Figure 2

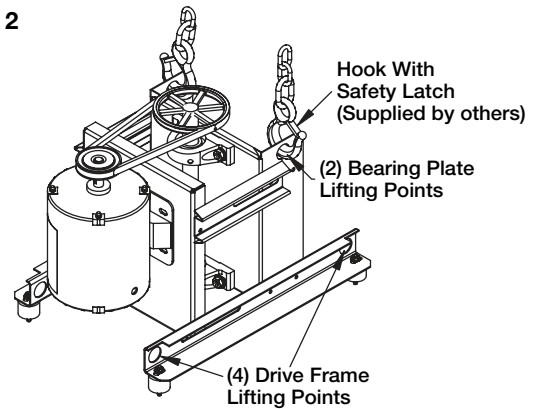
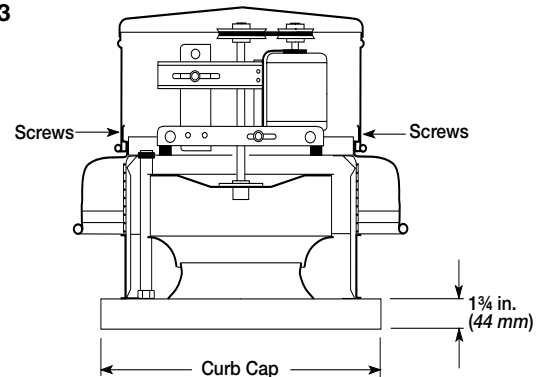


Figure 3



Storage

Fans are protected against damage during shipment. If the unit cannot be installed and operated immediately, precautions need to be taken to prevent deterioration of the unit during storage. The user assumes responsibility of the fan and accessories while in storage. The manufacturer will not be responsible for damage during storage. These suggestions are provided solely as a convenience to the user.

Indoor - The ideal environment for the storage of fans and accessories is indoors, above grade, in a low humidity atmosphere which is sealed to prevent the entry of blowing dust, rain or snow. Temperatures should be evenly maintained between 30° to 110°F (-1° to 43°C) (wide temperature swings may cause condensation and “sweating” of metal parts). All accessories must be stored indoors in a clean, dry atmosphere.

Remove any accumulations of dirt, water, ice or snow and wipe dry before moving to indoor storage. To avoid “sweating” of metal parts, allow cold parts to reach room temperature. To dry parts and packages, use a portable electric heater to get rid of any moisture buildup. Leave coverings loose to permit air circulation and to allow for periodic inspection.

The unit should be stored at least 3½ inches (89 mm) off the floor on wooden blocks covered with moisture proof paper or polyethylene sheathing. Aisles between parts and along all walls should be provided to permit air circulation and space for inspection.

Outdoor - Fans designed for outdoor applications may be stored outdoors, if absolutely necessary. Roads or aisles for portable cranes and hauling equipment are needed.

The fan should be placed on a level surface to prevent water from leaking into the fan. The fan should be elevated on an adequate number of wooden blocks so that it is above water and snow levels and has enough blocking to prevent it from settling into soft ground. Locate parts far enough apart to permit air circulation, sunlight and space for periodic inspection. To minimize water accumulation, place all fan parts on blocking supports so that rain water will run off.

Do not cover parts with plastic film or tarps as these cause condensation of moisture from the air passing through heating and cooling cycles.

Fan wheels should be blocked to prevent spinning caused by strong winds.

Inspection and Maintenance During Storage

While in storage, inspect fans once per month. Keep a record of inspection and maintenance performed.

If moisture or dirt accumulations are found on parts, the source should be located and eliminated. At each inspection, rotate the wheel by hand ten to fifteen revolutions to distribute lubricant in motor. If paint deterioration begins, consideration should be given to touch-up or repainting. Fans with special coatings may require special techniques for touch-up or repair.

Machined parts coated with rust preventive should be restored to good condition promptly if signs of rust occur. Immediately remove the original rust preventive coating with petroleum solvent and clean with lint-free cloths. Polish any remaining rust from surface with crocus cloth or fine emery paper and oil. Do not destroy the continuity of the surfaces. Thoroughly wipe clean with Tectyl® 506 (Ashland Inc.) or the equivalent. For hard to reach internal surfaces or for occasional use, consider using Tectyl® 511M Rust Preventive, WD-40® or the equivalent.

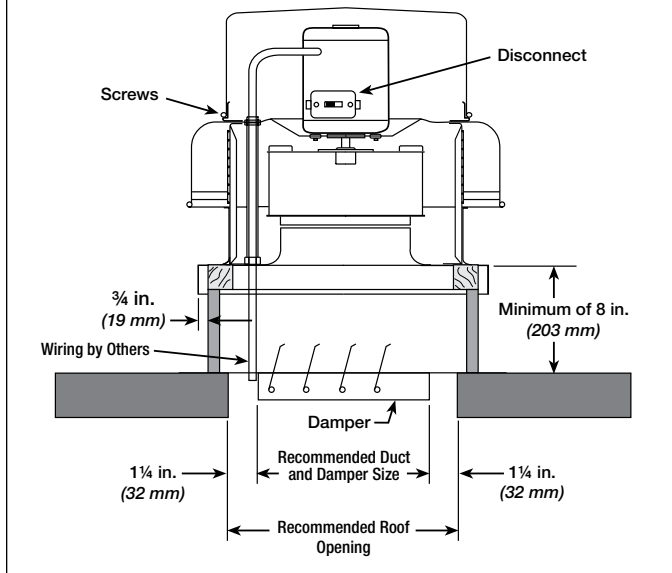
Removing From Storage

As fans are removed from storage to be installed in their final location, they should be protected and maintained in a similar fashion until the fan equipment goes into operation.

Dimensional Data

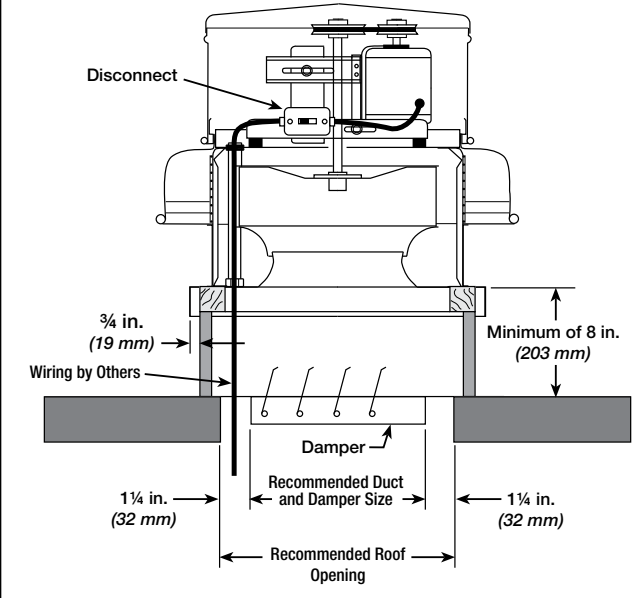
Direct Drive

Figure 4 - Typical Roof Mounting Installation



Belt Drive

Figure 5 - Typical Roof Mounting Installation



Model Size	Curb Cap	Damper	Roof Opening	**Approx. Weight
060, 070	17 (432)	8 (203)	13½ (343)	18 (8)
080, 090, 095	17 (432)	10 (254)	13½ (343)	26 (12)
097, 098, 099	19 (483)	12 (305)	15½ (393)	57 (26)
100, 103*, 100HP, 103HP*	19 (483)	12 (305)	15½ (393)	62 (28)
120, 123*	19 (483)	12 (305)	15½ (393)	65 (30)
130, 133*	19 (483)	12 (305)	15½ (393)	66 (30)
140, 143*, 140HP, 143HP*	22 (559)	16 (406)	18½ (470)	76 (35)
160, 163*	22 (559)	16 (406)	18½ (470)	80 (36)
180, 183*	30 (762)	24 (610)	26½ (673)	119 (54)
200, 203*, 200HP	30 (762)	24 (610)	26½ (673)	130 (59)
240	34 (864)	24 (610)	30½ (775)	158 (72)
300	40 (1016)	34 (864)	36½ (927)	320 (145)

• All dimensions are in inches (millimeters).

* Previous size, no physical product change with new size

** Approximate weight shown in pounds (kilograms) is the largest cataloged open drip proof motor.

• "Curb Cap" is the inside dimension of the curb cap.

• The roof curb should be ½ in. (38 mm) less than the curb cap to allow for roofing and flashing.

• Roof opening is a square dimension

Model Size	Curb Cap	Damper	Roof Opening	**Approx. Weight
071*, 097, 081*, 098, 091*, 099	19 (483)	12 (305)	15½ (393)	58 (26)
100, 101*, 100HP, 101HP*	19 (483)	12 (305)	15½ (393)	63 (29)
120, 121*	19 (483)	12 (305)	15½ (393)	66 (30)
130, 131*	19 (483)	12 (305)	15½ (393)	67 (30)
140, 141*, 140HP, 141HP*	22 (559)	16 (406)	18½ (470)	83 (38)
160, 161*, 160HP, 161HP*	22 (559)	16 (406)	18½ (470)	89 (40)
180, 180HP	30 (762)	24 (610)	26½ (673)	125 (57)
200, 200HP	30 (762)	24 (610)	26½ (673)	138 (63)
220, 220HP, 240, 240HP	34 (864)	24 (610)	30½ (775)	158 (72)
260	40 (1016)	34 (864)	36½ (927)	305 (138)
300, 300HP	40 (1016)	34 (864)	36½ (927)	320 (145)
330	46 (1168)	40 (1016)	42½ (1080)	385 (175)
360, 360HP	46 (1168)	40 (1016)	42½ (1080)	403 (183)
420	52 (1321)	46 (1168)	48½ (1232)	495 (225)
480	58 (1473)	52 (1321)	54½ (1384)	623 (283)
500	64 (1626)	58 (1473)	60½ (1537)	687 (312)
540	64 (1626)	58 (1473)	60½ (1537)	748 (339)

• All dimensions are in inches (millimeters).

* Previous size, no physical product change with new size

** Approximate weight shown in pounds (kilograms) is the largest cataloged open drip proof motor.

• "Curb Cap" is the inside dimension of the curb cap.

• The roof curb should be ½ in. (38 mm) less than the curb cap to allow for roofing and flashing.

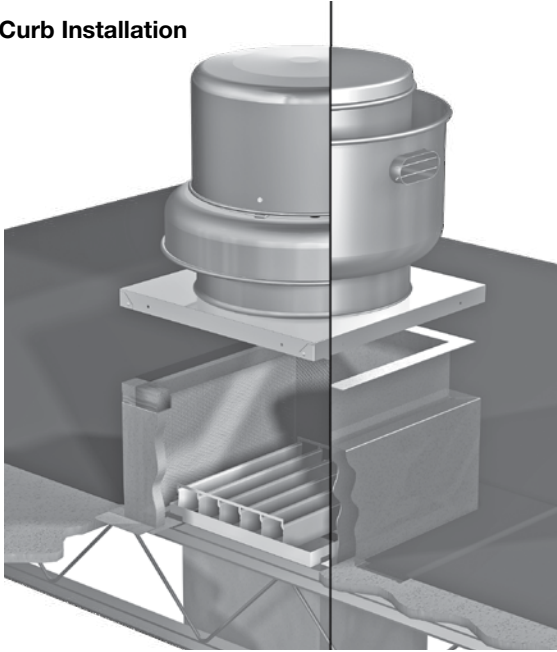
• Roof opening is a square dimension

Installation

Typical Roof Mounting Installation

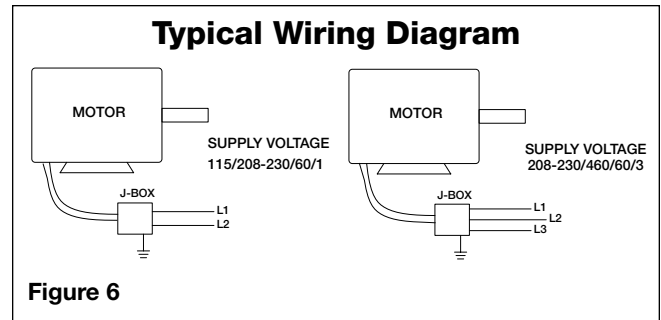
1. On the roof surface, cut an appropriate sized hole and follow manufacturer's instructions on curb installation. Caulk and flash the curb to ensure a water tight seal.

Roof Curb Installation



2. If unit is equipped with a backdraft damper, it should be installed now.
3. Remove motor cover. Access to the motor compartment is accomplished by removing the screws as shown in Figure 3, page 2.
4. On **belt drive** fans, use the lifting lugs on the drive frame or bearing plate to lift and place the unit on top of roof curb. Refer to Figure 2, page 2.
5. On **direct drive** fans, lift and place the unit on top of roof curb using hooks under the lip of the shroud. Refer to Figure 1, page 2.
6. Secure fan to curb using a minimum of eight lag screws, metal screws or other suitable fasteners. Shims may be required depending upon curb installation and roofing material.
7. Verify power line wiring is de-energized before connecting fan motor to power source.
8. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Check the power source for compatibility with the requirements of your equipment.
9. Check fan wheel for free rotation, recenter if necessary. Check setscrew(s) for tightness.
10. Check all fasteners for tightness.

11. Mount and wire safety disconnect switch under motor cover. Wire control switches at ground level, refer to Figure 6.
12. Replace motor cover.



Vari-Green Wiring

For Vari-Green wiring, refer to the Vari-Green Motor and Controls Installation, Operation and Maintenance Manual for complete wiring and operation instructions.

IMPORTANT

Installation, troubleshooting and parts replacement are to be performed only by qualified personnel. Consult and follow all applicable national, state and local codes. They will supersede this document.

Pre-Starting Checks

1. Check all fasteners and setscrews for tightness. The wheel should rotate freely and be aligned as shown in Figure 7.

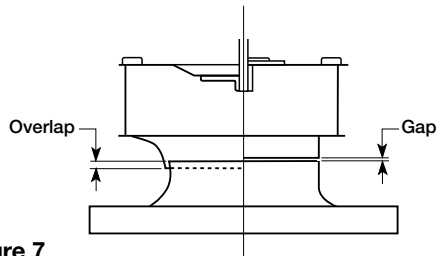


Figure 7

Model Type		Size	Overlap in. (mm)	Gap in. (mm)
Direct	Belt			
X	—	060-095	—	3/32 (2)
X	—	097-163	1/4 (6)	—
—	X	071-161	1/4 (6)	—
X	X	180-240	3/8 (10)	—
X	—	300	1/2 (13)	—
—	X	260-540	1/2 (13)	—

2. Wheel position is preset and the unit is test run at the factory. Movement may occur during shipment and realignment may be necessary.
3. **Belt Drive:** Centering wheel across the inlet can be accomplished by loosening the bolts holding the drive frame to the vibration isolators and repositioning the drive frame.

Direct and Belt Drive: If further alignment is needed, loosen shroud bolts and move shroud and motor to align wheel over inlet properly.

Wheel and inlet cone overlap can be adjusted by loosening the setscrews in the wheel hub and moving the wheel to the desired position. For both **direct and belt drive** models with wheel hubs and shaft pulleys utilizing a tapered bushing interface, reference page 8 for the tapered bushing removal and move the wheel to the desired position.

Fan RPM should be checked and verified with a tachometer.

4. Check wheel rotation (viewing from the shaft side) by momentarily energizing the unit. Rotation should be clockwise as shown in Figure 8 and correspond to rotation decal on the unit.

If wheel rotation is incorrect, reverse two of the wiring leads or check motor wiring for single phase. Fan RPM should be checked and verified with a tachometer.

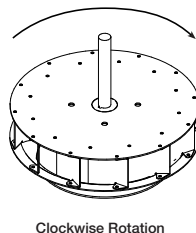


Figure 8

WARNING

Correct direction of wheel rotation is critical. Reversed rotation will result in poor air performance, motor overloading and possible motor burnout.

AVERTISSEMENT

La turbine doit impérativement tourner dans le bon sens. Une rotation en sens inverse entraînerait de mauvaises performances de soufflage, une surcharge du moteur voire un grillage du moteur.

IMPORTANT

The fan has been checked for mechanical noises at the factory prior to shipment. If mechanical noise should develop, suggested corrective actions are offered in the Troubleshooting section.

IMPORTANT

Over tightening belts will cause excessive bearing wear and noise. Too little tension will cause slippage at startup and uneven wear.

Belt Drive Pre-Starting Belt Tension Checks

5. Always loosen tension enough to install belts without stretching. Do not force belt(s) see Figure 9. Forcing belts will break the cords and cause belt failure.

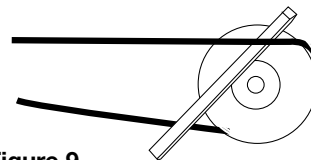


Figure 9

6. For units with two groove pulleys, adjust so the tension is equal in both belts.
7. If adjustments are made, it is very important to check the pulleys for proper alignment. Misaligned pulleys lead to excessive belt wear, vibration, noise and power loss, see Figure 10.

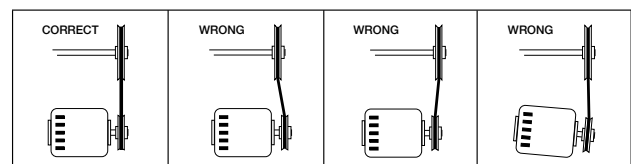


Figure 10

8. Belt tension can be adjusted by loosening four fasteners on the drive frame, see Figure 11. The motor plate slides on the slotted adjusting arms and drive frame angles in the same manner.

Four (4) fasteners in total.

Identical fasteners on opposing side must also be loosened.

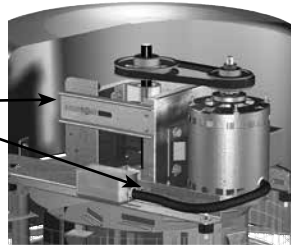


Figure 11

9. **Sizes 097-160:** Belts should be tensioned just enough to prevent slippage at full load. Belts should have a slight bow on the slack side while running at full load, see Figure 12a.

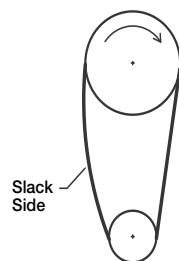


Figure 12a

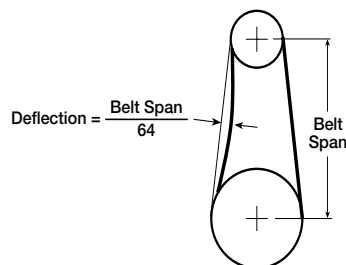


Figure 12b

Sizes 180-540: Belt tension should be adjusted to allow 1/64 in. (0.397 mm) of deflection per inch of belt span. For example, a 15 in. (381 mm) belt span should have 15/64 in. (5.95 mm) (or about 1/4 in. (6 mm)) of deflection with moderate thumb pressure at mid-point between pulleys, see Figure 12b.

10. The adjustable motor pulley is factory set for the RPM specified. Speed can be increased by closing or decreased by opening the adjustable motor pulley.
11. Any increase in speed represents a substantial increase in the horsepower required by the unit.
12. Motor amperage should always be checked to avoid serious damage to the motor when speed is varied.

Operation

1. Before starting up or operating fan, check all fasteners for tightness. In particular, check the setscrews in the wheel hub (or the tapered bushing and pulleys if applicable).
2. While in the OFF position or before connecting the fan to power, turn the fan wheel by hand to be sure it is not striking the venturi or any obstacle.
3. Start the fan and shut it off immediately to check rotation of the wheel with directional arrow in the motor compartment, see Figure 8.
4. When the fan is started, observe the operation and check for any unusual noises.
5. With the system in full operation and all ductwork attached, measure current input to the motor and compare with the nameplate rating to determine if the motor is operating under safe load conditions.
6. Keep inlets and approaches to fan clean and free from obstruction.

IMPORTANT

Adjust (tighten) belt tension after the first 24-48 hours of operation.

Inspection

Inspection of the fan should be conducted at the first 30 minute and 24 hour intervals of satisfactory operation.

30 Minute Interval: Inspect bolts, setscrews and motor mounting bolts. Adjust and tighten as necessary.

24 Hour Interval: Check all internal components. On belt drive units only, inspect belt alignment and tension. Adjust and tighten as necessary.

Maintenance

DANGER

Disconnect and secure to the "off" position all electrical power to the fan prior to inspection or servicing. Failure to comply with this safety precaution could result in serious injury or death.

DANGER

Pour écarter les risques de blessure grave ou de mort, débrancher et verrouiller l'alimentation électrique en position « Arrêt » avant tout contrôle ou entretien.

WARNING

This unit should be made non-functional when cleaning the wheel or housing (fuses removed, disconnect locked off).

AVERTISSEMENT

L'appareil doit être rendu non opérationnel lors du nettoyage de la turbine ou du caisson (fusibles retirés, sectionneur verrouillé).

IMPORTANT

Uneven cleaning of the wheel will produce an out of balance condition that will cause vibration in the fan.

Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations and who are experienced with this type of equipment.

Motor maintenance is generally limited to cleaning and lubrication (where applicable). Cleaning should be limited to exterior surfaces only. Removing dust buildup on motor housing ensures proper motor cooling.

Greasing of motors is only intended when fittings are provided. Many fractional horsepower motors are permanently lubricated and should not be lubricated after installation. Motors supplied with grease fittings should be greased in accordance with manufacturer's recommendations. Where motor temperatures do not exceed 104°F (40°C), the grease should be replaced after 2,000 hours of running time as a general rule.

Wheels require very little attention when moving clean air. Occasionally, oil and dust may accumulate causing imbalance. When this occurs, the wheel and housing should be cleaned to ensure smooth and safe operation.

All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.

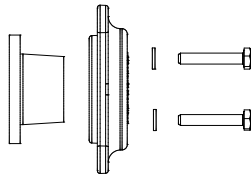
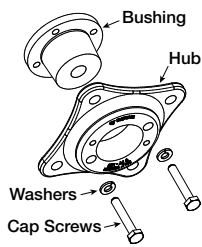

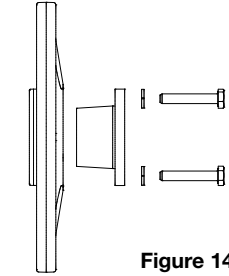
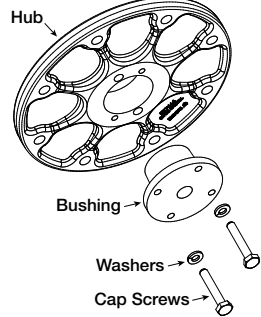

A proper maintenance program will help these units deliver years of dependable service.

Tapered Bushing Hub Installation and Removal

For wheel hubs and shaft pulleys utilizing a tapered bushing interface, follow this procedure for installation and removal. There are two possible setups for the tapered bushing, both have the same procedure, but orientation of the hub varies.

Tapered Bushing Removal:

1. If present, loosen the setscrew holding the bushing and shaft key in place.
2. Loosen and remove the socket head cap screws which fasten the bushing to the hub as shown in the section views and examples of Figures 13-16.

Standard Mounting	Reverse Mounting
 <p>Figure 13</p>  <p>Figure 15 Standard Bushing Orientation</p>  <p>Figure 15 Standard Bushing Orientation</p>	 <p>Figure 14</p>  <p>Figure 16 Reverse Bushing Orientation</p>  <p>Figure 16 Reverse Bushing Orientation</p>

3. **Standard Mounting:** Take the two socket head cap screws that were removed and install them into the visibly threaded holes on the wheel hub.

Reverse Mounting: Install the two socket head cap screws into the visibly threaded holes of the bushing flange.

4. Once both socket head cap screws are installed, tighten them an eighth of a turn at a time, alternating between the two until the hub comes loose from the bushing.

Bushing Installation:

1. Clean all surfaces of hub and bushing to remove any oil or residue present. Do not use any lubricant to install bushing into the hub. For both standard and reverse mounting styles, the socket head cap screws are adjustable from the inlet of the fan.
2. **Standard Mounting:** Slide the bushing and shaft key onto the fan shaft followed by the wheel and hub assembly. If present, use the keyway setscrew to hold the shaft key and bushing in place but DO NOT overtighten as this can damage the bushing. Align the unthreaded holes of the hub with the threaded holes of the tapered bushing.
Reverse Mounting: Slide the wheel and hub assembly on to the fan shaft followed by the bushing and shaft key. If present, use the keyway setscrew to hold the shaft key and bushing in place but DO NOT overtighten as this can damage the bushing. Align the unthreaded holes of the tapered bushing with the threaded holes of the hub.
3. Install the two bushing socket head cap screws into the aligned holes by hand (or without excessive torque) until the heads of the socket head cap screws are seated against the mating surface.
4. Adjust the height of the wheel in the fan relative to the inlet venturi then tighten the two socket head cap screws an eighth turn at a time in an alternating fashion and reach a torque of 10 ft-lbs.

Belt and Bearing Maintenance

1. Belts tend to stretch after a period of time. They should be checked periodically for wear and tightness. When replacing belts, use the same type as supplied with the unit.
2. Matched belts should always be used on units with multi-groove pulleys.
3. For belt replacement, loosen the tensioning device enough to allow removal of the belt by hand.
4. Once installed, adjust belts as shown in "Pre-Starting Checks."
5. To ensure tightness, check pulley setscrews. Proper keys must be in keyways.
6. Fan RPM should not be readjusted. Only use pulleys of identical size and type when replacing pulleys.
7. Shaft bearings can be classified in two groups: relubricating and non-relubricating. All non-relubricating bearings on belt drive fans are factory lubricated and require no further lubrication under normal use (between -20° to 180°F (-29° to 82°C) in a relatively clean environment).

8. On belt drive fans, the standard cast pillow block bearings are factory lubricated and are provided with external grease fittings. Annual lubrication is recommended, or more frequently if needed. See Table 2. Do not over-grease. Use only one or two shots of lubricant with a hand gun. Maximum hand gun rating is 40 psi. Rotate bearings during lubrication where good safety practice permits. Caution should be employed to prevent over packing or contamination.
9. Units installed in hot, humid or dirty locations should be equipped with special bearings. These bearings will require frequent lubrication. Caution should be employed to prevent over packing or contamination.
10. Grease fittings should be wiped clean. The unit should be in operation while lubricating bearings. Extreme care should be used around moving parts.
11. Grease should be pumped in very slowly until a slight bead forms around the seal. A high grade lithium base grease should be used. See Table 3.
12. During the first few months of operation, check bearing setscrews periodically to ensure tightness.
13. If unit is to be left idle for an extended period, remove belts and store in a cool, dry place to avoid premature belt failure.

Bearing Lubrication Schedule

NOTE: If unusual environment conditions exist (extreme temperature, moisture or contaminants) more frequent lubrication is required.

A good quality lithium base grease, conforming to NLGI Grade 2 consistency, such as those listed in Table 3 may be used.

Table 2: Suggested Fan Bearing Lubrication Intervals

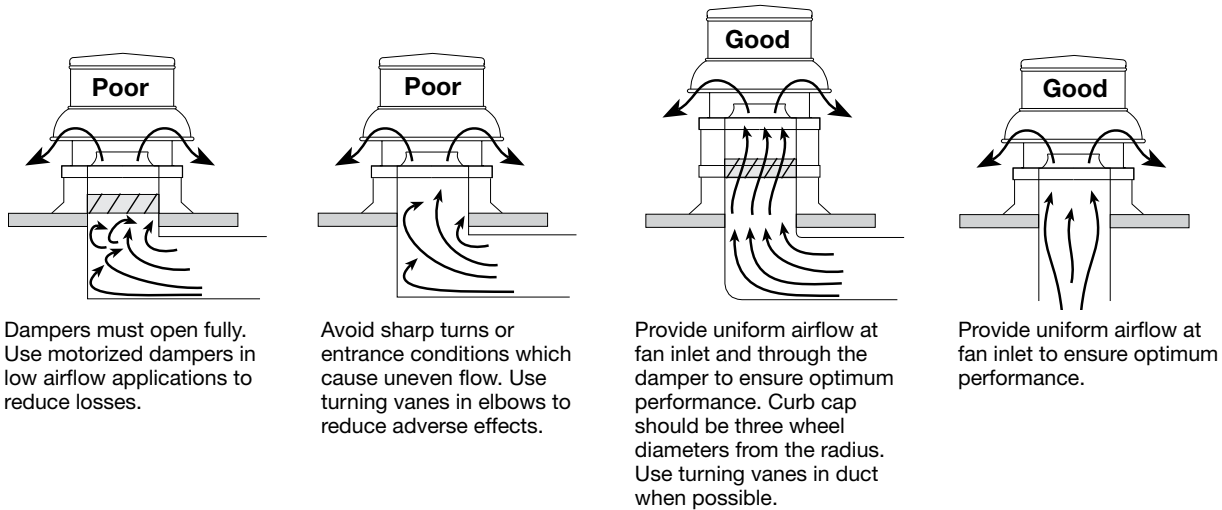
Interval (months)	Type of Service
1 to 3	Heavy duty in dirty, dusty locations; high ambient temperatures; moisture laden atmosphere; vibration.
3 to 6	12 to 24 hours per day, heavy duty, or if moisture is present
6 to 12	8 to 16 hours per day in clean, relatively dry atmosphere
12 to 18	Infrequent operation or light duty in clean atmosphere

Table 3: Grease Manufacturers

Manufacturer	Grease (NLGI #2)
U.S. Electric Motors	Grease No. 83343
Chevron U.S.A. Inc	Chevron SRI Grease #2
Mobil Oil Corporation	Mobilith
	Mobil 532
Texaco, Inc.	Premium BRB #2
	Texaco Multifak #2
Amoco Oil Co.	Rykon Premium #2
Exxon	Unirex N2
Shell	B Shell Alvania #2

Fan Inlet Connections

In order to ensure proper fan performance, caution must be exercised in fan placement and connection to the ventilation system. Obstructions, transitions, poorly designed elbows, improperly selected dampers, etc., can cause reduced performance, excessive noise and increased mechanical stress. For performance to be as published, the system must provide uniform and stable airflow into the fan.



Parts List

Each fan bears a manufacturer's nameplate with model number and serial number. This information will assist the local representative and the factory in providing service and replacement parts. Before taking any corrective action, make certain unit is not capable of operation during repairs.

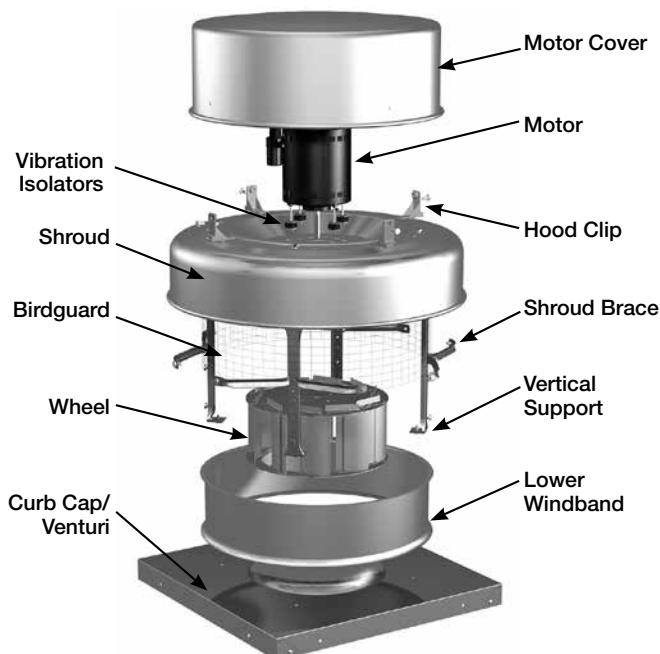
CAUTION

A fan manufactured with an explosion resistant motor does not certify the entire unit to be explosion proof. Refer to UL Listing mark for the fans approved usage.

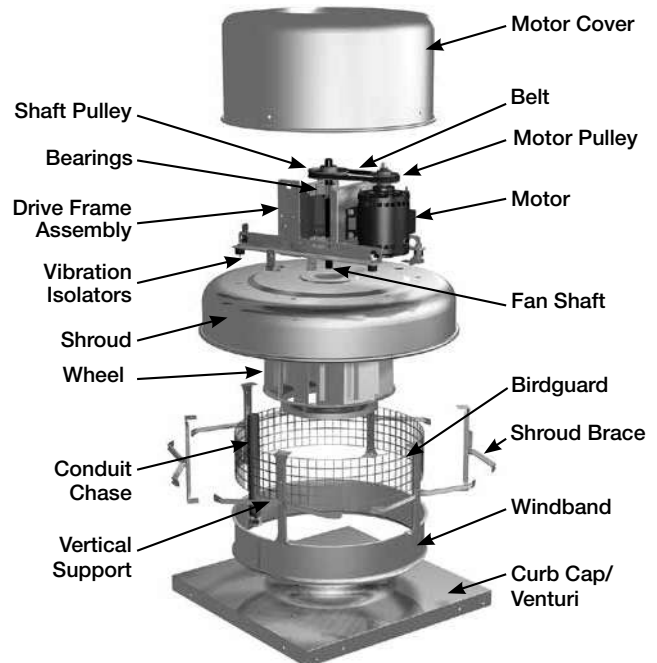
CAUTION

La présence d'un moteur antidéflagrant sur un ventilateur ne garantit pas que tout l'appareil est antidéflagrant. Pour connaître les emplois autorisés de l'appareil, voir son marquage de conformité UL.

Direct Drive



Belt Drive



Troubleshooting

WARNING

Before taking any corrective action, make certain unit is not capable of operation during repairs.

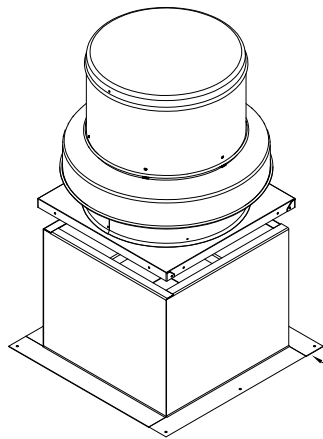
AVERTISSEMENT

Avant d'entreprendre toute action corrective, s'assurer que l'appareil ne pourra pas fonctionner durant les réparations.

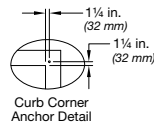
PROBLEM	CAUSE	CORRECTIVE ACTION
Excessive noise or vibration	Wheel rubbing inlet	Adjust wheel and/or inlet cone. Tighten wheel hub or bearing collars on shaft.
	V-belt drive	Tighten pulleys on motor/fan shaft. Adjust belt tension. Align pulleys properly, see page 6, Figures 9 and 10. Replace worn belts or pulleys.
	Bearings	Replace defective bearing(s). Lubricate bearings. Tighten collars and fasteners.
	Wheel unbalance	Clean all dirt off wheel. Check wheel balance, rebalance in place if necessary.
	Belts too tight or too loose	Adjust tension, see page 7, Figure 12a-b.
	Wheel improperly aligned and rubbing	Center wheel on inlet, see page 6, Figure 7.
	Loose drive or motor pulleys	Align and tighten. See "Pre-Starting Checks", see page 6 and 7.
	Foreign objects in wheel or housing	Remove objects, check for damage or unbalance.
	Fan base not securely anchored	Secure properly.
	Motor hood loose and rattling	Tighten fasteners to secure the motor hood.
	Defective or loose motor bearings	Replace motor with same frame size, RPM-HP.
High horsepower	Fan	Check rotation of wheel, see page 6, Figure 8. Reduce fan speed.
	Duct system	Resize ductwork. Check proper operation of face and bypass dampers. Check filters and access doors.
Fan does not operate	Electrical supply	Check fuses/circuit breakers. Check for switches off. Check for correct supply voltage.
	Drive	Check for broken belts. Tighten loose pulleys or belts.
	Motor	Ensure motor is correct horsepower and not tripping overload protector.
Motor overloads or overheats	Lubrication	Check for excessive or insufficient grease in the bearing.
	Mechanical	Replace damaged bearing. Relieve excessive belt tension. Align bearings. Check for bent shaft.
	Belt slippage	Adjust tension or replace bad belts, see pages 6 and 7.
	Over/Under line voltage	Contact power company.
	Incorrect wheel rotation	Check motor wiring, see page 5, Figure 4. Confirm wheel rotation, see page 6, Figure 8.
	Wheel RPM too high	Check drives or slow down fan by opening variable pitch pulley on motor shaft.
	Undersized motor	Check motor ratings with catalog speed and air capacity chart.
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor.
Reduced airflow	System resistance too high	Check system: Proper operation of backdraft or control dampers, obstruction in ductwork, clean dirty filters.
	Unit running backwards	Correct as shown on page 6, Figure 8.
	Excessive dirt buildup on wheels	Clean wheel.
	Improper wheel alignment	Center wheel on inlet, see "Pre-Starting Checks" on page 6.
	Dampers closed	Inspect and repair.
	Blocked duct/clogged filter	Clean or replace.
	Belt slippage	Replace and adjust tension.
	Speed too slow	Check for correct drives.

Mounting for Severe Duty Installations

Fan to Curb Mounting: 5/16-inch self-drilling fasteners are to be installed on each side of fan with one fastener 4 inches from each edge and one fastener in the center. Fasteners are to be equally spaced.

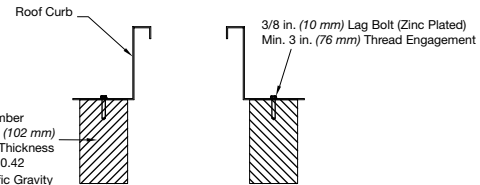
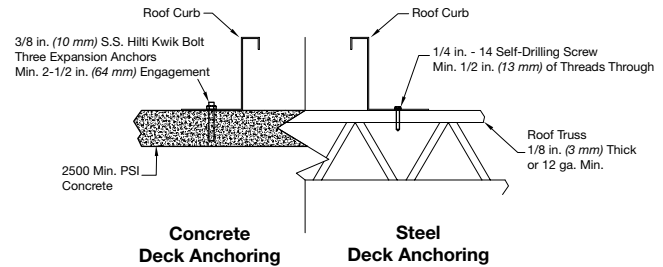


Fan Size	Fasteners Per Side
≤ 163	3
180 to 240	5
≥ 260	9



Roof Curb
Model GPF, GPFHL, GPFHD or Equivalent
18 ga. min.
High wind ratings – 42 in. Tall Max
Seismic ratings – 24 in. Tall Max
Steel Welded Construction

Curb to Deck Mounting: Fasteners need to be located on all four sides of the curb.



Timber Anchoring

High Wind Ratings				Seismic Ratings		
	Fan Size	Curb Cap Size	Self-Drilling Screw Size	Fasteners		
				Per Side	Total	
Concrete	≤ 143	17x17 to 22x22 (432x432 to 559x559 mm)	3/8"	3	12	060-300
	> 143	26x26 to 40x40 (660x660 to 1016x1016 mm)		3	12	330-540
Steel	≤ 143	17x17 to 22x22 (432x432 to 559x559 mm)	1/4" - 14	3	12	060-300
	> 143	26x26 to 40x40 (660x660 to 1016x1016 mm)		4	16	330-540
Timber	≤ 143	17x17 to 22x22 (432x432 to 559x559 mm)	3/8"	3	12	060-300
	> 143	26x26 to 40x40 (660x660 to 1016x1016 mm)		4	16	330-540

All dimensions are in inches (millimeters).

NOTE: Installation instructions for seismic ratings are only recommendations.

Final design must be determined by Structural Engineer of Record (SEOR) including requirements for curb construction, mounting of unit to curb and mounting of curb to structure.

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Specific Greenheck product warranties are located on greenheck.com within the product area tabs and in the Library under Warranties.

Greenheck Centrifugal Roof Downblast Exhaust Fans catalog provides additional information describing the equipment, fan performance, available accessories, and specification data.

AMCA Publication 410-96, Safety Practices for Users and Installers of Industrial and Commercial Fans, provides additional safety information. This publication can be obtained from AMCA International, Inc. at www.amca.org.

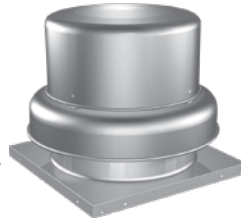


Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.

Direct Drive Downblast Centrifugal Exhaust

These fans are specifically designed for roof mounted applications exhausting relatively clean air. The maximum continuous operating temperature is 130°F (54°C). Direct drive models are made with nominal wheel diameter ranging from 8 to 30 inches (203 to 762 mm) (060-300 unit sizes). Each fan shall bear a permanently affixed manufacturer's embossed metal nameplate containing the model number and individual serial number. All fans are UL/cUL Listed Standard 705.



Belt Drive Downblast Centrifugal Exhaust

These fans are specifically designed for roof mounted applications exhausting relatively clean air. The maximum continuous operating temperature is 180°F (82°C). Belt drive models are made with nominal wheel diameters ranging from 11 to 54 inches (279 to 1372 mm) (097-540 unit sizes). Each fan shall bear a permanently affixed manufacturer's embossed nameplate containing the model number and individual serial number. All fans are UL/cUL Listed Standard 705.

General Safety Information

Only qualified personnel should install this fan. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards. Other considerations may be required if high winds or seismic activity is present. If more information is needed, contact a licensed professional engineer before moving forward.

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the National Fire Protection Agency (NFPA), where applicable. Follow the Canadian Electric Code (CEC) in Canada.
2. The rotation of the wheel is critical. It must be free to rotate without striking or rubbing any stationary objects.
3. Motor must be securely and adequately grounded.
4. Do not spin fan wheel faster than max cataloged fan RPM. Adjustments to fan speed significantly affects motor load. If the fan RPM is changed, the motor current should be checked to make sure it is not exceeding the motor nameplate amps.
5. Do not allow the power cable to kink or come in contact with oil, grease, hot surfaces or chemicals. Replace cord immediately if damaged.
6. Verify that the power source is compatible with the equipment.

7. Never open access doors to a duct while the fan is running.

DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

CAUTION

When servicing the fan, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.

CAUTION

Precaution should be taken in explosive atmospheres.

DANGER

Pour écarter les risques d'incendie, de choc électrique ou de blessure grave, veiller à toujours débrancher, verrouiller et étiqueter la source de courant avant l'installation ou l'entretien.

ATTENTION

Lors de toute intervention sur la soufflante, le moteur peut être suffisamment chaud pour provoquer une douleur voire une blessure. Laisser le moteur refroidir avant toute maintenance.

ATTENTION

Faire preuve de précaution dans les atmosphères explosives.

Receiving

Upon receiving the product, check to ensure all items are accounted for by referencing the delivery receipt or packing list. Inspect each crate or carton for shipping damage before accepting delivery. Alert the carrier of any damage detected. The customer will make notification of damage (or shortage of items) on the delivery receipt and all copies of the bill of lading which is countersigned by the delivering carrier. If damaged, immediately contact your representative. Any physical damage to the unit after acceptance is not the responsibility of the manufacturer.

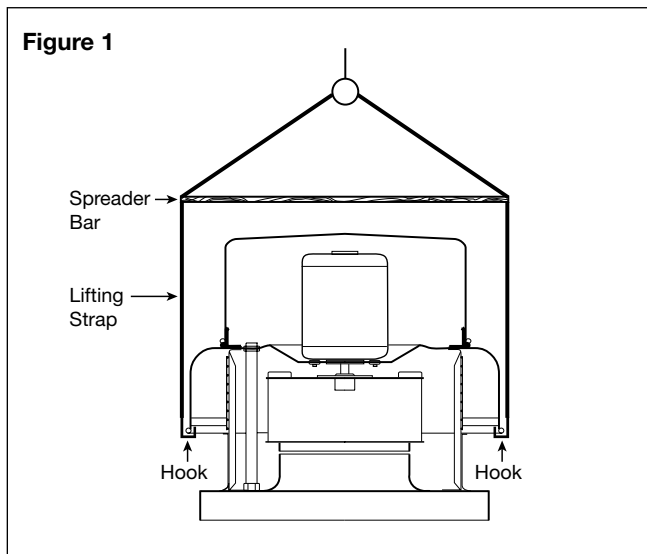
Unpacking

Verify that all required parts and the correct quantity of each item have been received. If any items are missing, report shortages to your local representative to arrange for obtaining missing parts. Sometimes it is not possible that all items for the unit be shipped together due to availability of transportation and truck space. Confirmation of shipment(s) must be limited to only items on the bill of lading.

Handling

Belt and Direct Drive Units

Lift Direct Drive unit on to the roof utilizing hooks under the lip of the shroud. Evenly space the hooks around the shroud using a minimum of four lifting straps. Use a spreader bar to ensure the straps do not come in contact with the unit (see Figure 1).



When lifting a belt drive unit on to the roof, use either the four lifting points on the drive frame or the two lifting points on the bearing plate if present (see Figure 2 for lifting points). Access to the drive frame is accomplished by removing the screws identified in Figure 3. The cover can then be removed and placed on a flat surface in an area protected from strong winds.

When direct and/or belt drive unit is on the roof, move fan to desired location using lifting points and fasten securely through mounting holes in base. Shims may be necessary depending upon roofing material thickness.

The motor amperage and voltage ratings must be checked for compatibility to supply voltage prior to final electrical connection. For direct and/or belt drive installations, the electrical supply should be routed through the conduit chase located between the curb cap and the bottom of the motor compartment. Wiring must conform to local and national codes.

Figure 2

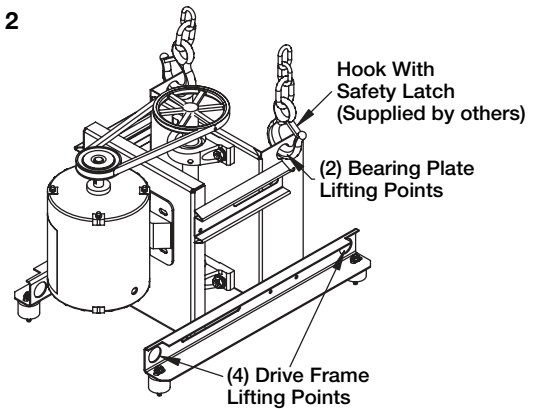
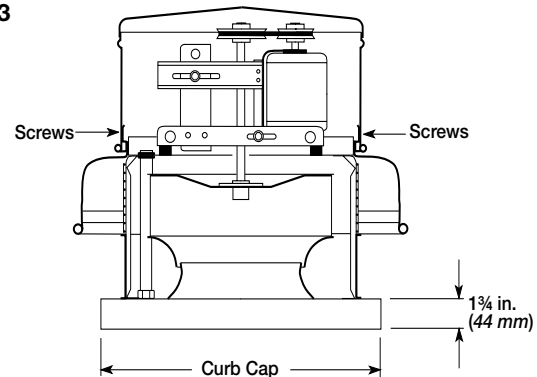


Figure 3



Storage

Fans are protected against damage during shipment. If the unit cannot be installed and operated immediately, precautions need to be taken to prevent deterioration of the unit during storage. The user assumes responsibility of the fan and accessories while in storage. The manufacturer will not be responsible for damage during storage. These suggestions are provided solely as a convenience to the user.

Indoor - The ideal environment for the storage of fans and accessories is indoors, above grade, in a low humidity atmosphere which is sealed to prevent the entry of blowing dust, rain or snow. Temperatures should be evenly maintained between 30° to 110°F (-1° to 43°C) (wide temperature swings may cause condensation and “sweating” of metal parts). All accessories must be stored indoors in a clean, dry atmosphere.

Remove any accumulations of dirt, water, ice or snow and wipe dry before moving to indoor storage. To avoid “sweating” of metal parts, allow cold parts to reach room temperature. To dry parts and packages, use a portable electric heater to get rid of any moisture buildup. Leave coverings loose to permit air circulation and to allow for periodic inspection.

The unit should be stored at least 3½ inches (89 mm) off the floor on wooden blocks covered with moisture proof paper or polyethylene sheathing. Aisles between parts and along all walls should be provided to permit air circulation and space for inspection.

Outdoor - Fans designed for outdoor applications may be stored outdoors, if absolutely necessary. Roads or aisles for portable cranes and hauling equipment are needed.

The fan should be placed on a level surface to prevent water from leaking into the fan. The fan should be elevated on an adequate number of wooden blocks so that it is above water and snow levels and has enough blocking to prevent it from settling into soft ground. Locate parts far enough apart to permit air circulation, sunlight and space for periodic inspection. To minimize water accumulation, place all fan parts on blocking supports so that rain water will run off.

Do not cover parts with plastic film or tarps as these cause condensation of moisture from the air passing through heating and cooling cycles.

Fan wheels should be blocked to prevent spinning caused by strong winds.

Inspection and Maintenance During Storage

While in storage, inspect fans once per month. Keep a record of inspection and maintenance performed.

If moisture or dirt accumulations are found on parts, the source should be located and eliminated. At each inspection, rotate the wheel by hand ten to fifteen revolutions to distribute lubricant in motor. If paint deterioration begins, consideration should be given to touch-up or repainting. Fans with special coatings may require special techniques for touch-up or repair.

Machined parts coated with rust preventive should be restored to good condition promptly if signs of rust occur. Immediately remove the original rust preventive coating with petroleum solvent and clean with lint-free cloths. Polish any remaining rust from surface with crocus cloth or fine emery paper and oil. Do not destroy the continuity of the surfaces. Thoroughly wipe clean with Tectyl® 506 (Ashland Inc.) or the equivalent. For hard to reach internal surfaces or for occasional use, consider using Tectyl® 511M Rust Preventive, WD-40® or the equivalent.

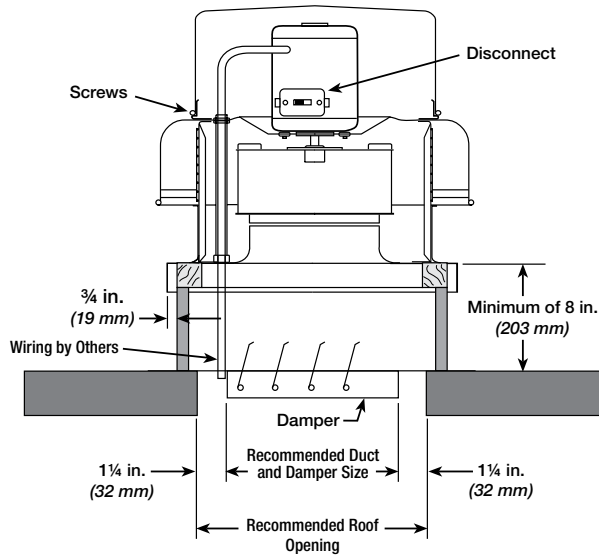
Removing From Storage

As fans are removed from storage to be installed in their final location, they should be protected and maintained in a similar fashion until the fan equipment goes into operation.

Dimensional Data

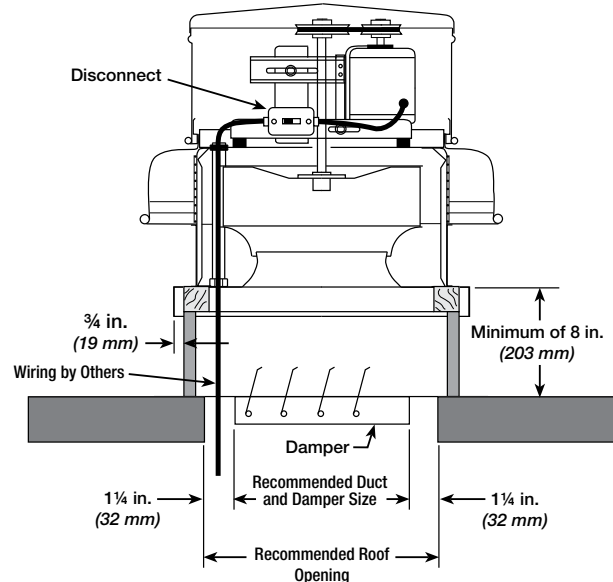
Direct Drive

Figure 4 - Typical Roof Mounting Installation



Belt Drive

Figure 5 - Typical Roof Mounting Installation



Model Size	Curb Cap	Damper	Roof Opening	**Approx. Weight
060, 070	17 (432)	8 (203)	13½ (343)	18 (8)
080, 090, 095	17 (432)	10 (254)	13½ (343)	26 (12)
097, 098, 099	19 (483)	12 (305)	15½ (393)	57 (26)
100, 103*, 100HP, 103HP*	19 (483)	12 (305)	15½ (393)	62 (28)
120, 123*	19 (483)	12 (305)	15½ (393)	65 (30)
130, 133*	19 (483)	12 (305)	15½ (393)	66 (30)
140, 143*, 140HP, 143HP*	22 (559)	16 (406)	18½ (470)	76 (35)
160, 163*	22 (559)	16 (406)	18½ (470)	80 (36)
180, 183*	30 (762)	24 (610)	26½ (673)	119 (54)
200, 203*, 200HP	30 (762)	24 (610)	26½ (673)	130 (59)
240	34 (864)	24 (610)	30½ (775)	158 (72)
300	40 (1016)	34 (864)	36½ (927)	320 (145)

• All dimensions are in inches (millimeters).

* Previous size, no physical product change with new size

** Approximate weight shown in pounds (kilograms) is the largest cataloged open drip proof motor.

• "Curb Cap" is the inside dimension of the curb cap.

• The roof curb should be ½ in. (38 mm) less than the curb cap to allow for roofing and flashing.

• Roof opening is a square dimension

Model Size	Curb Cap	Damper	Roof Opening	**Approx. Weight
071*, 097, 081*, 098, 091*, 099	19 (483)	12 (305)	15½ (393)	58 (26)
100, 101*, 100HP, 101HP*	19 (483)	12 (305)	15½ (393)	63 (29)
120, 121*	19 (483)	12 (305)	15½ (393)	66 (30)
130, 131*	19 (483)	12 (305)	15½ (393)	67 (30)
140, 141*, 140HP, 141HP*	22 (559)	16 (406)	18½ (470)	83 (38)
160, 161*, 160HP, 161HP*	22 (559)	16 (406)	18½ (470)	89 (40)
180, 180HP	30 (762)	24 (610)	26½ (673)	125 (57)
200, 200HP	30 (762)	24 (610)	26½ (673)	138 (63)
220, 220HP, 240, 240HP	34 (864)	24 (610)	30½ (775)	158 (72)
260	40 (1016)	34 (864)	36½ (927)	305 (138)
300, 300HP	40 (1016)	34 (864)	36½ (927)	320 (145)
330	46 (1168)	40 (1016)	42½ (1080)	385 (175)
360, 360HP	46 (1168)	40 (1016)	42½ (1080)	403 (183)
420	52 (1321)	46 (1168)	48½ (1232)	495 (225)
480	58 (1473)	52 (1321)	54½ (1384)	623 (283)
500	64 (1626)	58 (1473)	60½ (1537)	687 (312)
540	64 (1626)	58 (1473)	60½ (1537)	748 (339)

• All dimensions are in inches (millimeters).

* Previous size, no physical product change with new size

** Approximate weight shown in pounds (kilograms) is the largest cataloged open drip proof motor.

• "Curb Cap" is the inside dimension of the curb cap.

• The roof curb should be ½ in. (38 mm) less than the curb cap to allow for roofing and flashing.

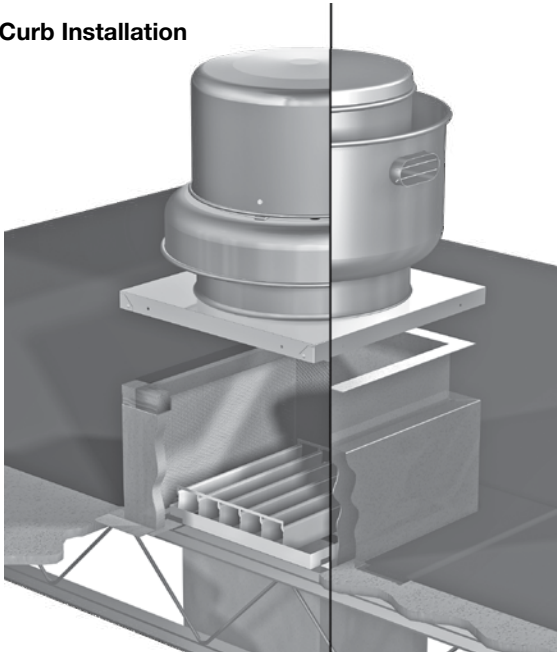
• Roof opening is a square dimension

Installation

Typical Roof Mounting Installation

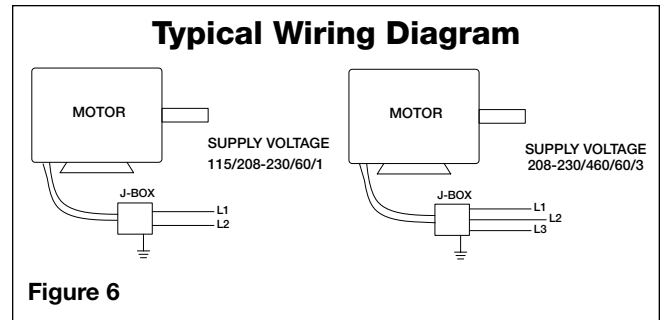
1. On the roof surface, cut an appropriate sized hole and follow manufacturer's instructions on curb installation. Caulk and flash the curb to ensure a water tight seal.

Roof Curb Installation



2. If unit is equipped with a backdraft damper, it should be installed now.
3. Remove motor cover. Access to the motor compartment is accomplished by removing the screws as shown in Figure 3, page 2.
4. On **belt drive** fans, use the lifting lugs on the drive frame or bearing plate to lift and place the unit on top of roof curb. Refer to Figure 2, page 2.
5. On **direct drive** fans, lift and place the unit on top of roof curb using hooks under the lip of the shroud. Refer to Figure 1, page 2.
6. Secure fan to curb using a minimum of eight lag screws, metal screws or other suitable fasteners. Shims may be required depending upon curb installation and roofing material.
7. Verify power line wiring is de-energized before connecting fan motor to power source.
8. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Check the power source for compatibility with the requirements of your equipment.
9. Check fan wheel for free rotation, recenter if necessary. Check setscrew(s) for tightness.
10. Check all fasteners for tightness.

11. Mount and wire safety disconnect switch under motor cover. Wire control switches at ground level, refer to Figure 6.
12. Replace motor cover.



Vari-Green Wiring

For Vari-Green wiring, refer to the Vari-Green Motor and Controls Installation, Operation and Maintenance Manual for complete wiring and operation instructions.

IMPORTANT

Installation, troubleshooting and parts replacement are to be performed only by qualified personnel. Consult and follow all applicable national, state and local codes. They will supersede this document.

Pre-Starting Checks

1. Check all fasteners and setscrews for tightness. The wheel should rotate freely and be aligned as shown in Figure 7.

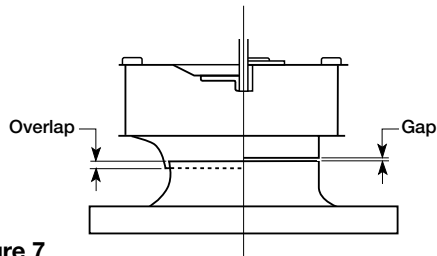


Figure 7

Model Type		Size	Overlap in. (mm)	Gap in. (mm)
Direct	Belt			
X	—	060-095	—	3/32 (2)
X	—	097-163	1/4 (6)	—
—	X	071-161	1/4 (6)	—
X	X	180-240	3/8 (10)	—
X	—	300	1/2 (13)	—
—	X	260-540	1/2 (13)	—

2. Wheel position is preset and the unit is test run at the factory. Movement may occur during shipment and realignment may be necessary.
3. **Belt Drive:** Centering wheel across the inlet can be accomplished by loosening the bolts holding the drive frame to the vibration isolators and repositioning the drive frame.

Direct and Belt Drive: If further alignment is needed, loosen shroud bolts and move shroud and motor to align wheel over inlet properly.

Wheel and inlet cone overlap can be adjusted by loosening the setscrews in the wheel hub and moving the wheel to the desired position. For both **direct and belt drive** models with wheel hubs and shaft pulleys utilizing a tapered bushing interface, reference page 8 for the tapered bushing removal and move the wheel to the desired position.

Fan RPM should be checked and verified with a tachometer.

4. Check wheel rotation (viewing from the shaft side) by momentarily energizing the unit. Rotation should be clockwise as shown in Figure 8 and correspond to rotation decal on the unit.

If wheel rotation is incorrect, reverse two of the wiring leads or check motor wiring for single phase. Fan RPM should be checked and verified with a tachometer.

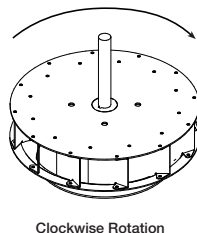


Figure 8

WARNING

Correct direction of wheel rotation is critical. Reversed rotation will result in poor air performance, motor overloading and possible motor burnout.

AVERTISSEMENT

La turbine doit impérativement tourner dans le bon sens. Une rotation en sens inverse entraînerait de mauvaises performances de soufflage, une surcharge du moteur voire un grillage du moteur.

IMPORTANT

The fan has been checked for mechanical noises at the factory prior to shipment. If mechanical noise should develop, suggested corrective actions are offered in the Troubleshooting section.

IMPORTANT

Over tightening belts will cause excessive bearing wear and noise. Too little tension will cause slippage at startup and uneven wear.

Belt Drive Pre-Starting Belt Tension Checks

5. Always loosen tension enough to install belts without stretching. Do not force belt(s) see Figure 9. Forcing belts will break the cords and cause belt failure.

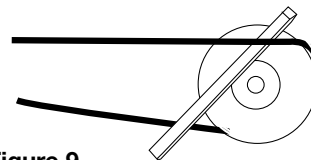


Figure 9

6. For units with two groove pulleys, adjust so the tension is equal in both belts.
7. If adjustments are made, it is very important to check the pulleys for proper alignment. Misaligned pulleys lead to excessive belt wear, vibration, noise and power loss, see Figure 10.

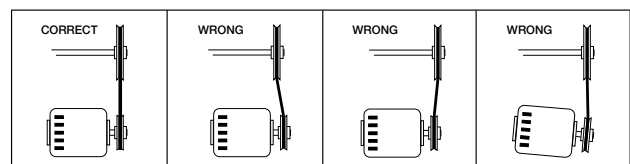


Figure 10

8. Belt tension can be adjusted by loosening four fasteners on the drive frame, see Figure 11. The motor plate slides on the slotted adjusting arms and drive frame angles in the same manner.

Four (4) fasteners in total.

Identical fasteners on opposing side must also be loosened.

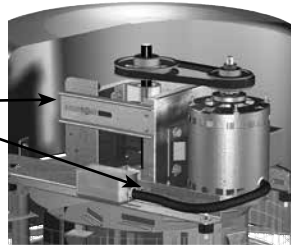


Figure 11

9. **Sizes 097-160:** Belts should be tensioned just enough to prevent slippage at full load. Belts should have a slight bow on the slack side while running at full load, see Figure 12a.

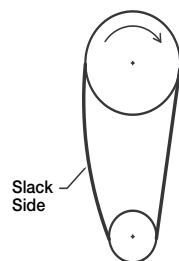


Figure 12a

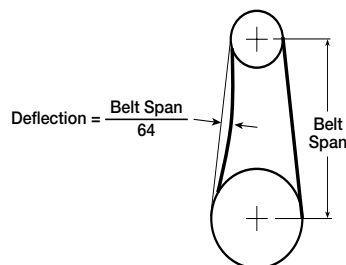


Figure 12b

Sizes 180-540: Belt tension should be adjusted to allow 1/64 in. (0.397 mm) of deflection per inch of belt span. For example, a 15 in. (381 mm) belt span should have 15/64 in. (5.95 mm) (or about 1/4 in. (6 mm)) of deflection with moderate thumb pressure at mid-point between pulleys, see Figure 12b.

10. The adjustable motor pulley is factory set for the RPM specified. Speed can be increased by closing or decreased by opening the adjustable motor pulley.
11. Any increase in speed represents a substantial increase in the horsepower required by the unit.
12. Motor amperage should always be checked to avoid serious damage to the motor when speed is varied.

Operation

1. Before starting up or operating fan, check all fasteners for tightness. In particular, check the setscrews in the wheel hub (or the tapered bushing and pulleys if applicable).
2. While in the OFF position or before connecting the fan to power, turn the fan wheel by hand to be sure it is not striking the venturi or any obstacle.
3. Start the fan and shut it off immediately to check rotation of the wheel with directional arrow in the motor compartment, see Figure 8.
4. When the fan is started, observe the operation and check for any unusual noises.
5. With the system in full operation and all ductwork attached, measure current input to the motor and compare with the nameplate rating to determine if the motor is operating under safe load conditions.
6. Keep inlets and approaches to fan clean and free from obstruction.

IMPORTANT

Adjust (tighten) belt tension after the first 24-48 hours of operation.

Inspection

Inspection of the fan should be conducted at the first 30 minute and 24 hour intervals of satisfactory operation.

30 Minute Interval: Inspect bolts, setscrews and motor mounting bolts. Adjust and tighten as necessary.

24 Hour Interval: Check all internal components. On belt drive units only, inspect belt alignment and tension. Adjust and tighten as necessary.

Maintenance

DANGER

Disconnect and secure to the "off" position all electrical power to the fan prior to inspection or servicing. Failure to comply with this safety precaution could result in serious injury or death.

DANGER

Pour écarter les risques de blessure grave ou de mort, débrancher et verrouiller l'alimentation électrique en position « Arrêt » avant tout contrôle ou entretien.

WARNING

This unit should be made non-functional when cleaning the wheel or housing (fuses removed, disconnect locked off).

AVERTISSEMENT

L'appareil doit être rendu non opérationnel lors du nettoyage de la turbine ou du caisson (fusibles retirés, sectionneur verrouillé).

IMPORTANT

Uneven cleaning of the wheel will produce an out of balance condition that will cause vibration in the fan.

Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations and who are experienced with this type of equipment.

Motor maintenance is generally limited to cleaning and lubrication (where applicable). Cleaning should be limited to exterior surfaces only. Removing dust buildup on motor housing ensures proper motor cooling.

Greasing of motors is only intended when fittings are provided. Many fractional horsepower motors are permanently lubricated and should not be lubricated after installation. Motors supplied with grease fittings should be greased in accordance with manufacturer's recommendations. Where motor temperatures do not exceed 104°F (40°C), the grease should be replaced after 2,000 hours of running time as a general rule.

Wheels require very little attention when moving clean air. Occasionally, oil and dust may accumulate causing imbalance. When this occurs, the wheel and housing should be cleaned to ensure smooth and safe operation.

All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.

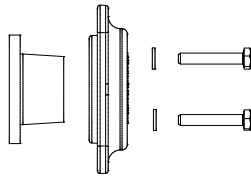
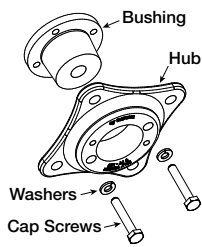

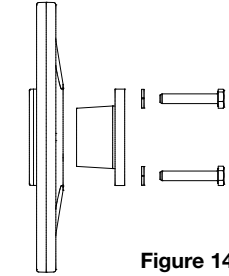
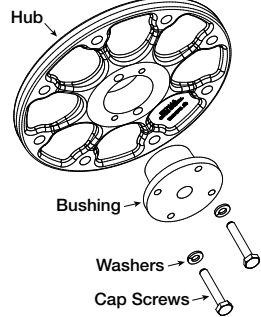

A proper maintenance program will help these units deliver years of dependable service.

Tapered Bushing Hub Installation and Removal

For wheel hubs and shaft pulleys utilizing a tapered bushing interface, follow this procedure for installation and removal. There are two possible setups for the tapered bushing, both have the same procedure, but orientation of the hub varies.

Tapered Bushing Removal:

1. If present, loosen the setscrew holding the bushing and shaft key in place.
2. Loosen and remove the socket head cap screws which fasten the bushing to the hub as shown in the section views and examples of Figures 13-16.

Standard Mounting	Reverse Mounting
 <p>Figure 13</p>  <p>Figure 15 Standard Bushing Orientation</p>  <p>Figure 15 Standard Bushing Orientation</p>	 <p>Figure 14</p>  <p>Figure 16 Reverse Bushing Orientation</p>  <p>Figure 16 Reverse Bushing Orientation</p>

3. **Standard Mounting:** Take the two socket head cap screws that were removed and install them into the visibly threaded holes on the wheel hub.

Reverse Mounting: Install the two socket head cap screws into the visibly threaded holes of the bushing flange.

4. Once both socket head cap screws are installed, tighten them an eighth of a turn at a time, alternating between the two until the hub comes loose from the bushing.

Bushing Installation:

1. Clean all surfaces of hub and bushing to remove any oil or residue present. Do not use any lubricant to install bushing into the hub. For both standard and reverse mounting styles, the socket head cap screws are adjustable from the inlet of the fan.
2. **Standard Mounting:** Slide the bushing and shaft key onto the fan shaft followed by the wheel and hub assembly. If present, use the keyway setscrew to hold the shaft key and bushing in place but DO NOT overtighten as this can damage the bushing. Align the unthreaded holes of the hub with the threaded holes of the tapered bushing.
Reverse Mounting: Slide the wheel and hub assembly on to the fan shaft followed by the bushing and shaft key. If present, use the keyway setscrew to hold the shaft key and bushing in place but DO NOT overtighten as this can damage the bushing. Align the unthreaded holes of the tapered bushing with the threaded holes of the hub.
3. Install the two bushing socket head cap screws into the aligned holes by hand (or without excessive torque) until the heads of the socket head cap screws are seated against the mating surface.
4. Adjust the height of the wheel in the fan relative to the inlet venturi then tighten the two socket head cap screws an eighth turn at a time in an alternating fashion and reach a torque of 10 ft-lbs.

Belt and Bearing Maintenance

1. Belts tend to stretch after a period of time. They should be checked periodically for wear and tightness. When replacing belts, use the same type as supplied with the unit.
2. Matched belts should always be used on units with multi-groove pulleys.
3. For belt replacement, loosen the tensioning device enough to allow removal of the belt by hand.
4. Once installed, adjust belts as shown in "Pre-Starting Checks."
5. To ensure tightness, check pulley setscrews. Proper keys must be in keyways.
6. Fan RPM should not be readjusted. Only use pulleys of identical size and type when replacing pulleys.
7. Shaft bearings can be classified in two groups: relubricating and non-relubricating. All non-relubricating bearings on belt drive fans are factory lubricated and require no further lubrication under normal use (between -20° to 180°F (-29° to 82°C) in a relatively clean environment).

8. On belt drive fans, the standard cast pillow block bearings are factory lubricated and are provided with external grease fittings. Annual lubrication is recommended, or more frequently if needed. See Table 2. Do not over-grease. Use only one or two shots of lubricant with a hand gun. Maximum hand gun rating is 40 psi. Rotate bearings during lubrication where good safety practice permits. Caution should be employed to prevent over packing or contamination.
9. Units installed in hot, humid or dirty locations should be equipped with special bearings. These bearings will require frequent lubrication. Caution should be employed to prevent over packing or contamination.
10. Grease fittings should be wiped clean. The unit should be in operation while lubricating bearings. Extreme care should be used around moving parts.
11. Grease should be pumped in very slowly until a slight bead forms around the seal. A high grade lithium base grease should be used. See Table 3.
12. During the first few months of operation, check bearing setscrews periodically to ensure tightness.
13. If unit is to be left idle for an extended period, remove belts and store in a cool, dry place to avoid premature belt failure.

Bearing Lubrication Schedule

NOTE: If unusual environment conditions exist (extreme temperature, moisture or contaminants) more frequent lubrication is required.

A good quality lithium base grease, conforming to NLGI Grade 2 consistency, such as those listed in Table 3 may be used.

Table 2: Suggested Fan Bearing Lubrication Intervals

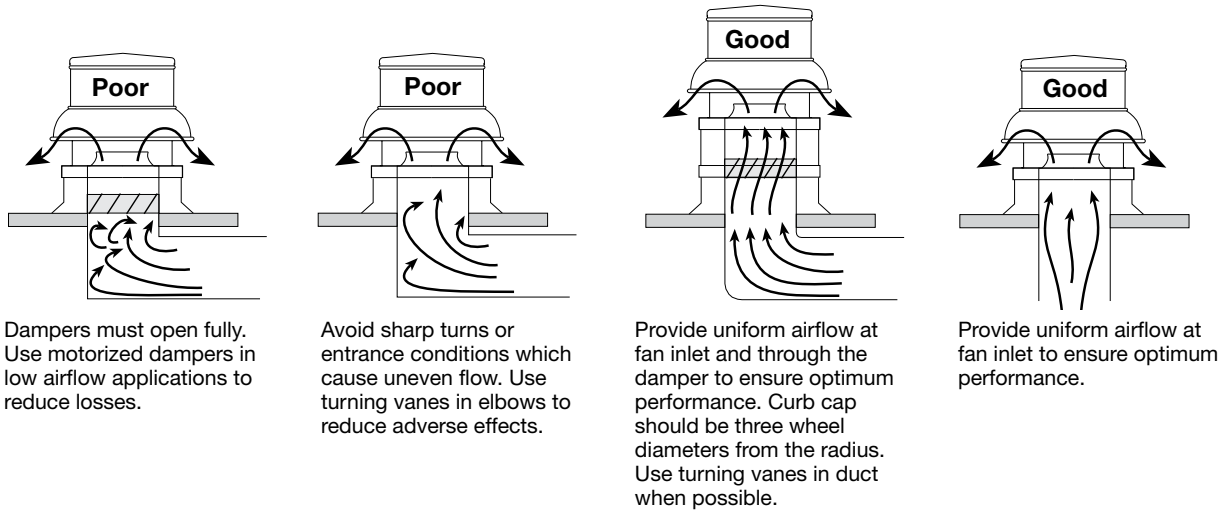
Interval (months)	Type of Service
1 to 3	Heavy duty in dirty, dusty locations; high ambient temperatures; moisture laden atmosphere; vibration.
3 to 6	12 to 24 hours per day, heavy duty, or if moisture is present
6 to 12	8 to 16 hours per day in clean, relatively dry atmosphere
12 to 18	Infrequent operation or light duty in clean atmosphere

Table 3: Grease Manufacturers

Manufacturer	Grease (NLGI #2)
U.S. Electric Motors	Grease No. 83343
Chevron U.S.A. Inc	Chevron SRI Grease #2
Mobil Oil Corporation	Mobilith
	Mobil 532
Texaco, Inc.	Premium BRB #2
	Texaco Multifak #2
Amoco Oil Co.	Rykon Premium #2
Exxon	Unirex N2
Shell	B Shell Alvania #2

Fan Inlet Connections

In order to ensure proper fan performance, caution must be exercised in fan placement and connection to the ventilation system. Obstructions, transitions, poorly designed elbows, improperly selected dampers, etc., can cause reduced performance, excessive noise and increased mechanical stress. For performance to be as published, the system must provide uniform and stable airflow into the fan.



Parts List

Each fan bears a manufacturer's nameplate with model number and serial number. This information will assist the local representative and the factory in providing service and replacement parts. Before taking any corrective action, make certain unit is not capable of operation during repairs.

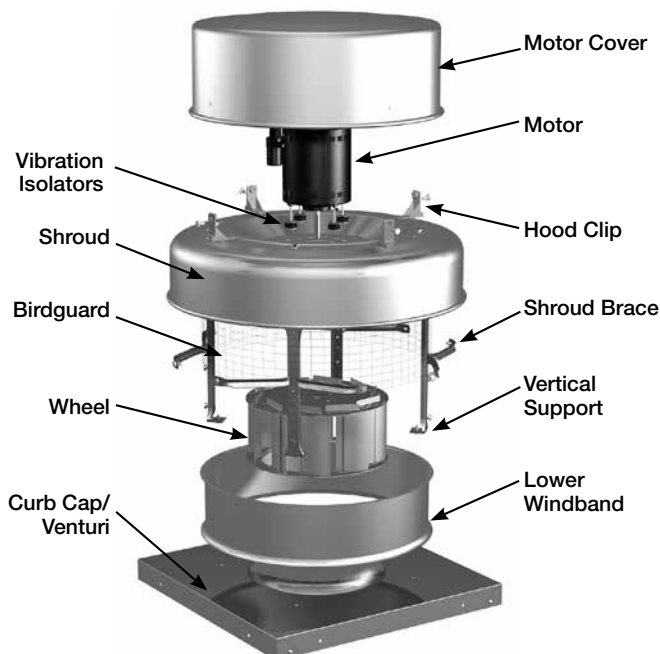
CAUTION

A fan manufactured with an explosion resistant motor does not certify the entire unit to be explosion proof. Refer to UL Listing mark for the fans approved usage.

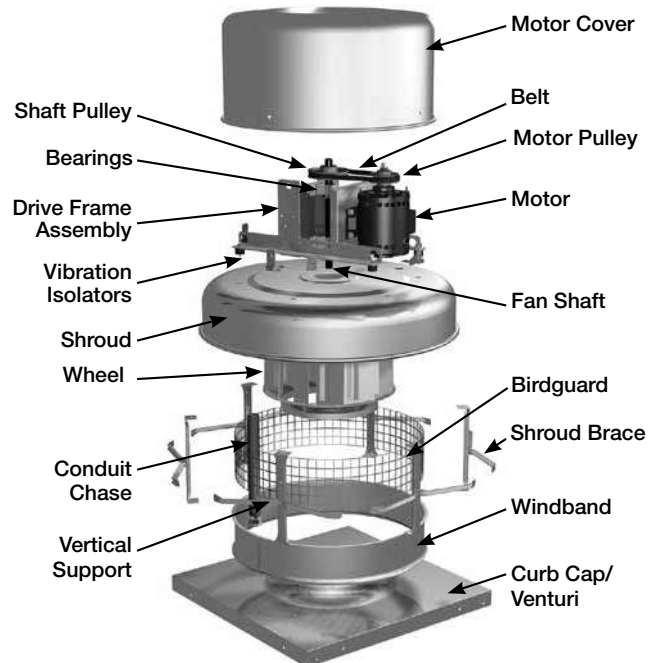
CAUTION

La présence d'un moteur antidéflagrant sur un ventilateur ne garantit pas que tout l'appareil est antidéflagrant. Pour connaître les emplois autorisés de l'appareil, voir son marquage de conformité UL.

Direct Drive



Belt Drive



Troubleshooting

WARNING

Before taking any corrective action, make certain unit is not capable of operation during repairs.

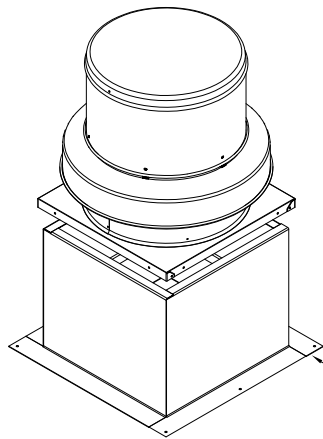
AVERTISSEMENT

Avant d'entreprendre toute action corrective, s'assurer que l'appareil ne pourra pas fonctionner durant les réparations.

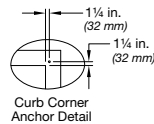
PROBLEM	CAUSE	CORRECTIVE ACTION
Excessive noise or vibration	Wheel rubbing inlet	Adjust wheel and/or inlet cone. Tighten wheel hub or bearing collars on shaft.
	V-belt drive	Tighten pulleys on motor/fan shaft. Adjust belt tension. Align pulleys properly, see page 6, Figures 9 and 10. Replace worn belts or pulleys.
	Bearings	Replace defective bearing(s). Lubricate bearings. Tighten collars and fasteners.
	Wheel unbalance	Clean all dirt off wheel. Check wheel balance, rebalance in place if necessary.
	Belts too tight or too loose	Adjust tension, see page 7, Figure 12a-b.
	Wheel improperly aligned and rubbing	Center wheel on inlet, see page 6, Figure 7.
	Loose drive or motor pulleys	Align and tighten. See "Pre-Starting Checks", see page 6 and 7.
	Foreign objects in wheel or housing	Remove objects, check for damage or unbalance.
	Fan base not securely anchored	Secure properly.
	Motor hood loose and rattling	Tighten fasteners to secure the motor hood.
	Defective or loose motor bearings	Replace motor with same frame size, RPM-HP.
High horsepower	Fan	Check rotation of wheel, see page 6, Figure 8. Reduce fan speed.
	Duct system	Resize ductwork. Check proper operation of face and bypass dampers. Check filters and access doors.
Fan does not operate	Electrical supply	Check fuses/circuit breakers. Check for switches off. Check for correct supply voltage.
	Drive	Check for broken belts. Tighten loose pulleys or belts.
	Motor	Ensure motor is correct horsepower and not tripping overload protector.
Motor overloads or overheats	Lubrication	Check for excessive or insufficient grease in the bearing.
	Mechanical	Replace damaged bearing. Relieve excessive belt tension. Align bearings. Check for bent shaft.
	Belt slippage	Adjust tension or replace bad belts, see pages 6 and 7.
	Over/Under line voltage	Contact power company.
	Incorrect wheel rotation	Check motor wiring, see page 5, Figure 4. Confirm wheel rotation, see page 6, Figure 8.
	Wheel RPM too high	Check drives or slow down fan by opening variable pitch pulley on motor shaft.
	Undersized motor	Check motor ratings with catalog speed and air capacity chart.
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor.
Reduced airflow	System resistance too high	Check system: Proper operation of backdraft or control dampers, obstruction in ductwork, clean dirty filters.
	Unit running backwards	Correct as shown on page 6, Figure 8.
	Excessive dirt buildup on wheels	Clean wheel.
	Improper wheel alignment	Center wheel on inlet, see "Pre-Starting Checks" on page 6.
	Dampers closed	Inspect and repair.
	Blocked duct/clogged filter	Clean or replace.
	Belt slippage	Replace and adjust tension.
	Speed too slow	Check for correct drives.

Mounting for Severe Duty Installations

Fan to Curb Mounting: 5/16-inch self-drilling fasteners are to be installed on each side of fan with one fastener 4 inches from each edge and one fastener in the center. Fasteners are to be equally spaced.

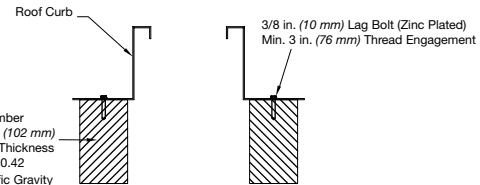
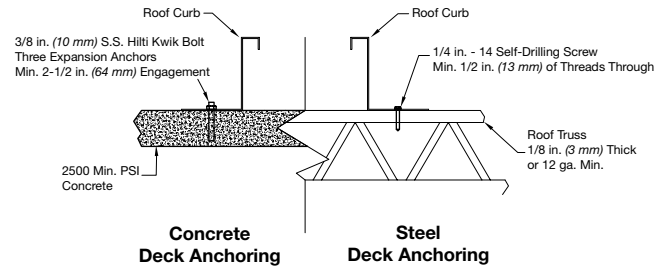


Fan Size	Fasteners Per Side
≤ 163	3
180 to 240	5
≥ 260	9



Roof Curb
Model GPF, GPFHL, GPFHD or Equivalent
18 ga. min.
High wind ratings – 42 in. Tall Max
Seismic ratings – 24 in. Tall Max
Steel Welded Construction

Curb to Deck Mounting: Fasteners need to be located on all four sides of the curb.



Timber Anchoring

High Wind Ratings				Seismic Ratings		
	Fan Size	Curb Cap Size	Self-Drilling Screw Size	Fasteners		
				Per Side	Total	
Concrete	≤ 143	17x17 to 22x22 (432x432 to 559x559 mm)	3/8"	3	12	060-300
	> 143	26x26 to 40x40 (660x660 to 1016x1016 mm)		3	12	330-540
Steel	≤ 143	17x17 to 22x22 (432x432 to 559x559 mm)	1/4" - 14	3	12	060-300
	> 143	26x26 to 40x40 (660x660 to 1016x1016 mm)		4	16	330-540
Timber	≤ 143	17x17 to 22x22 (432x432 to 559x559 mm)	3/8"	3	12	060-300
	> 143	26x26 to 40x40 (660x660 to 1016x1016 mm)		4	16	330-540

All dimensions are in inches (millimeters).

NOTE: Installation instructions for seismic ratings are only recommendations.

Final design must be determined by Structural Engineer of Record (SEOR) including requirements for curb construction, mounting of unit to curb and mounting of curb to structure.

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Specific Greenheck product warranties are located on greenheck.com within the product area tabs and in the Library under Warranties.

Greenheck Centrifugal Roof Downblast Exhaust Fans catalog provides additional information describing the equipment, fan performance, available accessories, and specification data.

AMCA Publication 410-96, Safety Practices for Users and Installers of Industrial and Commercial Fans, provides additional safety information. This publication can be obtained from AMCA International, Inc. at www.amca.org.



Miami-Dade Approved Wind-Driven Rain Louver

Application and Design

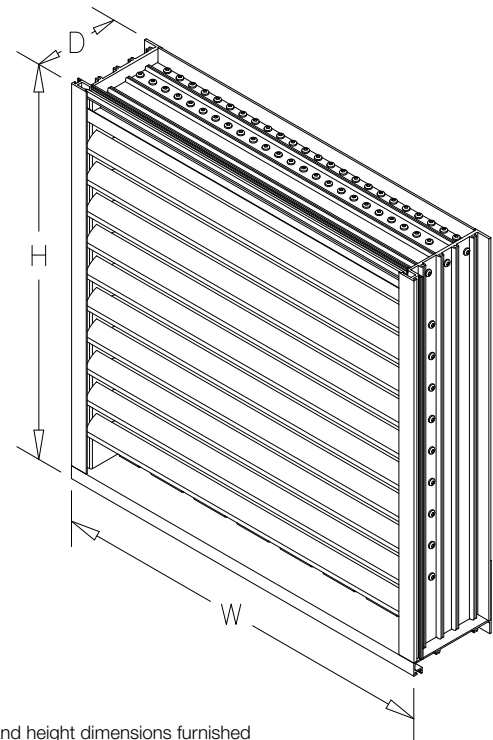
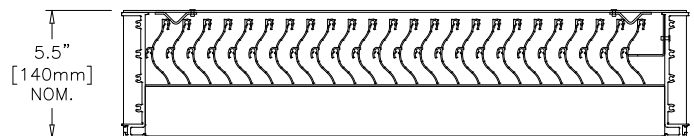
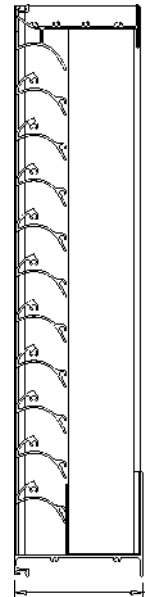
EHV-550D is a High Velocity Wind Driven Rain louver designed to protect intake and exhaust openings in building exterior walls. EHV-550D is tested in accordance with AMCA 500-L Air Performance, Water Penetration and Wind Driven Rain. EHV-550D is tested in accordance with AMCA 540 Test Method for Louvers Impacted by Wind Borne Debris (Basic Protection - Missile Level D, and Enhanced Protection - Missile Level E). EHV-550D is tested in accordance with AMCA 550 Test Method for High Velocity Wind Driven Rain Resistant Louvers. **EHV-550D is licensed to bear the AMCA seal allowing design professionals to select and apply with confidence.** EHV-550D is tested and qualified per the following Florida test protocols: TAS 201 (Large Missile Impact, Enhanced Protection - Missile Level E), TAS 202 (Uniform Static Air Pressure) and TAS 203 (Cyclic Wind Loading). Per Miami-Dade D.R.E.R, the EHV-550D may be installed in locations where the room behind the louver is NOT designed to drain water penetrating into the room or the room will house non-water resistant or water proof equipment, components or supplies.

Standard Construction

- Frame** Heavy gauge extruded 6005-T5 aluminum (jambs), heavy gauge extruded 6005-T5 aluminum (head & sill), 5.5 in. x 0.081 in. nominal wall thickness
- Blades (Front)** . . . J style, heavy gauge extruded 6005-T5 aluminum, 0.081 in. nominal wall thickness, positioned on approximately 1.9 in. blade spacing
- Blades (Rear)** . . . Vertical rain resistant style, heavy gauge extruded 6005-T5 aluminum, 0.050 in. nominal wall thickness, positioned on approximately 0.88 in. blade spacing
- Construction** . . . Mechanically fastened
- Birdscreen** 3/4 in. x 0.051 in. flattened expanded aluminum in removable frame, inside mount (rear)
- Finish** Mill
- Minimum Size** . . . 12 in. W x 12 in. H
- Maximum Single Section Size** . . . 60 in. W x 96 in. H

Options (at additional cost)

- A variety of bird and insect screens
- Blank-off panel
- Extended sill
- Filter rack
- Flanged frame
- Security bars
- A variety of architectural finishes including:
 - Clear anodize
 - Integral color anodize
 - Baked enamel
 - Kynar



*Width and height dimensions furnished approximately 0.50 inch under size.

PERFORMANCE DATA

EHV-550D


Florida Product Approval No.: FL30297
Miami-Dade, FL NOA No.: 19-0430.03 EXP. 08/15/2024
AMCA 540 and 550 Listed
Maximum Wind-load: 100 PSF

Wind-Driven Rain Performance

75mm/h (3 in/hr) Rainfall & 13 m/s (29 mph) Wind Velocity				200mm/h (8 in/hr) Rainfall & 22 m/s (50 mph) Wind Velocity			
Ventilation Air Core Velocity m/s (fpm)	Free Area Velocity m/s (fpm)	Water Penetration Effectiveness %	Water Penetration Classification	Ventilation Air Core Velocity m/s (fpm)	Free Area Velocity m/s (fpm)	Water Penetration Effectiveness %	Water Penetration Classification
0.0 (0)	0.0 (0)		A	0.0 (0)	0.0 (0)		A
0.5 (98)	0.9 (177)		A	0.5 (98)	0.9 (177)		A
1.0 (197)	1.8 (356)		A	1.0 (197)	1.8 (356)		A
1.5 (295)	2.7 (533)		A	1.5 (295)	2.7 (533)		A
2.0 (394)	3.6 (712)		A	2.0 (394)	3.6 (712)		A
2.5 (492)	4.5 (889)		A	2.5 (492)	4.5 (889)		A
3.0 (591)	5.4 (1068)		A	3.0 (591)	5.4 (1068)		A
3.5 (689)	6.3 (1245)		A	3.5 (689)	6.3 (1245)		A
4.0 (787)	7.2 (1422)		A	4.0 (782)	7.2 (1413)	99.7	A
4.5 (886)	8.1 (1600)		A	4.5 (883)	8.1 (1595)	99.6	A
5.0 (980)	9.0 (1770)	100.0	A	5.0 (980)	9.0 (1770)	99.5	A

Discharge Loss Coefficient Class (Intake) = 3

Weather louvers shall be classified by their ability to reject simulated rain. The table shows different classifications based on the maximum simulated rain penetration per square meter (square feet) of louver. Water penetration rating at a given louver face velocity is determined by the water penetration while the louver is subjected to a selected simulated rainfall rate and wind velocity.



Greenheck Fan Corporation certifies that the EHV-550D louvers shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance, water penetration, and wind-driven rain ratings.



HIGH VELOCITY RAIN RESISTANT WITH BLADES FULLY OPEN AND IMPACT RESISTANT LOUVER
Enhanced Protection Level E
See www.AMCA.org for all certified or listed products

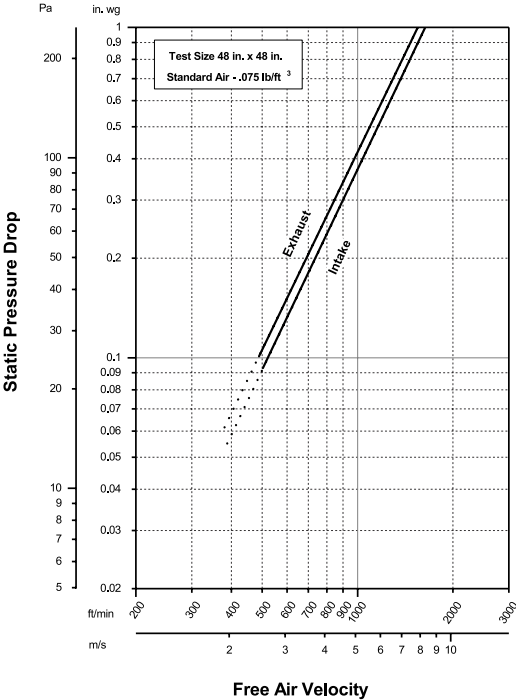
This label does not signify AMCA airflow performance certification.

Greenheck Fan Corporation certifies that the EHV-550D louvers shown herein are approved to bear the AMCA Listing Label. The Ratings shown are based on tests and procedures performed in accordance with AMCA Publications and comply with the requirements of the AMCA Listing Label Program. The AMCA Listing Label applies to Wind Borne Debris Impact Resistant and High Velocity Wind-Driven Rain Resistant Louvers.

Discharge Loss Coefficient Classifications	
Class	Discharge Loss Coefficient
1	0.4 and Above
2	0.3 to 0.399
3	0.2 to 0.299
4	0.199 and Below

Wind-driven Rain Penetration Classes	
Class	Effectiveness
A	1 to 0.99
B	0.989 to 0.95
C	0.949 to 0.80
D	Below 0.80

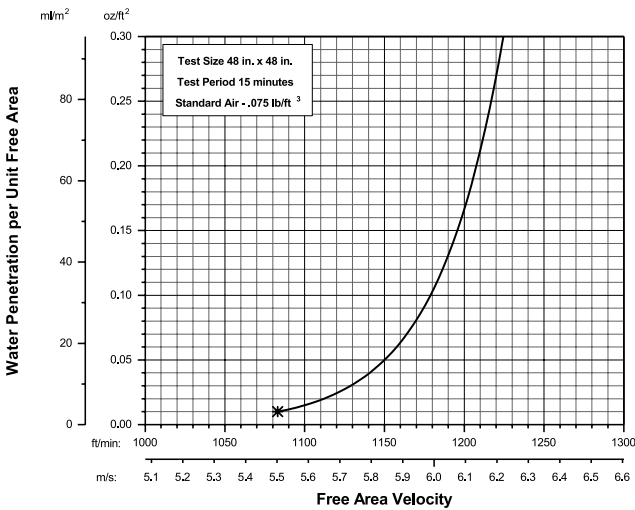
Airflow Resistance (Standard Air - .075 lb/ft³)



Model EHV-550D resistance to airflow (pressure drop) varies depending on louver application (air intake or air exhaust). Free area velocities (shown) are higher than average velocity through the overall louver size. See louver selection information. (Test Figure 5.5-6.5)

Water Penetration

Test Size 48 in. x 48 in. Test Duration of 15 min



The AMCA Water Penetration Test provides a method for comparing various louver models and designs as to their efficiency in resisting the penetration of rainfall under specific laboratory test conditions. The beginning point of water penetration is defined as that velocity where the water penetration curve projects through 0.01 oz. of water (penetration) per sq. ft. of louver free area. ***The beginning point of water penetration for Model EHV-550D is 1083 fpm free area velocity.** These performance ratings do not guarantee a louver to be weather-proof or stormproof and should be used in combination with other factors including good engineering judgement in selecting louvers.

PERFORMANCE DATA

EHV-550D

Florida Product Approval No.: FL30297
Miami-Dade, FL NOA No.: 19-0430.03 EXP. 08/15/2024
AMCA 540 and 550 Listed
Maximum Wind-load: 100 PSF

Free Area Chart (sq. ft.)

Louver Height Inches	Louver Width in Inches								
	12	18	24	30	36	42	48	54	60
12	0.23	0.38	0.52	0.66	0.81	0.95	1.09	1.24	1.38
18	0.47	0.75	1.04	1.33	1.61	1.90	2.19	2.47	2.76
24	0.72	1.16	1.60	2.04	2.48	2.92	3.36	3.80	4.24
30	0.97	1.56	2.16	2.75	3.35	3.94	4.54	5.13	5.73
36	1.22	1.97	2.72	3.47	4.22	4.97	5.72	6.47	7.22
42	1.47	2.38	3.28	4.19	5.10	6.00	6.91	7.81	8.72
48	1.71	2.76	3.81	4.86	5.92	6.97	8.02	9.07	10.12
54	1.94	3.14	4.33	5.53	6.72	7.92	9.11	10.31	11.50
60	2.18	3.52	4.86	6.20	7.54	8.88	10.22	11.56	12.90
66	2.43	3.93	5.42	6.92	8.41	9.91	11.40	12.90	14.39
72	2.68	4.33	5.98	7.63	9.29	10.94	12.59	14.24	15.89
78	2.93	4.74	6.55	8.35	10.16	11.97	13.77	15.58	17.38
84	3.19	5.15	7.11	9.07	11.03	12.99	14.95	16.91	18.87
90	3.42	5.52	7.63	9.73	11.83	13.94	16.04	18.14	20.25
96	3.65	5.90	8.14	10.39	12.64	14.89	17.13	19.38	21.63

Core Area Chart (sq. ft.)

Louver Height Inches	Louver Width in Inches								
	12	18	24	30	36	42	48	54	60
12	0.62	1.01	1.39	1.78	2.16	2.55	2.93	3.32	3.70
18	1.03	1.67	2.30	2.93	3.57	4.20	4.84	5.47	6.11
24	1.44	2.32	3.21	4.09	4.97	5.86	6.74	7.63	8.51
30	1.84	2.98	4.11	5.25	6.38	7.52	8.65	9.78	10.92
36	2.25	3.63	5.02	6.40	7.79	9.17	10.56	11.94	13.32
42	2.66	4.29	5.92	7.56	9.19	10.83	12.46	14.10	15.73
48	3.06	4.95	6.83	8.72	10.60	12.48	14.37	16.25	18.14
54	3.47	5.60	7.74	9.87	12.01	14.14	16.27	18.41	20.54
60	3.87	6.26	8.64	11.03	13.41	15.80	18.18	20.57	22.95
66	4.28	6.92	9.55	12.18	14.82	17.45	20.09	22.72	25.36
72	4.69	7.57	10.46	13.34	16.22	19.11	21.99	24.88	27.76
78	5.09	8.23	11.36	14.50	17.63	20.77	23.90	27.03	30.17
84	5.50	8.88	12.27	15.65	19.04	22.42	25.81	29.19	32.57
90	5.91	9.54	13.17	16.81	20.44	24.08	27.71	31.35	34.98
96	6.31	10.20	14.08	17.97	21.85	25.73	29.62	33.50	37.39

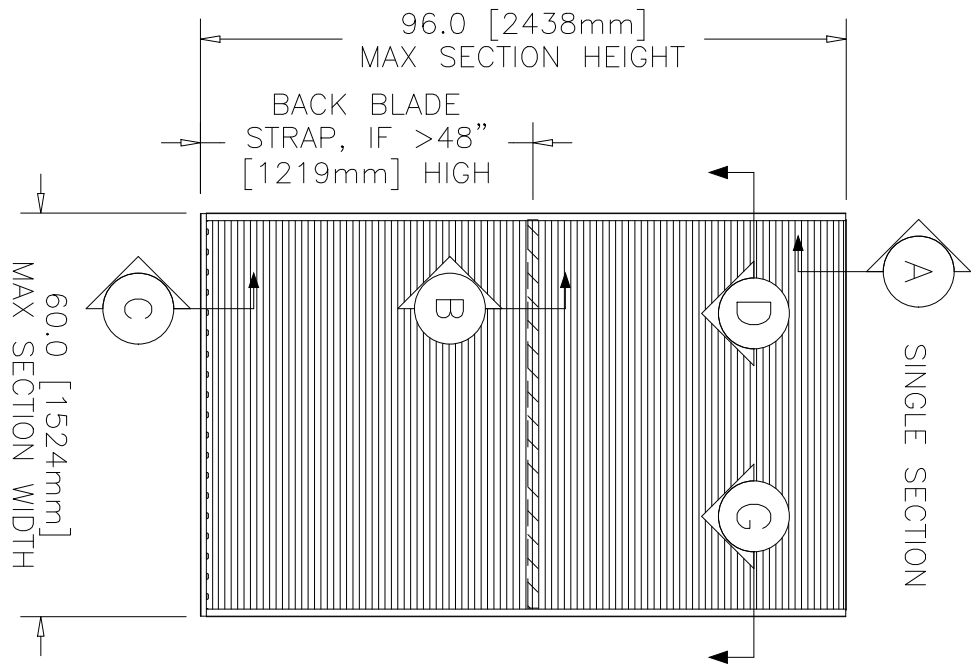
INSTALLATION DETAILS

EHV-550D

Florida Product Approval No.: FL30297
Miami-Dade, FL NOA No.: 19-0430.03 EXP. 08/15/2024
AMCA 540 and 550 Listed
Maximum Wind-load: 100 PSF

Maximum Size and Installation Information

Model EHV-550D is a Miami-Dade Approved and Florida Product Approved louver and must be installed in accordance with the installation instructions shown in the Miami-Dade NOA. Model EHV-550D is qualified for installation within concrete/masonry, steel, aluminum and wood substrate. Model EHV-550D is tested and qualified to withstand positive and negative wind pressure loads up to 100 PSF. The maximum single section width is 60 inches. The maximum single section height is 96 inches. Multi-wide assemblies are permitted without any additional reinforcing. Multi-high assemblies are permitted provided suitable load bearing structure is provided (by others) at each louver section(s) head and sill condition so the louver section(s) may be installed in accordance with the Miami-Dade NOA. Structural reinforcing members along with any associated installation hardware or anchors is not provided by Greenheck unless indicated otherwise by Greenheck. Options and are not subject to structural analysis unless indicated otherwise by Greenheck.

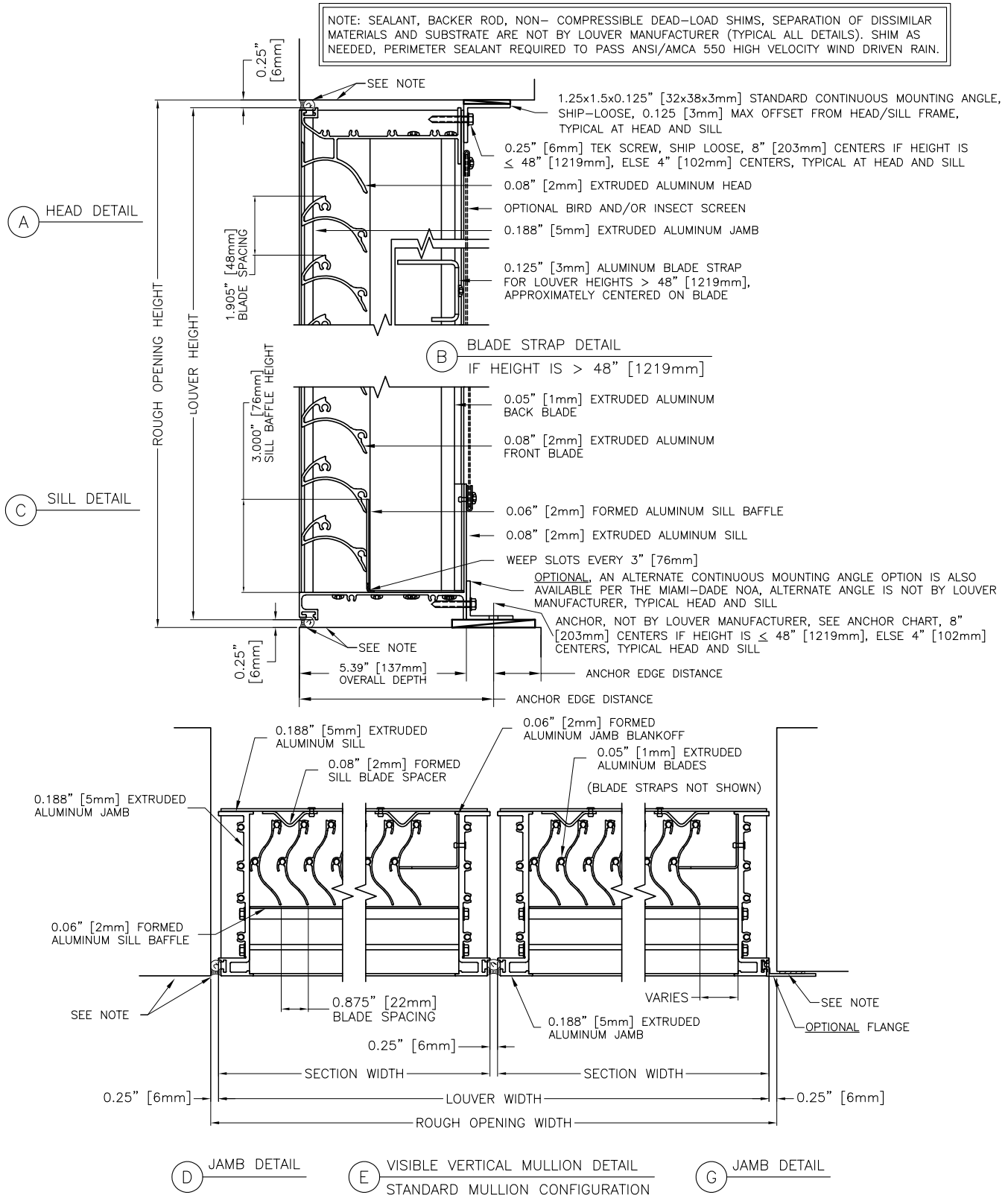


Minimum Single Section Size	Maximum Single Section Size
12 in. W x 12 in. H	60 in. W x 96 in. H

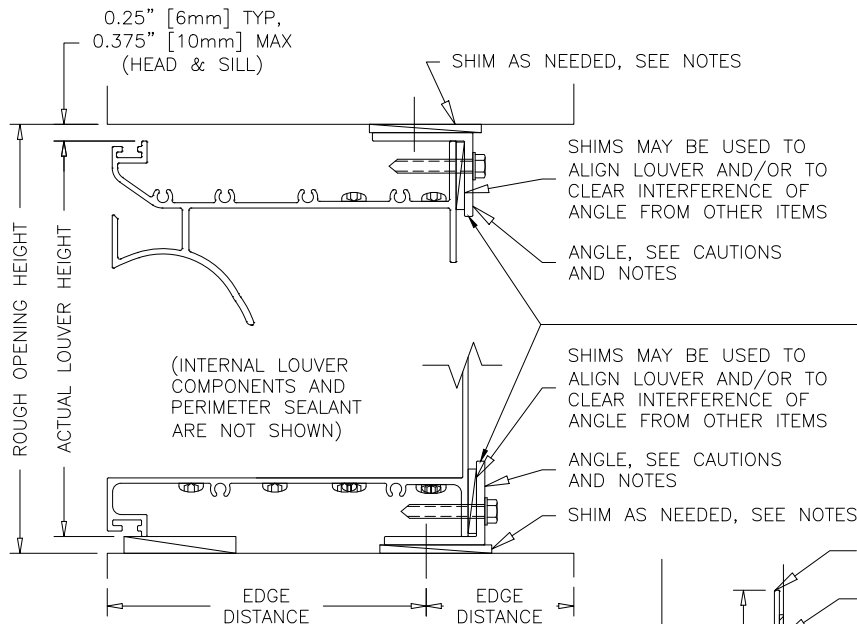
PRODUCT DETAILS

EHV-550D

Florida Product Approval No.: FL30297
Miami-Dade, FL NOA No.: 19-0430.03 EXP. 08/15/2024
AMCA 540 and 550 Listed
Maximum Wind-load: 100 PSF



OPTIONAL INVERTED CONTINUOUS MOUNTING ANGLE: SETUPS, CAUTIONS, & NOTES



CAUTION! THE MANUFACTURER PROVIDED STANDARD CONTINUOUS MOUNTING ANGLES CAN ONLY BE USED IN THE INVERTED POSITION IF ONLY ONE OF THE STANDARD ANGLES IS INVERTED. EITHER AT THE HEAD OR AT THE SILL, NOT BOTH.

WHY: DUE TO REQUIRED OFFSETS, USE OF THE FACTORY PUNCHED HOLES IN THE STANDARD CONTINUOUS MOUNTING ANGLE WILL POSITION THE HORIZONTAL LEG OF THE STANDARD ANGLE UP AGAINST THE HEAD/ SILL FRAME MEMBER (AS SHOWN ON THIS PAGE). THEREFORE, IT IS IMPOSSIBLE TO PRE-MOUNT BOTH STANDARD ANGLES TO THE SUBSTRATE IN THE INVERTED POSITION AND STILL HAVE CLEARANCE FOR THE LOUVER HEAD AND/OR SILL FRAME TO SLIDE OVER AND PAST THE ANCHOR HEADS ON THE INVERTED ANGLES.

SOLUTION: TO OVERCOME THE ABOVE ISSUE, AN ALTERNATE CONTINUOUS MOUNTING ANGLE (NOT BY MANUFACTURER) MUST BE USED AT EITHER THE HEAD AND/OR SILL. THE ALTERNATE ANGLE CAN SPAN A LARGER GAP BETWEEN THE LOUVER FRAME AND THE SUBSTRATE, WHICH ALLOWS FOR MORE CLEARANCE BETWEEN THE LOUVER FRAME AND THE ANCHOR. REFER TO THE "ALTERNATE CONTINUOUS MOUNTING ANGLE ALLOWABLE SETUPS" TABLE FOR DESIGN INFORMATION. NOTE THAT THE STANDARD CONTINUOUS MOUNTING ANGLE CAN HAVE ITS FRAME FASTENER HOLES DRILLED IN A NEW LOCATION OF UP TO 0.75" [19mm] AWAY FROM THE OUTSIDE CORNER OF THE STANDARD ANGLE (SEE NOTES 1 & 2 ON THE LOUVER'S MIAMI-DADE NOA "ALTERNATE CONTINUOUS MOUNTING ANGLE ALLOWABLE SETUPS" TABLE).

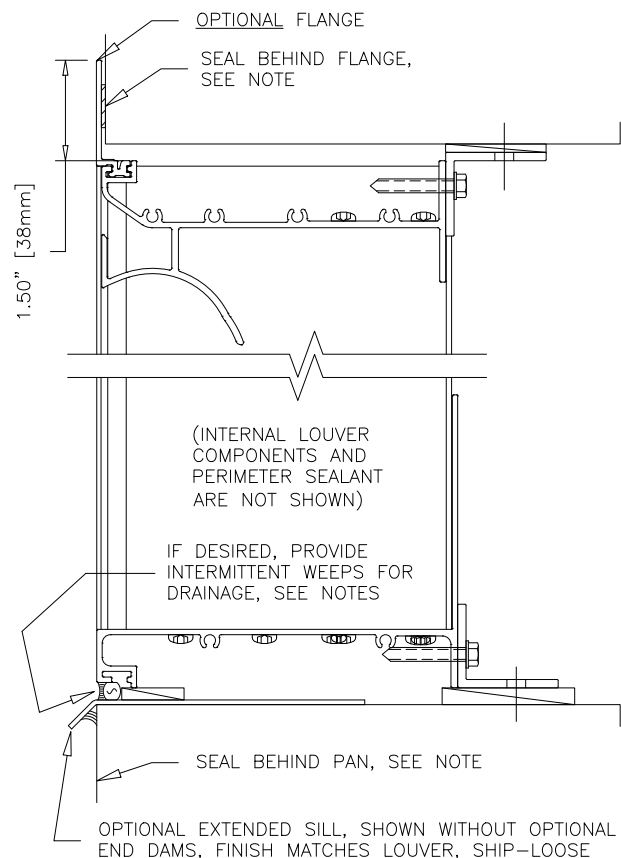
CAUTION! NO MATTER WHAT TYPE OF CONTINUOUS MOUNTING ANGLE IS USED IN AN INVERTED SETUP, A LARGER THAN TYPICAL HEAD/SILL SUBSTRATE GAP CLEARANCE SHOULD BE CONSIDERED WHEN SIZING THE LOUVER IN ORDER TO MAKE SURE THE HEAD/SILL FRAME CAN SLIDE OVER AND PAST THE ANCHOR HEADS ON THE INVERTED MOUNTING ANGLE(S).

ANGLE PROVIDER: THE MANUFACTURER PROVIDES STANDARD CONTINUOUS MOUNTING ANGLES ONLY. ANY NEEDED ALTERNATE CONTINUOUS MOUNTING ANGLE IS BY OTHERS.

NOTES: INVERTED ANGLE OPTION SHOWN UTILIZING THE THE MANUFACTURER PROVIDED STANDARD CONTINUOUS MOUNTING ANGEL AT THE HEAD/SILL. THE STANDARD ANGEL SHALL NOT EXTEND MORE THAN 0.125" [3mm] PAST THE TOP OF THE HEAD/SILL.

THE STANDARD CONTINUOUS MOUNTING ANGLE CANNOT BE USED IN THE INVERTED POSITION AT BOTH THE HEAD AND SILL LOCATIONS. SEE CAUTION NOTES.

AN ALTERNATE CONTINUOUS MOUNTING ANGLE MAY BE USED FOR OTHER NEEDED SETUPS. AN ALTERNATE ANGLE CAN EXTEND MORE THAN 0.125" [3mm] PAST THE TOP OF THE HEAD/SILL. REFER TO THE LOUVER'S MIAMI-DADE NOA "ALTERNATE CONTINUOUS MOUNTING ANGLE ALLOWABLE SETUPS" TABLE FOR ALLOWABLE DESIGNS OF THE ALTERNATE ANGLE.



NOTE: SEALANT, BACKER ROD, NON-COMPRESSIBLE DEAD-LOAD SHIMS, SEPARATION OF DISSIMILAR MATERIALS AND SUBSTRATE ARE NOT BY LOUVER MANUFACTURER, SHIM AS NEEDED, PERIMETER SEALANT REQUIRED TO PASS ANSI/AMCA 550 HIGH VELOCITY WIND DRIVEN RAIN.

FASTENER CHART

EHV-550D

Florida Product Approval No.: FL30297
Miami-Dade, FL NOA No.: 19-0430.03 EXP. 08/15/2024
AMCA 540 and 550 Listed
Maximum Wind-load: 100 PSF

SUBSTRATE ANCHOR SPACING		
ACTUAL HEIGHT	< 48 IN.	> 48 IN.
ANCHOR SPACING	8 IN.	4 IN.

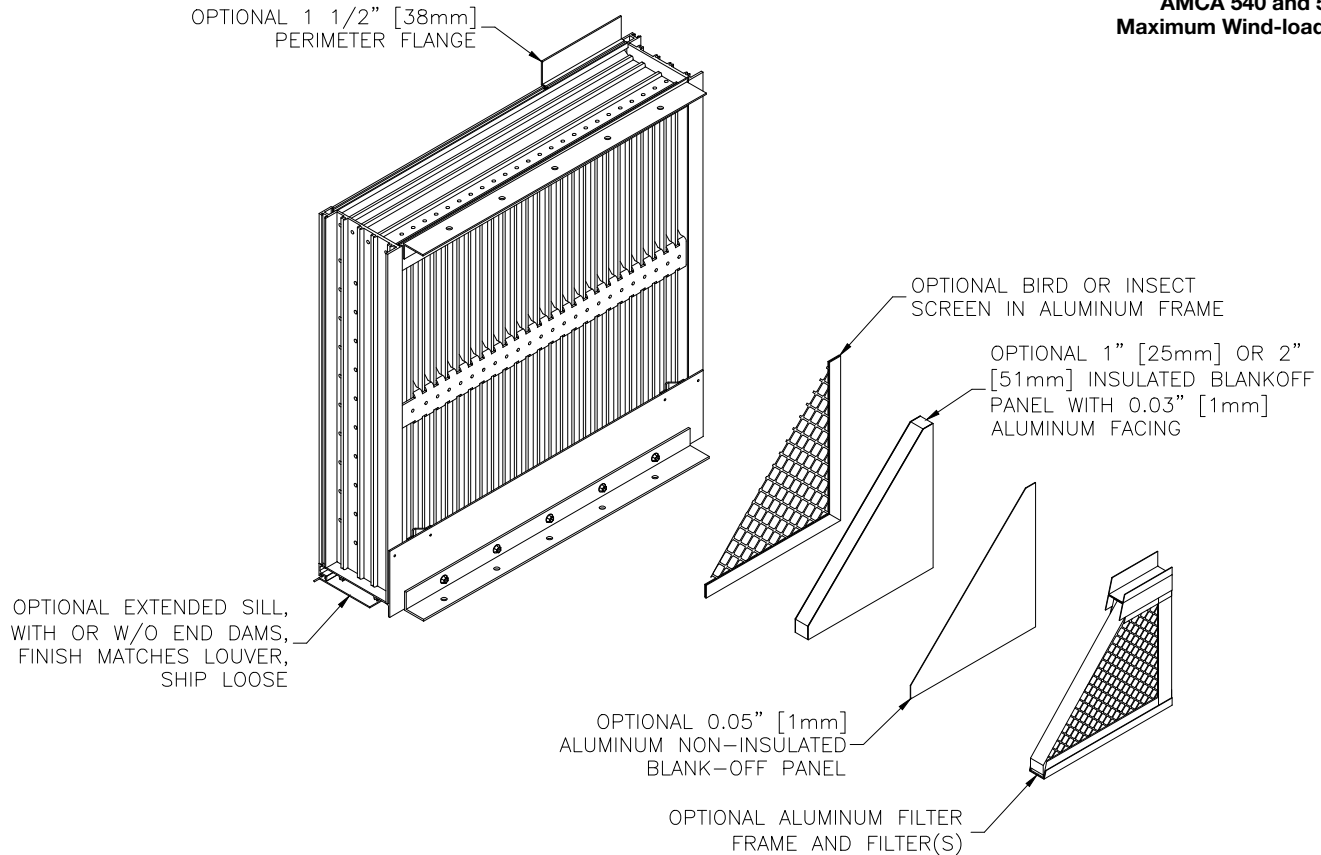
		SUBSTRATE MINIMUMS		ANCHOR MINIMUMS					
SUBSTRATE	THICKNESS	PROPERTY	ANCHOR TYPE	OVERALL	THREADED	EMBEDMENT	EDGE	Fy, Fu	
TYPE	(IN.)			LENGTH (IN.)	LENGTH (IN.)	(IN.)	(IN.)	(KSI)	
WOOD	3	SG 0.42	1/4 IN. LAG SCREW, COATED STEEL	3	2 1/2	2 1/2	1 1/2	70, 105	
			1/4 IN. LAG SCREW, 300 SERIES STAINLESS (1)					65, 100	
			1/4 IN. SPAX POWERLAG, HEX OR T-STAR WASHER HEAD, COATED STEEL		1 3/4				
			6 MM SPAX TIMBER SCREW, WASHER HEAD, 300 SERIES STAINLESS	80 MM	61 MM				
STEEL	16 GA	Fy 33 KSI	1/4-14 SCREW, COATED STEEL (6)	VARIES (2)	VARIES (2)	FULL	1/2	65, -	
			1/4-14 SCREW, 300 SERIES STAINLESS (1)			BOLTED			
			1/4-20 BOLT, 300 SERIES STAINLESS (1)						
ALUMINUM	1/8	Fy 25 KSI	1/4-20 SCREW, COATED STEEL (6)	VARIES (2)	VARIES (2)	FULL	1/2	65, -	
			1/4-20 SCREW OR THRU BOLT, 300 SERIES STAINLESS (1)			FULL/BOLTED			
CONCRETE (3)	3	Fc 2.5 KSI	1/4 IN. DEWALT SCREW-BOLT+, COATED STEEL	VARIES (2)	VARIES (2)	2 1/2 NOM.	2		
	4		3/8 IN. HILTI KWIK BOLT TZ EXPANSION, 304 OR 316 STAINLESS (5)			2 5/16 NOM.	3		
CRACKED CONCRETE (3)	4	Fc 2.5 KSI	3/8 IN. HILTI KWIK BOLT TZ EXPANSION, 304 OR 316 STAINLESS (5)	VARIES (2)	VARIES (2)	2 5/16 NOM.	3		
GROUT FILLED CMU (4)	4x4x16	Fm 1.5 KSI	3/8 IN. DEWALT SCREW-BOLT+, COATED STEEL (5)	VARIES (2)	VARIES (2)	3 1/4 NOM.	1 1/2		
			1/2 IN. THREADED ROD W/ HIT-HY 270 ADHESIVE, 300 SERIES STAINLESS (5)			4 1/2 EFF.	1 3/4	65, -	

- 1) ANCHOR MANUFACTURING PROCESS IS COLD-WORKED.
- 2) AS NEEDED TO COMPLY WITH THE EMBEDMENT WHILE ACCOUNTING FOR THE THICKNESS OF THE MOUNTING ANGLE, SHIM(S), ETC.
- 3) NORMAL WEIGHT CONCRETE, INCLUDING PRE-CAST.
- 4) LIGHT/MEDIUM/NORMAL-WEIGHT CMU CONFORMING TO ASTM C90, TYPE II, GROUT FILLED CONFORMING TO C476.
- 5) THE 1/4 IN. DIA. ANCHOR CLEARANCE HOLES IN THE MANUFACTURER PROVIDED STANDARD CONTINUOUS MOUNTING ANGLE WILL NEED TO BE FIELD ENLARGED TO ACCEPT THE ANCHOR.
- 6) SCREWS WITH THREADS AS NOTED MAY BE EITHER ELCO’S DRIL-FLEX WITH STALGARD, OR BRYNOLF’S GR-5 WITH PROCORR.

OPTION DRAWINGS

EHV-550D

Florida Product Approval No.: FL30297
Miami-Dade, FL NOA No.: 19-0430.03 EXP. 08/15/2024
AMCA 540 and 550 Listed
Maximum Wind-load: 100 PSF



FINISHES

Finish Type	Description/Application	Color Selection	Standard Warranty (Aluminum)
AAMA 2605 100% Fluoropolymer (FEVE) 2-Coat 70% Kynar® (PVDF) 3-Coat 70% Kynar® (PVDF) 4-Coat 70% Kynar® (PVDF)	"Best." The premier finish for extruded aluminum. Tough, long-lasting coating has superior color retention and abrasive properties. Resists chalking, fading, chemical abrasion and weathering.	Standard Colors: Any of the 27 standard colors shown can be furnished in 70% or 50% Kynar®, 100% Fluoropolymer or Baked Enamel. Mica Colors: Greenheck offers 6 standard Mica colors for 70% Kynar® or 100% Fluoropolymer. Custom Colors: Custom color matching is available. Consult your Greenheck representative for cost and/or lead-time implications if a custom color is required.	10 Years (20 Years Optional)
AAMA 2604 50% Kynar® / Acroflur®	"Better." Tough, long-lasting coating has excellent color retention and abrasive properties. Resists chalking, fading, chemical abrasion and weathering.		5 Years
AAMA 2603 Baked Enamel	"Good." Provides good adhesion and resistance to weathering, corrosion and chemical stain.		1 Year
AA-M10C22A42 Integral Color Anodize	"Two-step" anodizing is produced by following the normal anodizing step with a second, colorfast process.	Light, Medium, Dark or Extra Dark Bronze; Champagne; Black	5 years
AA-M10C22A41 Clear Anodize 215 R-1	Clear, colorless and hard oxide aluminum coating that resists weathering and chemical attack.	Clear	5 years
AA-M10C22A31 Clear Anodize 204	Clear, colorless and hard oxide aluminum coating that resists weathering and chemical attack.	Clear	1 Year
Prime Coat	Louvers or architectural products shall be cleaned, pre-treated and receive a prime coat finish suitable for field painting. Greenheck does not recommend prime coat or field painting of materials.		n/a
Mill	Materials may be supplied in natural aluminum or galvanized steel finish when normal weathering is acceptable and there is no concern for color or color change.		n/a

Finishes meet or exceed AAMA 2605, AAMA 2604, and AAMA 2603 requirements. Please consult www.greenheck.com for complete information on standard and extended paint warranties. Paint finish warranties are not applicable to steel products.

