



MARCH 31, 2020  
CONSTRUCTION DOCUMENTS PHASE III - 100%  
PROJECT MANUAL - VOLUME I OF I

# LEMON CITY BRANCH LIBRARY

PROJECT NUMBER No. LC-RENO-23-R1

REV.OCTOBER 24, 2023



## STATEMENT OF COMPLIANCE

"To the best of my knowledge these drawings and the project manual are complete, they include all work defined in the scope definition program, and do comply with the Florida Building Code 2017, 6th Edition, Florida Building Code (FBC) Accessibility 2017, 6th Edition, Florida Building Code (FBC), State Requirements for Educational Facilities - SREF 2017, 6th Edition and all Codes referenced under FBC. "

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**REV 1 -8DEC-2023**

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**SECTION 01110  
SUMMARY OF WORK**

1.1 SCOPE

The Work of this Contract comprises of the Renovations of

**Lemon City Branch Library (First Floor Restrooms Renovation, ADA Upgrades, Roof and Window Replacement, and Miscellaneous Upgrades As Indicated Below)**

A. Description:

1. Complete renovation of existing Male/Female and Staff Restrooms including but not limited to finishes, plumbing, mechanical and electrical upgrades.
2. Replacement of existing roofing system.
3. Replacement of existing windows.
4. Electrical and Low voltage upgrades including but not limited to new electrical data, removal of abandoned plastic wire molds, removal of all exposed electrical/data conduits and new conceal,
5. New LED lighting & ceiling tile/grid.
6. Replacement of existing return grilles.
7. Repair and patching of walls after electrical work upgrades.
8. Furring out of columns to conceal electrical outlets.
9. New interior and exterior painting.
10. New baseboards.
11. New electrical parking station.
12. 3 Exterior door replacement.

B. Type of Contract: Lump Sum

C. The Architect / Engineer for this Contract is:

**Laura M Perez and Associates, Inc.**

**2401 NW 7<sup>th</sup> Street Miami, FL 33125** or as identified by the owner

1.2 SCHEDULING AND CONCURRENT WORK

- A. Phasing of the Work: Project has not Phasing only (1) substantial completion for entire renovation
- B. Staging Area: The owner will designate an [exterior on-site] and/or [interior] area for the Contractor's use as shown in drawings. Maintain in a clean and organized manner.
- C. Demolition of Structures: See demolition and removal extent shown on Drawings.
- D. Selective Demolition: See demolition and removal extent shown on the Drawings.



- E. Safety of Occupants and Public: Provide a “safety plan” which delineates areas of construction and construction traffic during phases of the project, maintains required exits, and provides for barriers to separate construction areas from students and staff; the plan must provide for maintaining fire detection and warning systems in use while the Library is occupied. Provide and maintain safety signage barriers, and construction aids as specified in the “Construction Facilities and Services” section of these Specifications. Maintain the safety of the facility and its occupants.
- F. Anticipated Concurrent Work under Other Contracts: There will be a Phase II following Bathroom Renovation which will include Renovations of the 1<sup>st</sup> floor. Other concurrent work may be identified by M-DPLS during the course of the work.

### 1.3 DELIVERY AND STORAGE

- A. The times of delivery and storage of construction products and equipment shall permit, and be coordinated with, necessary library operations, such as public traffic and book deliveries etc.
- B. The storage of construction products and equipment and the parking of workers’ vehicles shall fit within limits of the staging area. SITE CONDITIONS
- C. Contractor's Use of Premises:
  - 1. M-DPLS will designate a staging area on-site or in building for Contractor's use. Keep the area clean, secure, and organized.
  - 2. Handle waste and clean areas affected by the work following the “Waste Removal and Cleaning” section of these Specifications.
  - 3. Remove debris such as construction material, debris, and spills from site each day. Dispose of lawfully using covered rubbish containers, recycling where possible.
  - 4. Provide security for products and equipment stored on-site. Maintain the safety of persons in and surrounding the project site.
  - 5. 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 M-DPLS. 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 M-DPLS.

### 1.4 SCHEDULING AND WORK RESTRICTIONS

- A. Schedule Renovation Work with A/E and M-DPLS:
  - 1. Additional work may be ordered and paid for as directed and approved by M-DPLS.
  - 2. Coordinate with A/E and M-DPLS work that will interfere with Library activities.
  - 3. Do not interfere or disrupt the use of the occupied facility during work on electrical, fire alarm, security, intercommunication systems or any other systems essential to life safety. Provide temporary life safety systems for (24/7) full-time coverage for occupants and property at no additional cost to M-DPLS.
- B. Demolition: Perform selective demolition within or outside the facility in ways that minimize noise, dust, time of disruption, and hazard to occupants and public.
  - 1. Perform selective demolition during hours agreed to by M-DPLS.
  - 2. Drill concrete and masonry, when necessary, in a manner to avoid reducing load-bearing capacities of structure and to avoid mechanical and electrical lines that may be concealed or built in.
- C. Work in Areas with Railings and Stairs:

1. Avoid work on or near these areas when the facility is occupied by students or staff.
- D. Work in Food Areas:
1. Avoid work in food preparation, storage, and serving areas while occupied by food staff or students. Verify the times that food staff and students need to have access to these areas with A/E and M-DPLS.
  2. At the end of each workday, leave these facilities in sanitary and operating condition.
  3. Use only cleaning products and methods approved by M-DPLS.
- E. Work in Custodial Areas, Storage Areas, and Toilets:
1. Schedule work within or affecting these areas with M-DPLS and A/E. Obtain approval of precisely which toilets may be used, and when.
- F. Work at Ceilings:
1. Remove existing ceiling construction as needed for the installation of mechanical, communications and electrical work and to allow work room for installing new walls.
  2. If scheduled for reuse, carefully remove and set aside existing light fixtures. Maintain in original condition or refurbish for subsequent reinstallation following the Construction Documents. Clean, re-lamp and reinstall all removed light fixtures indicated for reinstallation.
  3. Provide new ceiling suspension, grid and panels to match existing ceilings damaged during construction. Provide new light fixtures where shown on Drawings.
  4. New work shall match the existing texture, color, pattern, construction, type, and quality of finish.
  5. Do not work on ceilings or other overhead construction when the spaces are occupied.

**END OF SECTION**

**SECTION 01150  
MECHANICAL AND ELECTRICAL COORDINATION**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes: General procedures for mechanical and electrical work and equipment of other divisions. Provide ventilation, mechanical, plumbing, fire protection, and electrical systems to form complete operating systems.
  - 1. Furnish labor, supervision, energy, materials, tools, transportation, equipment, permits (if required), insurance, taxes, temporary protection, and correction necessary to provide the work shown and specified.
  - 2. Provide apparatus, appliances, materials, and work not shown on drawings but mentioned in specifications, or vice versa. Include incidental accessories necessary for proper installation and operation, even if not specified or shown, without additional expense to M-DPLS.
  - 3. Apparatus referred to in singular numbers, shall include as many such items required to complete the work.
  - 4. Provide piping, wiring, sheet metal connections, and miscellaneous accessories and materials necessary for a complete installation. Complete connections of supplied special traps, control valves, and other equipment furnished by M-DPLS, if any, and by other trades.
  
- B. Work Not Included: Equipment and wiring provided by local telephone and power utilities and by M-DCPS separate contractors and vendors.

**1.2 DRAWINGS**

- A. Drawings are diagrammatic and show general arrangement of systems and work:
  - 1. Do not scale drawings.
  - 2. Consult drawings, shop drawings, and details for locations of fixtures, thermostats, and equipment. If not definitely located, obtain locations as required from A/E in writing before rough-in.
  - 3. Confirm exact location and arrangement of floor outlets and Instructor's Technology Center outlets.
  
- B. Comply with drawings in laying out the work:
  - 1. Coordinate with the drawings of other trades to verify installation locations.
  - 2. Maintain maximum headroom clearances and space conditions at all locations as required by codes and regulations.
  - 3. Where headroom or space conditions appear inadequate, obtain instructions from A/E before proceeding with installation.
  
- C. Make reasonable modifications in layout to prevent conflict with work of other trades or for proper execution of work, without extra charge to M-DPLS.
  
- D. Engineering Drawings are schematic for equipment since exact dimensions and rough-in requirements may vary with different manufacturers.

### 1.3 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLE SUBMITTALS

- A. Submit shop drawings, edited catalog cuts of components, product data, and/or samples for, but not necessarily limited to, the following:
  - 1. Names, sizes, and catalog numbers of specialty equipment, fixtures, valves, and other similar items.
  - 2. Equipment connections.
  - 3. Details of grills, platforms, pads, hangers, and machine and equipment supports.
  - 4. Details of typical pipe and duct supports.
  - 5. Fabrication shop drawings for ductwork, interior air supply, and exhaust systems, including details of louvers and other components.
  - 6. Wiring diagrams for operating controls, temperature control systems, pneumatic piping diagrams, interlock wiring, security systems, and alarm systems including fire alarm and communications systems.
  - 7. Details and description of temperature control system.
  - 8. Shop drawings of switchgear, switchboards, panelboards, transformers, lighting fixtures, wiring and cable raceways and wireways, outlet boxes, pull boxes, junction boxes, wiring devices, disconnect switches, fuses, circuit breakers, lightning protection, and other electrical items.
  - 9. Submit layout drawings for main electrical equipment spaces such as closets, switchgear rooms, major conduit bank runs, and vaults. Submit layout drawings for review before installation of the work.
  - 10. Complete data and details of fans and motors, air handling units, and similar equipment including performance curves.
  - 11. Irrigation system and site lighting wiring, panels, switches, and controls.
  - 12. Locations of sleeves for piping and ductwork passing through concrete slabs, and concrete or steel structure.
- B. Submit catalog cuts and related shop drawings at the same time.

### 1.4 COORDINATION WITH OTHER TRADES

- A. To ensure full coordination between trades, furnish information necessary to impacted trades to allow work of all trades to be installed satisfactorily and with the least possible interference or delay. Contractor shall coordinate with the appropriate M-DCPS Departments Staff the installation of all infrastructures serving the ITS Telephone and Data System, Production/Distribution Systems, the Energy Management System, and the Security Camera System, to ensure proper sizing and placement of all in-contract items for these systems.
- B. Correct, without extra charge to M-DPLS, mechanical or electrical work causing interference, unacceptable clearances, or accessibility problems among the work of mechanical, electrical, and other trades.

### 1.5 SUPERVISION

- A. Require each subcontracted trade to provide services of an experienced superintendent in charge of installation of the work and skilled workers required to unload, transfer, erect, install, connect, adjust, start, operate, and test work. Each subcontracted trade superintendent shall be qualified and authorized to make decisions and answer questions directed to the Contractor by A/E regarding progress and details of work.

## 1.6 INSPECTIONS BEFORE M-DPLS'S SUBSTANTIAL COMPLETION INSPECTION

- A. Arrange and schedule as many inspections of the work as necessary.
- B. During the entire period scheduled for these inspections, Contractor and Contractor's superintendents of mechanical and electrical trades shall be present.
- C. Notify A/E of the following test and balance procedures:
  - 1. Test and balance work has been initially performed by M-DPLS's contracted test and balance agency.
  - 2. Completion of necessary corrective work.
  - 3. Final test and balance work has been performed by test and balance agency.
  - 4. Balance report has been completed.

## 1.7 CERTIFICATES

- A. Upon completion of the Work, when applicable, obtain certification of compliance or completion from authorities having jurisdiction over the Work and deliver certification to the A/E.
- B. See Section on Closeout of the Work for additional certification requirements.

## 1.8 MANUFACTURERS' NAMEPLATES

- A. Each major component of equipment shall have the manufacturer's name, address, model number, and rating on a metal plate securely affixed in a conspicuous place.
- B. ASME code ratings or other data die-stamped into surface of equipment shall be in a conspicuous place.
- C. Nameplates of distributing agents are not acceptable in lieu of the manufacturers'.

## 1.9 ACCEPTANCE

- A. Operation of mechanical and electrical work by Contractor does not constitute acceptance of work. Acceptance will occur after Contractor has adjusted equipment, demonstrated equipment satisfies requirements of drawings and specifications, has corrected defects, and furnished required certification, operations and maintenance manuals and warranty documents.

## PART 2 PRODUCTS

### 2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment required for the work shall be new, of good quality, furnished, delivered, erected, connected, finished, and arranged to fit properly into building spaces. Provide accessibility for maintenance and replacement of equipment without need for removing adjacent equipment or piping. If no specific type or quality of material is given, provide materials accepted by A/E.

- B. Equipment shall be of type and capacity shown on drawings, specification equipment schedules, and by manufacturers designated in specification.
- C. Use the same manufacturer of equipment for replacement parts and maintenance.
- D. Equipment, materials, and components shall be new and current products of manufacturers engaged in production of such equipment and shall be manufacturer's latest design conforming to Construction Documents. Components by the same manufacturer shall be mechanically and electrically consistent with ratings of installed apparatus. Materials used in fire rated construction and in electrical work shall be UL listed.
- E. Hardware and accessory fittings shall be standard sizes designed, intended, or appropriate for the use. Furnish with corrosion protection suitable for the atmosphere in which the item is installed.
- F. Equipment of a similar nature shall be by the same manufacturer.
- G. Coordinate space requirements, mounting arrangements, and service connections when approved substitute equipment is furnished.
- H. Before ordering, verify that equipment fits assigned spaces and can be moved into position without interference from door clearances, ceiling heights, crane access, and other equipment and construction.
- I. Be responsible for expenses caused by substitution of equipment used as a basis for design.
- J. Maintain clearances for electrical equipment as required by the edition of the National Electrical Code (NEC) edition referenced in the FBC designated for the project.
- K. Provide UL listings for all applicable components and equipment.

## PART 3 EXECUTION

### 3.1 EQUIPMENT INSTALLATION

- A. Obtain services of manufacturers' authorized representatives of major ventilating, air-conditioning, electrical, and plumbing equipment at job site during erection or construction of their equipment to insure proper installation. Failure to have such checks by manufacturers authorized representatives shall place full responsibility for proper installations on Contractor who shall make any corrections at no additional cost to M-DPLS.
- B. Where necessary to meet space conditions, bring equipment to its ultimate location disassembled and assemble in place. Provide flanges, studs, and the needed accessories for matching, alignment, and field assembly.
- C. Conduct field tests of equipment during and after assembly under direct supervision of manufacturer's authorized representative. Upon satisfactory conclusion of field tests, manufacturer shall furnish, for each such apparatus or equipment, a written statement

certifying there has been no invalidation of any warranties nor impairment of capacity or functioning of equipment. Field tests shall be in addition to factory tests, shop tests, and adjustments.

- D. Avoid field assembly wherever possible by suitable scheduling of the Work.
- E. Field assembly of equipment or apparatuses shall not be grounds for extra compensation.

### 3.2 FABRICATION AND INSTALLATION

- A. Workers: Use trained and experienced workers, knowledgeable with the items to be installed and manufacturer's current recommended methods of installation for actual fabrication, installation, and testing of work specified.
- B. Welding:
  - 1. All welding shall be performed by certified welders.
  - 2. All electric arc welding shall conform to American Welding Society standards.
  - 3. Clean each weld layer.
  - 4. Chip out trapped slag and unfused areas before applying next bead.
  - 5. Visually inspect finished weld for cracks, porosity, or imperfections.
  - 6. If weld contains any defects, repair to satisfaction of A/E.
- C. Set equipment level, properly aligned, and assembled. Secure equipment and materials firmly in place. Screws, bolts, nuts, clamps, fittings, and other fastening devices shall be tight.
- D. Repair to a new condition or replace materials damaged during delivery, storage, or installation. Touch-up scratched or marred finishes on equipment to match original finish or completely refinish.
- E. Enclosures, panels, cabinets, relays, safety switches, fixtures, or other exposed equipment or accessories shall be factory painted or finished, unless otherwise indicated. Group mounted items shall be similar in finish and color.
- F. Make connections for air-conditioning and ventilating equipment and controls. Furnish individually mounted starters, thermostats, firestats, and other control devices as specified.
- G. Install and connect starters, contactors, and other similar components including wiring requirements as determined by control wiring diagrams furnished under the Work.
- H. Do not cut, weld, or otherwise weaken building structure to ease installation of mechanical or electrical equipment and materials.
- I. Support electrical raceways, conduits, light fixtures, piping, and HVAC ducts from overhead structure. Support shall not be from ducts, pipes, conduits or other similar non-structural components.
- J. Design and coordinate to safely support suspended electrical and mechanical items on combined support systems.

### 3.3 SUPPORT ACCESSORIES

- A. Provide inserts, anchors, bolts, boxes, sleeves, and hangers for foundations, supports, pads, bases, and piers required for support of equipment, piping, pumps, tanks, compressors, motors, transformers, panels, racks, and other equipment specified.

### 3.4 EXCAVATION AND BACKFILLING

- A. Perform excavation, backfilling, and compaction of trenches required for the installation of mechanical and electrical services, tanks, and underground piping to points of connection with exterior underground utilities outside the building as specified in the –“Excavating, Backfilling, and Compaction for Utilities” section of these Specifications.

### 3.5 SLEEVE BLOCKOUTS, CUTTING AND PATCHING, AND CORING AND DRILLING

#### A. Sleeves:

1. Provide pipes passing through concrete slabs with sleeves constructed of galvanized sheet steel with lock seam joints of the following minimum gages.
  - a. 22 gage for pipes 3 inches and smaller.
  - b. 20 gage for pipes larger than 3 inches to 6 inches.
  - c. 18 gage for pipes over 6 inches.
2. Provide pipes passing through interior concrete or masonry walls and partitions with Schedule 40 steel pipe sleeves.
3. At pipes subject to expansion and contraction, provide sleeves of sufficient diameter to allow free movement of pipe. Where pipes are insulated, sleeves shall be of sufficient diameter to pass pipe insulation. Measure floor and wall construction and finishes to determine the proper length of sleeves for various locations. Actual lengths shall comply with the following:
  - a. Terminate sleeves flush with walls and ceilings and 2 inches above the finished floor in areas where the pipes are concealed.
  - b. Extend pipe sleeves 1/4" above finished floor in areas where the pipes are exposed.
  - c. Pipes passing through concrete slabs resting on earth or fill shall be integral with the concrete.
4. Extend sleeves according to NFPA, in mechanical equipment rooms and areas provided with fire protection sprinkler systems.
5. The annular space between the pipe or pipe covering in sleeves set in fire walls, fire rated walls and partitions, and fire rated floors, ceilings, floor/ceiling assemblies and roof/ceiling assemblies shall be firestopped according to U.L. or other tested, accepted firestopping/sealing assemblies that will maintain the required fire-rating at the penetration. The annular space between the pipe or pipe covering in sleeves set in walls and partitions, floors, ceilings, floor/ceiling assemblies and roof/ceiling assemblies that are required to be smoketight shall be packed with a noncombustible material that will maintain the smoketight condition at the penetration.

#### B. Blockouts:

1. Blockout areas of concrete or masonry to allow passage of ducts or installation of boxes.
2. Provide, as directed by A/E, extra reinforcement at sides and corners of concrete in size, quantity, and location not impairing structural performance of wall or slab.



3. Refer to Drawings for lintels above masonry wall blockouts, or if not indicated, consult with A/E.
- C. Provide shafts and chases where indicated or needed under work of other Sections.
- D. Cutting and Patching:
1. Cut and patch as needed for installation of mechanical and electrical equipment. Perform finish patching according to specifications for each finish, by workers skilled in each type of finish.
  2. Install work so no undue cutting and patching will be required in building construction. Do no cutting that might impair the strength of building construction. Get directions from A/E prior to cutting through or into structural components (such as beams, joists, trusses, slabs, concrete and masonry wall and columns) when such cutting is not indicated on the construction drawings.
  3. Cut and patch as needed for pipes if sleeves and inserts were not installed, or where incorrectly located.
  4. Provide for access through structural steel webs by noting number, size, and locations on shop drawing submittal, and only as accepted by A/E. Reinforce holes as directed by A/E.
  5. See additional requirements under the "Cutting and Patching" section of these Specifications.
- E. Coring and Drilling:
1. If a sleeve is omitted, core drill to allow insertion of a pipe sleeve with sufficient clearance to allow grouting in place.
  2. When core drilling or cutting duct holes in foundations, walls, beams, columns, or structural slabs, determine the location of reinforcement and tendons before coring.
    - a. Core or cut to provide 1-1/2" minimum cover over reinforcing steel or tendons below grade, at exterior or wet locations.
    - b. Leave 3/4 in. minimum cover in dry or interior locations.
    - c. If cutting tool comes in contact with reinforcement or a tendon, move to a location where steel will not be cut and patch to provide specified concrete coverage over reinforcement. Patch as directed by A/E.
    - d. Drill overhead concrete slabs from underside.
  3. Drill structure as needed to install hangers, anchors, and other supporting devices or fasteners only if inserts have been omitted from the concrete.
  4. Holes, except for small screws, shall not be drilled in beams or other structural members, without obtaining prior approval of A/E.
  5. See additional requirements under the "Cutting and Patching" section of these Specifications.
- 3.6 COVERING OF WORK
- A. Do not cover, or otherwise hide from view, ducts, piping, fittings, or any other work before such work has been examined or approved by A/E and authority having jurisdiction.
- B. Remove discovered defective work and replace or correct at no additional cost to M-DPLS.

### 3.7 BELT AND COUPLING GUARDS

- A. Provide guards for belt-driven units and at chains, gears, couplings, keys, projecting set screws, and other similar rotating or moving parts.
- B. Belt guards shall enclose pulleys and belts on exposed sides.
- C. Provide coupling guards on direct-connected units. Design guards for easy service removal.

### 3.8 SETTING AND ALIGNMENT OF EQUIPMENT

- A. Furnish templates and patterns for installation of equipment. Furnish setting plans and shop details of adjoining work of other trades.
- B. Set unattached electric motors in place under mechanical sections for connection under Division 16.
- C. Align fan and motor pulleys and adjust belt tension according to manufacturer's instructions.
- D. Level and align pumps and motors on bases and foundation pads according to manufacturer's instructions. Provide recommended tolerances using an indicating micrometer before any piping or electrical connections are made.
  - 1. After connections have been made and before placing pump in operation, recheck levels and alignment.
  - 2. Adjust to ensure thrust is balanced, shaft rotates freely when turned by hand, and pump is quiet in operation.
  - 3. When adjustments are completed, tight-bolt and grout motor and pump.
- E. Pumps with Mechanical Seals: Do not operate for testing purposes until systems are filled with water. Replace seals if leaks develop during setup and test at no additional cost to M-DPLS.
- F. Manufacturer's representative, qualified millwright or qualified machinist shall certify pump alignment. Insert certification of alignment in maintenance and operations manual.

### 3.9 NOISE ELIMINATION

- A. Design, select, and install electrical equipment to eliminate noise from electromagnetic fields, radio frequencies, and any other types and levels of noise capable of interfering with other audio, video, or radio frequency equipment in building.

### 3.10 NOMINAL VOLTAGE

- A. Advise trades and others furnishing equipment of the nominal characteristics, 120/208 volts or 277/480 volts. Equipment furnished shall be suitable for satisfactory operation at such nominal characteristics, either single phase or three phase wye, as shown on Drawings.

### 3.11 SOUND ISOLATION

- A. Back-to-back boxes, either for power, switches, telephone, or audiovisual are not allowed in walls or partitions.
- B. Stagger boxes to avoid sound transmission.

### 3.12 PIPING, DUCTWORK, AND RACEWAY INSTALLATION

- A. Provide clearances under beams and over windows in order to achieve maximum headroom. Verify locations of lines and types of fittings used to obtain these clearances.
- B. Coordinate piping, ductwork, raceway, and lighting trades with each other and with other equipment trades. Where insufficient headroom is provided for work above suspended ceilings or in vertical shafts, obtain clarification and instruction from A/E before installing work.
- C. Lines and Levels: Each trade is responsible for calculating and installing levels and slopes of ductwork and piping based on Contractor's reference lines and bench marks.

### 3.13 WATERPROOFING AND ROOFING

- A. Where mechanical or electrical work penetrates building envelope, roofing membrane or waterproofed construction, the method of installation shall prevent transmission of water, heat, cold, and drafts.
- B. Follow details, including architectural, establishing types of waterproofing construction for each penetration condition.
- C. Where a detail suitable to an encountered condition is lacking, request written instructions from A/E.
- D. Provide necessary sleeves, sealing, and flashing required to make openings and penetrations watertight.

### 3.14 PAINTING AND COATINGS

- A. Except for pipe and pipe fittings, equipment that is not galvanized, copper, bronze, or that has a factory applied final finish, shall be delivered to the job site with a factory applied prime coat of paint per manufacturer's standard specifications.
- B. Apply one coat of asphaltum or other moisture resistant coatings to coil housings. Coat insides of drip pans with 2 coats of asphaltum.
- C. Provide buried steel pipes and conduit with 2 coats of asphaltum.

### 3.15 DRIP PANS

- A. Examine the Drawings and coordinate the final location of electrical equipment to be installed near piping.

- B. Do not locate overhead piping within 2 feet of electric motors, controllers, switchboards, panelboards, or other similar electrical equipment.
  - 1. If installation of piping does not allow such clearances, relocate piping.
  - 2. Where a 2-foot clearance cannot be attained, provide gutters beneath piping. Make gutters watertight. Securely suspend gutters and pitch to a convenient point for drainage. Provide 3/4" copper drain with valve to nearest floor drain or service sink.
  - 3. In place of separate gutters, a continuous protection sheet of 0.025" thick sheet aluminum, adequately supported, braced, properly rimmed, pitched, and drained, shall be provided over electrical equipment, extending 2 feet beyond equipment footprint.

### 3.16 EXISTING CONDITIONS

- A. Work shall be according to the specifications and Drawings and to the complete satisfaction of M-DPLS and A/E. Materials and patching required to make project complete shall match existing where applicable.
- B. Items to be reused according to Construction Documents, temporarily removed, or de-energized shall be handled without causing damage. Removed equipment shall be maintained, if required, and returned to its original operating condition.
- C. Perform alterations, demolition, removal, cutting and patching, and other work necessary for construction without additional cost to M-DPLS. This includes removal, rerouting, etc. of electrical items required to complete installation.
- D. Patch or replace damaged floors, walls, ceilings, and other finished surfaces cut into or altered to accommodate the new construction. Patched surfaces shall match existing adjacent surfaces. When repainting is required, repaint the entire affected wall or ceiling plane – spot repainting shall not be accepted.
- E. Coordinate cutting, patching, demolition, repairing, or replacement of work.
- F. Where alterations take place in occupied areas, clean up daily. Keep noise to a minimum.
- G. Do not disrupt services to existing buildings in any way except with the written permission of M-DPLS.
- H. Reroute conduits in the way of new equipment and construction and extend or replace circuits as required.
- I. Execute Work to avoid interference with the use of and passage to and from adjoining buildings or areas.
- J. Be fully responsible for any damage to existing buildings and contents including machinery, furniture, and equipment due to construction operations. Repair or replace any damages at the direction of A/E at no additional cost to M-DPLS.
- K. Connection to existing structures shall be made as quickly as possible, and coordinated fully with M-DPLS with the convenience and safety of all persons involved, including employees.

**END OF SECTION**

**SECTION 01297  
SCHEDULE OF VALUES**

**1.1 DETAILED SCHEDULE OF VALUES**

- A. Submit a proposed Schedule of Values in accordance with the General Conditions of the Contract for review and acceptance by the A/E and M-DPLS.
  - 1. Organize, cost-load, and code data using the CSI-Format section numbers that are used in the Specifications for this Work.
  - 2. Provide in an electronic format acceptable to M-DPLS.
  - 3. Determine with the A/E what additional data is to be submitted to enhance payment procedures during the course of the Work.
  - 4. Provide a detailed breakdown of the Contract Amount with tasks identified and values assigned to each part of the Work, coded, numbered and organized by task and area of work, as compatible with and suitable for use in the CPM Construction Schedule.
  - 5. Provide detailed breakdown to correspond with any approved phases for the work so that complete payment can be made for each phase on the Requisition for Payment.
  - 6. Provide separate labor and material values for, but not limited to each major and minor construction stage and work task. Identify items by task, Specification section number, and – where applicable – by producer, supplier, Subcontractor, installer or other party responsible for incorporating the component in the Work. Where procurement and installation take more than a month, identify the task first by producer or supplier, then by installer.

**1.2 ACCEPTANCE**

- A. Contractor shall provide additional data as requested to set proper task scope, duration and value for use by the CPM construction scheduler and for analyzing requisitions for payment. When requested by A/E, provide copies of the subcontracts and other substantiating data in a form acceptable to the A/E and M-DPLS.
- B. Obtain the A/E's and M-DPLS's acceptance of the Schedule of Values before submitting the first Requisition for Payment.
- C. Base the Requisition for Payment on the accepted Schedule of Values and the CPM Construction Schedule, The A/E and M-DPLS will observe and analyze the progress of the of work completed as a basis for approving the Requisition for Payment.

**END OF SECTION**

**SECTION 01311  
CONSTRUCTION MEETINGS**

**1.1 CONSTRUCTION MEETINGS**

- A. Attend project preconstruction meeting(s) and regularly scheduled construction meetings at times agreed upon by M-DPLS and other parties to the Contract.
- B. Special construction meetings:
  - 1. Special construction meetings may be scheduled by M-DPLS during the progress of the Work.
  - 2. Preconstruction meetings for critical items of work shall be as specified, or as may be requested by Contractor or convened by M-DPLS in the interest of all-party coordination and construction quality.
- C. Location of Meetings:
  - 1. Additions, Remodeling and Renovations: Determine with M-DPLS at the project preconstruction meeting if space in the existing facility is available for meetings. Also determine what limits, if any, will be placed upon use of this space by the
- D. Chair: The A/E shall chair construction meetings:
  - 1. The chair shall prepare the agenda for the meetings.
  - 2. Contractor shall send its list of proposed agenda items to the chair at least 2 workdays before each meeting.
  - 3. Chair shall review and incorporate as appropriate into its list of agenda, with permanently numbered issues / items, which the chair will distribute to guide the meeting.
- E. Minutes: The chair shall prepare minutes for distribution to attendees no less than 2 workdays before the next scheduled meeting:
  - 1. Minutes shall continue each numbered issue until issue is complete or resolved.
  - 2. Assign one or more required actions to each problem wherever possible. Identify action items by each party responsible for its completion, reporting, and/or resolution.
- F. Scope: Address at least the following agenda items, in any orderly sequence as determined by the A/E, at each construction meeting, and include in the meeting minutes:
  - 1. Minutes of previous meeting.
  - 2. Work progress since last meeting.
  - 3. Field observations, problems, and conflicts.
  - 4. Problems impeding the construction schedule.
  - 5. Corrective measures and procedures to regain projected schedule.
  - 6. Status of and revisions to the construction schedule.
  - 7. Off-site fabrication and delivery schedules.
  - 8. Coordination of work for the following work period.
  - 9. Work quality standards.
  - 10. The presence of any toxic or potentially deleterious conditions.
  - 11. Substances, procedures or conditions that may affect sustainability.
  - 12. Any proposed changes and impact on construction schedule and completion date.
  - 13. Board's Requests for Proposals, and Change Order proposals.
  - 14. Request for Information (RFI) Log

15. Shop Drawing Log
16. See further agenda items in the Requisitions for Partial Payment article that follows.

G. Attendance:

1. Board representatives, including such parties as DCP, A/E, and consultants to A/E.
2. Contractor and its authorized representatives.
3. Subcontractors as appropriate to items on list of agenda.
4. Producer's representatives or suppliers as appropriate to items on list of agenda.
5. Persons representing other involved parties as acceptable to chair and as appropriate to items on list of agenda.

1.2 REQUISITION MEETINGS AND CERTIFICATION FOR PAYMENT

A. Added Agenda Items: When a construction meeting coincides with the A/E's review for certifying the current Requisition for Payment of the Contractor, the following agenda items will be added. Report on each item for the meeting minutes:

1. Provide notarized Requisition for Payment.
2. Subcontractor payment: After the initial meeting, submit lien releases as required by the General Conditions of the Contract for Construction.
3. Schedule: The latest updated baseline schedule and reports, with value of the work items, as specified in the CPM Construction Schedule and Schedule of Values sections.
4. As-built information: A/E shall examine and verify that as-built information is up-to-date, for the work of the Contractor and all subcontractors, on the dedicated as-built set of documents.
  - a. Add to minutes: The A/E's remarks on the quality and completeness of as-built information added to the dedicated set of Drawings and Project Manual since the last requisition meeting – to the extent that visual observation of construction can disclose.
5. Progress: The remarks of each design discipline as to what degree the completeness in the Work agrees with the percentages on the requisition, noting any poor workmanship or defects observed – to the extent that visual observation of construction can disclose in a walkthrough.
  - a. Add to minutes: The A/E's assessment of the quality, clarity and comprehensiveness of the latest construction schedule – to the extent that brief examination can disclose.

B. Certification for Payment Procedure: The A/E and M-DPLS will follow the detailed instructions in the General Conditions of the Contract for Construction in assessing all of the conditions that permit, reduce, or delay payment.

C. Attendance: The portion of the meeting devoted solely to the requisition for payment may, as directed by A/E or M-DPLS, be held after the construction meeting. Attendance may be reduced to involve only those parties with direct interest in the payment process.

**END OF SECTION**

**SECTION 01321**  
**CPM CONSTRUCTION SCHEDULE FOR PROJECTS LESS THAN \$2 MILLION**  
**(M-DPLS may elect to do graph schedule in lieu of CPM)**

1.1 CRITICAL PATH METHOD (CPM) CONSTRUCTION SCHEDULE:

- A. Create a preliminary schedule and then create and maintain a baseline schedule and periodic updates with reports. Schedule the progress of construction from the date of M-DPLS's Award of Contract, continuing through Substantial Completion and Final Payment, until the date that ends the Correction Period / Warranty Phase:
  - 1. The CPM document, in all its updates, will be referred to throughout as the "Schedule".
  - 2. "Periodic" shall mean monthly, except when construction meetings are held biweekly.
  - 3. "Days" are calendar days for phases, milestones and completion times.
- B. Software: Perform scheduling on Primavera Project Planner Version 3.1 Windows (or later version) software, or other software as reviewed and approved by A/E and M-DPLS that can compute 3000 or more activities and produce the reports specified herein:
  - 1. Later versions of Primavera that are already approved by M-DPLS are P5 and P6.
- C. Formats: As the Work progresses, produce the Schedule in 4 formats and as specified in detail below:
  - 1. Preliminary Schedule.
  - 2. Baseline Schedule.
  - 3. Updates of Baseline Schedule.
  - 4. Correction Schedule and its updates.
- D. Content: Detailed options in the Schedules' software, style, content, and reports are subject to approval by the A/E and M-DPLS:
  - 1. Use approved schedules of tasks and values following the "Schedule of Values" section of these Specifications.
  - 2. Acceptance by A/E and M-DPLS covers only the Contractor's compliance with the CPM construction schedule's form and how its activity attributes fit within the Contract Time and Sum, and not to the Contractor's construction means and methods or detailed coordination and sequences of the work.
- E. Periodic Backup: Provide a dated, labeled CD or stick memory backup copy of each Schedule and its updates, in .prx or .xer format, to the A/E for M-DPLS's analysis and archiving, until the end of the Correction Period / Warranty Phase is reached.
- F. Look-Ahead Schedules: In addition to monthly updates of the CPM construction schedule and reports, the Contractor shall prepare two-week look-ahead schedules for each construction meeting as specified below.

1.2 EFFECTS ON CONTRACT

- A. Until Final Payment, M-DPLS may withhold approval of Requisition for Payment until Schedules have been submitted on time by Contractor and approved by A/E and M-DPLS.



### 1.3 PRELIMINARY SCHEDULE.

- A. Within 15 days after Award of Contract, prepare and submit a preliminary construction Schedule to A/E and M-DPLS.
  - 1. The preliminary Schedule may be a bar chart or other graphic display of the first 90 days of work but shall also include the Contractor's general approach to executing the rest of the Work within the Contract Time.
  - 2. The preliminary Schedule shall include no more than 200 activities, and shall include phases, major milestones, and critical subcontract activities as follow:
    - a. Activities in detail:
      - 1) Clearing and initial grading.
      - 2) Excavation and other initial earthwork.
      - 3) Foundations.
      - 4) Utilities and sewers.
      - 5) Initial structural shell activities.
    - b. Activities in less detail:
      - 1) Roofing assembly.
      - 2) Major interior space finishes.
      - 3) Fire suppression.
      - 4) Plumbing.
      - 5) HVAC.
      - 6) Electric power & distribution.
      - 7) Low voltage systems (automation, communications, safety & security).
- B. No payments shall be made to Contractor until the preliminary construction Schedule has been submitted as specified above and accepted by A/E and M-DPLS.

### 1.4 BASELINE SCHEDULE.

- A. Schedule Design:
  - 1. Within 30 days after receipt of Notice to Proceed, submit 3 copies of a computer-produced precedence format schedule (Schedule) to A/E and M-DPLS consisting of:
    - a. Network diagram.
    - b. Computer-produced reports.
    - c. Narratives.
    - d. Graphic reports.
  - 2. The initial baseline Schedule shall contain no Contract changes or delays that may have occurred before they are approved by M-DPLS. These shall appear in the first Schedule update.
  - 3. Include the following lists in this Baseline Schedule:
    - a. List of Phases / Milestones.
    - b. List of Critical Subcontracts.
    - c. List of Substitution Requests.
  - 4. No payments after Notice to Proceed shall be made to Contractor until Baseline CPM construction schedule has been submitted as specified and accepted by A/E and M-DPLS.
- B. List of Subcontracts: Within 45 days after Notice to Proceed, expand the tasks / activities identified and priced in the Schedule of Values to include:
  - 1. Task durations.
  - 2. Task responsibilities (Subcontractor/installer and major producers).

3. Network logic.

## 1.5 UPDATES TO BASELINE SCHEDULE

- A. Submit to M-DPLS and A/E monthly status reports in the form of updated computer printouts and narrative reports:
  1. Include in the updated report such information as:
    - a. Actual construction progress.
    - b. Logical restraints.
    - c. Sequence changes.
    - d. Pre-construction meetings.
    - e. Testing.
    - f. Inspections.
    - g. Correction of defective work.
    - h. Change orders.
    - i. Delays.
    - j. Major weather disruptions of more than 2 days.
    - k. Other pertinent data that affect construction progress.
  2. Include in the narrative report a description of problem areas, current and anticipated delaying factors, and their impact on performance of other activities and completion dates.
- B. The Contractor shall submit an updated Schedule each month even if no Requisition for Payment is submitted by the Contractor for that month. The updated Schedule shall be submitted by the regular monthly calendar date on which it was agreed that Requisitions would be submitted.

## 1.6 SUBCONTRACTOR AGREEMENT

- A. Until Substantial Completion, Contractor shall review progress under the Schedule for the preceding month with Subcontractors and the A/E 5 to 7 days before Contractor's monthly Requisition for Payment.
- B. Obtain the agreement of critical Subcontractors in areas critical to timely performance of the Work Schedules and durations of any tasks and labor efforts required to complete them. Obtain agreement in areas such as but not limited to:
  1. Structure.
  2. Partitions.
  3. Fire suppression.
  4. Controls / EMS.
  5. Electrical.
  6. Roof assembly.
  7. Ceilings, floors.
  8. Plumbing.
  9. Communications.
  10. Elevators.
  11. Windows, doors.
  12. Food service.
  13. HVAC.
  14. Electronic safety/security.

- C. The baseline Schedule shall be signed by each critical Subcontractor, indicating agreement with scheduled durations:
1. Each specified critical Subcontractor, 30 days before its start of work on-site, shall also sign its agreement with the Schedule, reporting any reason it has to disagree with items affecting it.
  2. Each signed agreement shall include the file date of the edition of Schedule upon which agreement is based.
  3. Failure of a Subcontractor to agree with this Schedule shall serve as notice to the Contractor of potential schedule difficulties.
  4. Contractor shall work with disagreeing Subcontractor and report when agreement is reached.
  5. Under no circumstances shall the disagreement by a Subcontractor be cause for excusable or compensable delay for the Contractor. The full responsibility for completing the Work on time remains with the Contractor.

## 1.7 SPECIAL CONSTRUCTION ACTIVITIES

- A. Submittals and Review: Until Final Completion, in addition to the baseline construction activities, provide activities for the submittal of shop drawings, approval, fabrication, and delivery. Procurement activities shall typically number no less than 120 in addition to the number of Work activities. Show activities of M-DPLS and A/E that affect progress, and Contract-required dates for completion of all or parts of Work.
- B. Complex Submittals: Review shop drawing and other submittal durations with an eye to the size, complexity and duration of the Project. Introduce early submittal of lengthy shop drawings and product data, as well as submittals needing much coordination with other work, to allow adequate time for A/E (and often M-DPLS) review and the resubmittal and second review of rejections:
1. Schedule long lead-time and special fabrication items.
  2. Review time shall be as specified in "Submittals" section of these Specifications and the General Conditions of the Contract for Construction.
  3. Schedule specified early submittals and Special Warranty approvals.
- C. Sub-projects: The Contractor shall identify sub-projects that need to be integrated with the baseline Schedule for review and acceptance by A/E and M-DPLS.
- D. Contingencies, Expediting and Delays: Note in the Schedule the time of other factors and impacts that affect the completing of the Work within Contract Time, such as:
1. Work to be performed during other than normal working hours.
  2. Unavailable dates due to Library sessions, student or special Library activities.
  3. Work to be done by separate contractors employed by M-DPLS.
  4. Force majeure events such as major utility outages, riots, hurricanes, and flooding.
  5. These and similar impacts, whether foreseen or unexpected, require prior written approval by the A/E and M-DPLS before they are included in the Schedule.

## 1.8 ADJUSTING THE DATE OF SUBSTANTIAL COMPLETION

- A. Contract Time will be adjusted only for causes specified in the Contract. Early completion shall not entitle Contractor to compensation for acceleration.

- B. Changes and additions to the Schedule require prior written approval by the A/E and M-DPLS before they are included in the Schedule. Incorporate appropriate activities into the Schedule as each Change Order or GMP Contingency Adjustment is approved by M-DPLS.

#### 1.9 CONTRACTOR'S ACTIONS TO COMPLETE THE WORK ON TIME

- A. Whenever it becomes apparent from the periodic construction meetings or the Schedule updates that phasing, Substantial Completion or Final Completion dates will not be met, the Contractor, at no additional cost to M-DPLS shall take actions such as:
  1. Increase construction manpower in such numbers and trades as will eliminate the backlog of Work.
  2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of Work.
  3. Reschedule the Work under this contract in conformance with all other specification requirements.

#### 1.10 NETWORK DIAGRAM AND ACTIVITIES

- A. Network (or logic) diagram shall contain between 100 and 1000 detail tasks, including restraint activities and submittal / approval / fabrication tasks as appropriate to the Work and shall account for the entire duration of the Contract Time. Their selection and number shall be subject to approval of A/E and M-DPLS:
  1. The M-DPLS may require the addition of up to 200 tasks into the network diagram and reports in addition to the tasks that are the responsibility of the Contractor.
  2. Activities relating to the Work's total duration, such as general requirements or supervision, shall be established as a hammock type insertion so that earned value will always be in proportion to the percentage complete of the entire Work.
  3. The baseline network diagram and monthly updates shall reveal a continuous critical path – the shortest route through all activities – from the start to the finish of the Work.
  4. Under no circumstances shall the Schedule show any negative float.
  5. Adjustments to phasing requirements approved by A/E and M-DPLS shall be reflected in subsequent network diagram updates, at no cost to M-DPLS.
- B. Each activity shall show on the diagram and shall report the following on an associated computer-generated report:
  1. Predecessors (or successors) and relationships.
  2. Activity name (concise and distinctive description).
  3. Location in the Work (group activities by location where feasible).
  4. Responsibility code.
  5. Duration in work days.
  6. Early start, early finish, late start, late finish.
  7. Actual start and actual finish (by calendar dates).
  8. Percent of activity complete.
  9. Total float.
  10. Project phasing or staging as applicable.
  11. CSI Division.

- C. Time scale the network diagram: Diagram shall show a continuous flow from left to right with no arrows from right to left:
1. Show date of revision on each sheet of each update, using a data date.
  2. Sheet size of the network diagram: 36 x 24 in.
  3. Submit network diagrams each month. Until Substantial Completion, show with every update the critical path to completion on the network diagram using a colored, heavy or dotted line through all critical activities.
  4. Display a copy of each updated network diagram in Contractor's Field office.
  5. Until Final Payment, M-DPLS may withhold approval of Requisition for Payment until Schedules have been submitted by Contractor and approved by A/E and M-DPLS.

#### 1.11 NETWORK DIAGRAM CODING AND LOGIC

- A. Flags / Milestones:
1. Introduce project flags or milestones occurring at the completion of significant events including, but not limited to, M-DPLS's Building Code Consultant's (BCC) Code inspections or other inspections, completion of major systems or assemblies, or substantial or partial completion dates for each area or type of work.
  2. Make flags and milestones the first grouping that appears on any network diagram.
- B. Delayed Information: In the 60 days after issuing the Baseline Schedule, the Contractor shall allocate resources for un-contracted tasks to the best of its ability. The Contractor shall report needed modifications to the baseline schedule to the A/E and M-DPLS for review and approval while updating so that the information in the second update is dependable and has Contractor, Subcontractor, A/E and M-DPLS approval.
- C. Identifier: A 4-digit project name (such as used by Primavera) shall be supplied to Contractor by M-DPLS for both the baseline and updated Schedules. These names shall remain constant through the life of the project:
1. When resubmitting a baseline schedule, use a name change that closely resembles the original file name.
  2. Examples: XXXB, the original baseline, becomes XXB1. XXB2 would be used for revised baseline files.
- D. Resource Dictionary:
1. Load resource crew information into the resource dictionary for the network diagram using CSI Format section designations.
  2. Identify each trade crew by a CSI-related crew code consisting of the first 3 digits of the appropriate CSI code for the work being performed.
  3. Identify the type of resource as follows:  
LAB = Labor          MAT = Material          EQU = Equipment  
(Example: 022LAB for Earthwork, 033LAB for Concrete)
  4. Each resource crew or equipment type shall have reasonable resource limits as established by the Contractor, appropriate to the work of each subcontractor. Establish the normal and the maximum number of resources available each day.
    - a. Examples: Labor = Person days, Material = Units, Equipment = Units).
    - b. Establish resource budgeted quantities and units per day for each task and each resource set as a driving resource so that the duration of the task is dependent on the quantities assigned.
  5. Provide a forward leveled resource run for network diagram's baseline acceptance, demonstrating that using the defined resources can cause completion of the Work

and its phases within the Contract Time, as defined in the General Conditions for the Contract for Construction.

6. The Contractor shall use resource-loading reports to ensure that appropriate numbers of Contractor and subcontractor personnel are available during all phases of the Work.

E. Cost Accounts:

1. Cost Account Numbers may be established using the appropriate 5 digit CSI-MF number and a cost category code (L=Labor, M=Material, E=Equipment, O=Other).

F. Activity Codes:

1. The following table identifies M-DPLS's required activity codes. The Contractor may use additional codes for its own requirements.

<u>Activity ID No.</u>	<u>Name</u>	<u>Length</u>	<u>Description</u>
1	CSI	3	CSI-Format code
2	STEP	2	Increment to make CSI-unique
3	BLDG	1	Building / or area
4	SUBA	4	Sub area / or floor

<u>Activity Code No.</u>	<u>Name</u>	<u>Length</u>	<u>Description</u>
1	PHAS	1	Phase
2	DIV	2	CSI-spec section
3	PROJ	8	M-DPLS project number
4	RESP	2	Responsible party
5	CRIT	1	Critical flag or milestone
6	TYPE	1	Task type

G. Code each task to minimally define:

1. Location of Work.
2. Applicable section number and name as shown in Specifications.
3. Party responsible for performing work.
4. Location of the work item including building, floor, room, and position as applicable.
5. Phase of the Work as defined by M-DPLS and Contract agreement.
6. Until Substantial Completion, code each task type as follows:
  - a. Submittals.
  - b. Approvals.
  - c. Fabrication / Delivery.
  - d. Installation.
  - e. Administrative.
  - f. Other tasks
7. After Substantial Completion, code each task type as follows:
  - a. Number of Correction of Work item, or number of action under a Special Warranty or a punchlist number.
  - b. State whether task is work to be completed, or a defect to be corrected.
8. Critical Flags and Milestones.

H. Schedule Content:

1. Whenever there is a logical inconsistency in the network diagram, such as insufficient resources to complete tasks within the allotted time, mandatory date constraints that

- override logical constraints, or out of sequence progress, correct the Schedule to eliminate the inconsistency.
2. Explain imposed constraints by a log entry in the appropriate task.
  3. Schedule activities as early as possible unless specific tasks must logically be scheduled otherwise.
- I. Schedule on the network diagram long lead time and special fabrication items. Schedule specified early submittals and early Special Warranty approvals. Provide appropriate selection codes incorporated into each item, including at least the following categories:
1. Submittal.
  2. Approval.
  3. Fabrication / Delivery.
  4. Installation.
- J. Code each task to allow selection for preparation of or exclusion from any given set of reports. After the initial report, updates shall have the lists of submittal, approval, and fabrication tasks segregated from the list of installation tasks, unless otherwise directed by M-DPLS.
- K. Schedule each task on the network diagram as follows:
1. Task durations. Schedule tasks in working days (5 working days each week, less holidays) and in precedence format.
  2. Milestone and completion times. Schedule milestones, phases and days to completion in calendar days.
  3. Maximum original duration: 20 work days (except procurement) without including a follow up activity.
  4. Maximum duration for procurement: 30 work days. Procurement time may exceed 30 days if long-procurement items are listed, with time needed, for review and approval by A/E and M-DPLS.
  5. Schedule all tasks that lead to building code compliance, such as compliance inspections.
  6. Schedule all tasks identified in the production monthly reports. Schedule tasks identifying the production of monthly updating reports.
  7. Use verbs in task descriptions to describe the action taken. For example, say "Install lighting fixtures" instead of "Light fixtures".

## 1.12 UPDATES

- A. Provide initial input data and submit monthly updates to A/E showing actual work activities accomplished. Forecast future work activities and durations.
1. Designate the original properly submitted Schedule as the baseline Schedule. Produce a Schedule that is updated monthly. Show in a single report, the baseline and updated Schedules.
  2. State in each update actual start and finish dates and remaining duration of started tasks.
  3. Report problem areas to A/E, including current, unresolved or anticipated delays and their impact on other activities. State what steps are being taken or planned to complete within Contract Time.
  4. Review monthly progress and recommend ways to improve Schedule and to avoid delays and safety problems.

5. Inform and update participants in the Work of revisions to the construction Schedule using the specified narrative report.
  6. Submit revised Schedule each month concerning future construction activities.
  7. Submit the update, supporting the Contractor's Requisition for Payment, and include:
    - a. Contractor's narrative report, similar in form to M-DPLS Narrative Form in .xls.
    - b. All required scheduling reports.
    - c. Copy of Contractor's Requisition for Payment.
- B. Percentage of Completion: State in each update actual start and finish dates as well as the remaining duration of started tasks in order to verify the percentage of completion.
- C. Change Orders: Reflect each approved change order in the updated Schedule and update the previous baseline or target schedule. An example follows:
1. Change Order 1 when reflected in the baseline shall create Target 1 (updated baseline including Change Order 1); Change Order 2 shall create Target 2; etc.
- D. Review of Logic: Review each monthly update for "out of sequence progress". If logic errors exist, correct them either by physical adjustment or by using the "progress override" method of scheduling.
- E. Negative Float Mitigation: If the initial run of any monthly update of the scheduled results in negative float, (delay in projected completion date of any phase or final completion) and the project delay can be mitigated by adjusting the Schedule through changes in logic or reducing durations of critical items, Contractor may make those changes before the submission of Schedule reports provided:
1. Mitigation is explained as specified in Negative Float Mitigation below.
  2. A copy of the original total float report, showing only those activities with negative float, along with the entire revised total float report, are included in the bound report.

### 1.13 NARRATIVE REPORT

- A. Narrative:
1. Scope: Narrative report shall accurately inform M-DPLS of the updated status of the project, future anticipated problems, delaying factors, and explanation of corrective actions taken or proposed to mitigate the problems or delays.
  2. Organization: Follow Schedule of Tasks by Subcontract as specified under the "Schedule of Values" section of these Specifications. Break down complex tasks by Specification section numbers as needed for clarity. Alternatively, organize by Specification section numbers throughout the Narrative.
  3. Format: Similar to M-DPLS form "Narrative Form.xls".
  4. Include with: Each bound report and with each Requisition for Payment.
- B. Negative Float Mitigation:
1. Include a detailed explanation of the amount of negative float and schedule corrective action in the narrative report.
  2. Include changes in duration that are realistic and supportable by historic productivity and quantity analyses. Provide supporting data if requested by M-DPLS.
  3. Logic changes shall be consistent with standard industry practices.



## 1.14 OTHER COMPUTER-PRODUCED REPORTS

- A. Baseline Network Logic Report (accompanying each network diagram):
  - 1. Scope and Organization: Show activities grouped by location, including task number, description, original duration, early start and finish, and total float, for reviewing the underlying logic, sequence and dependencies of the various activities.
  - 2. Provide a similar report for each proposed change order to reveal its impact.
- B. Sorts: Provide the following computer-produced sorts sequenced by activity number:
  - 1. List all uncompleted activities sorted by total float and then by early start date.
  - 2. Float or slack, from the least to the most.
  - 3. Early start sub-sorted by activity number.
  - 4. Responsibility by early start.
- C. Costs: Load the cost of each product's supply / installation activity in the Schedule.
  - 1. Report costs in the Budgeted Costs section of the CPM software.
  - 2. If approved by A/E and M-DPLS, costs may be reported on the network diagram, and shall include:
    - Cost of equipment: RESOURCE code = xxxEQU,
    - Cost of products installed: RESOURCE code = xxxMAT, and
    - Cost of installation labor: RESOURCE code = xxxLAB.
  - 3. Insert the man-hours required to complete each activity as budgeted quantities.
    - RESOURCE Code = xxxLab.
  - 4. Insert in report or diagram the quantity of units installed for each unit of time.
  - 5. Insert in report or diagram each driving resource.
  - 6. Insert in report or diagram the actual costs to M-DPLS. Closely follow the approved Schedule of Tasks and Values, coded by CSI-Format section number.
- D. Tabular Reports: Supply the following reports on 8.5 x 11 in. paper as initial reports from the baseline Schedule, each update, and with each Requisition for Payment. Organize reports by activity location and sub-sort by early start date:
  - 1. Schedule Report: List the updated status of all activities, sorted by activity number from lowest to highest and not by area.
  - 2. Detailed Time Logic Chart: Initial Detailed Time Logic Chart grouped by location showing activity numbers and descriptions, total float, and duration.
  - 3. Monthly Update Bar Chart: A bar chart comparing current progress to the most recently approved target schedule.
    - a. Color-print, adjusting grayscale so that all shades are readable when copied.
    - b. Sort the chart by location, early start date, and show the activity ID, original duration, percent complete, total float, baseline late finish, current early finish, budgeted cost, earned value in the tabular portion, and activity description in the bar portion.
  - 4. Earned Value by CSI-Task: Show the total budget and earned amounts for this period and to date for each task. Payment requests will be verified from this report
    - a. Amounts shall correspond to the Schedule of value identified in General Conditions of the Contract for Construction.
    - b. Organize report by area unless otherwise requested.
  - 5. Cost Summary by CSI-section number: Show section number, description, percent complete, construction amount, earned to date, earned this period, balance to complete, and retainage.

6. Initial S-Curves: S-Curve of Early and Late Dates including the costs of all tasks that total to the contract price.
  7. In addition to other specified reports, M-DPLS may request special reports to clarify the status of work or construction logic in critical locations.
- E. Data Precedence: Reports requiring comparison between the updated Schedule and target (updated baseline) shall use the most recent target schedule unless M-DPLS directs otherwise.

#### 1.15 REPORT PRINTING AND SEQUENCING

- A. Paper:
1. Print reports (except network diagrams) on 8.5 x 11 in. paper, one-sided, at each time of Requisition For Payment, bound in the following sequence.
  2. Print cover page (on cover stock), and identical title page, with project name, number and location, date, Contractor, and Requisition for Payment number.
- B. Sequence:
1. Schedule, including network diagram, baseline network logic and other sorts.
  2. Narrative report, with logic changes since last Schedule.
  3. Requisition for Payment summary and copy of Requisition for Payment.
  4. Tabular reports specified above.
  5. Attach each Contractor's look-ahead report issued since the last Schedule update.

#### 1.16 SCHEDULE DATA WITH EACH REQUISITION FOR PARTIAL PAYMENT

- A. Until Final Completion, attach the monthly status report with each Requisition for Payment.
1. If the computer printout, including critical path, the narrative, and float or slack data, is not attached to the Requisition for Payment, the Requisition is incomplete and will not be processed.
  2. Supply one hardcopy and one copy on CD, of each update in .prx or .xer format to M-DPLS each month with the Requisition for Payment. Insert the requisition number and the date of the update in the "No./Version" field.
    - a. Format: Req. No.– month/day/year. Example: 01 – 03/15/08.

#### 1.17 LOOK-AHEAD REPORTS

- A. In addition to monthly updates of the CPM construction schedule and reports, the Contractor shall prepare look-ahead reports for each construction meeting.
1. Develop these reports, elaborating on data contained in the most recent Schedule update, to display those activities that must be completed during the next 14 days.
  2. At whatever interval construction meetings are held, a look-ahead report shall be prepared by the Contractor for distribution at each construction meeting (other than special meetings of limited scope, such as requisition-only meetings or walk-throughs). But whatever the meeting interval, the scope of each look-ahead report shall be for the next 14 days.
- B. Look-Ahead Report Format and Content: Cover areas of significant progress being pursued, new trades starting, delivery delays, submittal progress, help needed from other parties, problems anticipated, and other matters affecting the Contractor's critical path.

Generate by computer, for ease of distribution and archiving. Both narrative and graphic presentation are encouraged for ease of comprehension by all parties. See form after page 12, this form is required for projects less and over \$1 Million.

1.18 PROJECTS LESS THAN \$1 MILLION

- A. The M-DPLS may elect to waive some of the requirements for the CPM Construction Schedule when the total construction value of a project is less than \$1 million. In such cases M-DPLS will provide written notification to the Contractor with instructions for the new requirements for the CPM Construction Schedule.

1.19 TURNOVER AT COMPLETION OF THE PROJECT

- A. At the end of the correction of work / warranty period, deliver the CPM program and data to M-DPLS, in CD format, to serve as the nucleus of a tracking system for maintenance of and replacements in the Facility for the duration of its useful life.

**END OF SECTION**

## **PROJECT SCHEDULE NARRATIVE**

### **MONTHLY SCHEDULE UPDATES:**

- A. 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 MDPLS. Three (3) 11" X 17" copies of the updated schedule shall be submitted by the Contractor.
- B. The Contractor shall submit an updated narrative in the form of monthly progress reports in a format acceptable to work. 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. Information included in the updated narrative will not relieve the Contractor of the notice requirements contained in the Contract documents. 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.
- C. The Contractor shall submit on a weekly basis a simplified two-week look-ahead bar chart schedule showing all anticipated work scheduled to take place during the next fourteen (14) calendar days. This two-week look-ahead schedule shall be based on the approved baseline schedule.

### **PAY REQUESTS:**

- A. The Contractor's pay request shall be based on completed activities and 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.
- B. 5% of each Contractor's pay request amount will be held as retainage.
- C. All Contractor pay requests will be submitted in a form suitable to MDPLS based on the approved schedule of values under the contract.
- D. No payment will be made to the Contractor for uncompleted activities.

### **MEASUREMENT AND PAYMENT:**

- A. Work under this section will be paid for as part of the pay item unit prices required to perform the work under this contract.

**BASELINE NARRATIVE FORM FOR BAR CHART SCHEDULES**

Contract Title: \_\_\_\_\_

Contract No.: \_\_\_\_\_

Contractor: \_\_\_\_\_

Baseline and/or Update No.: \_\_\_\_\_

**1. Contractor's general approach for completing the work:**

Including but not limited to any additional or unusual requirements not clearly represented in the schedule, the basis for the Contractor's determination of durations for major work items and his approach for meeting the interim and final completion dates in his schedule.

Use additional sheets if necessary.

**2. Equipment to be used:**

Including time that the equipment is to be on-site. Use additional sheets if necessary.

**BASELINE NARRATIVE FORM FOR BAR CHART SCHEDULES**

Contract Title: \_\_\_\_\_

Contract No.: \_\_\_\_\_

Contractor: \_\_\_\_\_

Baseline and/or Update No.: \_\_\_\_\_

**3. Anticipated delivery dates for material/equipment:**

Use additional sheets if necessary.

**4. Crews and Crew Sizes:**

Use additional sheets if necessary.

**5. Rates of Production and Estimated Quantities:**

Use additional sheets if necessary.

**BASELINE NARRATIVE FORM FOR BAR CHART SCHEDULES**

Contract Title: \_\_\_\_\_

Contract No.: \_\_\_\_\_

Contractor: \_\_\_\_\_

Baseline and/or Update No.: \_\_\_\_\_

**6. Workdays per week/Hours per Shift:**

Use additional sheets if necessary.

**7. Non-work Periods assumed in the planning of the work:**

Including holidays, rain days and any other non-work period assumed by the Contractor.

Use additional sheets if necessary.

**8. Activities which may be expedited by the use of overtime or additional shifts:**

Use additional sheets if necessary.

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PROJECT SCHEDULE NARRATIVE

RPQ NO. LC-RENO-23-R1  
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**BASELINE NARRATIVE FORM FOR BAR CHART SCHEDULES**

Contract Title: \_\_\_\_\_

Contract No.: \_\_\_\_\_

Contractor: \_\_\_\_\_

Baseline and/or Update No.: \_\_\_\_\_

**9. Sequencing and other restraints affecting the work:**

Including manpower, material, and equipment restraints. Use additional sheets if necessary.

**MONTHLY SCHEDULE UPDATE NARRATIVE FORM FOR BAR CHART**  
**SCHEDULES**

Contract Title: \_\_\_\_\_

Contract No.: \_\_\_\_\_

Contractor: \_\_\_\_\_

Baseline and/or Update No.: \_\_\_\_\_

**1. Progress This Period:**

Including all activities started, completed or in progress and signed material delivery tickets indicating when material was delivered on-site or to the fabrication plant as applicable.

Use additional sheets if necessary.

2. **Planned Progress for Next Period:**

Use additional sheets if necessary.

**MONTHLY SCHEDULE UPDATE NARRATIVE FORM FOR BAR CHART  
SCHEDULES**

Contract Title: \_\_\_\_\_

Contract No.: \_\_\_\_\_

Contractor: \_\_\_\_\_

Baseline and/or Update No.: \_\_\_\_\_

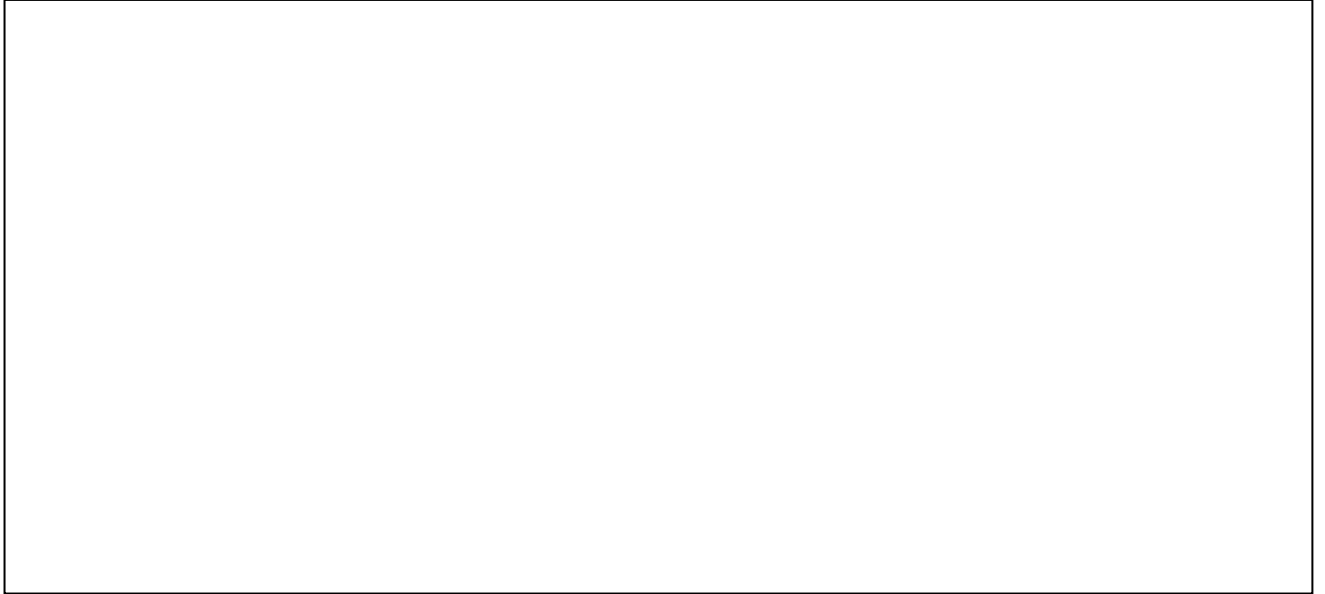
ii. **Problems and Solutions:**

Including a listing of all delayed activities, the reasons for delay and proposed recovery actions. Use additional sheets if necessary.

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- iii. **Changes Since Last Period:**  
Use additional sheets if necessary.



**MONTHLY SCHEDULE UPDATE NARRATIVE FORM FOR BAR CHART  
SCHEDULES**

Contract Title: \_\_\_\_\_

Contract No.: \_\_\_\_\_

Contractor: \_\_\_\_\_

Baseline and/or Update No.: \_\_\_\_\_

iv. **Special Concerns and/or Questions regarding the Schedule:**

Use additional sheets if necessary.

**END OF SECTION**

**SECTION 01325**  
**AS-BUILT INFORMATION FOR RECORD DOCUMENTS**

**1.1 AS-BUILT INFORMATION FOR RECORD DOCUMENTS**

- A. Recording As-Built Information on Drawings.
1. The Contractor shall keep accurate notes on a set of Drawings dedicated to recording as-built data and details for all parts of the Work, as actually constructed. Show locations of field changes, Addenda, Change Orders and Contingency Adjustments and details not in original Construction Documents.
  2. In addition to building data, include dimensions of underground lines, their offsets, inverts, and manhole and valve locations. Record all site improvements.
  3. Dimension locations of interior utilities, equipment and fixtures concealed in the Work, measured from visible, accessible, permanent features.
  4. Keep the dedicated as-built set apart from Drawing sets used in construction. Neatly mark AS-BUILT DATA in large print on each page of the dedicated as-built set.
  5. In addition to notes, sketch as-built information as needed to clarify the nature of what has been built differently. If sketches are put on a separate sheet of paper, number the sheets to identify which sheet and detail of the Drawings they clarify.
  6. Record as-built information concurrently – preferably daily or at least weekly – as the Work progresses.
  7. Do not conceal any work until the information is marked in the as-built set.
- B. Recording As-Built Data in Specifications:
1. Mark each project manual and addendum to record producer, supplier, product name, catalog number, and location of each product installed.
  2. Mark the title pages and covers of the dedicated project manual and all addenda with the words AS-BUILT DATA in neat large print.

**1.2 SUBMITTAL WITH EACH PAYMENT REQUEST**

- A. Requirement at each Requisition for Payment: The Contractor shall update the as-built information sets each month in time for the A/E's monthly review for compliance even if no Request for Partial Payment is submitted by the Contractor for that month.
- B. Non-compliance will be grounds for A/E to disapprove the Requisition for Payment:
1. This, in turn, will be grounds for not processing the Requisition for Payment, as stated in the General Conditions of the Contract for Construction.

**1.3 EARLY RECORD DOCUMENTS**

- A. When the A/E determines that the Work is 75% completed, the Contractor shall provide the A/E a copy of the latest as-built data reflecting the work completed to date, for review and acceptance by the A/E and M-DPLS.

**1.4 SUBMITTAL AT TIME OF CLOSEOUT**

Final As-built information in the form of Drawings and Specifications as specified in the "Closeout of the Work" section of these Specifications shall be delivered to A/E at time of closeout of the Work.

**END OF SECTION**

## **SECTION 01330 SUBMITTALS**

### **1.1 TYPES OF SUBMITTALS**

- A. Submittals in this Section: After Contractor's check, coordination and approval, submit (as each of the following is required) with a signed copy of the attached Submittals form.
  - 1. Submittals: Product data (including installation and maintenance instructions), shop drawings, selection samples, and record samples. Also notices of worksite mockups and sample walls when they are ready for approval by A/E and M-DPLS.
  - 2. Samples (as a record of type and quality).
  - 3. Mockups and sample walls: Give notice of readiness for inspection by A/E and M-DPLS.
  - 4. Information Submittals, requiring no response from A/E, such as:
    - a. Certifications.
    - b. Test or laboratory reports.
    - c. Source quality control reports.
    - d. Producer's instructions.
    - e. Sustainable design submittals.
    - f. Producer site observations.
    - g. Material Safety Data Sheets (MSDS).
    - h. Recycling certificates.
    - i. Installation meeting reports.
    - j. Inspection reports and Installation quality control reports.
- B. Submissions not specified in this Section.
  - 1. Closeout deliverables: As specified in "Closeout of the Work".

### **1.2 PROCEDURES FOR ALL SUBMITTALS**

- A. Schedule scope and time: Designate in the CPM construction schedule the dates for submittal to A/E and the review completion dates needed for each submittal's A/E review, to maintain the required Contract Time.
- B. Attach filled-out Submittal form: After checking each submittal for compliance with the Construction Documents and coordination with the rest of the Work, attach a filled-out and signed copy of the Submittal form that is attached to this section to each submittal.
- C. Identify the data: Identify submitted product data, shop drawings, and samples by referring to sheets, details, schedules, or room numbers as shown on Drawings.
- D. Cover or include, in all submittals:
  - 1. Field measurements and worksite conditions.
  - 2. Catalog numbers, ASTM standards and other quality assurance data.
  - 3. Performance criteria, capacities and limits, ingredients, detailed finish data, etc.
  - 4. Dimensions that ensure clearances, fit, and expected movement in use.
  - 5. Key each product to its location in the Work using room numbers, Drawing sheet and detail numbers, marks, etc.
  - 6. Coordination with other parts of the Work, including needed work by others.
  - 7. Wiring, control, piping, connection diagrams and schematic diagrams.
  - 8. Compliance with Construction Documents.



9. Installation, cleaning and maintenance instructions.
  10. Draft of each special warranty where specified.
  11. Contractor shall bear the cost of all submittals such as printing, samples, calculations, engineering services, mock-ups, and delivery.
- E. Unify submittals: Submit product data, shop drawings, test data, color charts / selection samples and special warranty at the same time for each product, using one (1) Submittal form.
- F. Maintain and up-to-date spreadsheet record of all submittal activity. Record spreadsheet shall include, at a minimum, the submittal number; description of the product(s) covered in the submittal; the manufacturer(s) of the product(s); the subcontractor, materials or equipment supplier or fabricator who prepared the submittal; the number of copies received from the subcontractor, materials or equipment supplier or fabricator; date the submittal was received from the subcontractor, materials or equipment supplier or fabricator; the date the submittal was sent to the A/E for review; the date the submittal was returned by the A/E with their review; the number of copies returned by the A/E; the A/E's review finding; the date the reviewed submittal was returned to the subcontractor, materials or equipment supplier or fabricator; and the number of copies returned to the subcontractor, materials or equipment supplier or fabricator. Record spreadsheet shall include all initial submittals and follow-up submittals. Copies of record spreadsheet shall be made available to A/E and M-DPLS as needed to facilitate their administration of the submittal process. The record spreadsheet shall be coordinated with, and may be based on or incorporated into the "Submittal Schedule" specified in article 1.5 A. of this section.
- G. Review: Check each submittal for conformity to the Construction Documents, coordination with other work, dimensions, needed clearances and fit, fastenings and support, power and piping connections, finishes, needed prior work and accessory products.
1. Excessive errors, omissions, and/or incompleteness in a submittal, and/or gross lack of coordination with the requirements of the project or the conditions of the installation, or other evidence of a lack of understanding of the applicable project requirements by the entity responsible for the submittal will be cause for the A/E's rejection of the submittal.
  2. Contractor's failure, prior to transmitting submittal to A/E, to check submittal and affix Contractor's review approval stamp with Contractor's signature and date will be cause for A/E's rejection of the submittal.
- H. Deviations: Notify the A/E, in writing, at time of submission, of deviations from the requirements of the Construction Documents in what is being submitted.
1. Deviations shall be prominently displayed, and identified as deviations, so that the A/E will not miss them in reviewing.
  2. Minor deviations, if not marked or listed, will be cause for A/E to return the submittal. A major deviation, noted or not, will be considered an attempt at unauthorized substitution and will be cause for A/E to reject the submittal.
  3. The A/E shall be the judges of when a change qualifies, not as a substitution, but as a minor deviation not affecting function, performance or appearance.
  4. Submittal of products deemed to be of lower quality than that specified will be cause for A/E's rejection of the submittal.
- I. Accept: Both Contractor, and then A/E, shall review and approve (or take other appropriate action for) each submittal for conformance to Contract.

1. Terms equivalent to “approve” may be used by Contractor or A/E, as long as the term used ensures that professional attention has been given in analyzing that each submittal maintains the design intent as expressed in the Construction Documents.
- J. Resubmitting: When a resubmittal is required by the A/E’s finding in the preceding review, identify the resubmittals with the initial submittal number, followed by a hyphen (-) and a letter A, B, etc. to show the resubmittal sequence.
- K. Fabricating and Shipping: Do not ship products from stock or fabricate products until submittals have been reviewed, accepted and returned by A/E:
  1. Unless a submittal is unusually lengthy or complex, allow / limit review time to:
    - a. Two (2) weeks for architectural submittals.
    - b. Three (3) weeks for engineering submittals.
    - c. Plus an additional one (1) week if M-DPLS needs to advise on the acceptability of a submitted product.
    - d. For samples for color selection, and for submittals for products that require color selection, allow the complete timeframe for review and color selection that is provided for in the approved CPM schedule for the project (see Sections 01321 and/or 01322).
- L. Field file: Always maintain and have available for reference a field copy of approved shop drawings, catalog cuts, and installation instructions at the worksite.
- M. Closeout deliverables: While processing submittals, assemble, as one file, one (1) copy of all approved submittals (in the case of samples, the signed and approved Submittal form only) for delivery to A/E and M-DPLS at time of closeout of the Work.

### 1.3 CONTRACTOR APPROVAL PROCEDURE

- A. Generally limit each submittal to one (1) product, except as follows:
  1. For each system or assembly where a number of components or equipment interacts, a coordinated booklet of data sheets shall be compiled for ease of review by A/E.
  2. For comprehensive lists of products similar in function (such as roof assembly, firestopping, sealants, access panels, hardware, paints, toilet accessories, kitchen equipment, plumbing fixtures, wiring devices, lighting fixtures, and playground equipment) a booklet of data sheets may be compiled for coordinated review by A/E.
- B. No substitutions or other significant deviations from the Construction Documents shall appear or be requested in any submittal:
  1. To request a substitution, follow the General Conditions of the Contract for Construction with its time limit for such a request. In addition comply with all the requirements noted under the “Products” section of these Specifications, using the “Substitution Request Form” contained therein.
- C. Stamp, approve, and sign each submittal before transmitting to A/E. If not so checked and certified, submittals will be returned to the Contractor without being reviewed by the A/E.
- D. Provide a blank space approximately 6 inches x 4 inches in the lower right corner of each sheet in the shop drawing set:
  1. In the space the A/E’s will place their shop drawing stamp. Include the Contractor’s approval, initialed by the reviewing person who signs the accompanying Submittal form.
  2. Alternatively, a separate Contractor’s approval stamp may be added, initialed by the reviewing person who signs the accompanying Submittal form.

## 1.4 PRODUCT DATA SUBMITTALS

- A. Manufacturer's catalog cuts and other product data: Submit 8 copies of each catalog cut or eight (8) edited catalogs:
  - 1. Product data shall contain detailed information as to the materials, physical properties, coats and thicknesses, compatibility, finish, available colors, method of installing, jointing, terminations or trim, operating, energy characteristics and consumption, cleaning, and maintenance as appropriate to each product.
- B. Submittal of Color Charts or Color Chips for Selection and Coordination. Unless otherwise specified:
  - 1. Submit three (3) copies of all product color charts or boxes of color chips within sixty (60) days after start of construction to allow for selection, color coordination, and final approval by A/E. Submit producer's full range of colors and patterns, including but not limited to the standard and premium ranges of colors and patterns, unless specified otherwise.
  - 2. For architectural pre-cast concrete, cast-in-place architectural concrete, and cast stone, submit at least four (4) – 8 inch x 8 inch samples of color and texture.
  - 3. For exposed unpainted block (CMU), submit at least two (2) sets of 4x4 in. samples in producer's full color and texture range.
  - 4. For shingles, roof tiles, and siding, submit at least two (2) sets of samples in producer's full range of colors and textures.
- C. Producers' stock publications, including such items as printed product data, catalog cuts, illustrations, tables, charts, details, schematic drawings, and diagrams:
  - 1. Mark pages by crossing out information not applicable to the Work.
  - 2. Circle or highlight selections made or that identify items to be provided for this Work.
  - 3. Supplement standard information to provide information applicable to this Work.
  - 4. Failure to indicate products selected will be cause for A/E's rejection of the submittal.
  - 5. Make sure reproduced or faxed copies of submittal information are legible. Illegibility of submittal information will be cause for A/E's rejected of the submittal.
- D. Disclosure: Approval will not be given to producers who withhold information deemed essential to A/E's analysis for acceptance. In submitting product data, make full disclosure of the design and composition of the product, including such information as physical and chemical composition and characteristics, weights and thicknesses, design of components, connections/fastenings, control diagrams, wiring diagrams, and the availability of maintenance and repair service by authorized and trained mechanics.
- E. Selection samples: No individual color selections from color/texture/pattern samples will be approved before receipt of all samples, including paint, to ensure overall coordination.
  - 1. Submit all exterior color selection samples at one time.
  - 2. Submit all interior color samples, for floor, wall, and ceiling finish products at one time.

## 1.5 SHOP DRAWING SUBMITTALS

- A. A proposed "Submittal Schedule" shall be submitted to the A/E as required by General Conditions of the Contract for Construction.
- B. Shop Drawings: Submit 2 or more prints, together with a sepia or electronic "original", for each required shop drawing.

1. The number of prints shall be as agreed to by Contractor and A/E after examining project size and complexity, as well as how many tiers of subcontracts, at the initial construction meeting.
2. Advise in writing entities providing submittals of the number of copies required.
3. At the earliest possible construction meeting, agree, with A/E and various trades, on the most effective medium for making copies of the "original" and the precise number of prints for various submittals.
4. Submittal of shop drawings that require M-DCPS review and approval (such as door finish hardware / M-DCPS Lock-shop, roofing systems / M-DCPS Roofing Dept., EMS / M-DCPS Energy Management, etc.) shall be coordinated with the M-DCPS Project Manager to ensure prompt and proper handling of these submittals.

- C. Identify each shop drawing with at least the following information placed on each sheet:
1. Name of the facility and M-DPLS's project number.
  2. Name of firm preparing the shop drawing and name of Contractor.
  3. Date of drawing and any revision dates.
  4. Identification referring to exactly which Drawing and detail in the Construction Documents the shop drawing or shop drawing detail refers to. A/E may decline to review shop drawings without precise references to the Drawings.

#### 1.6 SAMPLE SUBMITTALS

- A. Submit samples of sufficient size and quantity to clearly illustrate the functional characteristics of product, its component parts, attachment devices, and operation. Submit in A/E's selection of color, texture, and pattern if known.
- B. Record samples: After selections have been made, submit record samples for each product, if and as required by A/E.

#### 1.7 FIELD SAMPLE AND MOCK-UP SUBMITTALS

- A. Erect at worksite, at a location facing southerly (southeast to southwest) with at least 40 ft of frontal viewing room, or otherwise as approved by A/E:
1. Size and area: As shown on Construction Documents.
  2. Incorporate reinforcing, accessories, and how head, jambs, sill and stools are coordinated with doors / windows / louvers and sealed against wind & water intrusion.
  3. Place on concrete foundation, elevate against mud splash, brace against overturning.
  4. Remove samples and mockups at completion of Work, as directed by the A/E.

#### 1.8 ATTACHED AS PART OF THIS SECTION

- A. Submittal form:
1. Contractor to provide attached form. This form may be reproduced, the footer deleted, and stock information (such as project name and numbers, and names and addresses of the parties) replaced with project-specific information. **Items under contractor's certification SHALL BE INCLUDED IN ALL SUBMITTALS.**

**END OF SECTION**

**SUBMITTAL FORM**

Submittal No: \_\_\_\_\_

Date submitted by Contractor to A/E: \_\_\_\_\_

**CONTRACTOR'S SUBMITTAL:** *(Submit items from only one section of Specifications at a time on this form.)*

PROJECT \_\_\_\_\_ M-DPLS Project No: \_\_\_\_\_

Specification Section: \_\_\_\_\_ Section Title: \_\_\_\_\_

Description of item: \_\_\_\_\_

Name of Producer: \_\_\_\_\_

Name of Subcontractor: \_\_\_\_\_

- Contractor's Certification:
- This submittal complies with the Construction Documents and has been coordinated with the rest of the Work
  - This submittal is a proposed Substitution (Substitution Request Form must be submitted to the A/E for M-DPLS Approval )

\_\_\_\_\_  
Signature of Contractor's officer

\_\_\_\_\_  
Print name of Contractor's officer

\_\_\_\_\_  
Date

\_\_\_\_\_  
Officer's title

\_\_\_\_\_  
Contractor's firm name

**ACTION SUBMITTALS**

Quantity

Submittal (require approval or other action)

Product data attached	_____	_____
Shop drawings attached	_____	_____
Accompanying sample(s)	_____	_____
Design or calculations	_____	_____
Statement of qualifications	_____	_____
Warranty Sample	_____	_____
Other item(s)	_____	_____

**A/E ACTION:**

**REMARKS:** \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Signature of A/E

\_\_\_\_\_  
Print name of A/E

\_\_\_\_\_  
Date

\_\_\_\_\_  
A/E Title

\_\_\_\_\_  
A/E firm name

*(The space below is for the A/E's submittal action stamp)*

**SECTION 01452  
TESTING AND INSPECTING SERVICES**

**1.1 TESTING BY M-DPLS TESTING LAB**

- A. M-DPLS will hire independent testing laboratories to perform special testing for work, such as HVAC Testing and Balancing:
  - 1. Cooperate with Test Lab as it performs its work.
  - 2. Testing by Test Lab does not relieve Contractor of its obligation under the Contract to construct and maintain quality control and Contract compliance in its Work.
  
- B. Authorizing Tests:
  - 1. In addition to required tests already specified in the Construction Documents, the A/E or M-DPLS reserves the right to designate and contract for additional quality compliance tests to be performed at its own cost.
  - 2. The contractor shall not obligate M-DPLS for additional tests without A/E's and M-DPLSs approval.
  
- C. Limitations of M-DPLS's Authorized Testing Laboratories (Independent Labs). Independent Labs are not authorized to:
  - 1. Release, revoke, alter, or expand requirements of Construction Documents.
  - 2. Approve any portion of the Work.
  - 3. Perform any duties required of the Contractor.
  
- D. Contractor's Responsibilities: Cooperate with Independent Lab personnel and provide access to work or to producer's place of fabrication:
  - 1. Cooperate and deliver to the Independent Lab adequate quantities of representative samples of products to be tested.
  - 2. Provide copies of test reports to A/E and to M-DPLS.
  - 3. Provide labor and facilities:
    - a. For access to work to be tested.
    - b. To obtain and handle samples at worksite or at the source of product to be tested.
    - c. To facilitate inspections and tests.
    - d. For storage and curing of test samples.
  - 4. Notify M-DPLS before testing operation to allow for laboratory assignment.

**1.2 ADDITIONAL TESTING BY THE OWNER**

- A. As a quality check, various products, methods and equipment will be designated for testing, then tested by M-DPLS's testing laboratory at no cost to the contractor.
  - 1. Cooperate with each Independent Lab as it performs its work.
  - 2. Employment of laboratory does not relieve Contractor of it's obligation under the Contract to construct and maintain quality control in its Work.
  - 3. The A/E and M-DPLS will designate tests to be performed.
  - 4. Obtain and deliver to Test Lab adequate quantities of samples of the products to be tested.
  - 5. Provide labor and facilities:
    - a. For access to work to be tested.
    - b. To obtain and handle samples at worksite or at source of product to be tested.

- c. To facilitate inspections and tests.
- d. For storage and curing of test samples.

### 1.3 TESTING AND INSPECTING COSTS TO BE PAID FOR BY CONTRACTOR

- A. Defective Products and Workmanship: Work that has tested defective, non performing, or non-compliant shall be corrected or reconstructed and retested at no cost to M-DPLS until defect-free as indicated in the General Conditions of the Contract for Construction.
- B. Tests Not Required in Construction Documents: Tests by Contractor for its own benefit, and ordered by contractor, shall be paid by Contractor.
  - 1. Contractor may employ M-DPLS's Testing Laboratory or may employ a separate, equally qualified independent testing laboratory, acceptable to M-DPLS and the A/E, to perform additional inspections, samples and testing the Contractor has determined to be of Contractor's benefit.
- C. Contractor shall provide water, electricity, gas, and chemicals as needed for testing at the worksite.
- D. If use of substitute products is requested by Contractor, Contractor shall pay testing costs deemed necessary by the A/E to establish compliance with the Construction Documents.

### 1.4 BUILDING CODE INSPECTOR

- A. Building Official will make periodic inspections.
- B. The Building Official or the authorized representative will inspect construction phases as required by the Florida Building Code (FBC) and the General Conditions for the Contract for Construction.
- C. Contractor shall provide the Building Inspector with access to the work, including but not limited to all areas of the construction site and field office, and shall ensure that all subcontractors and services performing work on the construction site shall cooperate with and provide access to the Building Code Inspector for the areas of work under their responsibility. Contractor shall make available to the Building Code Inspector the approved field sets of plans and specifications, As-Built documents, reviewed shop drawings and product data, and all other documentation that may be required to demonstrate compliance of construction with the Building Code. Contractor shall make accessible to the Building Inspector all areas and portions of the work being inspected, and shall provide the Building Inspector with such equipment and aids as may be needed by the Inspector to properly observe the work being inspected during the inspection, including but to limited to ladders, scaffolds, lifts, flashlights, area lighting, electric and water. Contractor shall remove all obstructions, finishes, debris and unapproved construction which prevent the inspector's full and proper observation of the area or portion of the work being inspected.

**END OF SECTION**

**SECTION 01520  
CONSTRUCTION FACILITIES AND SERVICES**

1.1 RELATED REQUIREMENTS

- A. For additional requirements in remodeling work, follow the "Summary of Work" section of these Specifications. .

1.2 OVERALL REQUIREMENTS

- A. Contractor's Use of Premises:
  - 1. If not already shown in Drawings, M-DPLS will designate a staging area in the worksite for the Contractor's use. Maintain the area in a clean and organized manner.
- B. During construction and the correction / warranty phases provide:
  - 1. Temporary Structures: Provide offices, storage and work sheds (or trailers), and service vehicles. Supply, install, and maintain during construction and correction of the Work.
    - a. Before installing offices and sheds, obtain approval of A/E and M-DPLS as to the number, size, design, furnishings and equipment, location, access, plumbing, HVAC, electrical, communications, and security provisions for each type of unit.
  - 2. Fences and Barriers: Provide as needed to prevent unauthorized entry and to protect the facility's occupants, the Work, staging area, existing facilities, and landscaping from construction and related operations.
  - 3. Construction Aids: As needed to facilitate construction.
  - 4. Construction Services: As needed for cleanliness and order.
- C. Comply with applicable requirements shown elsewhere in the Contract Documents:
  - 1. Materials may be new or used, and shall suitable for the intended purpose.
  - 2. Comply with requirements of FBC, Authorities Having Jurisdiction (AHJ), and other regulations.
  - 3. Locate and relocate construction aids as needed for construction progress, storage, and needs of others, such as M-DPLS and other contractors employed by M-DPLS at the worksite, also using the staging area as appropriate.
  - 4. Maintain facilities and equipment in good, operable/usable condition.
- D. Year Round Hurricane Precautions: Provide appropriate tie-downs for trailers, field offices, sheds, and other staging area vehicles and equipment to be capable of withstanding wind velocity pressures following American Society of Civil Engineers (ASCE):
  - 1. Submit to the A/E calculations and connection details, signed and sealed by a Florida registered Professional Engineer, using wind velocity pressure values for the specific structure according to the ASCE 7 edition adopted by the FBC applicable to the Project.
- E. Remove construction aids when no longer needed for the work. Remove foundations and underground installations installed for construction aids, including casting beds for tilt-up panels and gravel beds for parking. Repair damage caused by installation and use of construction aids.



### 1.3 CONSTRUCTION PROJECT SIGN

- A. Furnish, erect, and maintain signs as required by applicable safety regulations or as necessary to safeguard life and property.
- B. Before the construction project sign is accepted by the A/E as to size, design, type, location, and local regulations, Contractor and subcontractors may erect temporary signs for purposes of identification and controlling traffic.
- C. Upon starting construction, provide an 8'-0" x 8'-0" project sign as required by M-DPLS

### 1.4 FIELD OFFICES AND SHEDS: (if required for this project)

- A. Construction:
  - 1. Structurally sound, weathertight, with floor raised aboveground.
  - 2. Temperature Transmission Resistance: Compatible with human occupancy and storage requirements.
  - 3. At Contractor's option, portable or mobile buildings may be used. Mobile homes, when used, shall be modified for field office use.
- B. Contractor's Field Office: (if required for this project)
  - 1. Size as required for general use and to provide space for project meetings.
  - 2. Services:
    - a. Lighting: 50 foot-candles at desk-top height.
    - b. Exterior lighting at entrance door.
    - c. Automatic heating and cooling equipment to maintain 70 to 75 °F.
    - d. At least six 110 V duplex electric outlets, with 1 or 2 each wall of major spaces.
    - e. Electric Distribution Panel: Two circuits minimum, 110 volt, 60 Hz service.
    - f. Drinking water and toilet facilities.
    - g. Telephone: Direct line instrument.
    - h. Photocopier available for use by M-DPLS and A/E.
    - i. Facsimile machine available for use by M-DPLS and A/E.
    - j. Two wireless 2-way communication devices for use by M-DPLS.
    - k. Mount thermometer at a convenient outside, continuously shaded location.
  - 3. Meeting Area Furnishings:
    - a. Conference table and chairs for at least 8 persons.
    - b. Racks and files for Project Record Documents in or next to the meeting area.
    - c. Other Furnishings: Contractor's Option.
    - d. Provide electrical, lighting, and telephone services as necessary.
  - 4. One 10-inch (250 mm) outdoor-type thermometer.
- C. M-DPL's Field Office: Provide an adjacent air-conditioned and heated field office space. (if required for this project)
  - 1. Arrange space to allow separation and privacy by means of a lockable door.
  - 2. A minimum area of 120 square feet of space, adequately lighted, with electrical service and receptacles for normal office aids.
  - 3. Furnishings: Include one secretarial type desk and chair, one table approximately 3 feet by 6 feet, one lockable 4-drawer letter size file cabinet, and a vertical blueprint rack.
  - 4. Provide a desk telephone in M-DPLS's office for M-DPLS's exclusive use.
  - 5. Provide direct line telephone service and DSL service at the construction site as follows:

- a. One direct line telephone for A/E, and Board.
- b. One direct fax line for A/E, and Board.
- c. Other instruments at Contractor's option, or as required by law.
- d. Contractor shall pay costs for installation, service charges, maintenance, removal, including charges for local calls and DSL.
- e. New mid-range desktop computer complete with 19" flat screen monitor and keyboard, which will become the property of M-DPLS.
- f. Six (6) hardhats for sole use by Board personnel.

- D. Storage Sheds: Provided as needed for various subcontractors or trades.
1. Dimensions: Adequate for storage and handling of products.
  2. Ventilation: Comply with specified and code requirements for products stored.

#### 1.5 USE OF PERMANENT FACILITIES IN PLACE OF FIELD OFFICES AND SHEDS

- A. Permanent facilities, enclosed, habitable, and with operable mechanical and electrical facilities, may be used as offices located in the building.
1. Consult with A/E and M-DPLS regarding permission for use of selected areas within the building.
  2. Provide specified furnishings, equipment, and services as for field offices and sheds, unless some of these items are made available by arrangement with the host facility.

#### 1.6 INSTALLATION AND OPERATION OF FIELD OFFICES AND SHEDS

- A. Fill and grade sites for temporary structures to provide surface drainage without ponding.
- B. Construct, or set portable, temporary field offices and sheds on proper foundations within staging area. Provide connections for utility services.
1. Secure temporary structures against break-ins and hurricane winds.
  2. Provide intrusion alarm system reporting 24/7 to a central monitoring service approved by the A/E and M-DPLS.
  3. Provide slip-resistant steps and landings at entrance doors.
  4. Provide an ADA-compliant ramp leading to room used for construction meetings.
  5. Provide an ADA compliant restroom adjacent to the room used for construction meetings.

#### 1.7 VEHICLE AND EQUIPMENT PARKING

- A. Contractor Parking: Within the assigned construction staging area, provide space for construction vehicle and equipment parking for the Contractor and all tiers of Subcontractors, suppliers and service personnel, and visitors. Construction workers shall be directed to park their personal vehicles in the staging area when room is available for them; if insufficient room is available in the staging area for the parking of construction workers' vehicles, workers shall be directed to park their vehicles off of the library site and so as not to obstruct or interfere with traffic and library operations and vehicles, including (but not limited to) library busses and parents' vehicles that are dropping off or picking up students. The Contractor shall be responsible for monitoring and policing the off-site parking of construction workers and making sure that no workers park improperly or drive their vehicles to and from the library area in a manner that presents a danger to the public.

- B. A/E and M-DPLS Parking: Within the staging area, provide 2 to 3 reserved spaces for A/E, Building Inspector's and M-DPLS vehicles.
- C. Provide crushed rock of sufficient thickness to prevent mud and rut formation at all vehicle parking spaces and their access lanes. Also provide crushed rock at parking locations for equipment that is frequently used, in order to keep staging area mud and rutting to a minimum. **All staging areas to be aerated and sodded at end of construction, no seeding will be allowed.**

#### 1.8 FENCES AND BARRIERS

- A. Fences: (as required)
  - 1. Before start of work, enclose the worksite with chain link fence at least 6 ft. high, with multiple gates, all approved as to type, number and location by A/E and M-DPLS:
    - a. Locate fences to enclose construction areas and construction staging area. Construction parking may be included only if approved by A/E and M-DPLS.
    - b. Provide vehicle gates as needed for construction and access to existing facility and parking. Do not interfere with existing traffic patterns.
    - c. Provide pedestrian gates as needed to provide controlled entry of construction personnel and other persons.
- B. Provide barriers, new or used, as needed:
  - 1. Vehicle barriers: Concrete jersey barriers, movable.
  - 2. Maintain and relocate barriers as needed during construction.

#### 1.9 TEMPORARY AIR-CONDITIONING AND VENTILATING

- A. Provide air-conditioning and ventilation as needed to:
  - 1. Maintain adequate environmental conditions to facilitate progress of the Work.
  - 2. Meet specified minimum temperature, humidity and air circulation conditions for the installation of each material.
  - 3. Protect materials and finishes from damage due to temperature, moisture, drafts or humidity.
  - 4. Provide adequate forced ventilation of enclosed areas for curing of installed materials, to disperse humidity, or to prevent hazardous accumulations of dust, fumes, vapors, and gases.
  - 5. Pay costs of installation, maintenance, operation, removal, and for energy/fuel consumed.

#### 1.10 CONSTRUCTION AIDS

- A. Provide scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, casting beds for tilt-up panels, insect and rodent control, sanitary facilities and services, and other equipment, aids and services as needed to construct and correct the Work and to protect site, construction and the public.
- B. Keep construction aids in good condition, clean, with warnings to protect occupants and public, and remove when no longer needed.

#### 1.11 CONSTRUCTION SERVICES

- A. Protect the work and the site from infestations, such as from rodents and insects.

## 1.12 CLEANING, MAINTENANCE, AND REMOVAL

- A. Provide periodic cleaning and maintenance for field offices and sheds, barriers, fences and construction aids. For building cleaning and waste management, see Section "Waste Removal and Cleaning" of these Specifications.
- B. Remove field offices and sheds, barriers, fences and construction aids when no longer needed, at time each removal is approved by A/E and M-DPLS:
  - 1. Remove foundations and debris, grade site to specified elevations, and complete remaining site work indicated on Construction Documents.
  - 2. Clean and repair damage caused by installation or removal of construction facilities.
  - 3. Re-grade so as to properly drain, compact the fill, and sod the areas that remain after removing tilt-up panel casting beds, concrete spillage, and after filling tracks and ruts left by tilt-up and other equipment.

## 1.13 ADDITIONS, RENOVATIONS AND REMODELING

- A. In addition to the requirements specified above, provide the following construction facilities and services when adding to, renovating or remodeling an existing facility.
- B. Contractor's Use of Premises:
  - 1. The M-DPLS will designate an on-site area for the Contractor's use. Maintain in a clean and organized manner.
  - 2. Remove excess materials from the site after the completion of each sequence or phase of construction.
  - 3. Remove debris and clean areas of the building and project site containing construction materials, debris, and spills on a daily basis to the satisfaction of M-DPLS. Dispose using covered rubbish containers.
  - 4. Be responsible for the security of materials and equipment stored on-site. Maintain the safety of persons in and surrounding the project site.
  - 5. Before Substantial Completion, repair and return the designated on-site area to its original condition or to its revised use to the satisfaction of A/E and M-DPLS.
- C. Sequencing and Scheduling: Work performed on library holidays or weekends shall be at no additional expense to M-DPLS, except when approved by M-DPLS:
  - 1. The sequence of delivery and storage of materials shall comply with M-DPLS's restrictions for use of the site.
  - 2. Coordinate and schedule the Work to ensure deliveries are not obstructed or delayed. The sequence and scheduling of this Work require acceptance by M-DPLS and the A/E.
- D. Work Restrictions:
  - 1. Demolition:
    - a. Perform demolition in a manner to minimize noise, dust, time of disruption, and safety hazards.
    - b. Perform demolition during hours agreed to by M-DPLS.
    - c. Drill or cut concrete and masonry in such manner as to avoid reducing load bearing capacities of structural elements and to avoid mechanical and electrical services that may be concealed or built into these materials.
  - 2. Safety: Supply and maintain safety signage, barriers, and construction aids. Conduct work in such manner as to maintain the safety of the building occupants.
  - 3. Schedule Work with M-DPLS and the A/E.

4. Food Preparation, Food Storage, Food Serving Areas:
    - a. Avoid all work in these areas during occupancy by kitchen staff or students. Verify times of kitchen staff and student use of these areas with M-DPLS and A/E.
    - b. At the end of each workday, leave these facilities in a sanitary and operational condition.
    - c. Use only cleaning products and methods accepted by M-DPLS.
  5. Railings, Guardrails, and Stairs: Avoid work on or near these areas when they are occupied by visitors or staff.
  6. Occupied Spaces: Schedule Work with M-DPLS and A/E to minimize the number of spaces interrupted during any work period.
  7. Ceilings:
    - a. Remove existing ceiling construction as required for the installation of mechanical and electrical work or to allow working room for the installation of new walls.
    - b. If scheduled to be reused, carefully remove and set aside existing light fixtures. Maintain in original condition or refurbish for subsequent reinstallation according to Construction Documents. Reinstall light fixtures at appropriate time.
    - c. Provide new ceiling materials to match existing ceilings damaged during construction. Provide new light fixtures in locations as noted on Drawings.
    - d. New work shall match existing texture, color, pattern, construction, type, and quality of finish. Where repainting is required, repaint the entire affected ceiling surface – spot repainting is not acceptable.
- E. Coordinate the following with A/E and M-DPLS:
1. Do not interfere or disrupt the use of the facility during electrical, fire alarm, detection systems, or intercommunication system work.

**END OF SECTION**

## **SECTION 01600 PRODUCTS**

### **1.1 DEFINITIONS OF TERMS USED IN THE CONSTRUCTION DOCUMENTS**

- A. Product: Material, item of equipment, accessory, component, fabrication, assembly, sub-system, or system to be installed in the Work, including instructions for installation, operation and maintenance, or correction or replacement if defective:
  - 1. Products include such items as connections, support, fastenings, casings, finish, hardware, accessories, trim, wiring, hookup, controls, and testing.
- B. Producer: Provider, manufacturer, fabricator, including, where cited, the producer's representatives, trainers, product designers / engineers, and authorized distributors.
- C. Substitution: A change, other than a minor deviation, in a product or its installation from what is shown in the Construction Documents. See General Conditions of the Contract for Construction for details:
  - 1. Substitution request. Documented proposal by Contractor to change a product.
  - 2. Deviation: A minor change submitted for A/E review. See "Submittals" Section of these Specifications for details.

### **1.2 AUTHORITY OF REFERENCED STANDARDS**

- A. Follow the specified issue or revision date of each reference standard:
  - 1. When more stringent requirements than those made by the standard are specifically required by FBC (Florida Building Code), comply with FBC.
- B. For products or workmanship that are specified in part or wholly by reference standards, follow the standard(s), except: when the specified description of a product is more stringent or detailed than the (usually more generic) requirements of a standard:
  - 1. The specified standard for a product will be enforced over the specified or unspecified properties of a named producer's brand. If a choice must be made between following the standard or the brand, follow the standard.
- C. Method of Specifying Products: In these Specifications each product is specified by its:
  - 1. Description.
  - 2. Referenced standard(s).
  - 3. Product name and its producer.or by one, two or all of these methods but always in that order of precedence.
  - 4. Additional requirements are added where applicable, such as required performance or the location of the product in the Work.
- D. Priority of Description over Standards: In case of disagreement, the specified description of each product takes precedence over provisions in a standard:
  - 1. The governing standard shall be the edition of that standard as listed in the edition of the FBC applicable to the project.
  - 2. If the referenced standard is not listed in FBC, the edition of that standard indicated in the Specifications shall govern, provided that the standard does not conflict with other requirements of the FBC.

- E. Priority of Description over Product / Producer: The specified description of each product takes precedence over producer names, product brand names, and producers' catalog numbers:
  - 1. Also, if there is conflict between any aspect of named producer's brand and a provision of the referenced standard(s), the referenced standard (s) shall govern. If a choice must be made between following the brand or standard, follow the standard.
- F. For convenience in communicating the design intent of the Construction Documents, certain products may be designated by a brand or trade name or the name of the producer, together with catalog number or other identifying information:
  - 1. Where two or more products/producers are specified by name, the Contractor has the option of furnishing any one of the named product brands.
  - 2. If, the Contractor wishes to propose an alternative product, it shall then describe the product it proposes by means of a fully executed Substitution Request Form, (as attached to this section). The Contractor must receive approval from M-DPLS on the Substitution Request Form, to order or install the Contractor's proposed substitute product.
  - 3. For products specified by naming two or more products / producers without the words "or equal", "or equal in quality and performance as approved by A/E and M-DPLS", or similar language, The Contractor has the option to select, but to not to substitute.
- G. Options Available to Contractor:
  - 1. Where products are specified by reference standard only, Contractor may select any product it deems to comply with the requirements of the standard. Submit name of selected product and producer for review by A/E and M-DPLS.
  - 2. Single source. Where one product/producer is specified, furnish that product, as described, unless a substitute is approved following Contractor's submittal of a fully executed substitution request.
  - 3. Do not request substitutions as part of a required submittal. The substitute product must be approved by the A/E and endorsed by M-DPLS prior to the required submittal.
- H. No Substitution: When one product/ producer is specified, followed by "No substitution", or similar wording, provide that product alone unless its unavailability can be documented on the Substitution Request Form contained in this section of the Specifications.
- I. Basis of Design Specification: Where a specific producer's product is termed "basis of design" along with its type, model or other distinguishing properties, that product can be used in the Work, along with other products that the Contractor can demonstrate to be equal in quality, appearance and performance. Approval will be given upon submittal of product data and shop drawings or sample, for review and acceptance by A/E and M-DPLS.

### 1.3 SUBMITTALS

- A. Products List: Within 20 days after NTP date, submit to A/E and M-DPLS a list of specified products to be provided, with the name of each producer and subcontractor or installer as indicated in Schedule of Values.
- B. If a Materials Safety Data Sheet (MSDS) is specified for submittal, it is only to confirm to A/E and M-DPLS that product ingredients follow the Specifications, and not to relieve the Contractor of its responsibility to enforce safety in the Work. MSDS will not be reviewed or approved by the A/E or M-DPLS.

1. Substances that may be hazardous: The law requires that an MSDS for each product be obtained by the Contractor and made available to workers and building occupants. In educational facilities, comply with the requirements of FBC 423.6.2, Contractor toxic substance safety precautions: "When hazardous chemicals as defined by 29 CFR 1910.1200, OSHA Hazard Communication Standard, are to be used during the maintenance, renovation, remodeling, or addition to an existing facility, the contractor shall notify the administrator in writing at least three working days before any hazardous chemical is used. The notice shall indicate the name of each of the hazardous chemicals to be used, where and when they will be used, and a copy of a Material Safety Data Sheet (MSDS) for each hazardous chemical. The contractor shall comply with the safety precautions and handling instructions set forth in the MSDS. Copies of hazardous waste manifests documenting disposal shall be provided to the facility's administrator who will notify occupants of the anticipated presence of toxic substances during the maintenance, renovation, remodeling, or addition to an existing facility."

#### 1.4 SELECTING APPEARANCE FEATURES

- A. All products are subject to selection by the A/E for appearance features. The term "appearance feature" includes such qualities as color, style, texture, pattern, and accent colors:
  1. An "accent color" is a differing color that is used for inserts, bands or borders in any selected "field color"; it is also the second color in a pattern, such as a checker M-DPLS pattern.
  2. In addition, numerous products – such as wood, glass, tile, carpet, wall and ceiling finishes, paint, coatings, casework, trim, elevator cars, equipment finishes, and mechanical / electrical fixtures – require that either one selection be made by the A/E for each space, or – at no addition to the Contract Sum – multiple selections be made by the A/E for:
    - a. One or several appearance features throughout multiple spaces;
    - b. One or several appearance features within a space;
    - c. One or several appearance features at the exterior of a building.
- B. Provide products that follow the A/E's selection of appearance features at no increase in the Contract Sum for each product that is submitted by the Contractor for approval.
- C. Samples for Selection: Selection samples shall be submitted for selection
  1. Submit color selection samples covering the full line of appearance features that are available without special order or custom production, unless otherwise specified in the Contract Documents.
  2. In the case of paint and coatings, each color in a producer's book of samples shall be considered standard.
  3. Include for appearance feature selection all interior and exterior products:
    - a. That possess features that are visible in the finished work and,
    - b. That are not products usually left in their natural state (such as stainless steel, glass, and bituminous products).

#### 1.5 TIMELY PROCUREMENT BY CONTRACTOR

- A. Schedule and place orders for products early to ensure delivery in time for installation following the Construction Schedule. Place critical "order" and "deliver" times on the Schedule and monitor as required to avoid delays in delivery.



- B. Place all product orders early enough that delivery delays and product unavailability does not occur. No increase in Contract Time will be approved because of the Contractor's failure to analyze its needs well in advance of product delivery.
- C. Track products with availability or delivery problems on the Construction Schedule and take actions to expedite.

#### 1.6 DELEGATED DESIGN

- A. Where custom or further detailed design of a product is required in the Construction Documents, A/E will provide performance and design criteria as needed for the Work:
  - 1. The Contractor's design professional shall provide the services of a Florida-licensed Architect or Engineer for the delegated design task.
  - 2. The Contractor's design professional shall provide the delegated design of the system, assembly, component, or item of equipment. Signed and sealed shop drawings complete with any required engineering calculations shall be submitted for acceptance by M-DPLS's and A/E.
  - 3. If M-DPLS's A/E accepts the delegated design, it shall be only for the limited purpose of checking the Contractor's design professional's conformance with information given and the design concept as expressed in the Construction Documents.
  - 4. The A/E and M-DPLS are entitled to rely on the adequacy, accuracy and completeness of the services and certifications provided by the Contractor's design professional.
  - 5. The Contractor and its design professional shall promptly notify the A/E of missing performance and design criteria in the Construction Documents.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products so as to prevent damage, deterioration and theft. Follow each producer's instructions.
- B. Deliver products to worksite in undamaged condition, in sealed shipping containers or palletized and wrapped, labeled, with instructions for handling, storing, protecting, installing, and cleaning.
  - 1. Schedule delivery to not delay work and to keep on-site storage period short.
  - 2. Inspect delivered products to ensure Contract compliance, including no damage and proper protection.
- C. Store products away from moisture and protect them so that deterioration, deformation, and mold cannot develop. Reject and dispose of damaged wet or moldy products immediately.
- D. Store products so as not to overload structure or interfere with other work:
  - 1. Protect from rain and dew by storing products in building, or outside under waterproof covers, secured against wind and theft, at top and all sides. Elevate to protect from flooding, moisture and rusting, and to promote air circulation under cover.
  - 2. Protect light-sensitive products against deterioration.
  - 3. Protect temperature-sensitive products against excessive heat, freezing, melting and decomposition.
  - 4. Store, secure and shelve products so that identifying, accessing, and assembling can proceed with security, accuracy and in good light.
  - 5. Maintain products and equipment by desiccating, lubricating, treating for rust, and periodically turning over or rotating, as applicable.

- E. Coordinate and work with the A/E and M-DPLS to designate suitable and adequate storage locations for both construction products and existing and N.I.C FF&E items.

## 1.8 PRODUCT SUBSTITUTIONS

- A. Product Substitutions: Should Contractor find a compelling reason to use a material, equipment, product or system other than specified, Contractor shall secure from M-DPLS through A/E, written approval for the use of the alternative material, equipment, product or system following the General Conditions of the Contract for Construction:
  - 1. Submit and fully document any request for a substitute product or installation procedure using the Substitution Request form attached as part of this section.
  - 2. Contractor shall make such Request for Substitution, in writing, not later than ten **(10) days after the NTP** of the Contract and before ordering any materials requiring approval. M-DPLS is not obligated to consider Requests for Substitution or re-submittal of previously rejected substitutions after the foregoing ten(10) day period.
- B. **After the 10-day period has elapsed, the only substitution requests that may be considered by M-DPLS are for documented unavailability. Failure of Contractor to order in time to meet the Construction Schedule will not be considered.**
- C. A request for substitution of a product may be considered by the A/E and M-DPLS only after the Contractor has performed the following:
  - 1. Has investigated the proposed product and determined it is equal or superior to the specified product, giving the name and address of a similar installation.
  - 2. Provides an explanation and justification that the product to be provided as the substitution is equal or superior in quality and performance, including durability, appearance, ease of maintenance and resistance to vandalism and hurricanes.
  - 3. Provides an explanation that the proposed product is compatible with adjacent products.
  - 4. States that the use of the proposed substitutions will create no change, or a reduction, in Contract Time and Contract Sum.
  - 5. Agrees to provide same or better warranty for the proposed product substitution as for the product specified.
  - 6. Agrees to be responsible for coordinating and installing the substitution, including fit and needed clearances.
  - 7. Agrees to pay for any necessary changes to other work required by the substitution.
  - 8. Agrees to pay costs, for A/E's services required to revise the Construction Documents, for all work impacted by the substitution and make the Work complete and to function properly.
  - 9. Waives all claims for additional costs in the Work that may subsequently become apparent and attributable to the Contractor's request for substitution.
  - 10. Provide samples when requested by A/E.
- D. The burden of proof as to the comparative quality or suitability of proposed substitute products shall be on the Contractor.
- E. The decision of A/E and M-DPLS whether to accept or reject each substitution request shall be final.

## 1.9 ATTACHED AS PART OF THIS SECTION

- A. Substitution Request form:

1. This form may be reproduced, the footer deleted, and stock information (such as project name and numbers, and names and addresses of the parties) replaced with project-specific information.

**END OF SECTION**

**SUBSTITUTION REQUEST FORM**

Substitution Request No. \_\_\_\_\_

Date Received by the A/E: \_\_\_\_\_

**CONTRACTOR'S REQUEST AND SUPPORTING INFORMATION**

PROJECT: \_\_\_\_\_ M-DPLS Project No. \_\_\_\_\_  
Specification Section & Paragraph: \_\_\_\_\_ Section Title: \_\_\_\_\_  
Description of item in Contract: \_\_\_\_\_

**TIME OF REQUEST**

Date of Award of Contract: \_\_\_\_\_  
Days from Contract Award to Request: \_\_\_\_\_

**SUPPORTING DOCUMENTS ATTACHED**

Product data  yes  no  
Sample(s)  yes  no  
Cost Comparison  yes  no  
Drawings  yes  no  
(Drawings shall convey information that will appear when shop drawings are submitted for approval.)

REASON FOR REQUEST: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SUBSTITUTE PROPOSED**

Name: \_\_\_\_\_ Model: \_\_\_\_\_  
Finish: \_\_\_\_\_  
Producer of substitute: \_\_\_\_\_ Phone: \_\_\_\_\_  
Installer of substitute: \_\_\_\_\_ Phone: \_\_\_\_\_  
How substitute is different from specified product: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Existing similar installation: \_\_\_\_\_  
Address of installation: \_\_\_\_\_  
Owner of installation: \_\_\_\_\_ Phone: \_\_\_\_\_

**CONTRACTOR'S CERTIFICATION**

Proposed substitute has been investigated and it is equal or superior to specified product.  yes  no  
Contractor & producer will provide same warranty terms as required for specified product.  yes  no  
Equal maintenance service and parts are available equal to specified product.  yes  no  
Proposed substitute will not delay construction schedule.  yes  no  
Proposed substitute does not affect dimensions, fit, or clearances.  yes  no  
Proposed substitute will have no adverse effect on other work.  yes  no  
Cost comparison is complete.  yes  no  
Surrounding work will be altered to accommodate substitute, at no cost to M-DPLS.  yes  no  
Contractor will credit M-DPLS for A/E fees to redesign and administer changes in work caused by proposed substitution.  yes  no

\_\_\_\_\_  
Signature of Contractor's corporate officer

\_\_\_\_\_  
Print name of corporate officer

\_\_\_\_\_  
Corporate officer's title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Contractor firm name

\_\_\_\_\_  
Address

\_\_\_\_\_  
Contractor phone

\_\_\_\_\_  
Contractor e-address

**SUBSTITUTION REQUEST FORM**

M-DPLS Project No. \_\_\_\_\_

Substitution Request No. \_\_\_\_\_

**FINDINGS OF A/E AFTER REVIEW**

- Request made within time permitted by General Conditions.  yes  no
- Original specified product is unavailable.  yes  no
- Comprehensive supporting documents are acceptable.  yes  no
- Reason for substitution request is acceptable.  yes  no
- Proposed Substitute is equal or better than specified product.  yes  no
- Proposed producer of substitute is acceptable.  yes  no
- Proposed substitute is aesthetically acceptable.  yes  no
- Proposed substitution durability and life cycle cost are acceptable.  yes  no
- Proposed substitution installation elsewhere examined and found acceptable.  yes  no
- No addition will be made to Contract Sum for proposed substitute.  yes  no
- No addition will be made to Contract Time for proposed substitute.  yes  no
- Proposed substitution addition to Contract Sum found to be acceptable.  yes  no
- Credit for proposed substitution found to be acceptable.  yes  no
- Proposed substitution addition to Contract Time found to be acceptable.  yes  no
- Proposed substitute does not require design revisions.  yes  no
- Other reasons to recommend approval or rejection of substitution request:

\_\_\_\_\_

**A/E RECOMMENDATIONS**

- Recommend Rejection of Request (See Remarks)  Recommend Approval
- Recommend Request Returned due to Incompleteness (See Remarks)
- Recommend Request Returned stating other steps to take for Acceptance (See Remarks)

**REMARKS:**

\_\_\_\_\_

Signature of A/E	Print name of A/E	Date
A/E's Title	A/E firm name	

**M-DPLS ACTION**

- Request Rejected  Substitution Approved
- Return Request; Submittal Incomplete (See Remarks) (Change Order must be
- Return Request, Instructions to submit another product approved for any change
- to contract cost or time.)

**REMARKS:**

\_\_\_\_\_

Signature of M-DPLS Project Manager	Print name	Date
Signature of Facilities Design & Standards	Print name	Date

## SECTION 01 62 00

### 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 Notice to Proceed (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 the Miami-Dade Public Library System (MDPLS) and Engineer of Record EOR may be furnished. A request must be submitted to the MDPLS as required for substitutions, for acceptance of products not specifically named.
  - 3. **Approve Equal:** Where named products or sources are accompanied by the term "or 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 Section 01 62 00 – Substitutions and Product Options, 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 MDPLS 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 Library System. MDPLS 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 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 submittal 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:**

- A. Work under this section will not be separately measured for payment.

**5.01 PAYMENT:**

- A. No separate measurement or payment will be made for this section and it will be paid for as part of the overall contract lump sum.

**END OF SECTION**



**SECTION 01700  
EXECUTION AND COORDINATION**

**1.1 INTERPRETATIONS AND COORDINATION OF THE CONSTRUCTION DOCUMENTS**

- A. Where a discrepancy occurs between large scale Drawings and small scale Drawings, or within a document itself, the use of the item or arrangement of better quality, greater quantity, or higher cost shall be included in the contract price or the GMP (exclusive of the owner's contingency) unless otherwise directed by the A/E and the M-DPLS in writing. The A/E interpretations and directions shall be final:
1. Engineering drawings are diagrammatic and show general arrangement of systems in the Work.
  2. Follow Drawings in laying out Work and coordinate drawings of various trades involved in the Work. Verify space sizes and clearances as suitable to receive each item of work. Compare and coordinate Drawings and dimensions before laying out work.
  3. Notify A/E if space, layout or fit conditions appear inadequate before executing work. If directed by A/E, make reasonable modifications in layout as needed to prevent conflict in the work or to allow proper execution of Work at no cost to the M-DPLS.

**1.2 CONTRACTOR'S USE OF PREMISES**

- A. Continuity of library activities: If work required under this Contract adjoins areas housing library activities, establish work procedures acceptable to M-DPLS. Arrange, with A/E and M-DPLS, for:
1. Site access, deliveries, parking, staging, and proper storage and protection of products and equipment.
  2. Permitted hours and levels of noise.
  3. Protection of life and property.
  4. Removals of any type from building(s) and site.
- B. Contractor's Use of Premises:
1. M-DPLS will designate a site area for Contractor's use. Keep clean and organized.
  2. Remove excess materials from site after completion of each phase of construction.
  3. Remove debris and clean areas of the building and project site containing construction materials, debris, and spills on a daily basis. Dispose using covered rubbish containers.
  4. Be responsible for the security of materials and equipment stored on-site. Maintain the safety of persons in and surrounding the project site.
  5. Before date of Substantial Completion, repair and return the designated worksite area to its original condition or to its revised use as indicated in the Construction Documents.
- C. Security: The Contractor shall provide at no additional cost to M-DPLS, a watchman's service or other means of security acceptable to M-DPLS, to achieve a reasonable level of security for the project based on local and existing conditions.
- D. Work Restrictions:
1. Demolition:
    - a. Perform demolition in a manner to minimize noise, dust, time of disruption, and safety hazards.
    - b. Perform demolition during hours agreed to by M-DPLS.

2. Safety: Supply and maintain safety signage, barriers, and construction aids. Conduct work to maintain the safety and security of the building occupants.
  3. Schedule Work with M-DPLS and the A/E.
  4. Occupied Spaces: Schedule Work with M-DPLS and A/E to minimize the number of spaces interrupted during any work period.
  5. Items scheduled to be reused, shall be carefully removed, set aside and protected. Maintain in original condition or refurbish for subsequent reinstallation according to Construction Documents. Reinstall the items at the appropriate time to prevent them from being damaged by other work.
- E. Sequencing and Scheduling: Work performed on library holidays or weekends shall be at no additional expense to the M-DPLS:
1. The sequence of delivery and storage of materials shall comply with M-DPLS's restrictions for use of the site.
  2. Coordinate and schedule the Work to ensure deliveries are not obstructed or delayed.
- F. Coordinate the following with A/E and M-DPLS:
1. Work in or affecting custodial, storage and toilet areas.

### 1.3 MEASURING

- A. Take on-site dimensions and coordinate them with dimensions shown or implied by Construction Documents and with product sizes to be ordered or fabricated. Where fabrication, fit, clearances or access will be affected by new or existing conditions, verify existing dimensions and obtain instruction from A/E where conflicts or discrepancies are found.

### 1.4 COORDINATION

- A. Coordinate the Work in areas where many materials or a great deal of equipment must fit together to ensure that the work can be performed as indicated in the Contract Documents.
- B. Submit and obtain review of shop drawings that are required by Construction Documents.

### 1.5 UTILITY SHUT-OFF

- A. Planned Shutoff: Notify M-DPLS, by letter through the A/E, at least 2 weeks before required shut-off of any utilities, security systems, fire protection, life safety, or energy management systems or equipment. Notify the A/E and M-DPLS in a timely manner so that it does not negatively affect the schedule. Do not proceed with the shut-off without written approval from the M-DPLS's Project Manager and the authorities having jurisdiction:
1. Letter shall state date, time, and duration of shut-off. Protection of water and heat-using equipment shall comply with the following:
    - a. Immediately before water shut-off, coordinate with M-DPLS for the electrical shut-off to water heaters, boilers, cooling towers and other equipment damaged by lack of water.
    - b. Upon restoration of water supply, coordinate with M-DPLS re-energizing water and heat-using equipment.
- B. Make immediate shut-off without notice if life or property is endangered.

- C. Emergency Shut-Off: In case of a need for unplanned cutoff during evenings, weekends, holidays, or other times when A/E or M-DPLS is not immediately available, contact:
  - 1. M-DPLS's Project Manager.
  - 2. Affected public utilities and authorities having jurisdiction.

## 1.6 ENVIRONMENTAL CONDITIONS

- A. Environmental Conditions: Install work in temperature, moisture, and weather conditions which ensure good performance. Maintain proper temperature, humidity, and protection until cured or protecting work is complete.
- B. Provide necessary temporary ventilation fans, power, temporary heat, temporary lighting, temporary power outlets or place air-conditioning systems in operation at appropriate locations to provide proper humidity and temperature conditions for installation or application of flooring, paint, coatings, acoustical ceilings, and any other items requiring climate control or any other means acceptable to A/E and M-DPLS.

## 1.7 BEFORE INSTALLATION

- A. If product submittals are required by the contract documents, do not install the product without referring to a copy of the approved submittal.
- B. Install all products following the approved submittals except where the Construction Documents make more stringent requirements.
- C. Inspect each product before installing. Reject worn, damaged, off-color and defective items.
- D. Installer of each part of the Work shall inspect substrate and surrounding conditions and report unsatisfactory conditions to Contractor. Do not start work until unsatisfactory conditions have been corrected.
- E. Prepare substrates for proper performance of each item of work to be installed. Follow producer's recommendations and good practice for each item.

## 1.8 INSTALLATION AND CONSTRUCTION QUALITY

- A. Workmanship: Install work level, square, smooth and uniform, as appropriate to each product.
  - 1. Provide uniform joint widths in exposed work, aligned for good visual effect.
  - 2. Install work level, square, smooth and uniform, as appropriate to each product.
  - 3. Refer questions of visual effect to A/E for decisions.
- B. Scheduling: Sequence the speed and order of construction so as not to overload structure, contaminate clean work by dirty work, crowd of trades during installation, cause excessive downtime or interference with library traffic, or result in improper curing of both substrates and the finishes applied over them. Sequence work to avoid having to tear out wrongly sequenced, uninspected or untested work.
- C. Group Pipes: Cluster pipes and conduit to reduce clutter, to group lines that serve similar functions and to ease identification.

- D. Inspection: Contractor shall inspect all work and shall replace or repair defects before continuing work or covering up. Do not enclose or cover up mechanical and electrical work until testing and inspections by installing trades, Contractor and public utilities are complete. Notify authorities having jurisdiction of the readiness of each part of the work for inspection.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Arrange deliveries of products according to construction schedules. Avoid conflicts with work, site conditions, and library operations, if applicable.
  - 1. Schedule product delivery for minimum storage time at the site.
  - 2. Products shall be delivered in undamaged condition, in manufacturer's original containers or packaging, and with identifying labels intact and legible.
  - 3. Immediately upon delivery, inspect shipments to ensure compliance with Construction Documents and approved submittals. Verify products are not damaged.
- B. Handling: Transport and handle products by methods that avoid product damage.
  - 1. Deliver dry in undamaged condition in manufacturer's unopened container or packing.
  - 2. Handle products without soiling or damaging.
- C. Storage Locations: Before starting work, obtain from the A/E and M-DPLS assignment of space for temporary staging of materials, location of equipment and temporary structures.
  - 1. Space assignments are temporary and the Contractor shall relocate stored materials and equipment when directed by A/E to avoid interference with building occupants or other construction or education operations.
  - 2. The storage and parking of construction products, equipment and vehicles shall fit within limits of the staging area and shall not obstruct library traffic. Construction workers' shall be directed to park their personal vehicles in the staging area when room is available for them; if insufficient room is available in the staging area for the parking of construction workers' vehicles, workers shall be directed to park their vehicles off of the library site and so as not to obstruct or interfere with traffic and library operations and vehicles, including (but not limited to) library busses and parents' vehicles that are dropping off or picking up students, The Contractor shall be responsible for monitoring and policing the off-site parking of construction workers and making sure that no workers park improperly or drive their vehicles to and from the library area in a manner that presents a danger to the public.
- D. Storage and Protection:
  - 1. Store products according to manufacturers printed instructions, with seals and labels intact and legible.
    - a. Store products prone to damage by elements in weather tight enclosures.
    - b. Maintain temperature and humidity within range required by manufacturer's instructions.
    - c. Store products aboveground, on blocking, or skids to prevent soiling or staining.
    - d. Cover products prone to deterioration with waterproof covers and provide adequate ventilation to avoid condensation.
    - e. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
    - f. Arrange storage to provide easy access for inspection. Inspect stored products periodically to ensure products are maintained under specified conditions and are free from damage or deterioration.
    - g. Manually operate or rotate items of equipment with moving parts, lubricated parts, or parts that can freeze or corrode if not periodically activated.

- E. Interior storage: Store products sensitive to weather in substantial watertight enclosures.
  - 1. Maintain temperature and humidity within ranges stated in manufacturer's instructions. Provide humidity control and ventilation for sensitive products as stated in manufacturer's instructions.

#### 1.10 INSTALLING PRODUCTS

- A. Producer's Instructions: Follow latest published recommendations of producer for storing, handling, mixing, assembling, installing, adhering, fastening, finishing, connecting, cleaning, adjusting, curing, protecting, testing and putting in service, except where approved submittals or the Construction Documents make more stringent requirements.
- B. If job conditions or specified requirements conflict with manufacturer's instructions, notify A/E. Do not proceed with the work until A/E issues a clarification.
- C. Support and Fastening: Provide supports, attachment and connecting devices for securing the work and its trim against severe loading conditions that can reasonably be anticipated in places subject to abuse by occupants or the public:
  - 1. Construct supports and fastenings to allow for thermal movement, deflection under loads, vibration and building movement.
  - 2. Construct supports and fastenings to contain or resist or vibration or loosening under movement.
  - 3. Construct supports for each item of equipment to not transmit vibration, to secure the equipment in place, to confine leakage of any kind, to resist exterior wind forces, and to permit servicing and cleaning.
  - 4. At exterior envelope, products and their fastenings shall resist positive and negative wind loads required for each location in the Work, as shown in the Construction Documents, and as may be required by ASCE 7 and the FBC.
- D. Mounting Heights:
  - 1. Mount items of work at heights shown in Construction Documents.
  - 2. Where several items must be mounted in close proximity, whether on a wall or in a ceiling, line up horizontally and vertically in a neat pattern, with ease of access and ease of use in mind. Arrange group of electrical boxes such as switches and panels, in neat, regular, functional order.
  - 3. Refer questions on mounting heights and arrangement to A/E for decision.

#### 1.11 QUALITY CONTROL

- A. Notify major subcontractors to be present at inspections with necessary tools and equipment to facilitate easy and safe access to all parts of the buildings and equipment.
- B. Tests, Inspections:
  - 1. Coordinate the enclosing and covering-up of each portion of the work with the tests and inspections required by the Construction Documents and authorities having jurisdiction. If work was closed before inspections were performed, uncover the work for inspection and enclose and finish it again after inspection has passed at no additional cost to M-DPLS.
  - 2. Notify A/E, inspecting parties, and testing agency of the readiness of each part of Work for tests and inspection.
- C. Put each operating item in good working order and demonstrate it to work properly under a full range of settings and loads as required by the Contract Documents. Additional

demonstrations of equipment are to be provided as a part of training M-DPLS staff in the operation and maintenance of equipment.

- D. For systems and equipment identified in the Construction Documents provide trained labor to operate them upon completion of installation and testing until the Operation and Maintenance (O&M) manuals are submitted and accepted and the O&M training of the M-DPLS staff has been completed.

#### 1.12 CORRECTION OF DEFECTIVE WORK AFTER INSTALLATION

- A. Repair and Replacement. Repair or replace defects and damage to each item in the Work:
  - 1. Repair defective work, work that is damaged in demonstration or use, and work that becomes damaged as a result of other construction operations.
  - 2. Repair defective work and work that becomes damaged as a result of vandalism, theft, weather damage, fire, wear and tear, and other destructive forces until the date of Substantial Completion.
  - 3. After the date of Substantial Completion and throughout the correction / warranty phase of the Contract, Contractor remains responsible for repairing defective work at no additional cost to M-DPLS.
- B. Protection after Installation: Protect installed products from damage. Remove coverings when protection is no longer needed.

**END OF SECTION**

**SECTION 01732  
CUTTING AND PATCHING**

1.1 GENERAL

- A. Section Includes: Cutting, fitting, patching, refinishing, excavation, and backfill as required to complete the Work.

1.2 SUBMITTALS

A. Written Request:

1. Submit a written request to A/E before any cutting or alteration affecting:
  - a. Work of other general contractor hired by M-DPLS.
  - b. Structural value or integrity of any element of the Work.
  - c. Integrity of weather-exposed or moisture-resistant elements or systems.
  - d. Fire rating, resistance or interior finish class of the affected elements.
  - e. Efficiency, operational life, maintenance, or safety of building elements.
  - f. Visual qualities of sight-exposed elements.
  - g. Security of facility.
2. Written request shall include:
  - a. Location of the Work.
  - b. Description of proposed work:
    - 1) Scope of cutting, patching, alteration, or excavation.
    - 2) Trades executing the work.
    - 3) Products proposed to be used.
    - 4) Extent of refinishing to be done.
  - c. Description of existing construction affected.
  - d. The reason for cutting, alteration, or excavation.
  - e. Effect on work of any separate contractor.
  - f. Effect on structural or weatherproof integrity of the Work.
  - g. Alternatives to cutting and patching.
  - h. Written permission of any separate contractor whose work will be affected.
  - i. Date and time the Work will be uncovered.
  - j. Date and time the Work shall be completed or restored.

1.3 INSPECTION

- A. Contractor shall inspect existing conditions of the Work, including elements subject to damage or to movement during cutting and patching:
1. After uncovering work, inspect conditions affecting installation of products or performance of work.
  2. Report unsatisfactory or questionable conditions to A/E in writing. Do not proceed with the Work until A/E has provided further written instructions.
- B. Cutting and patching work must be inspected by the project's Building Code Inspector.

1.4 PREPARATION

- A. Provide adequate temporary support as necessary to ensure structural integrity of the Work.
- B. Provide protection for the structural, fire resistive and weather-tight qualities of the facility.

- C. Provide devices and methods to protect other portions of the Work from damage.
- D. Provide protection from elements for portions of the Work exposed by cutting and patching work.
- E. Employ qualified mechanics skilled in performing each kind of cutting and patching work.
- F. Protect and cover all fire alarm devices from dust during cutting and patching.
- G. Protect and cover all HVAC air handlers, ductwork and grilles from dust during cutting and patching.

#### 1.5 PERFORMANCE

- A. Execute cutting and demolition by methods that will not damage other work and will provide proper surfaces to receive installation of new work:
  - 1. Removal of millwork installed using plaster grounds also requires removal of plaster grounds. Patch and paint to match adjacent wall surfaces.
  - 2. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
    - a. For continuous surfaces, refinish to nearest intersecting plane.
    - b. For an assembly, refinish entirely.
    - c. Spot repainting will not be accepted.
- B. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.
- C. Restore temporarily cut or removed work.
- D. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations.
- E. Excavate and backfill using methods that will not cause settlement or damage to other work. Maintain excavations free from water.
- F. Restore work in a timely manner coordinated with the A/E and M-DPLS.

**END OF SECTION**



**SECTION 01740  
WASTE REMOVAL AND CLEANING**

1.1 COORDINATION

- A. Coordinate cleaning of the Work and the disposal of waste with all other work.

1.2 HOUSEKEEPING

- A. During construction maintain all inside and outside areas in organized and clean condition, free of waste.
- B. Outside waste collection area:
  - 1. This area shall be where all waste bins shall be parked to receive waste and for periodic emptying or hauling away.
  - 2. Where the area is close to on- or off-site pedestrian traffic or close to neighboring buildings, screen sightlines to the area and obtain approval from A/E and M-DPLS.
  - 3. Maintain the ground in the waste collection area in clean condition, with no spilled waste and rodent free, and with odors and insect infestation maintained at minimal levels.

1.3 TYPES OF WASTE REMOVAL

- A. Demolition Waste. Handle and remove as specified for demolition work.
- B. Construction Waste. Remove packaging materials, excess material, rubbish, and dirt from each work area as often as needed to maintain clean condition during construction:
  - 1. Construction waste also includes staining, foul odors, dangerous, highly flammable, toxic and unsanitary materials, each of which must be disposed of lawfully.
  - 2. Place construction waste in bins located at the exterior of the building and cover bins each night. Do not permit bins to overflow.
  - 3. Haul waste away frequently, preferably daily, but in no case less than weekly. Haul full bins away immediately. Dispose of waste lawfully.
  - 4. M-DPLS highly recommends that recyclable waste be identified on site and be hauled away to recycling centers.
- C. Do not burn waste materials. Do not bury debris or excess materials on M-DPLS property. Do not discharge flammable, harmful, or dangerous materials into on-site or public drainage systems, sewer systems and waterways.
- D. The Contractor shall only allow the discharge of waste concrete or concrete slurry in a designated area on the site. Waste concrete and concrete slurry shall be completely removed from the designated temporary area prior to Substantial Completion.

1.4 CLEANING DURING CONSTRUCTION

- A. Cleaning during Installation:
  - 1. Clean each product and its components before installing as needed for proper installation, good appearance and operation.
  - 2. Clean each product after it is installed, then protect it from damage by weather, other work operations, construction traffic, occupants and the public.

- B. Follow more specific cleaning and protection requirements as they appear in these Specifications for particular products, or in the manufacturer's instructions or recommendations.
- C. Prior to Substantial Completion, remove temporary protection devices, remove debris, remove stains, and clean and ready the Work for occupancy.
- D. As work is performed by the Contractor during the Punch Out and Warranty Period, clean the work as soon as it has been repaired or replaced and inspected.

## 1.5 FINAL CLEANING

- A. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected for the intended use. All work shall receive final cleaning such as, but not limited to the following:
  - 1. Follow producer's written instructions for cleaning.
  - 2. Engage a licensed pest exterminator to make a final inspection and rid the Work of rodents, insects, and other pests.
  - 3. Clean worksite and grounds in areas disturbed by construction activities, including landscaped areas, of rubbish, waste, and litter.
  - 4. Sweep paved areas broom clean. Remove spilled concrete, stains, oil, gum, paint, and other discoloration from paving. The A/E may require excessively or irreparably stained or soiled paved surfaces to be pressure cleaned, sandblasted, or completely refinished or replaced.
  - 5. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
  - 6. Remove tools, construction equipment, and surplus material from work site.
  - 7. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces.
  - 8. Restore reflective surfaces such as bright metal to their original condition.
  - 9. Remove debris and dirt from limited access spaces such as roofs, plenums, shafts, tunnels, and equipment vaults.
  - 10. Vacuum carpet and similar soft surfaces, removing debris and excess nap. Shampoo if visible soil or stains persist. The A/E may require excessively or irreparably stained or soiled surfaces or finishes to be completely refinished or replaced.
  - 11. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other noticeable, vision-obscuring materials. Replace chipped, scratched or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
  - 12. Remove labels that are not required to be permanent.
  - 13. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
  - 14. Wipe surfaces of mechanical, electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
  - 15. Clean plumbing fixtures to a sanitary condition, free of stains.
  - 16. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grilles.
  - 17. Clean ducts and coils for the air conditioning system.
  - 18. Clean light fixtures, lamps, globes, light switches and reflectors so as to function with full efficiency.
  - 19. Clean all animals and insects waste and remains from the building and site.

20. Clean all existing and new equipment, furnishings and specialty items.

**END OF SECTION**

**SECTION 01770  
CLOSEOUT OF THE WORK**

**1.1 PREPARATION FOR CLOSEOUT MEETING**

- A. 90 days before Substantial Completion is scheduled, the Contractor shall prepare a list of deliverables (based on 1.2 below) and submit to the A/E for approval. Start assembling deliverables for the closeout submittals.
- B. The Contractor shall conform to all of the requirements in the General Conditions of the Contract for Construction for closeout of the contract.

**1.2 CONTRACTOR'S CLOSEOUT DELIVERABLES**

- A. Deliver, to the A/E the following items:
  - 1. Operating and Maintenance (O&M) Manuals.
  - 2. Final Completion Form or Letter.
  - 3. Certification for all life safety systems such as fire suppression and fire alarm.
  - 4. Certification by Contractor that no asbestos-bearing products have been used in the Work.
  - 5. Final Certified building and site survey.
  - 6. Signed Warranties.
  - 7. Contractor's final as-built information including drawings and specifications, suitable for A/E to use in preparing record documents.
  - 8. Evidence that all keys have been delivered.
  - 9. Record of all O&M Training Sessions including the audio/visual, digital recording and the subject of instruction given to M-DPLS's staff.
  - 10. Evidence that all extra stock, spare parts, and special tools have been delivered to the facilities Administrator.
  - 11. Record list of building finish products and coatings, interior and exterior, for floors, walls and ceilings/soffits, with producer and producer's brand name or catalog number for each, along with color and pattern.
  - 12. CD containing the CPM Construction Schedule program and data, including all updates.
  - 13. Final Lien Releases from the Contractor and all subcontractors.
  - 14. Additional closeout submittals and deliverables required from subcontractors, producers and installers required in various technical sections of the Specifications.

**1.3 RESPONSIBILITY FOR OPERATION AND MAINTENANCE**

- A. The Contractor shall operate and maintain, at no additional cost to M-DPLS, all systems and equipment related to the Work until all the following conditions are satisfactorily met:
  - 1. The A/E and the M-DPLS have declared the Work Substantially Completed.
  - 2. All O&M Manuals have been delivered to the A/E as specified under the "Operations and Maintenance, Data and Training" section of these Specifications.
  - 3. All training sessions of personnel designated by M-DPLS, have been completed, as specified under the "Operations and Maintenance, Data and Training" section of these Specifications.
- B. If any of the conditions noted above are not satisfied, the Contractor shall maintain qualified operating and maintenance personnel at the work site to operate and maintain systems and equipment that require O & M Manuals.

- C. If the Contractor fails to provide the necessary personnel to perform the operating and maintenance of the equipment and systems as indicated above, M-DPLS may undertake to perform the necessary operations and maintenance of the equipment and back-charge the Contractor for all the cost incurred by M-DPLS. If as a result of the failure of the Contractor to perform the necessary maintenance, the equipment suffers damage or failure, the Contractor will be responsible for all expense incurred by M-DPLS to correct the situation. Any acts by M-DPLS to operate or perform needed maintenance shall not invalidate any warranty provisions or reduce the warranty responsibilities of the Contractor.

#### 1.4 FINAL ADJUSTMENTS OF ACCOUNTS

- A. Submit a statement of accounting to A/E. Statement shall reflect all adjustments to contract sum and the following:
  - 1. The original contract sum.
  - 2. Additions and deductions resulting from:
    - a. Previous change orders.
    - b. All Contingency Adjustments.
    - c. Allowances.
    - d. Unit prices.
    - e. Deductions for uncorrected work.
    - f. Deductions for liquidated damages.
    - g. Deductions for additional construction review payments.
    - h. Other adjustments.
  - 3. Total contract sum, as adjusted.
  - 4. Previous payments.
  - 5. Sum remaining due.

#### 1.5 FINAL CHANGE ORDER

- A. Prepare a Final Change Order, reflecting approved adjustments to contract sum not made by previous Change Orders.

#### 1.6 FINAL APPLICATION FOR PAYMENT

- A. Contractor shall submit Final Application for Payment only after the A/E and M-DPLS have determined that the work has achieved "Final Completion" in accordance with all the requirements of the general conditions of the contract.

**END OF SECTION**

**SECTION 01782**  
**OPERATION & MAINTENANCE DATA AND TRAINING**

1.1 OPERATION AND MAINTENANCE MANUALS

- A. Within 30 Days after the A/E has accepted the mechanical and electrical equipment shop drawings, submit 2 draft copies of complete operating and maintenance manuals for review by A/E and M-DPLS.
- B. Contractor shall submit copies of final Operation and Maintenance (O&M) Manuals as approved by A/E and M-DPLS within 5 workdays after Contractor declares that the project has achieved Substantial Completion. Quantities to be determined by M-DPLS:
  - 1. Bind in durable 3-ring binders with tabs, table of contents in front and index in back. Break down the manuals into easily handled units according to the Division that under which the equipment was specified.
  - 2. Properly identify and mark each producer's standard literature to clearly point out the information that applies to each item of installed equipment.
  - 3. Provide information on parts replacement, trouble-shooting, and who to call or e-mail for immediate help. Include measurements, sizes, catalog numbers, source phone numbers, e-mail addresses, and other details needed by staff to order replacement parts.
    - a. Examples: Filter size, grade of lubricating oil, recommended coil cleaner, etc.
    - b. The O&M Manuals will be reviewed by A/E for completeness and detail before acceptance.
  - 4. See each specification section for further O&M Manual requirements.
- C. Contents of each O&M Manual or section thereof shall include, but not be limited to, the following:
  - 1. Step-by-step procedures for system start-up, including a pre-start checklist. Refer to controls and indicators by nomenclature used on panels and in control diagrams.
  - 2. Detailed instructions in proper sequence, for each mode of operation.
  - 3. Emergency Operation: If some functions of equipment can be operated while other functions are disabled, give instructions for operations under such conditions. Include only those alternate methods of operations the operator can follow when there is a partial failure, malfunctioning of components, or other unusual conditions.
  - 4. Shutdown Procedure: Include instructions for stopping and securing equipment after operation. If a specific sequence is required, give step-by-step instructions in order of sequence.
- D. Maintenance Instructions and Requirements: Provide the following categories:
  - 1. Preventive Maintenance: Provide a tabular form schedule for preventive maintenance listing recommended frequency of performance for each of the following preventive maintenance tasks:
    - a. Cleaning and lubrication: Provide instructions and schedules for routine cleaning, lubrication and inspection with recommended cleansers and lubricants.
    - b. Inspection: If periodic inspection of equipment is required for operation, cleaning, or other reasons, show items requiring inspection and give inspection criteria for motors, controls, filters, and other maintenance items.
    - c. Provide instructions for minor repairs or adjustments required for preventive maintenance routines.
    - d. Identify test points and give values for each.

2. Corrective Maintenance: For a rapid replacement procedure to reduce equipment downtime, provide the following:
  - a. For troubleshooting tables, charts, or diagrams of specified procedures, use a 3-column chart entitled "Malfunction, Probable Cause, and Recommended Action."
  - b. Indicate repair and replacement procedures most likely to be required in maintenance of equipment.
  - c. List safety precautions and instructions to be followed before, during, and after making repairs, adjustments, or routine maintenance.
  - d. Manufacturer's literature covering equipment with illustrations, exploded views, and replacement part lists.

## 1.2 OPERATIONS AND MAINTENANCE TRAINING

- A. Scheduling and preparing for Training: Within 10 working days after the Work has been declared Substantial Completed, the Contractor shall submit a proposed schedule for all required Training Sessions. The schedule shall be fully coordinated with the A/E and M-DPLS's Project Manager. During the Training Sessions the Contractor and most appropriate equipment manufacturers' and installers' representatives, technicians and experts shall demonstrate each operating system and its components, and instruct M-DPLS designated staff in the operation, adjustment, cleaning, and maintenance of each systems:
  1. Give M-DPLS at least 10 working days notice of the first proposed class (along with dates and times of all sessions) so that M-DPLS can schedule and notify staff.
  2. All equipment must be fully functioning prior to the Training Session. Re-schedule any Training Session when the full function of the equipment cannot be demonstrated.
  3. Have installers and producers set up a session for each system, with additional days as needed for complex components or in those systems.
  4. Provide qualified, experienced and articulate presenters in each specialty. Contractor and its instructors shall provide both demonstration and hands-on instruction.
  5. Provide M-DPLS with names and a brief description of the subject matter for each session, with proposed dates and times.
  6. All Training Sessions shall be filmed by the Contractor and developed into a training video in digital format. Three (3) DVD's of each filmed Training Sessions shall be included as part of the Contractor's closeout documents for the project.
- B. Training Handouts: Prepare for M-DPLS's personnel, in reproducible form, detailed Training Session Hand-Outs for each specialty or system.
  1. Include a description and a summary of operation, adjustment, cleaning, and maintenance of each system and its components.
  2. Incorporate identical material as that bound in O&M Manuals, as helpful for teaching.
  3. Keep the Training Handouts slim: Where detailed information (beyond the summary of operation, etc.) can be found in the O&M Manuals, refer to the location in the O&M Manuals where the detailed information can be found.
  4. Print Training Handouts in such quantity that each attendee can take one.
- C. Notify the A/E and M-DPLS of completion of instruction and demonstration classes in writing. Transmit Sign-in Sheets with the names of all staff attending each Training Session, for M-DPLS's record.

## 1.3 PROMPT DELIVERY OF O&M MANUALS AND TRAINING SESSIONS

- A. Deliver O&M Manuals and complete all Training Sessions before Final Completion and closeout of the Work. The Project can not achieve Final Completion until all Training

Sessions have been completed and all Session DVD's and Sign-in Sheets have been transmitted to the M-DPLS.

- B. The Contractor shall operate and maintain, at no additional cost to the M-DPLS, all systems and equipment related to the Work until all the following conditions are satisfactorily met:
1. The A/E and M-DPLS have declared the Work Substantially Completed.
  2. All O&M Manuals have been delivered to the A/E as specified under this section.
  3. All training sessions of M-DPLS personnel designated by M-DPLS, have been completed, as specified under this section.

**END OF SECTION**



## **SECTION 01786 WARRANTIES**

### **1.1 SUMMARY**

- A. **Work Includes:** General administrative and procedural requirements for manufacturers' standard or special warranties on products as specified.
- B. **Disclaimers and Limitations:** Manufacturers' disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work incorporating the products, nor does it relieve suppliers, manufacturers, or subcontractors required to countersign special warranties with the Contractor.
- C. **When work is performed under separate contracts, separate Prime Contracts:** Each prime Contractor is responsible for warranties related to its own Contract.

### **1.2 DEFINITIONS**

- A. **Standard Product Warranties:** Preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to M-DPLS.
- B. **Special Warranties:** Written warranties required by or incorporated in the Construction Documents, either to extend time limits provided by standard warranties or to provide greater rights for M-DPLS.
- C. **Warranty Phase:** The phase of a project, or a portion of a project, that begins on the date of Substantial Completion and that applies to such entities as an entire facility, buildings within a facility, or major equipment.
  - 1. For most aspects of construction the warranty period lasts for 1 year after Substantial Completion. Many specialized items may have longer special warranty periods, as specified in the project Specifications. When a system, product or installation is determined not to have been completed and accepted as of the date of Substantial completion, the warranty period for that system, product or installation shall be considered to commence on the date the A/E certifies that system, product or installation to be completed (generally, the date on which the A/E removes the deficiency for that system, product or installation from the Punch List).

### **1.3 WARRANTY REQUIREMENTS**

- A. **Related Damages and Losses:** When correcting warranted Work that has failed, remove and replace other Work damaged because of such failure or that must be removed and replaced to provide access for correction of warranted Work, at no cost to M-DPLS.
  - 1. Correction of work shall include shipping, labor, supervision, and related work involved in replacing defective parts or materials provided by manufacturers under their warranties.
- B. **Reinstatement of Warranty:** When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Construction Documents.
- D. M-DPLS's Recourse: Written warranties made to M-DPLS are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which M-DPLS can enforce other duties, obligations, rights, or remedies:
  - 1. Rejection of submitted warranty documents: M-DPLS reserves the right to reject submitted warranty documents and to limit selections to products with warranties not in conflict with requirements of the Construction Documents.
- E. Warranties made by subcontractors to the Contractor are a part of the Contractor's responsibility to M-DPLS.
- F. M-DPLS reserves the right to refuse acceptance of Work where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments have done so.

#### 1.4 RESPONSE PROCEDURES

- A. Lists of Contacts. Prepare the following:
  - 1. Emergency List: List personal and firm names, with office and cellular numbers, for normal work hours and for 24-hour contact. The list shall include each operating system (such as air conditioning, electrical system, alarm system, walk-in coolers, etc.), each critical item of operating equipment (such as sewage pumps, entrance locks), and each assembly or item crucial to maintaining health and safety (such as roof, windows, exit doors). Do not let the list get too long, to emphasize the critical nature of the listings.
  - 2. Speedy Response List: List firm names and name of the key supervisor or mechanic, with office and cellular numbers, for normal work-hour contact. The list shall include each operating system, item of operating equipment, and other items or assemblies in the Work that are important to the daily functioning of Library. Doors and door hardware, food service equipment, lighting, and communications equipment are examples of systems or components that are important in keeping M-DPLSs operating effectively and safely – but for which less-than-instant response is satisfactory when there is breakage or breakdown.
  - 3. Normal Response List. All other firms. Contractor's list of subcontracting or installing firms is sufficient.
- B. Response Times:
  - 1. Emergency response: Emergency List. Have mechanics and equipment at the location of the problem within 12 hours of a night time call (after 6 PM) and within 6 hours of a daytime call (after 6 AM). Mechanics arriving at the facility shall carry needed parts and shall be authorized to order parts. They shall be competent to estimate a realistic time for putting the system, assembly or equipment back in service.
  - 2. Speedy response: Speedy Response List: Have mechanics and equipment at the location of the problem within 24 hours of a call. Mechanics at the site of the facility shall carry basic needed parts and shall be authorized to order parts. They shall be

able estimate or obtain an estimate of time to put the system, assembly or equipment back in service.

3. Normal (or Scheduled) Response: The Normal Response category is for the majority of repairs that can be started in 3 to 10 working days without endangering or seriously delaying Library operations. Examples: Shaky railing, sticking drawers, peeling paint, noisy valve. Firms responding shall be able to estimate a realistic time to complete.

C. Timeline for Response and Correction. Normal response time shall not exceed 10 days. Emergency and speedy response times are specified above:

1. If Contractor's response to a request by M-DPLS for any type of correction exceeds 10 days, the Warranty Administrator will notify the Contractor that M-DPLS reserves the right to perform the corrective work and will deduct the cost from the Contract Sum or retainage.
2. If the Contractor fails to start correction within 10 days of this second request, M-DPLS reserves the right to have the work performed and deducted from Contract Sum or retainage.
3. After Final Payment, instead of deducting from Contract Sum, M-DPLS will charge the Contractor for the cost of correcting work that the Contractor has failed to complete or correct.

## 1.5 SUBMITTALS

A. Submit written warranties to the A/E before the date certified for Substantial Completion. If the A/E's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work or a designated portion of the Work, submit written warranties upon request of the A/E:

1. When a designated portion of the Work is completed and occupied or used by M-DPLS by separate agreement with the Contractor during the construction period, submit properly executed warranties to the A/E within 15 days of completion for the designated portion of the Work.

B. When a special warranty is required to be executed by the Contractor or the Contractor and a subcontractor, supplier, or manufacturer, prepare a written document containing appropriate terms and identification, ready for execution by the required parties. Submit a draft to M-DPLS through the A/E for approval before final execution:

1. Refer to individual Sections of Divisions 2 through 16 for specific content requirements and requirements for submittal of special warranties.

C. Form of Submittal: At Final Completion, compile four (4) copies of each required warranty properly executed by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the specifications.

D. Provide warranties in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders:

1. Use thicknesses as necessary to accommodate contents and sized to receive 8-1/2" by 11" paper.
2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES," the Project title or name, and the name of the Contractor.

3. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark tabs to identify products or installations.
4. Provide a typed description of the product or installation, including the name of the product.
5. Give reference to the applicable specification section, and the name, address, and telephone number of the installer.
6. When Operating and Maintenance Manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

#### 1.6 SCHEDULE OF WARRANTIES

- A. Schedule: Provide warranties on products and installations as specified in each specification section

**END OF SECTION**

**SECTION 03301  
CAST-IN-PLACE CONCRETE (SMALL PROJECTS)**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Cast-in-place concrete indicated on drawings and specified in this section.
- B. Related Sections:
  - 1. 02201 - Earthwork for Buildings.
  - 2. 04220 - Concrete Unit Masonry.
  - 3. 06100 - Carpentry.

**1.2 REFERENCES**

- A. American Society for Testing and Materials (ASTM):
  - 1. A185 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
  - 2. A615 Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
  - 3. D994 Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
  - 4. D1751 Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
  - 5. D1752 Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

**1.3 SUBMITTALS**

- A. Submit the following items and processes for review:
  - 1. Shop drawings for reinforcement and accessories.
  - 2. Concrete materials and mix designs.

**1.4 STANDARDS**

- A. ACI 301 "Standard Specifications for Structural Concrete for Buildings".
  - 1. Contractor shall keep one copy on the job, for reference.

**PART 2 PRODUCTS**

**2.1 MANUFACTURERS**

- A. Floor Sealing Compounds:

1. Kure-N-Seal by Sonneborn, Inc.
2. Crystal Clear Seal by Lambert Corp.
3. other A/E approved product.

## 2.2 MATERIALS

- A. Concrete Strengths (Normal weight concrete):
  1. Exterior or Interior Slabs on Fill: 2,500 psi.
  2. Footings: 3,000 psi.
  3. Unspecified Concrete: 3,000 psi.
- B. Reinforcing: Deformed bars according to ASTM A615, Grade 60FY=60,000 psi, domestic manufacture.
- C. Form Ties: Form ties leaving plastic tube lined holes through members are not allowed.
- D. Welded Wire Mesh: According to ASTM A185, galvanized smooth wire, sizes as indicated.
- E. Expansion Joint Filler: According to Paragraphs 6.2.2.1 of ACI 301 and ASTM D1752 non-bituminous Type I compatible with polysulfide joint caulking compound for joints with caulking or sealant. Other joints, without caulking, bituminous treated fiber board type according to ASTM D994 and ASTM D1751.
- F. Adhesion and Patching Material: Proprietary materials for adhesion or patching are allowed.

## 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 CONCRETE WORK

- A. Comply with ACI 301, Specifications for Structural Concrete for Buildings, except as otherwise specified.
  1. Proportioning: ACI 301, Method 2 for normal weight concrete.
  2. Bond Development at Construction Joints: Comply with Paragraphs 6.1.4.3 and 8.5 of ACI 301.
  3. Placing of concrete under water is not allowed.
  4. The use of earth cuts as forms is not allowed.

### 3.3 FIELD QUALITY CONTROL TESTING

- A. Perform field quality control testing according to following requirements: Comply with Chapter 16 of ACI 301.

- B. Mold 2 additional cylinders for 3 and 7 day tests (total of 5 cylinders required per batch tested).
- C. Tests specified in ACI 301 Paragraphs 16.3.4 and 16.5 will be performed by the Board Testing Laboratory.

### 3.4 FINISHES

- A. As specified in ACI 301, Paragraphs 10.4 and 11.8, unless otherwise specified or noted on drawings.
- B. Floor Sealing Compound: Apply on concrete floor slabs unless otherwise specified or noted on drawings.
- C. Exterior Platforms, Sidewalks, Curbs, and Ramps: Light broom finish unless otherwise specified or noted on drawings.
- D. Maximum allowable tolerances for floor slabs not receiving ceramic or quarry tile shall be 1/8" in a 10 foot radius.

### 3.5 TESTING LABORATORY NOTIFICATION

- A. Notify the Board Testing Laboratory and the Board's building code inspectors (BCI) 48 hours before scheduled time of each concrete pour.

**END OF SECTION**

**SECTION 04530  
MASONRY PATCHWORK**

**PART 1 GENERAL**

**1.1 SUMMARY**

A. Related Sections:

1. 09000 - Patching and Finishes.
2. 09905 - Component Epoxy Resin Wall Finish.

**1.2 REFERENCES**

A. American Society for Testing and Materials (ASTM), latest edition:

1. C55 - Specification for Concrete Brick.
2. C90 - Specification for Loadbearing Concrete Masonry Units.
3. C91 - Specification for Masonry Cement.
4. C144 - Specification for Aggregate for Masonry Mortar.
5. C150 - Specification for Portland Cement.
6. C270 - Specification for Mortar for Unit Masonry.

**1.3 SUBMITTALS**

- A. Properly identified manufacturer's literature before starting work.
- B. Samples: Properly identified samples of masonry units and each type of metal anchor and accessory.

**1.4 QUALITY ASSURANCE**

- A. Submit unit masonry manufacturer's "CM-2" Certificate of Compliance issued by the Florida Concrete and Products Association for each type of unit masonry specified.
- B. U-block is not allowed.

**1.5 PROJECT CONDITIONS**

- A. Environmental Conditions:
1. Temperature: 40 degrees F. minimum and rising.
  2. Weather: No application during precipitation.

**PART 2 PRODUCTS**

**2.1 LOAD BEARING AND NON BEARING CONCRETE UNIT MASONRY**

- A. Weight: Normal.



- B. Size: 8 inches x 16 inches x 8 inches thick or as indicated on drawings, 2 cell stretcher type.
- C. Texture: Medium.
- D. Grade: ASTM C90; Grade N-1, amended to allow a maximum moisture content of 50 percent total absorption.

## 2.2 CONCRETE BRICK

- A. Grade: ASTM C55, Grade N-1, amended to allow a maximum moisture content of 50 percent total absorption.
- B. Size: Appropriate to suit conditions.

## 2.3 MORTAR

- A. Portland Cement: ASTM C150, Type I, domestic.
- B. Masonry Cement: ASTM C91, domestic.
- C. Sand: ASTM C144.
- D. Water: Potable.
- E. Mortar Mix: ASTM C270, Type S, 1800 psi. Mix accurately in following proportions by volume:
  - 1. Type S:
    - a. 1 part masonry cement.
    - b. 1/2 part Portland cement.
    - c. 4 parts sand.

## PART 3 INSTALLATION

### 3.1 PATCHING

- A. Remove existing mortar from new opening.
  - 1. Fill in as required with new concrete masonry units and fresh mortar.
- B. Laying Units:
  - 1. Lay masonry plumb, true to line, with level and accurately spaced courses.
  - 2. Keep bond plumb throughout.
    - a. Where adjustment must be made after mortar has started to harden, remove mortar and replace with fresh mortar.
  - 3. Cut masonry units dry.

4. Joints: 3/8" thick thickness, strike flush.

C. Jointing Methods:

1. Lay concrete block with full beds of mortar on vertical and horizontal face shells.

a. Furrowing of mortar is not allowed.

D. Pointing: Point holes in masonry. Cut out and point up defective joints.

3.2 MORTAR FILLED ITEMS

A. Where necessary and where indicated on drawings.

B. Voids around penetrations through block work.

**END OF SECTION**

**SECTION 05520  
METAL HANDRAILS AND RAILINGS**

**PART 1 GENERAL**

**1.1 SUBMITTALS**

- A. Properly identified manufacturer's literature, including shop and erection drawings before starting work.
- B. Railing Assemblies or Railing Components: Submit shop drawings prepared under direction of an engineer licensed in the State of Florida showing compliance to the Florida Building Code (FBC).

**PART 2 PRODUCTS**

**2.1 HANDRAIL AND RAILING COMPONENTS**

- A. Wall Brackets: Malleable iron as manufactured by Julius Blum & Company, Inc., Carlstadt, NJ, or other A/E accepted equivalent.
  - 1. Material:
    - a. Type B: Malleable iron, Model #382 for use with steel pipe handrail section.
- B. Pipe Handrail Sections:
  - 1. Stair Handrails:
    - a. Size:
      - 1) Handrail (Typical handrail at 34 to 38 inches): 1-1/4" to 1-1/2" outside diameter.
    - b. Steel: Schedule 80, of design and dimensions indicated with smooth bends and welded joints ground smooth and flush.
  - 2. Vertical Members (Posts):
    - a. Steel: 1-1/4" nominal pipe size, Schedule 80, of design and dimensions indicated with welded joints ground smooth and flush.
  - 3. Design and construct to withstand 200-pound concentrated load applied at any point, from any direction.
    - a. Wall brackets and other points of support are shown to indicate general appearance. Submit shop drawings to indicate accurate location of necessary brackets and other points of support to show compliance with load requirements.
  - 4. Provide complete with necessary sleeves, brackets, tamper-resistant bolts, and tamper-resistant fastening devices as required for a complete installation.

5. Approved Tamper-Resistant Fasteners: 18-8 stainless steel screws with the head to be tamper-resistant, sized as recommended by the aluminum railing assembly manufacturer.

## 2.2 FINISHING

- A. Malleable Iron Handrail and Railing Components: Finish as per Specifications section 09900.

## 2.3 MISCELLANEOUS

- A. Hot Dip Galvanizing: Hot dip galvanize ferrous items according to ASTM A385 and ASTM A123, minimum 2.0 ounces per square foot.
- B. Galvanized Metal Repair Compound:
  1. Hot Applied: Federal Specifications O-G-93.
  2. Cold Applied: Galvaneal, Galvicon, or Z.R.C.
- C. Isolation Coating: Zinc chromate paint, heavy-bodied bituminous paint, water-white methacrylate lacquer, or acceptable non-conductive tape.
- D. Expanding Grout: Premix Anchoring Cement by Premix-Marbletite, Miami, FL, or other A/E accepted equivalent.

## 2.4 FASTENINGS, ANCHORS, AND BOLTS

- A. Provide required cast-in-place or self-drilling anchor bolts as indicated or as recommended by the handrail and railing assembly manufacturer, complete with matching washers and nuts.

## 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. Erection:
  1. Erect metal handrail and railing components and metal handrail and railing assemblies at proper locations and elevations as indicated, plumb, level, in alignment, and not distorted by fastenings.
  2. Erect according to accepted shop drawings and manufacturer's directions or as specified in this section.
- B. Supplementary Parts: Provide as necessary to complete each item.
- C. Contact With Dissimilar Materials:

1. Apply isolation coatings where dissimilar metals are in contact or aluminum components contact dissimilar metals or concrete or lime mortar surfaces.
  2. Select coatings appropriate to the condition from materials specified in this section.
- D. Expanding Grout: Apply according to manufacturer's printed instructions to clean and dust free surfaces to ensure proper mechanical bond.
- E. Malleable Iron Handrail and Railing Components: Paint to match adjacent surfaces.

**END OF SECTION**

## **SECTION 06100 CARPENTRY**

### **PART 1 GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes: Carpentry work including grounds, nailers, blocking, miscellaneous framing, plywood backing panels, plywood sheathing, preservative treatment, and necessary accessories indicated or specified in this section.
- B. Related Sections:
  - 1. 06300 - Wood Treatment.
  - 2. 07210 - Building Insulation.
  - 3. 10102 - Markerboards and Tackboards.
  - 4. 10120 - Bulletin and Display Cabinets.

#### **1.2 REFERENCES**

- A. American Society for Testing and Materials (ASTM), latest edition:
  - 1. A153 Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 2. D226 Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

#### **1.3 QUALITY ASSURANCE**

- A. Factory mark each piece of lumber and plywood to identify type, grade, agency providing inspection service, producing mill, and other qualities as specified.

#### **1.4 DELIVERY AND STORAGE**

- A. Keep materials dry during delivery and storage.
  - 1. Protect against weather and contact with damp or wet surfaces.
  - 2. Stack lumber and plywood and provide air circulation within stacks.

#### **1.5 SITE CONDITIONS**

- A. Gunpowder activated fastening systems may be used on M-DCPS Projects only on a limited-basis. They shall not be used as the main support for construction elements located overhead. Approval must be obtained from M-DCPS Facilities Design and Standards on a per project basis. In Remodeling Projects, gunpowder actuated fastening systems shall not be used when the public, staff and students are in the immediate area of construction.

### **PART 2 PRODUCTS**

#### **2.1 MATERIALS**

- A. Exterior Plywood:

1. Conform with US Department of Commerce PS 1-66, bearing APA grade mark.
  2. Grade: APA rated sheathing, EXT, span rating to suit rafter spacing.
  3. Thickness: Indicated on drawings.
- B. Interior Plywood (Concealed): Where plywood will be concealed by other work, provide exterior type plywood C-D plugged grade, unless otherwise specified.
- C. Interior Plywood (Painted Finish): Same as concealed, except with hardwood plywood or medium density overlay, Grade MDO EXT-101; smooth surface with no grooves.
- D. Interior Plywood (Transparent Finish):
1. Exterior type plywood, Grade A veneers on exposed surfaces, Grade B veneers on semi-exposed surfaces, and Grade D or better veneers on concealed surfaces.
    - a. Birch - (Natural) (Select) (Rotary Cut) (Red) (White).
    - b. Oak - (Rotary Cut) (Plain Sliced) (Red) (White).
- E. Lumber:
1. Standard:
    - a. Comply with American Softwood Lumber Standards PS-20 by U.S. Department of Commerce.
    - b. Nominal sizes are shown or specified, except as shown by actual dimensions.
    - c. Provide actual sizes complying with minimum size requirements for PS-20 for moisture content specified for each use.
  2. Moisture Content: Seasoned lumber with 19 percent maximum moisture content at time of dressing and complying with dry size requirements of PS-20, unless otherwise specified.
- F. Framing Lumber:
1. Lumber complying with grading rules according to requirements of National Grading Rule for Dimension Lumber of American Lumber Standards Committee established under PS-20.
  2. Light Framing (2 inches to 2 inches thick and 2 inches to 4 inches wide): "Stud" grade lumber for stud framing and "standard" grade for other light framing.
- G. Boards:
1. Boards complying with dry size requirements of PS-20 where lumber less than 2 inches in nominal thickness and 2 inches or more in nominal width is shown or specified.
  2. Moisture Content - Exposed Work: Moisture content of 19 percent maximum, SDRY Southern Pine No.2 per SPIB for paint finish.
  3. Moisture Content - Concealed Work: Moisture content of 19 percent maximum, Southern Pine (SPIB) No.2 boards.
- H. Miscellaneous Materials:

1. Fasteners and Anchorages:
  - a. Provide size, type, material, and finish and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers, and anchoring devices.
  - b. Provide metal hangers and framing anchors of size and type recommended by the manufacturer for each use including recommended nails.
  - c. Where rough carpentry Work is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with hot-dip zinc, ASTM A153.
2. Building Paper: ASTM D226, Type I, asphalt saturated felt, non-perforated, 15 lb. type.
- I. Treated Wood: Refer to Section 06300, "Wood Treatment".

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Protect installed carpentry work from damage by work of other trades until accepted by the Board.
  1. Review proposed protection methods with A/E for acceptance.
- B. Examine substrates, adjoining construction, and conditions where work is to be installed.
- C. Do not proceed with work where unsatisfactory conditions exist.
- D. Where rough carpentry is fitted to other work, obtain measurements of other work and verify dimensions shown on shop drawing details.
- E. Apply heavy brush coat of same chemical treatment material to surfaces exposed by sawing, cutting, or drilling.

### 3.2 INSTALLATION

- A. Materials: Use only sound, thoroughly seasoned materials of longest practical lengths and sizes to minimize jointing, free from warp that cannot be easily corrected by anchoring and attachment.
- B. Installation:
  1. Attachments and Anchors:
    - a. Closely fit and accurately set members to required lines and levels, and rigidly secure in place.
    - b. Nail size and nail spacing shall be sufficient to develop adequate strength for connection without splitting the member.
    - c. Countersink nailheads on exposed carpentry work and fill holes.
    - d. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish material(s).
    - e. Make tight connections between members.



- f. Install fasteners without splitting wood, pre-drill as necessary.
2. Wood Grounds, Nailers, Blocking, and Sleepers:
- a. Provide as shown and as required for screeding or attachment of other work.
  - b. Form to shapes as shown and cut as required for true line and level of work to be attached.
  - c. Set true to line and level, plumb, with intersections true to required angle.
  - d. Coordinate location with other work involved.
  - e. Provide wood blocking to strengthen and supplement horizontal metal stud framing members between studs required for recessed or surface mounted items including, but not limited to, cabinets, finish hardware, magnetic door holding devices, chalkboards.
  - f. Cut blocking to fit between framing members and rigidly attach thereto.
  - g. Secure blocking and nailers to building structure as indicated and as specified.
  - h. Provide wood grounds for attachment of finish trim and other work to plaster.
  - i. Grounds shall be dressed, preservative treated. Use key-beveled lumber not less than 2 inch nominal width and of thickness required to bring face of ground to exact thickness of finish material involved.
  - j. Remove temporary grounds when not longer required.
3. Roof Sheathing: Nail or staple to framing and use spacer clips at edges for expansion/contraction control.

END OF SECTION

**SECTION 07520  
MODIFIED BITUMINOUS MENBRANE ROOFING  
& INSULATION**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes
  - 1. Asphaltic modified bituminous roofing
  - 2. Insulation
  - 3. Flashing
  - 4. Walkways
  - 5. Roof Protection
- B. Related Sections
  - 1. Section 06100: Rough Carpentry
  - 2. Section 07620: Sheet Metal Flashing and Trim
  - 3. Section 15430: Plumbing Specialties

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM) - *Annual Book of ASTM Standards*
- B. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - *Architectural SheetMetal Manual*
- C. Asphalt Roofing Manufacturers Association (ARMA)
- D. National Roofing Contractors Association (NRCA)

1.03 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) *Roofing and Waterproofing Manual* for definitions of roofing terms related to this section.

1.04 PERFORMANCE REQUIREMENTS

- A. GAF® has been selected as “**Basis of Design (BoD)**” approved Manufacturer shall provide all primary roofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements meeting all requirements for **(BoD)**

1.05 SUBMITTALS

- A. Product Data: Provide product data sheets for each type of product indicated in this section.
- B. Shop Drawings: Provide manufacturers standard details and approved shop drawings for the roof systems specified including but not limited to roof plans showing roofing, base flashing, slopes, crickets, penetrations, traffic pads and details for proper roofing and flashing installation.

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- e
- C. Samples: Provide samples of insulation(s), fasteners and roll goods for verification of quality.
  - D. Certificates: Installer shall provide written documentation from the manufacturer of their authorization to install the roof system, and eligibility to obtain the warranty specified in this section.
  - E. Qualifications of each Roof Assembly installer: Each installer of each component of the Roof Assembly shall:
    - 1. Have 5 years of successful experience in the installation of that roof component
    - 2. Be currently licensed or certified by the producer of that part of the Roof Assembly for a twenty (20) year No Dollar Limit Warranty.
  - F. Product Data: Description of each product, including standards met, and the following:
    - 1. Miami-Dade Product Notice of Acceptance (NOA) or Florida Product Approval (FPA) number and expiration date note that date has to be valid at time of installation.
    - 2. Fasteners for mechanical attachment of base ply to each substrate , with withdrawal force test figures.
    - 3. List of roofing ply, base flashing and walkway products for torch installed and for hot mopped installation if applicable
    - 4. Products installation instructions
  - G. Insulation Shop Dwg:
    - 1. Submit in accordance with Section 01340.
    - 2. Layout of roof plan showing tapered insulation pattern, direction of slope, amount of slope, spot elevations indication thicknesses at high/low points, and overall building height.
    - 3. Sections through tapered insulation panels.
    - 4. Fastener layout diagram for each size of roof insulation utilized and approved. Fastener locations shall be dimensioned for field of roof, perimeter and corner conditions.
    - 5. Fastener field pull test results with manufacturer's written approval for proposed fastener.
    - 6. Product Data:
      - a. Data sheets for each component require, including insulation boards, fasteners, and plates.
      - b. Roofing system manufacturer's written acceptance of proposed insulation manufacturer, facer, fasteners, plates, fastener pattern, and procedures for installation at this geographic location, building elevation, and uplift pressures.

1.06 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: GAF® or approved equal Manufacturer shall provide a roofing system that meets or exceeds all criteria listed in this section.
- B. Installer's Qualifications:
  - 1. Installer shall be classified as a **Master Select** contractor as defined and certified by GAF® or as per approved equal Manufacturer.
- C. Source Limitations: All components listed in this section shall be provided by a single manufacturer or approved by the primary roofing manufacturer.

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D. Final Inspection

Manufacturer's representative shall provide a comprehensive final inspection after completion of the roofsystem. All application errors must be addressed and final punch list completed.

1.07 PRE-INSTALLATION CONFERENCE

A. Prior to scheduled commencement of the roofing installation and associated work, conduct a meeting at the project site with the installer, architect, owner, GAF® or approved equal Manufacturer representative and any other persons directly involved with the performance of the work. The installer shall record conference discussions to include decisions and agreements reached (or disagreements), and furnish copies of recorded discussions to each attending party. The main purpose of this meeting is to review foreseeable methods and procedures related to roofing work.

1.08 REGULATORY REQUIREMENTS

- A. All work shall be performed in a safe, professional manner, conforming to all federal, state and local codes.
- B. Florida Building Code: Provide a roofing system which will achieve a -210 psf (420 psf) wind uplift rating, as listed in the most current Florida Building Code Evaluation Report.  
1. FL16732-R18 C-48

1.09 DELIVERY, STORAGE AND HANDLING

- A. Deliver all roofing materials to the site in original containers, with factory seals intact. All products are to carry either a GAF® label or approved equal Manufacturer label.
- B. Store all pail goods in their original undamaged containers in a clean, dry location within their specified temperature range.
- C. Store roll goods on end on pallets in a clean, dry, protected area. Take care to prevent damage to roll ends or edges. Do not double stack modified bitumen products.
- D. Do not expose materials to moisture in any form before, during, or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.
- E. Remove manufacturer supplied plastic covers from materials provided with such. Use "breathable" type covers such as canvas tarpaulins to allow venting and protection from weather and moisture. Cover and protect materials at the end of each work day. Do not remove any protective tarpaulins until immediately before the material is to be installed.
- F. Materials shall be stored above 55°F (12.6°C) a minimum of 24 hours prior to application.

1.10 PROJECT CONDITIONS

- A. Weather
1. Proceed with roofing only when existing and forecasted weather conditions permit.
  2. Ambient temperatures must be above 45°F (7.2°C) when applying hot asphalt or water

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based adhesives.

1.11 WARRANTY

- A. Provide Manufacturer's standard WeatherStopper® Diamond Pledge  Guarantee or approved equal Manufacturer Warranty with single source coverage\* and no monetary limitation, where the manufacturer agrees to repair or replace components in the roofing system, which cause a leak due to a failure in materials or workmanship.
  - 1. Duration: Twenty (20) years from the date of completion.
    - a) Materials and workmanship of listed products within this section are included when installed in accordance with current Manufacturer's publication and specification requirements.

**PART 2 PRODUCTS**

2.01 ACCEPTABLE MANUFACTURER

- A. GAF® - 1 Campus Drive, Parsippany, NJ 07054 **Basis of Design (BoD)**
- B. Soprema
- C. Siplast
- D. Firestone

2.02 INSULATION

- A. Rigid polyisocyanurate board, with a glass-reinforced cellulosic felt facer. Conforms to or exceeds the requirements of ASTM C 1289 Type II, Class 1, Grade 2. **EnergyGuard™ Polyiso Insulation or approved equal Manufacturer**, with the following characteristics:
  - 1. Board Thickness: 1.5"
  - 2. Thermal Resistance (LTTR value) of: R8.6
  - 3. Board Size: 4' x 4'
  - 4. Compressive Strength: 20 psi
- B. Rigid, tapered polyisocyanurate board, with a glass-reinforced cellulosic felt facer. Conforms to or exceeds the requirements of ASTM C 1289 Type II, Class 1, Grade 2. **EnergyGuard™ Tapered Polyiso Insulation or approved equal Manufacturer**, with the following characteristics:
  - 1. Board Thickness: ¼" slope
  - 2. Thermal Resistance (LTTR value) of: varies
  - 3. Board Size: 4' x 4'
  - 4. Compressive Strength: 20 psi

2.03 COVER BOARD

- A. Fiber-reinforced gypsum panel with an integral water-resistant core. **Securock® Gypsum Fiber Roof Board** by US Gypsum **or approved equal Manufacturer**.
  - 1. Board Thickness: ¼"
  - 2. Board Size: 4' x 8'
  - 3. Thermal Resistance (R value) of: .20

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2.04 INSULATION ACCESSORIES

- A. Cant Strip: Factory fabricated rigid perlite strip cut at angles to provide a true 45° Angle between horizontal and vertical surfaces, **EnergyGuard® Perlite Cant Strip**, by GAF® or approved equal Manufacturer.
- B. Tapered Edge Strip: Factory fabricated rigid perlite strip cut at angles to provide a smooth transition between differences in elevation. **EnergyGuard® Tapered Edge Strip**, by GAF® or approved equal Manufacturer.

2.05 BASE / PLY SHEETS

- A. Tough, resilient, smooth surfaced, asphalt modified bitumen membrane containing a core of non-woven polyester mat coated with flexible, SBS polymer-modified asphalt designed for heat weld application. Conforms to or exceeds requirements of ASTM D 6164 Type I Grade S. Each roll contains one square of material, approximately 39.625' x 32.6' (1 m x 9.9 m), 88 lbs. (47.2 kg), **RUBEROID® HW Smooth base /ply sheet** or approved equal Manufacturer .

2.06 MEMBRANE MATERIALS

- A. ENERGY STAR listed, fire resistant, coated granule surfaced modified bitumen membrane containing a core of non-woven polyester mat coated with flexible, SBS polymer-modified asphalt designed for heat weld application. Conforms to or exceeds requirements of ASTM D 6164 Type II Grade G. Each roll contains one square of material, approximately 39.625' x 32.75' (1 m x 9.98 m), 108 lbs. (49 kg), **Ruberoid® EnergyCap™ HW Plus Granule FR** roof membrane . or approved equal Manufacturer

2.07 FLASHING MATERIALS

- A. Tough, resilient, smooth surfaced, asphalt modified bitumen membrane containing a core of non-woven polyester mat coated with flexible, SBS polymer-modified asphalt designed for heat weld application. Conforms to or exceeds requirements of ASTM D 6164 Type I Grade S. Each roll contains one square of material, approximately 39.625' x 32.6' (1 m x 9.9 m), 88 lbs. (47.2 kg), **Ruberoid® HW Smooth flashing membrane** or approved equal Manufacturer .
- B. ENERGY STAR listed, fire resistant, coated granule surfaced modified bitumen membrane containing a core of non-woven polyester mat coated with flexible, SBS polymer-modified asphalt designed for heat weld application. Conforms to or exceeds requirements of ASTM D 6164 Type II Grade G. Each roll contains one square of material, approximately 39.625' x 32.75' (1 m x 9.98 m), 108 lbs. (49 kg), **Ruberoid® EnergyCap™ HW Plus Granule FR** flashing membrane or approved equal Manufacturer.

2.08 BITUMEN / ADHESIVES

- A. Asphalt Primer: ASTM D 41 **Matrix® 307 Premium Asphalt Primer**, by GAF® or approved equal Manufacturer

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- B. Two component fast-acting, low-rise polyurethane foam adhesive. The “A” and “B” components are dispensed from two pre-pressurized disposable cylinders. **OlyBond500® Equipment Free Canister System** distributed by GAF® or approved equal **Manufacturer**

2.09 ACCESSORIES

- A. Standard Vents
  - 1. A spun aluminum vent, pre-flashed with modified bitumen designed to waterproof soil pipes and roofing protrusions. The **Standard MVent**, by MWeld® or approved equal **Manufacturer**.  
***NOTE: Not for use over active pipes that emit steam or excessive moisture vapor, condensation may occur. Not for use over boiler or heater/furnace vent pipes.***
- B. Sealant Pans
  - 1. A structural urethane outer shell, bonded to the roof surface, filled with a urethane rubber sealant. The urethane sealant conforms to the shape of any roof penetration through a roof surface to protect the roof system from moisture. The **M-Curb** and **M-Thane**, by MWeld® or approved equal **Manufacturer**
- C. Expansion Joint Covers
  - 1. Factory fabricated assemblies used to accommodate three-dimensional joints in a roof structure. Heavy reinforced flexible cover with a flexible flame retardant foam bellows for support. Nailing flanges conform to curb irregularities. The **Metalastic® Expansion Joint Cover**, by GAF® or approved equal **Manufacturer** .
- D. **EnergyCote™ Coating or approved equal Manufacturer** , a brilliant white, water based, low VOC, highly reflective elastomeric coating which cures to form a seamless rubber membrane. It has been specifically designed to treat seams, laps, flashings and other edges and details in reflective cap sheet products such as EnergyCap™ . Designed to add reflectivity and protect areas of asphalt bleed-out on white reflective asphalt roll roofing to give a uniform, brilliant white finish across the whole roof area.

**PART 3 EXECUTION**

3.01 SITE CONDITIONS

- A. Obtain verification that the building structure can accommodate the added weight of the new roofing system.
- B. Confirm the adequacy of the new roofing system to provide positive slope to drain. Eliminate ponding areas by the addition of drainage locations or by providing additional pitch to the roof surface.
- C. Prepare substrate surfaces thoroughly prior to application of new roofing materials. This is particularly important for re-cover and reroofing applications. Providing a smooth, even, sound, clean, and dry substrate minimizes the likelihood that underlying deficiencies will cause premature deterioration or even failure of the new roofing system.

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- D. All defects in the roof deck or substrate must be corrected by the responsible parties before new roofing work commences. Verify that the deck surface is dry, sound, clean, and smooth, and free of depressions, waves, or projections.
- E. Protect building surfaces against damage and contamination from roofing work.
- F. Where work must continue over completed roof areas, protect the finished roofing system from damage.
- G. Verify that the surfaces and site conditions are ready to receive work.
- H. Verify that the deck is supported and secured.
- I. Verify that the deck surfaces are dry and free of ice or snow.
- J. Verify that all roof openings, curbs, pipes, sleeves, ducts, vents or other penetrations through the roof are solidly set, and that all flashings are tapered.

3.02 SUBSTRATE PREPARATION

A. General:

1. Prepare substrate surfaces thoroughly prior to application of new roofing materials. This is particularly important for re-cover and reroofing applications. Providing a smooth, even, sound, clean, and dry substrate minimizes the likelihood that underlying deficiencies will cause premature deterioration or even failure of the new roofing system.
2. The surface of the deck must be dry, firm, smooth, and free of dirt and loose material. Electrical conduits, bolts, and other small items must be removed from the surface of the roof deck; such surface irregularities cannot be properly insulated and roofed. It is the responsibility of the roofing contractor, deck contractor, or owner's representative to determine the suitability of the roof deck surface to receive the roof assembly. The deck must meet GAF® requirements as described in the Roof Design section of the current GAF® Application and Specifications Manual **or approved equal Manufacturer**. None of the foregoing factors are the responsibility of GAF® which under no circumstances will assume such responsibility.
3. Perimeter and penetration wood nailers and curbs must be in place as specified.
4. The roof deck must provide positive drainage or tapered insulation must be used to provide slope.
5. Outlets must be placed and installed to remove water promptly and completely from the roof.
6. Expansion joints, roof vents, roof drains, etc., must be installed using acceptable industry standards and GAF® specifications and flashing details **or approved equal Manufacturer**.

B. Tear-off

1. All old roofing must be removed down to the deck. The deck shall be cleaned, repaired, and otherwise conditioned to conform to the requirements of a new deck.
2. All old flashing must be removed and stripped from walls, curbs, etc.
3. All existing composition and metal flashing must be removed and replaced.
4. All existing metal counterflashing, metal coping, and other metal work above the roof system must be inspected and replaced to provide a watertight assembly.
5. All metal flashing must as per attached Section 07620 Steel Blocking and Sheet Metal.



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6. Prime all masonry, metal, and existing asphalt surfaces and substrates with Matrix™ 307 Premium Asphalt Primer where GAF® membranes are to be adhered **or approved equal Manufacturer.**
7. Inspect roof drains and outlets. Remove existing drain flashings and replace broken or stripped bolts, clamping rings, and strainers. Drains must be M-Weld™ drains or drains with metal-type clamping rings. Plastic drains are not acceptable. All drains, including retro fit or insert drains, must be sumped to promptly remove water from the roof surface and meet code requirements.
8. **Note: Substrates must be inspected and accepted by the deck contractor, roof contractor, or owner as being ready to receive and hold the roof system as specified.**

C. Structural Concrete Deck

1. Minimum deck thickness for structural concrete is 4" (10.2 cm).
2. Only poured in place concrete decks that provide bottom side drying are acceptable. Decks that are installed over non-vented metal decks or pans that remain in place may trap moisture in the deck beneath the roof system and are not acceptable.
3. The roof deck shall be properly cured prior to application of the roofing system; twenty-eight (28) days is normally required for proper curing. Curing agents must be checked for compatibility with roofing materials. Prior to the installation of the roof assemblies, GAF® recommends the evaluation of the surface moisture and deck's dryness through the use of ASTM D-4263 or hot bitumen test.
4. The deck must be smooth, level and cannot be wet or frozen. If deck is determined to be wet, it must be allowed to dry.
5. Treat cracks greater than 1/8" (3 mm) in width in accordance with the deck manufacturer's recommendations.
6. Sumps for the roof drains shall be provided in the casting of the deck.
7. When insulation or roofing is to be adhered with hot asphalt, prime the deck with asphalt/concrete primer, ASTM D 41 at the rate of one gallon per 100 square feet (0.4 L/m<sup>2</sup>). Allow the primer to dry prior to the application of the roofing system.
8. In all retrofit roof applications, it is required that deck be inspected for defects. Any defects are to be corrected per the deck manufacturer's recommendations prior to the new roof application.

3.03 INSTALLATION

A. GAF® Ruberoid® Specification #: I02HGPFREC **or approved equal Manufacturer**

B. General:

1. Install GAF® roofing system according to all current application requirements in addition to those listed in this section.
2. Substrates must be inspected and accepted by the contractor as suitable to receive and hold roof membrane materials.
3. Start the installation of all membrane plies at the low point or drains, so the flow of water is over or parallel to the ply laps, but never against the laps.
4. Chalk lines where necessary to ensure proper alignment and headlap widths of membrane plies.
5. Use half base sheet width as a starter strip in two-ply roof constructions.
6. Installation of all membrane plies, except those that are mechanically fastened, shall result in a visible, uniform flow-out of bitumen at side and end laps.

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7. Ensure that all membrane plies lay flat and are uniformly secured to their substrate. Wrinkles, fishmouths, and similar defects must be removed and patched.
8. Extend all membrane plies to dimensions necessary to accommodate flashing conditions shown in the RUBEROID®/GAFGLAS® Roof Flashing Details Manual.
9. All lap edges for GAF® cap membranes **or approved equal Manufacturer** shall be rolled-in or walked-in immediately after installation. Additional care must be taken to ensure complete bonding at “T” laps. Lap edges on all membrane sheets should be inspected for full and uniform bonding to the underlying membrane sheet.
10. Stagger all adjacent end laps for all membrane plies a minimum of 18" (457 mm). Side laps shall not coincide with underlying plies in multiple layer applications.
11. Prime all masonry, metal, and existing asphalt surfaces and substrate with asphalt primer where insulation or GAF® membranes are to be adhered. Matrix™ 307 Premium Asphalt Primer (ASTM D41) **or approved equal Manufacturer** shall be applied at the rate of 1 gal/square (0.41 L/m<sup>2</sup>). Allow the primer adequate time to dry.
12. Brooming-in of glass felts is vital to minimize voids and ensure complete, uniform attachment.
13. Occasionally, a roll of felt or membrane will contain a splice that was fabricated as part of the manufacturing process. These splices are marked. Cut out all splices and treat as an end lap.
14. Back nailing of felts and cap sheets, and the use of ASTM D312 Type IV asphalt is required on slopes 1/2:12 or greater. Refer to “Steep- Slope Requirements” in the next section.

C. Phasing:

1. The term “phasing” refers to the practice of applying part of a total roof membrane at one time and allowing that part to remain exposed to the weather for a period of time before applying the remaining elements of the roof system. Membranes applied in this manner are subject to early deterioration.
2. Blisters, voids, membrane damage, and moisture infiltration are much more likely to occur in “phased” roof membranes.
3. Whenever it is necessary to put a building “in the dry” quickly, a temporary roof covering is recommended; this temporary roof should be removed prior to installation of the roof system.

3.04 INSULATION - GENERAL

- A. Do not apply roof insulation or roofing until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment. A vapor retarder coated lightly with asphalt may be applied to protect the inside of the structure prior to the insulation and final roofing installation. Before the application of the insulation, any damage or deterioration to the vapor retarder must be repaired.
- B. Do not install wet, damaged or warped insulation boards.
- C. Install insulation boards with staggered board joints in one direction (unless taping joint).
- D. Install insulation boards snug. Gaps between board joints must not exceed ¼" (6 mm). All gaps in excess of ¼" (6 mm) must be filled with like insulation material.
- E. Wood nailers must be 3-1/2" (8.9 cm) minimum width or 1" (25 mm) wider than metal

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flange. They shall be of equal thickness as the insulation with a minimum 1" (25 mm) thickness. All nailers must be securely fastened to the deck.

- F. Do not kick insulation boards into place.
- G. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.
- H. Do not install insulation over old lightweight insulating concrete decks without the use of a vapor retarder. Insulation should not be installed over new lightweight insulating concrete.
- I. Cant strips must be installed at the intersection of the roof and all walls, parapets, curbs, or transitions approaching 90°, to be flashed. They shall be approximately 4" (10.2 cm) in horizontal and 4" (10.2 cm) in vertical dimension. The face of the cant shall have an incline of not more than 45 degrees with the roof.
- J. Adhesion test is required for any insulation that will be installed with low rise foam adhesive.
- K. Do not install any more insulation than will be completely waterproofed each day.

3.05 INSULATION – BASE LAYER

- A. OLYBOND 500
  1. The substrate must be free of and debris, dust, dirt, oil, grease, and standing water before applying the adhesive.
  2. OlyBond 500 **or approved equal Manufacturer** must be applied using the specially designed PaceCart dispenser. OlyBond 500 SpotShot shall be applied using one of the specially designed dual cartridge dispensers. OlyBond 500 Equipment Free Canister System dispenses with 25' hose and gun assembly included with product.
  3. Install insulation layers applied with bands of OlyBond 500 **or approved equal Manufacturer** to achieve proper coverage rates for insulation attachment:
    - a) Field: 12" o.c.
    - b) Perimeter: 6" o.c.
    - c) Corners: 4" o.c.
  4. Approximate coverage rate is ½ to 1 gallon per 100 square feet, depending on the substrate. Allow the foam to rise ¾" to 1". Walk each board firmly into place. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6" (15.2 cm) to eliminate continuous vertical gaps.

3.06 INSULATION – SUBSEQUENT LAYERS

- A. OLYBOND 500
  1. The substrate must be free of and debris, dust, dirt, oil, grease, and standing water before applying the adhesive.
  2. OlyBond 500 **or approved equal Manufacturer** must be applied using the specially designed PaceCart dispenser. OlyBond 500 SpotShot shall be applied using one of the specially designed dual cartridge dispensers. OlyBond 500 Equipment Free Canister System dispenses with 25' hose and gun assembly included with product.
  3. Install insulation layers applied with bands of OlyBond 500 to achieve proper coverage

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rates for insulation attachment:

- a) Field: 12" o.c.
  - b) Perimeter: 6" o.c.
  - c) Corners: 4" o.c.
4. Approximate coverage rate is ½ to 1 gallon per 100 square feet, depending on the substrate. Allow the foam to rise ¾" to 1". Walk each board firmly into place. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6" (15.2 cm) to eliminate continuous vertical gaps.

3.07 PLY / CAP  
SHEET

- A. Prime cover board with Matrix™ 307 per FBC requirements.
- B. Install one ply of the specified Ruberoid® smooth sheet and follow with the specified granule surfaced sheet.
- C. Lap sheets 3" (7.6 cm) on the sides and 6" (15.2 cm) on ends. All end laps must be staggered a minimum of 18" (45.7 cm) so that no adjacent end laps coincide. If end laps fall in line or are not staggered the proper distance, a full width of membrane must be installed over the end laps. End laps, flashing sheets and other seams formed over granule surfaces require pre-heating of the top surface of the underlying granule surface membrane to a point where the granules just begin to sink into, and the modified bitumen compound comes up through the granules to ensure proper seam construction and adhesion.
- D. The surface over which the membrane is to be installed must be clean, smooth, dry and prepared in accordance with GAF requirements. Do not apply membrane directly to a fresh asphalt glaze or flood coat, or over base plies with excessive asphalt mopping bleed out at laps.
- E. For slopes 3/4 " per foot (6.2 cm per meter) and over, membrane must be run parallel to the roof slope and back nailed in accordance with GAF® or **approved equal Manufacturer** steep slope application requirements. On slopes less than 3/4" per foot (6.2 cm per meter), install cap sheet perpendicular to the slope.
- F. Never apply membrane by any method except welding with a propane torch or other equipment specifically designed for application of torchable modified bitumen.
- G. The coiled membrane must be unrolled approximately 10 ft. (3 meters), and aligned. The propane torch flame is then applied uniformly across the exposed back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. A complete burn-off of release films where present on the underside of the rolls, membrane selvage edges or both surfaces is necessary. Avoid overheating which may result in damage to or improper adhesion of the membrane. (The flame should be moved from side to side in the shape of an "L", applying about 75% of the heat to the membrane and 25% to the substrate or underlying plies including the lap area of the previously installed courses.) The membrane is slowly unrolled as heat is applied to ensure proper adhesion. When complete, re-roll the opposite end of the membrane and install in the same manner.

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- H. A minimum 3/8" (10 mm) bitumen flow-out must be obtained at all seam areas. Dry laps are not acceptable. To ensure the proper 3/8" (10mm) flow of bitumen at the seam areas, a roller may be used. Roller application should follow behind the torch no more than 4 ft. (1.2 m) nor less than 3 ft. (0.91 m) to be sure that the membrane will be at the proper temperature to produce proper flow. Hand rollers or "walking-in the seam" methods are also acceptable. Check all seams for full and uniform adhesion. Un-adhered seams must be lifted with a heated trowel and resealed by lightly torching the seam area.
- I. (Optional) Matching granules may be broadcast into the modified bitumen bleed out at seams while hot to enhance the finished appearance of the membrane.
- J. All laps must be parallel or perpendicular to the slope of the roof such that the flow of water is never against the lap.
- K. Membranes must not be applied during adverse weather or without precautionary measures in temperatures below 45°F (7.2°C). Contact GAF® Contractor Services for details.
- L. If damage by other trades or any inadvertent damage should occur to the EnergyCap™ product during installation, and for aesthetic purposes only, an additional fog coat of EnergyCote™ or approved equal Manufacturer coating can be applied to the sheet at a rate of ½ to 1 gallon per 100 sq. ft.

3.08 BITUMINOUS BASE FLASHINGS

- A. Install GAF® base flashing specification 2XHHEC over all cant strips, horizontal to vertical transitions, roof edges and roof penetrations. Flashings are to be secured in accordance with current GAF® application guidelines.
- B. Nailable curbs and walls must be covered with a layer of approved GAFGLAS® Base Sheet or backer ply fastened 8" (20.3 cm) o.c. in all directions with approved fasteners. All vertical laps shall be 4" (10.2 cm). Base sheet or backer ply must extend out onto the field of the roof as shown in the applicable GAF® construction detail.
- C. Prime all metal and masonry surfaces with asphalt primer, and allow adequate drying time prior to adhering flashing plies.
- D. Backer plies installed over masonry or other non-nailable substrates must be cut into manageable lengths to ensure adequate adhesion to the cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4" (10.2 cm). Backer plies shall extend onto the field of the roof as shown in the applicable GAF® construction detail.
- E. The finished ply of base flashing shall be run vertically to provide a selvage edge that will aid in achieving proper adhesion at the 3" (7.6 cm) vertical laps. If the sheet is run horizontally, the vertical laps must be a minimum of 6" (15.2 cm) and the selvage edge must be removed from the sheet or fully covered by the counterflashing. The finished flashing ply must extend out onto the field of the roof as shown in the applicable GAF® construction detail, and must be extended a minimum of 4" (10.2 cm) beyond the edge of the prior flashing plies. The flashing must be soundly adhered to the parapet, cant area and roof surface to result in a minimum void, non-bridging construction.

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- F. Base flashing heights must be a minimum of 8" (20.3 cm) and a maximum of 24" (61.0 cm) above the roofline.
- G. Corner membrane flashings, such as "bow ties" for outside corners and "footballs" for inside corners or other membrane reinforcements are required to ensure that base flashing corners are sealed at cant areas. An alternate method of corner reinforcing is to install a smooth MB membrane reinforcement piece on the prepared corner substrate prior to final surfacing membrane. Refer to MB Flashing Details section of the GAF® *Application and Specifications Manual*.

3.10 WALKWAYS

- A. Walkways for normal rooftop traffic may be constructed from two plies of modified bituminous membrane of the same type as the field of the roof. This type of walkway is not for sidewalk or patio-type use.
- B. Construct walkways by solidly adhering a first ply of smooth surfaced membrane to the field of the roof followed by a granule surfaced membrane to the surface of the first ply.
- C. Walkway sections should be no longer than 10' (3 m), with a 6" (15.2 cm) minimum gap between each section to allow for drainage.

3.11 ROOF PROTECTION

- A. Protect all partially and fully completed roofing work from other trades until completion.
- B. Whenever possible, stage materials in such a manner that foot traffic is minimized over completed roof areas.
- C. When it is not possible to stage materials away from locations where partial or complete installation has taken place, temporary walkways and platforms shall be installed in order to protect all completed roof areas from traffic and point loading during the application process.
- D. Temporary tie-ins shall be installed at the end of each workday and removed prior to commencement of work the following day.

3.12 CLEAN-UP

- A. All work areas are to be kept clean, clear and free of debris at all times.
- B. Do not allow trash, waste, or debris to collect on the roof. These items shall be removed from the roof on a daily basis.
- C. All tools and unused materials must be collected at the end of each workday and stored properly off of the finished roof surface and protected from exposure to the elements.

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- D. Dispose of or recycle all trash and excess material in a manner conforming to current EPA regulations and local laws.
- E. Properly clean the finished roof surface after completion, and make sure the drains and gutters are not clogged.
- F. Clean and restore all damaged surfaces to their original condition.

**END OF  
SECTION**

**SECTION 07620**  
**ROOF ASSEMBLY STEEL BLOCKING AND SHEET METAL**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- A. Coordinate Roof Assembly roof insulation work with work before and after. See especially:
1. 07522 - RA Modified Bitumen Roofing and insulation
  2. 07620 – RA Steel Blocking and Sheet Metal
  3. 07630 - RA PVC Rainleaders and Storm Sewer

**1.2 QUALITY ASSURANCE**

- A. Installer's Qualifications: Each installer of a shown part of the Roof Assembly shall:
1. Have 5 years of successful experience in the installation of that roof component.
  2. Be currently licensed or certified by the producer of each Roof Assembly steel blocking and sheet metal component for the installing the steel blocking and sheet metal parts of the Roof Assembly.
- B. Insurer Certification: Assist MDPLS in preparing steel blocking and roofing sheet metal acceptance certification as needed for the fire and extended coverage insurance of the Roof Assembly.
- C. Pre-Installation Meeting: At least 6 weeks before installation of Roof Assembly, the Contractor shall conduct a meeting at the worksite with installers of each part of the Roof Assembly, affected installers of other work, A/E, AHJs, and MDPLS representatives.

**1.3 SUBMITTALS**

Follow 01330

- A. Special Warranties: Before making any other submittals, and at least 10 weeks before pre-installation meeting, submit and obtain approval of draft of (or form for) each specified Special Warranty.
- B. Product Data: Description of each product, including standards met, and the following:
1. Miami-Dade Product Notice of Approval (NOA) number and expiration date.
  2. Evidence of specified FM Wind Resistance Classification.
  3. Producer's installation instructions.
- C. **Shop Drawings: Roof plan showing slopes, expansion joints, scuppers, hatches, smoke vents, equipment supports, crickets, equipment curbs, portals, roof penetrations and how they are fitted with steel cants and penetration flashings. Show details for proper installation.**
1. Show negative pressures on each part of the roof where SRB and RPF occur (no less than those shown in roof wind pressure diagrams in the Construction Documents).



2. Show details of interface between deck, steel blocking, metal flashings, insulation, and roofing. Show crickets and expansion joints and how they will be flashed.
3. Show the number and type of fasteners in SRB, RPF and sheet metal to fasten to roof structure and vertical surfaces.
4. Show location of sealants in or at edge of SRB, RPF and sheet metal to make the Roof Assembly watertight
5. Show how hatches, smoke vents, equipment curbs, and portals are provided with steel cants and receivers for flashing.
6. Show how any changes in roof insulation thickness will be accommodated.
7. Show how water is conducted by scupper, gutter, conductor head, and stainless steel downspout from a higher roof to a lower one, and from conductor heads at lowest roof level to PVC rainleaders.

D. Samples:

1. 8 in. length of SRB for roof perimeter blocking, cant, coping, and expansion joint.
2. 8 in. length of sheet metal drip edge, window head, door head.
3. 8 in. length of gutter and of downspout, along with one gutter bracket, spacer bracket and downspout bracket.
4. Strap support for rainleaders.
5. Typical sheet metal flashing for a round roof penetration, and a conical sealant cover.

E. Certification, before installation: Letter from the producer of steel roof blocking and roofing sheet metal, approving the proposed installer.

1.4 SPECIAL WARRANTIES

Follow 01790

- A. By Membrane Producer: Provide a 20 year Special Warranty from the roof membrane producer covering correction of defects in the steel blocking and sheet metal component of the Roof Assembly.
- B. By Steel Roof Blocking and Roofing Sheet Metal Producer and Installer: Provide a 10 year Special Warranty in which the SRB producer / installer agrees to correct defective SRB work.
  1. See 07500 for the full requirements of this Special Warranty that shall accompany the Roof Assembly Special Warranty.
  2. At time of project closeout, submit this signed Special Warranty to the roof membrane producer for transmittal to Contractor, A/E, and MDPLS.

PART 2 PRODUCTS

Follow 01600

2.1 ROOF ASSEMBLY STEEL ROOF BLOCKING (SRB)

[07620.srb]

- A. Description: Engineered galvanized steel brake metal, designed to replace wood blocking and, with proper fastening, to withstand positive and negative pressures in roof construction in HVHZ areas as defined in FBC. SRB fabrications include such items as stainless steel covers for use in areas exposed to view that mate with blocking profiles. SRB includes such items as blocking, cants, copings, expansion joint covers, scuppers, umbrellas, and counterflashings.

1. Structural fabrications: 16 gage galvanized steel; ASTM A653, G90.
2. Covers: 24 gage Type 304 stainless steel; ASTM A240.
3. Reinforcement: Add welded steel reinforcing before galvanizing where needed to withstand project-specific extreme positive and negative wind pressures at various locations as inferred from wind pressure diagrams.
4. Accessory products: Cleats, fasteners sized and spaced to withstand specified wind pressures, compressible closed-cell elastomeric insulation, and silicone sealants
5. Fabrications: See specified SRB fabrications for specific uses below.

B. Product / Producer: This specification is based on the properties and performance of one Basis of Design (BOD) line of products. Provide specified BOD products or submit a detailed approval request to use another producer's line.

1. Provide SRB from a fabricator licensed by the following holder of ARBS patents, or equal approved by A/E and MDPLS: Alternative Roof Blocking System.
2. Equal product in quality and performance as approved after review by A/E and MDPLS Maintenance & Operations – Roofing Division.

## 2.2 ROOF ASSEMBLY ROOF PENETRATION FLASHING (RPF) [07620.rpf]

A. Description: Close-fitting stainless steel flashings for penetrating pipes, vents, conduit, coaxial cable, guys, penetration umbrellas, scuppers, structural supports, and hoods/shacks for grouped penetrating lines.

1. Material: 24 to 28 gage, as practical for various configurations, Type 304 stainless steel, ASTM A240.
2. Accessory products: Solder, gaskets, elastomeric foam fill, backer foam, EPDM sheet, silicone sealants, hose clamps, and fastenings size and spaced to withstand specified wind pressures. Provide vandal-resisting caps for vents.
3. Fabrications: See specified RPF fabrications for specific uses below.

B. Product / Producer: This specification is based on the properties and performance of one Basis of Design (BOD) line of products. Provide specified BOD products or submit a detailed approval request to use another producer's line.

1. SBC Industries.
2. Equal product in quality and performance as approved after review by A/E.

## 2.3 ROOF AND WALL SHEET METAL (SM) [07620.sm]

A. Description:

1. Sheet metal: Type 304 stainless steel; ASTM A240.
2. Accessory products: Cleats, fasteners sized and spaced to withstand specified wind pressures, compressible closed-cell elastomeric strips and fillers, and silicone sealants
3. Fabrications: See specified sheet metal fabrications for specific uses below.

B. Product / Producer: Roof membrane installer's shop or SRB fabricator's shop.

## 2.4 ACCESSORY PRODUCTS

- A. Strap supports for Rainleaders to Storm Sewer: Hemmed, safety edge 11 ga stainless steel, suitable for bolting PVC rainleaders to walls at top, bottom and 36 to 44 in. oc between, complete with 4 screw anchor fasteners for each strap.
  - 1. Confirm quantities needed, fabricate, supply fasteners, and supply to PVC rainleader installer.
- B. Priming and Protective Coatings: Bituminous paint or zinc-rich primer such as zinc molybdate in an alkyd vehicle.
- C. Elastomeric Coating (sometimes referred to as "paint") for drip edges, scuppers, gutters, collection boxes, downspouts, rainleaders, and window and door head flashings: As specified in elastomeric coating section (Div 09).
  - 1. Time of coating: Before installation of each sheet metal item, preferably at shop.
  - 2. Texture: Smooth, without granules.
  - 3. Color: Match each wall color directly in background of each sheet metal fabrication.
- D. SBS-modified Bitumen: As specified in roofing assembly modified bitumen roofing section.
- E. Roofing Cement: Asphalt or SBS-modified asphalt, asbestos-free; ASTM D4586.
- F. Flashing Cement: Asphalt or SBS-modified asphalt, fibered, asbestos free, non-sag; ASTM D4586, Type I.
- G. Primer for stainless steel, copper, and other sheet metal that is to be embedded in roofing or base flashing plies: Asphalt or SBS-modified asphalt, asbestos-free, such as Elastocol 500, by Soprema: ASTM D2027.
- H. Alsan flashing: Alsan flashing, by Soprema, or equal product approved by A/E. Do not use this flashing unless approved by A/E for each condition where no other flashing detail or product is suitable.
- I. Fasteners:
  - 1. Screw anchors (for use in concrete and masonry): Case hardened steel screws with baked-on rust-inhibitive coating, for use in drilled holes, such as GrabCon by Grabber, Tapcon by ITW Buildex, or Tapper by Powers.
    - a. For products having Miami-Dade County Product Approval or FBC product acceptance, use only the specific brand of fasteners used in testing the product, and in the same diameter, length, and structural penetration.
  - 2. Screws (for attaching to metal): Stainless steel machine screws in tapped holes or self-drilling screws.
  - 3. Solder: Tin alloy, lead-free.

## 2.5 STEEL ROOF BLOCKING (SRB) AND SHEET METAL (SM) FABRICATIONS

- A. Drip Edge Assembly:

1. Design: As shown on the Plans and as reviewed and approved by A/E and MDPLS Maintenance – Roofing Division. Where the thickness of insulation varies, provide blocking sections of varying height to match profile of insulated roof edge.
2. Standard: Follow FBC RAS 111 – Table 2.
3. SRB blocking and closers: 16 ga galvanized steel.
4. Drip edge cover: 22 ga stainless steel in sections no more than 10 ft long.
5. Cover cleat with 22 ga stainless steel edge profile.
6. Roof flange: At least 4 in. wide.
7. Bottom drip: Not less than 1 in. below bottom of wood roof sheathing, with kick to shed water 3/4 in. from finish wall.
8. Elastomeric coat surfaces at any elevation that will be visible from ground.
9. At roof edges, in existing wood blocking assemblies only, such as tile or shingle roofs: Provide a continuous 20 ga. stainless steel cleat with punched holes 6 in. o.c., without SRB. If cleat extends more than 6 ft, punch holes 12 in. oc.

B. Surface-Mounted Counterflashing (one-piece):

1. Design: As shown on the Plans and as reviewed and approved by A/E and MDPLS Maintenance & Operations – Roofing Division.
2. Stainless steel sheet, fabricated in approximately 10 ft sections.
3. Provide flashing with 1-1/2 in. wall flange with 1/4 in. kick at top to receive sealant, a 1/2 in. 135° face sloping to flange, and a 4 in. bottom flange formed inward 3/4 in. towards wall with a hemmed 1/2 in. kick at bottom.
4. Shop punch wall flange 12 in. oc for fastening.
5. Provide shop fabricated corner splices 4 in. wide.
6. Elastomeric coat surfaces below 60 ft elevation that will be visible from ground.

C. Cants With Counterflashing Above:

1. Design: As shown on the Plans and as reviewed and approved by A/E and MDPLS Maintenance & Operations – Roofing Division.
2. SRB edge blocking / cant fabrication: 16 ga galvanized steel, fastened 12 in. oc with #14 steel roof fasteners or 1-1/2 in. screw anchors, with, each over 3/4 in. steel washers.
3. Counterflashing: As specified for surface-mounted counterflashing.

D. Stucco Stop with Counterflashing (two-piece):

1. Design: As shown the Plans and as reviewed and approved by the A/E and MDPLS Maintenance & Operations – Roofing Division.
2. Stainless steel sheet, 22 ga. fabricated in approximately 10 ft sections.
3. Receiver: 1-1/2 in. wall flange, 3/4 in. sloping stucco stop, 3/4 in. flange bent downward with 1/2 in. hem.
4. Shop punch wall flange 12 in. oc for fastening.
5. Corner splices: Shop-fabricated, extending 4 in. each way.
6. Counterflashing: 1-1/2 in. 45° top flange with 1/4 in. kickback at top and a 4 in. bottom flange formed inward 3/4 in. towards wall with a hemmed 1/2 in. kick at bottom.
7. Storm cleats: 1-1/2 in. x 4 in.
8. Elastomeric coat surfaces below 60 ft elevation that will be visible from ground.

E. Scuppers:

1. Design: As shown on Plans and as reviewed and approved by A/E and MDPLS Maintenance & Operations – Roofing Division.
2. Standard: Follow FBC RAS 111 – Table 2.
3. SRB blocking and cants: 16 ga galvanized steel.
4. Stainless steel sheet, 22 ga.
5. Lock seam corners, solder watertight and hem outer exposed edges.
6. Wall flanges: At least 4 in. wide, formed to fit cants, decks and vertical wall surface. Shop punch 6 in. oc for fastenings.
7. Where a scupper discharges to the ground, extend lip 3 - 4 in. beyond the wall plane to reduce drippage against wall. Over collector boxes, extend lip 2 in.
8. Elastomeric coat side, soffit and drip surfaces at any elevation above grade.
- 9.

F. Duct Portals, Insulated (as needed):

1. Design: As shown on the Plans, rising straight for 12 in. to receive counterflashing, and as reviewed and approved by A/E and MDPLS Maintenance & Operations – Roofing Division.
2. Standard: Follow FBC RAS 111 – Table 2.
3. SRB blocking and field-applied cants: 16 ga galvanized steel.
4. Stainless steel sheet, 22 ga, fabricated with upper finish exposed to weather in approximately 10 ft sections.

## 2.6 ROOF PENETRATION FLASHING (RPF) FABRICATIONS

- A. Roof Penetration Fabrications: Fabricate in two pieces where needed to install around penetrations, with provision for interlocking seams filled with sealant in field. Fabricate and install to drain water away from sealant joints, and protect sealant in joints from sunlight and standing water.
- B. Flashings for Pipes, Conduits, and Equipment Supports That Penetrate or Rest on Roof:
1. Form tubular stainless steel base flashing sleeves at least 8 in. high to fit pipe, conduit, and round equipment support and with 4 in. wide roof flanges soldered watertight.
  2. Form split tubular stainless steel counterflashing to minimum loose edge lap, of 5-1/2 in. minimum height and lapping 4 in. over base flashings.
  3. Conical sealant cover: Slope outward and downward at 30° to 45° from the horizontal plane with ID equal to the vent stack diameter and with OD 1 to 2 in. larger.
- C. Curb-to-Duct Flashing and Counter Flashing:
1. Coordinate curb sizing so that their roof deck metal flanges can be fastened to the structural deck to achieve height at least of 8 in. above the finish roof surface. Provide greater height when required by code.
  2. Fabricate flashings from stainless steel to fit duct curbs and ducts projecting from curbs.
  3. Provide 4 in. vertical flange to cover top edge of bituminous base flashings. Form flange bottom towards curb, with 1/4 in. bottom edge bent 1/4 in. out and hemmed.

4. At top of curbs bend metal 90° and extend horizontally over to duct, then bend upward and extend vertically not less than 3 in. from top edge of flashing out 3/8 in. to receive sealant.
5. Provide for field soldered lap joints at corners and 1 in. lap joints at horizontal miter splices.
6. Provide roof crickets at the highest side of roof curbs, roof hatches, smoke vents, fan bases, and goosenecks.

## 2.7 SHEET METAL (SM) FABRICATIONS

- A. Roof drain flashings: 16 oz copper at least 0.200 in. thick, 30 x 30 in. overall; ASTM B272, Temper 00 or 01. Do not use lead.
- B. Gutters: Stainless steel, 22 ga. For gutters with a girth (length of a cord encircling gutter) that exceed 30 in., fabricate from 18 ga or heavier stainless steel. Hold front edge of the gutter at least 1 in. below the back edge. Provide continuous cleats at the back edge of the gutter. Elastomeric coat outside surfaces:
  1. Gutter expansion joints: Provide no more than 50 ft oc (or 25 ft from a corner).
    - a. Locate downspouts and attach gutter anchors and supports to accommodate, not constrain, thermal movement.
    - b. Lap joints in gutter at least 2 in. in direction of flow, and solder. Use only solder at lap and conductor head joints; no liquid gutter seal.
  2. Gutter brackets: Stainless steel, spaced no more than 30 in. oc.
    - a. Brackets: At least 1/8 in. thick (11 ga) by 1 in. wide for gutter girths up to 20 in., and 2 in. wide for girths exceeding 20 in.
    - b. Attach to the face of the gutter, in addition to the building structure at the back of the gutter.
  3. Spacer straps: Stainless steel, 1/16 in. thick (16 ga) x 1 in. wide, in gutters 5 in. or wider, halfway between all gutter brackets. Fasten only to front and back of gutter.
- C. Conductor Heads and Downspouts (Downspouts convey water from conductor heads to PVC rainleaders or to splash blocks on a lower roof or at grade:
  1. Conductor heads and downspouts: Stainless steel, 22 ga, soldered watertight.
  2. Make top of the conductor head at least 2 in. wider than and 1 in. below the scupper. Proportion following SMACNA Architectural Sheet Metal Manual.
  3. For conductor heads and s/s downspouts feeding rainleaders. Provide a tailpiece at least 3 in. long that will mate with the PVC rainleader pipe that is to be used in such a way that an airtight seal (using gasket or sealant) can be made.
  4. For conductor heads feeding s/s downspouts: Provide a tailpiece 2 to 4 in. long that will mate with the downspout to form a screwed and soldered, airtight joint.
  5. Strap supports: Hemmed safety edge 11 ga stainless steel, suitable for bolting downspouts to walls at top, bottom and 36 to 44 in. o.c. between, complete with 4 screw anchor fasteners for each strap.
  6. Prepare outside surfaces of conductor heads, downspouts and straps to receive field application of elastomeric wall coating.

### 3.1 EXAMINATION AND PREPARATION

- A. Check and prepare surfaces that will receive steel roof blocking and roofing sheet metal.
  - 1. Concrete condition: Dry, smooth, and free of shrinkage cracks, laitance, bond-breaking substances, loose material, pits, honeycomb, ridges and roughness.
  - 2. Metal condition: Clean and smooth. Verify that dissimilar metals are coated with bituminous paint or zinc-rich primer.
- B. Check openings for other work on or passing through roof deck, such as for roof drains, hatches, smoke vents, equipment curbs and portals, to confirm that they are complete, framed or reinforced, and trimmed straight and clean.
- C. Delivery, Storage and Weather: Deliver and store products in sealed protective packaging. Install products dry, in dry weather.
- D. Do not start the installation of this work until conditions detrimental to its proper completion have been corrected.

### 3.2 PRIMING AND COATING

- A. Priming: Before setting in place, prime topsides and undersides of flashings that are to be placed over the roof membrane.
  - 1. Set primed copper roof drain flashings in full bed of flashing cement (torch application) or SBS-modified bitumen (hot mopped application) over the intermediate ply of the roof membrane assembly and cement or hot mop cap sheet in place.
  - 2. Set other primed sheet metal items over cap ply.
  - 3. After priming the flanges, strip in the flanges of all roof-set sheet metal items with 2 roofing plies, torched in place (set in solid coats of hot bitumen if hot mopping)..
- B. Elastomeric Coating: Do not install sheet metal over previously applied elastomeric-coated walls until sheet metal items (including straps) have been coated by provider of elastomeric coating to match wall color (but in smooth un-textured formulation).

### 3.3 INSTALLATION OF ROOF BLOCKING AND STAINLESS STEEL COVERS (SRB).

- A. Install SRB following approved shop drawings and producers current published instructions, except as more stringently specified herein.
  - 1. Fasteners not covered by insulation or roofing membrane shall be removable
  - 2. Install steel blocking to even, smooth, sound, thoroughly clean and dry surfaces that are free from defects that might affect performance.
  - 3. Lap, weld, bolt, rivet, lock, or seal joints and provide sufficient fasteners to ensure complete and weathertight assemblies. Fasten to building structure.
  - 4. Isolate dissimilar metals with isolation sheets or heavy isolation coatings.
  - 5. Install blocking and sheet metal to drain water away from sealant joints. Protect sealant in joints from sunlight and standing water.
- B. Edge Drips:

1. Install a continuous 20 ga stainless steel cleat.
2. Set 22 ga stainless steel edge drip roof flanges in full bed of roofing cement over completed roofing.
3. Lap splices 4 in. minimum and seal top horizontal surface laps with cold SBS bitumen.
4. Stagger-nail the 4 in. flange to roof deck 4 in. oc and cover with 2 plys of felt stripping set in full bed of roofing cement.
5. Locate drip bottom not less than 3/4 in. away from finished vertical surfaces

C. Stucco Stop with Counterflashing (2- piece)

1. Set receiver on exterior walls where shown, but in no case less than 11 in. above level of roofing. Lap splices at least 4 in. and seal laps with silicone sealant.
2. Fasten receiver to wall with #10 x 1-1/4 in. or larger screw anchors 12 in. oc.
3. Check for watertight membrane/bitumen seal at top of base flashing before installing counterflashing.
4. Attach storm cleats 30 in. oc, with one cleat at each joint. Insert counterflashing into receiver, and fasten tightly with storm cleats.

D. Surface Mounted Flashing (1-piece):

1. Set on exterior walls over base flashing where shown. Lap splices at least 4 in. and seal laps with silicone. Fasten to wall with #10 x 1-1/4 in or larger pan head concrete screw anchors 12 in. oc. Provide neoprene sealing discs over stainless steel washers at each fastener.
2. Over corrugated metal walls, place premolded neoprene filler strip on wall immediately above top of metal base flashing. Set filler strip in silicone and seal abutting edges of filler strip likewise. Set counterflashing in silicone sealant over filler strip and fasten flashing to metal wall through filler strip with #10 stainless steel sheet metal screws of appropriate length, 6 in. oc, centered on wall flutes.
3. Provide EPDM or neoprene discs and stainless steel washers under screw heads.
4. Check for watertight membrane/bitumen seal at top of base flashing before installing counterflashing.

E. Scuppers:

1. Set scuppers in full bed of roofing cement over completed base flashing and roof membrane.
2. Fasten to structure with stainless sheet metal fasteners and anchors 6 in. oc.
3. Seal against both sides of wall at scupper perimeter.

F. Cants: Provide and fasten SRB cants to hatches, smoke vents, portals, and equipment curbs that have not been fabricated with integral cants.

G. Crickets: Provide sheet metal crickets upstream of roof curbs to ensure that the rainwater course is divided to flow around obstructions.

### 3.4 INSTALLATION OF ROOF PENETRATION FLASHING (RPF)

- A. Install RPF following approved shop drawings and producers current published instructions, except as more stringently specified herein.



1. Slip stainless steel flashing over each vent stack and other roof penetration, lock 2-piece units with sealant in joints, and set roof flanges in full bed of roofing cement.
2. Mate shop fabricated half-sections around the penetrating item and solder vertical and horizontal seams watertight.
3. Set flashing roof flanges in full bed of roofing cement.
4. Cover flashing flanges with 2 layers of roofing felt stripping set in solid coats of hot SBS-modified bitumen or roofing cement.
5. Wrap pipe, conduit, and round equipment supports with one or more layers of 3/8 x 1 in. wide neoprene foam tape, with tight fitting butt joints.
6. Install counterflashing over base flashing and solder the vertical seam.
7. Wrap oversize backer rod around vent stack and insert it 3/8 in. below top of flashing.
8. Seal watertight at top edges with a one part silicone sealant and tool to shed water.
9. Install conical sealant covers directly above sealant.
10. Install vandal-resistant vent stack caps at vent stacks unless otherwise shown.

### 3.5 INSTALLATION OF SHEET METAL (SRB, SM AND RPF)

- A. Install sheet metal items following approved shop drawings and producers current published instructions, except as more stringently specified herein.
  1. Fasteners not covered by roofing membrane shall be removable.
  2. Extend each downspout or conductor head tailpiece that feeds a PVC rainleader from 2 to 4 in. into the rainleader, Seal the joint airtight with silicone or EPDM gasket.
  3. Screw and solder s/s downspouts to s/s conductor head tailpieces.
  4. Install roofing sheet metal items to even, smooth, sound, thoroughly clean and dry surfaces that are free from defects that might affect performance.
  5. Lap, screw, lock, and seal joints as field conditions require. Fasten to steel blocking and building structure wherever possible.
  6. Provide sufficient fasteners and hardware to ensure a complete, weathertight system.
  7. Isolate dissimilar metals with isolation sheets or heavy isolation coatings.
  8. Perform soldering work slowly, with properly heated coppers to thoroughly heat seam material and sweat solder through full width of seam that shall show not less than 1 in. of evenly flowed solder. Start soldering immediately after application of flux. Solder flat locked seams.
  9. Make flashing and sheet metal work water and weathertight, with lines, arises and angles sharp and true and plane surfaces free from waves and buckles.
- B. Installation of Downspouts:
  1. Extend each downspout to terminate within 1 in. above a splash block's high end.
  2. Downspout straps: Place close to each downspout top, bottom, and in-between so that straps are not more than 44 in. apart.
  3. Fasten each end of straps to walls using stainless steel sheet metal screws in shields, or screw anchors, 4 fasteners in each strap.
  4. Fasten each section of downspout to top strap with at least 2 stainless steel sheet metal screws. Do not fasten bottom end of each downspout section to strap – to allow for thermal movement.

### 3.6 PITCH PANS / SEALANT PANS PROHIBITED EXCEPT BY MDPLS APPROVAL

- A. Do not use any sealant pans, whether filled with asphalt, coal tar pitch, roof cement, or urethane, to flash oddly shaped or sized items that penetrate or rest on the roof membrane. Instead, provide penetration flashings of a design similar to those specified above.
  - 1. When a “hard-to-flash” situation arises, propose to A/E a flashing solution and obtain approval of A/E and MDPLS Maintenance & Operations – Roofing Division before building.
- B. If A/E and MDPLS determine that it is not be practical to use anything other than a sealant pan, submit details that follow this procedure to A/E and MDPLS Maintenance & Operations – Roofing Division for approval in each case.
  - 1. Fabricate and locate the sheet metal sealant pan frame (which shall be at least 3 in. high, so that it’s out-side roof flange can be set in a full bed of plastic roofing cement.
  - 2. Cover pan flanges with 2 layers of roofing felt stripping set in solid coats of hot SBS-modified bitumen or roofing cement.
  - 3. Fill sealant pan to a level 3/4 in. from rim with a flexible mixture of plastic roofing cement stiffened with Portland cement.
  - 4. Top out the sealant pan, fully to the rim, with 3/4 in. of hot SBS-modified bitumen or self-leveling urethane sealant
  - 5. Do not nip top edge of hem to allow for drainage of water. To shed water, use SBS-modified bitumen or self-leveling urethane to form a cone that slopes 1/2 in./ft from the penetration to the edge of the pan.

**END OF SECTION**

**SECTION 07630  
ROOF ASSEMBLY PVC RAINLEADERS TO STORM SEWER**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- A. Coordinate PVC rainleader work with work before and after. See especially:
- |   |       |
|---|-------|
| 1. Storm sewer  | 02720 |
| 2. Roofing sheet metal downspouts and conductor heads (stainless steel)   | 07620 |
| 3. Straps and strap fasteners for PVC rainleaders                         | 07620 |
| 4. Elastomeric coating at building exterior, for coating rainleaders also | 09964 |

**1.2 QUALITY ASSURANCE**

- A. Pre-Installation Meeting: At least 6 weeks before installation of Roof Assembly, the Contractor shall conduct a meeting at the worksite with installers of each part of the Roof Assembly, the PVC rainleader installer, A/E, AHJs, and MDPLS Maintenance & Operations – Roofing Division representatives.

**1.3 SUBMITTALS** Follow 01330

- A. Product Data and Shop Drawings: Description and size of PVC rainleader assembly, including cleanout, fittings, splashblocks and gravel outfalls, with pipe installation and jointing instructions.
1. Show method of mating and sealing to conductor head tailpieces.
  2. Show method of connecting to storm sewer line.

**1.4 SPECIAL WARRANTIES** Follow 01790

- A. By Membrane Producer: Provide a 20 year Special Warranty from the roof membrane producer covering correction of defects in the PVC rainleader component of the Roof Assembly as far as the storm sewer.
- B. By PVC Rainleader Producer and Installer: Provide a 10 year Special Warranty in which the PVC rainleader producer / installer agrees to correct defective PVC rainleader work. See 07500 for the full requirements of this Special Warranty that shall accompany the Roof Assembly Special Warranty.
1. At time of project closeout, submit this signed Special Warranty to the roof membrane producer for transmittal to Contractor, A/E, and MDPLS.

**PART 2 PRODUCTS** Follow 01600

**2.1 RAINLEADER ASSEMBLIES, FOR CONNECTING TO STORM SEWER** [07630.r1]

- A. Description of Rainleader Run from 9 ft above Grade to Grade Level. Schedule 80 PVC pipe assemblies consisting of elastomeric-coated bell-ended pipes, strap supports, conductor head seals, and cleanouts.

1. PVC pipe; bell & spigot; ASTM D1785: Schedule 80, with joint cement.
  2. Rainleader pipe size: Of size sufficient to conduct rainwater load and to permit the s/s conductor head's tailpiece or the s/s downspout to enter the PVC rainleader in such a way that an airtight seal can be made.
  3. Airtight seal: As specified in 07620.
  4. Cleanouts: The same size as rainleader. Install one in each rainleader, with center-line at a uniform height 8 in. above the level where rainleaders enter sidewalk.
  5. Gravel bed, at walk-level, around leader where it penetrates ground: Provide a 6 in. deep bed of tightly compacted angular gravel, 1 to 1-1/2 in. size, approximately 18 in. square, doused with weed-killer or on weed-killer fabric. Frame with the top of the bed 1 to 2 in. above grade using pressure treated 1x6 yellow pine, staked in place.
  6. Elastomeric coating: Cause the above-grade rainleaders, cleanouts, and strap supports to be coated with 2 coats of elastomeric exterior wall coating. Coating shall cover the full circumference of the entire above-grade PVC rainleader pipe assembly including the straps and their fasteners.
- B. Description of Rainleader Run from Grade Level to Storm Sewer: Schedule 80 PVC pipe assemblies consisting of bell-ended pipes of diameter equal to rainleader above grade. Provide discharge connections to sewer and sewer-connection seals.
1. PVC pipe; bell & spigot; ASTM D1785. Schedule 80, with joint cement.
  2. Street elbow below grade: 90° wide-radius type.
  3. Connection to storm sewer: Use EPDM or neoprene gasket or O-ring to form a watertight connection that will not blow out under pressure in either direction. Provide additional transition and sealing materials such as mortar and grout.
  - 4.

## 2.2 ACCESSORY PRODUCTS

- A. Elastomeric Coating for rainleader assemblies: As provided for coating walls of building..
1. Texture: Smooth, without texturing granules.
  2. Color: Match each wall color directly in background of each sheet metal fabrication.
- B. Straps and Fasteners:
1. Rainleader strap supports: Hemmed, safety edged, 11 ga stainless steel, as provided by the roofing sheet metal producer.
  2. Screw anchors (for use in concrete and masonry): Case hardened steel screws with baked-on rust-inhibitive coating, for use in drilled holes, such as GrabCon by Grabber, Tapcon by ITW Buildex, or Tapper by Powers.

## PART 3 EXECUTION

Follow 01700

### 3.1 HEIGHT OF PVC RAINLEADERS ABOVE GRADE

- A. Extend PVC rainleaders 9 ft above grade level unless other wise shown on Drawings.

### 3.2 COATING PVC RAINLEADER ASSEMBLIES

- A. Elastomeric Coating: Sand surface of PVC to a fine rough texture to prepare for first coat.

1. Cause 2 coats to be applied in a smooth formulation of the elastomeric coating used on the building, but without the texturing material, in the same color as will be used on the wall behind each rainleader.

### 3.3 INSTALLATION OF EACH PVC RAINLEADER ASSEMBLY

#### A. Installation of PVC Rainleaders:

1. Install rainleader assemblies following approved shop drawings.
2. Place top of each PVC rainleader around tailpiece of s/s conductor head or s/s downspout and seal airtight.
3. Rainleader straps: Drill wall and place straps and fasteners near top and bottom of each section, with intermediate straps spaced equally 36 to 44 in. oc unless otherwise shown.
4. Fasten each end of straps to wall with 2 screw fasteners; total 4 each strap.

#### B. Connecting to Storm Sewer:

1. If a route is not already shown on the Drawings, connect the underground portion of each PVC rainleader, individually, to a storm sewer, unless a sewer is not nearby or sufficient slope is not available.
2. Individual underground PVC rainleader lines may be ganged, using larger pipe sizes that will carry the volume of water, if calculations are shown on shop drawings and approved by A/E and MDPLS – Maintenance & Operations – Roofing Division.
3. Make joints in PVC rainleader lines watertight and construct each seal at sewer connection to withstand water pressure in either line without failure.

**END OF SECTION**

## **SECTION 07900 JOINT SEALERS**

### **PART 1 GENERAL**

#### **1.1 SUMMARY**

A. System Description: Joint sealers, fillers, and other related materials compatible with one another, with joint substrate, and other adjacent materials including finishes.

#### **B. RELATED SECTIONS**

1. 07840 - Firestopping and Smoke Sealing
2. 08800 - Glass & Glazing
3. 09250 - Gypsum Wallboard

#### **1.2 REFERENCE STANDARDS, latest edition.**

A. American Society of Testing and Materials (ASTM) – latest edition:

1. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer.
2. ASTM C834 - Standard Specification for Latex Sealants.
3. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.
4. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
5. ASTM C1193 - Standard Guide for Use of Joint Sealants.
6. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
7. ASTM D 1056-Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber
8. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness.

B. GREENGUARD Product Emission Standard for Children & Schools.

C. Standard Practice for The Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda. California Department of Health Services.

D. SWRI (Sealant, Waterproofing and Restoration Institute): Sealants: The Professional's Guide.

#### **1.3 SUBMITTALS**

A. Shop Drawings: Detail proper joint sealer and backing for the following joints:

1. Vertical and horizontal surfaces at interior and exterior locations.
2. Traffic areas at interior and exterior locations.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following:

1. **Submittal to indicate proposed location and application for each type of sealant**
2. Physical characteristics, including movement capability, hardness, cure time, and color availability.
3. Submit manufacturer's certification that all products comply with Standard Practice for The Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda. California Department of Health Services or GREENGUARD Product Emission Standard for Children & Schools
4. List of backing materials approved for use with the specific product.
5. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
6. Substrates the product should not be used on.
7. Substrates for which use of primer is required.
8. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
9. Sample product warranty.
10. Certification by manufacturer indicating that product complies with specification requirements.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

#### 1.4 QUALITY ASSURANCE

A. Provide single source responsibility for each type of joint materials.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience

#### 1.5 WARRANTY

A. Manufacturer shall provide warranties covering joint sealers for 10 years from date of Substantial Completion.

B. Contractor shall furnish MDPLS a 2-year written warranty from date of Substantial Completion, covering quality of construction from applicator.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

A. Joint Sealers:

1. Bostick a Division of Arkema.
2. Pecora Corp.
3. Sika Chemical Corp.

4. Sonneborn Building Products.
5. Thoro Systems Products.
6. Tremco Manufacturing Co.
7. W.R. Meadows, Inc.

## 2.2 JOINT SEALANT APPLICATIONS

### A. Scope:

1. Exterior Joints: Seal open joints, whether or not the joint is indicated on the drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items:
  - a. Wall expansion and control joints.
  - b. Joints between door, window, and other frames and adjacent construction.
  - c. Joints between different exposed materials.
  - d. Other joints indicated below.
2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include but are not limited to the following items:
  - a. Joints between door, window, and other frames and adjacent construction.
  - b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
  - c. Other joints indicated below.
3. Do not seal the following types of joints.
  - a. Intentional weep-holes in masonry.
  - b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
  - c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
  - d. Joints where installation of sealant is specified in another section.
  - e. Joints between suspended panel ceilings/grid and walls.

## 2.3 SCHEDULES

### A. Exterior:

1. Perimeters of exterior openings where frames meet exterior facade of building: Type 1 or 3.
2. Expansion and control joints in exterior surfaces of poured-in-place concrete walls: Type 1 or 3.
3. Exterior joints in horizontal wearing surfaces: Type 2 in areas subject to foot and vehicular traffic; Type 3 at plazas, malls, patios etc.
4. Skylights and glazing: Type 5.

### B. Interior:



1. Seal interior perimeters of exterior openings: Type 1.
2. Expansion and control joints in interior surfaces of poured-in-place concrete walls: Type 1 or Type 3.
3. Interior control and expansion joints in floor surfaces: Type 1 or Type 2.
4. Perimeters of interior frames: Type 1.
5. Perimeters of bath fixtures: Type 4.
6. Exposed interior control joints in drywall: Type 4.
7. Control joints in drywall, perimeter, and between metal framing and substrate in sound rated partitions: Type 6.

## 2.4 JOINT SEALANT MATERIALS

- A. Toxicity/IEQ: All joint sealant materials are to comply with Standard Practice for The Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda. California Department of Health Services or GREENGUARD Product Emission Standard for Children & Schools.
- B. Sealant Type 1:
  1. Polyurethane base, one-part, chemical curing.
  2. Non-sagging type for application in vertical joints.
  3. Capable of being immersed in water, withstand movement up to 25 percent of joint width and satisfactorily applied throughout a temperature range of 40 degrees to 90 degrees Fahrenheit.
  4. Shore A hardness: Minimum 15, maximum 50.
  5. Conforming to Requirements of ASTM C920 Type S Grade NS, Class 25, T, NT, O, M, G, I.
  6. Non-staining and non-bleeding.
  7. SWRI Sealant Validation.
  8. Color: Selected by Project A/E.
- C. Sealant Type 2:
  1. Polyurethane base, two-part, chemical curing.
  2. Self-leveling type for application in horizontal joints.
  3. Capable of being continuously immersed in water, withstand movement of up to 25 percent of joint width and satisfactorily applied throughout a temperature range of 40 degrees to 90 degrees Fahrenheit.
  4. Uniform, homogenous, and free from lumps, skins, and coarse particles when mixed.
  5. Shore A hardness: Minimum 30; maximum 35.
  6. Conforming to requirements of ASTM C920 Type M, Grade P, Class 25, Use T, NT, M, G, O, I.
  7. Non-staining and non-bleeding.
  8. Color: Selected by Project A/E.
- D. Sealant Type 3:
  1. Polyurethane, two-part, chemical cure.
  2. Non-sag type for vertical applications.

3. Capable of being continuously immersed in water; withstand movement up to 50 percent of joint width and satisfactory applied throughout a temperature range of 40 degrees to 90 degrees Fahrenheit.
4. Uniform, homogenous, and free from lumps, skins, and coarse particle when mixed.
5. Shore A hardness: Minimum 30, Maximum 40
6. Conforming to requirements of ASTM C920 Type M, Grade NS, Class 25, Use T, NT, M, G, O.
7. Non-Staining and non-bleeding.
8. Color: Selected by Project A/E.

E. Sealant Type 4

1. Acrylic base, one-part, solvent curing.
2. Capable of being continuously immersed in water, withstand movement up to 7-1/2 percent of joint width and satisfactorily applied throughout a temperature range of 40 degrees to 90 degrees Fahrenheit.
3. Shore A hardness: Maximum 55.
4. Non-staining and non-bleeding.
5. Conforming to requirements of ASTM C834.
6. Color: Selected by Project A/E.

F. Sealant Type 5:

1. Silicone base, one-part, neutral curing.
2. Withstand movement up to 50 percent of joint width and satisfactorily applied throughout a temperature range of 40 degrees to 90 degrees Fahrenheit.
3. Shore A hardness: Maximum 30.
4. Conforming to requirements of ASTM C920, Type S, Grade NS, Class 50, Use NT, M, G, A.
5. SWRI Sealant validation.
6. Color: Selected by Project A/E.

G. Sealant Type 6:

1. Synthetic Butyl Rubber, one-part moisture cure.
2. Non-sag acoustical sealant.
3. Non-hardening, non-bleeding.
4. Unexposed joints only.

H. Sealant Type 7:

1. Silicone base, one-part moisture cure
2. Shore A hardness:15
3. Conforming to requirements of ASTM C920 Type S, Grade NS, Class 100/50, Use T, NT, M, G. A and O.
4. SWRI sealant validation.
5. Color: Selected by Project A/E.

- I. Accessories: Provide backer rods, joint cleaners, primers, and other necessary materials as recommended by the caulking or sealant manufacturer essential for a complete installation. These include but not limited to the following:
  - 1. Backer Rod:
    - a. Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific applications.
    - b. Preformed material sized to require 25 percent to 50 percent compression upon insertion in joint.
    - c. Do not use materials impregnated with oil, bitumen or similar materials.
  - 2. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.
  - 3. Primer: Non-sagging, that will seal the surfaces and prevent absorption of the vehicle essential to the retention of elasticity by the caulking or sealant compound. As recommended by manufacturers of caulking or sealant used
  - 4. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue and compatible with surfaces adjacent to joints and sealants.
  
- J. Definitions:
  - 1. Interior Wet Areas: Bathrooms, restrooms, kitchens, and food service areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.
  - 2. Sound-Rated Partition/Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify joint dimensions, physical and environmental conditions are acceptable to receive work of this Section.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that joint backing and release tapes are compatible with sealant.

### 3.2 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

### 3.3 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surface and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- E. Install bond breaker backing tape where backer rod cannot be used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range or will be outside that range during the entire curing period, unless manufacturer's approval is obtained, and instructions are followed.
- H. Non-sag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- I. Orient sealant to shed water away from the joint and the building.
- J. As work progresses, immediately remove compound that may accidentally flow onto adjoining surfaces using manufacturer's recommended solvent and cleaners. Remove excess material from joints immediately
- K. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab
- L. Protect elements surrounding work of this section from damage or disfiguration
- M. At completion, carefully check all joints for damage and repair-damaged joints
- N. Clean adjoining surfaces
- O. Protect sealants and caulking until cured

### 3.4 FIELD QUALITY CONTROL

- A. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

### 3.5 POST-OCCUPANCY

- A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width, i.e. at the low temperature in the thermal cycle. Report failures immediately and repair.

END OF SECTION

**SECTION 08110  
STEEL DOORS AND FRAMES**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Steel doors and frames including necessary accessories.
- B. Section Does Not Include: Use of aluminum doors.
- C. Related Sections:
  - 1. 06100 - Carpentry.
  - 2. 07900 - Joint Sealers.
  - 3. 08710 - Door Hardware.
  - 4. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
  - 5. 09900 - Painting of Unpainted Surfaces.

**1.2 REFERENCES**

- A. American Society for Testing and Materials (ASTM), latest edition:
  - 1. A653 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. A924 Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
  - 3. C270 Specification for Mortar for Unit Masonry.
- 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.
  - 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. UL 1784 Air Leakage Test of Door Assemblies.
- G. National Fire Protection Association (NFPA), latest edition:
  - 1. NFPA 80 Standard for Fire Doors and Windows.
  - 2. NFPA 101 Life Safety Code.
  - 3. NFPA 105 Smoke and Draft Control Assemblies.
- H. Florida Department of Education, Office of Educational Facilities - State Requirements for Educational Facilities - 1999 (SREF).

- I. Florida Building Code (FBC).
- J. Americans with Disabilities Act and Accessibility Guidelines (ADA).
- K. American National Standards Institute (ANSI), latest edition:
  - 1. A250.4 Test Procedure and acceptance criteria for physical endurance, steel doors and frames.
  - 2. A224.1 Test Procedure and acceptance criteria for prime painted steel surfaces for steel doors and frames.
  - 3. A117.1 Accessible and Usable Buildings and Facilities.
- L. Warnock Hersey International (WHI), Division of Inchcape Testing Services.

### 1.3 SUBMITTALS

- 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, locations of finish hardware by dimension and locations/details of all openings and louvers. Do not proceed with any fabrication until all details are approved by A/E.
  - 2. Provide shop drawings for louver kits and light kits (when applicable)
- C. Upon request, submit nonreturnable samples necessary to be evaluated for construction compliance.
- D. Label Construction Certification: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, submit manufacturer's certification for each door and frame assembly constructed to conform to design, materials, and construction equivalent to requirements for labeled construction.

### 1.4 QUALITY ASSURANCE

- A. Provide doors and frames complying with SDI 100 and as specified.
- B. Owner reserves the right to cut open, at no cost to the board, a random door to verify construction and reinforcements for compliance with owner's previously accepted manufacturer's shop drawings. Non-Compliance will be grounds for removal and replacement of installed door at no expense to the owner.

### 1.5 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 A/E. Remove and replace damaged items as directed.

- C. Store doors and frames at building site 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.

## 1.6 WARRANTY

- A. Hollow metal doors and frames shall be supplied with a 1 year warranty against defects in materials and construction.
- B. Warranty shall begin on date of substantial completion of the project.

## 1.7 DEFINITIONS

- A. Areas subject to wet mopping include kitchens, dining rooms, toilets, locker/showers, custodial, and other similar spaces with hard or resilient flooring.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Steel Doors and Frames: Steel doors referenced below are "stock" models which shall be modified by appropriate manufacturer as may be necessary to meet all the requirements stated in this document.
  - 1. Model MS Medallion by Ceco Door Products, Carol Stream, IL.
  - 2. Model 747 by Curries Company, Mason City, IA.
  - 3. Model "H" Series by Flemming.
  - 4. Model F-16 by Quality Engineered Products Co., Inc., Tampa, FL.
  - 5. Model "B" Series by Steelcraft, Cincinnati, OH.
  - 6. Model DE416 by Republic Builders Products, Pembroke Park, FL.

### 2.2 DOORFRAMES

- A. Fabricate exterior frames and 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, SREF, or as otherwise directed by A/E.
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 door stop 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 scheduled in Section 08710.
- 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 mullion 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. Grouting of Frames:
    - a. Grout fill-in-place doorframes at the following locations:
      - 1) All exterior door openings,
      - 2) All door openings in masonry, concrete and tilt-wall construction.
      - 3) Other areas as indicated on the Construction Documents.
    - 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 masonry walls, concrete columns, and metal stud system as shown on drawings.

- 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.
- J. Security Switch Preparation: Refer to the Drawings and M-DPLS Design Criteria Appendix.

## 2.3 HOLLOW METAL DOORS

- A. Fabricate exterior and 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. Do not exceed 3/4" undercut for fire labeled doors.
  - 2. Provide 3/8" undercut at doors for exterior openings with ADA threshold.
- D. Door Perimeters:
  - 1. Stile Edges: Bevel for single acting doors shall be 1/8" in 2 inches.
  - 2. Reinforcing: Refer to the Drawings and M-DPLS Design Criteria Appendix.
  - 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.
    - c. Exterior door tops shall have flush surface.
- E. Doors:
  - 1. Classification: SDI Grade III - Model 2, 16 gage, seamless, and steel stiffened with M-DPLS 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. (when applicable)
  - 6. Exit Device Reinforcement: Minimum 14 gage channel or box minimum 16" long by 3-1/2" wide. (when applicable)

7. All spaces between stiffeners shall be insulated with fiberglass or mineral insulation.
8. 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.
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 criteria.**

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 M-DPLS accepted 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.

H. Slip-on Spats: 20 ga., #4 satin finish.

## 2.4 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

### 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. 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-in-place all doorframes at exterior doors, doors located in masonry, concrete and tilt-wall construction, and at other areas as indicated in the Construction Documents.

#### B. Doors:

1. Install in openings plumb, level, and true to line.
2. Apply hardware and adjust to achieve smooth and quiet operation.

### 3.3 ADJUST AND CLEAN

1. 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.
2. Protection Removal: Immediately before final inspection, remove protective plastic wrappings from prefinished doors.
3. Fill all dents, holes, etc. with metal filler and sand smooth flush with adjacent surfaces-paint to match.
4. 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:
5. Door Contact With Silencers: Doors shall strike a minimum of two silencers without binding lock or latch bolts in the strike plate.
6. Head, Strike, and Hinge Jamb Margin: 1/8".
7. Meeting Edge Clearance, Pairs of Doors:  $\pm 1/16"$ .
8. Bolts and Screws: Leave tight and firmly seated.
9. Soundseal gasketing

**END OF SECTION**

**SECTION 08305  
ACCESS PANELS**

**PART 1 GENERAL**

**1.1 SUMMARY**

**A. Related Sections:**

1. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
2. 09250 - Gypsum Wallboard.
3. 09310 - Ceramic Tile.
4. 09900 - Painting of Unpainted Surfaces.
5. 15430 - Piping Specialties (Plumbing).

**1.2 SUBMITTALS**

- A. Submit properly identified manufacturer's literature including manufacturer's specifications and installation instructions before starting work.
- B. Shop Drawings: Submit shop drawings for review.

**1.3 QUALITY ASSURANCE**

- A. Provide UL or other Nationally Recognized Testing Laboratory (NRTL) label on each fire-rated access door.
- B. Coordination: Furnish inserts and anchoring devices that must be built into other work for installation of access doors. Coordinate delivery with other work to avoid delay.

**PART 2 PRODUCTS**

**2.1 MANUFACTURERS**

**A. Access Panels:**

1. Milcor Limited Partnership, Lima OH.
2. Nystrom Inc., Minneapolis, MN.
3. Elmdor.

**2.2 EQUIPMENT**

- A. Sizes as shown on Drawings or required to provide sufficient access for the proper operation of maintenance. Minimum size shall be 12 inches x 12 inches.
- B. Provide 14 gage steel door with 16 gage steel frame with baked enamel prime coat.
- C. Provide fire-rated components at fire rated construction.

- D. Flush Panel Doors: Fabricate from not less than 14-gage sheet steel, with concealed spring hinges or concealed continuous piano hinge. Finish as noted on drawings.
  - 1. For fire-rated units, provide manufacture's standard insulated flush panel/doors, with continuous piano hinge and self-closing mechanism.
- E. Locking Devices: Furnish flush, screwdriver-operated cam locks of number required to hold door in flush, smooth plane when closed.
  - 1. Coordinate keying with facility
- F. Stainless Steel Access Panels for Plastered Surfaces :
  - 1. Milcor K.
  - 2. Nystrom Flush PW.
  - 3. Williams Bros. WB-PL.
  - 4. Elmdor.
- G. Stainless Steel Access Panels for Masonry and Tile Surfaces:
  - 1. Milcor M.
  - 2. Nystrom Flush TM.
  - 3. Elmdor.
- H. Stainless Steel Access Panels for Gypsum Wallboard.
  - 1. Milcor DW.
  - 2. Nystrom Flush WB.
  - 3. Willaims Bros. WB-DW.
  - 4. Elmdor.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.
- B. All installation shall be in accordance with manufacturer's published recommendations.
- C. Coordinate installation with work of other trades
- D. Leave surfaces clean and ready for final painting.
- E. Adjust to operate properly and replace damaged units.
- F. Finishes: Refer to respective sections of specifications.

**END OF SECTION**

**SECTION 08520  
ALUMINUM WINDOWS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Furnish and install aluminum windows complete with hardware and related components as shown on drawings and as specified in this section.
- B. Related Sections:
  - 1. 03300 - Cast-In-Place Concrete
  - 2. 07900 - Joint Sealers.
  - 3. 08800 - Glass and Glazing

**1.2 REFERENCES**

- A. American Architectural Manufacturers Association (AAMA)/NWWDA 101/IS2 (Latest Edition) - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors, latest edition.
- B. AAMA 902 – Voluntary Specifications for Sash Balances.
- C. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site, latest edition.
- D. American Society for Testing and Materials (ASTM) - latest edition of the following:
  - 1. A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - 2. B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 3. C509 - Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
  - 4. D2000 - Standard Classification System for Rubber Products in Automotive Applications.
  - 5. E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
  - 6. E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylight and Curtain Walls by Uniform Static Air Pressure Difference.
  - 7. E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylight, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
  - 8. E 1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.
  - 9. F 588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
- E. Florida Building Code (FBC), latest edition.

- F. American Society of Civil Engineers (ASCE) 7, latest edition.
- G. National Fire Protection Association (NFPA), latest edition.
- H. Florida Fire Prevention Code (FFPC), latest edition.
- I. Federal Specifications and Standards - FS L-S-125 - Screening, Insect, Nonmetallic; Revision B, latest edition.
- J. Society for Protective Coatings: SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").

### 1.3 DEFINITIONS

- A. Exposed: Any fasteners, anchors, clips, accessories, sealants, etc., visible on the exterior or interior side of a window when in the maximum open position.

### 1.4 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation Meeting: Before starting work in this section, the Contractor shall convene a meeting that includes the Project A/E, M-DCPS Project Manager, Contractor's representative and window installer. Agenda shall include review of the following items:
  1. Review NOA or Florida Product Approval submittals.
  2. Review surface preparation and window installation procedures.
  3. Review shop drawing submittals.
  4. Review special details and field conditions.
  5. Discuss sequence of construction, responsibilities and schedule for subsequent operations.
  6. Review "Window Field Leak Test" procedures and requirements.

### 1.5 SUBMITTALS

- A. Product Data: Manufacturer's specifications and catalog cuts. This information shall include but not be limited to all component dimensions, information on glass and glazing, internal drainage details, descriptions of hardware and accessories, fabrication methods, dimensions of individual components and profiles, hardware, and finishes for each type of product indicated.
- B. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.
- C. Shop Drawings:
  1. Signed and sealed by a Florida Registered Professional Engineer. Submit to A/E and the Building Code Consultant (BCC).
  2. Indicate elevations, sections, details, locations, markings, quantities, materials, jamb conditions, metal thicknesses, sizes, shapes, dimensions and finishes.
  3. Indicate locations for installing frames.
  4. Indicate methods of assembling, connecting, anchoring, fastening, and bracing.
  5. Indicate types, material, finishes, sizes, and locations of hardware.
  6. Indicate operable and fixed panels of each window unit.
  7. Identify each type of mullion and anchorage system.



- D. Any window identified on the drawings as an “emergency rescue” window, shall meet all the requirements for “Windows for Rescue” specified by FFPC, and NFPA 101.
- E. Missile Impact Certification:
  - 1. Provide current Miami-Dade County Notice of Acceptance (NOA) or Florida Product Approval, demonstrating compliance with FBC missile impact criteria for High Velocity Hurricane Zone (HVHZ), for window type, size, and configuration indicated on drawings.
  - 2. Comply with calculations, signed and sealed by a Florida registered Professional Engineer, establishing wind velocity pressure values for the specific project, according to FBC and ASCE 7, using Classification Of Buildings Category III, Exposure Category “C” and Importance Factor of 1.15.
- F. Calculations/Test Results/Details:
  - 1. Provide wind pressure test results by an M-DCPS nationally recognized testing laboratory (NRTL) demonstrating compliance with applicable HVHZ requirements for supplied window units.
  - 2. Provide Installation details, signed and sealed by a Florida registered Professional Engineer, detailing anchorage system noted and specified to comply with ASCE 7.
- G. Samples:
  - 1. Submit two samples, 12 x 12 inch in size, illustrating typical corner construction and accessories, including locks and color finishes.
  - 2. 12" x 12" glass.
  - 3. Sealants: Manufacturer color chart.
- H. Maintenance Data: For operable window sash, operating hardware, weather stripping, window system operators, and finishes to include in maintenance manuals.
- I. Forced Entry: Comply with AAMA 1302.5.
- J. Warranty certification.

## 1.6 SYSTEM DESCRIPTION

- A. Performance Requirements: Fabricate units to comply with:
  - 1. Design Wind Velocity Pressures: According to ASCE 7, latest edition.
  - 2. Requirements of testing and certification by AAMA/NWWDA 101 for commercial or higher rated windows complying with AAMA/NWWDA 101, Table 2.1 Gateway Performance listed values as determined by ASCE 7, latest edition.
  - 3. Provide double glazed windows with 45 condensation resistance factor according to AAMA 1502.6.

## 1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in fabrication of commercial aluminum windows of types required, with no fewer than five years of experience.

- B. Installer Qualifications: Capable of assuming engineering responsibility and performing Work of this Section and who is acceptable to manufacturer. Minimum of five years of experience in the installation of specified assemblies.
  - 1. Engineering Responsibility: Preparation of data for aluminum windows including the following:
    - a. Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer's standard assemblies.
- C. Notify inspector within 24-hours after completion of windows to arrange for inspection.
- D. Do not conceal anchors and connections until inspection is complete.
- E. Exposed fasteners, when the window is in a closed or opened position, shall be tamperproof.
- F. Coordination of Fabrication:
  - 1. Check actual window openings in construction work by accurate field measurement before fabrication. Show recorded measurements on final shop drawings.
  - 2. Coordinate fabrication schedule with construction progress as directed by Contractor to avoid delay of work.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of AAWA CW-10.
- B. Deliver packaged materials in manufacturer's original, unopened, labeled containers.
- C. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.
- D. Store items to prevent damage to materials or structure and in approximate order of use to avoid excessive re-handling.
- E. Repair damaged materials and replace materials that cannot be repaired to original condition. Replace warped materials.
- F. Protect exposed surfaces of metal with removable covering to prevent damage to finish. Protect metal while adjacent painting and caulking are being performed.

#### 1.9 WARRANTY

- A. Submit written warranty, signed jointly by manufacturer, installer, and Contractor, agreeing to replace aluminum window units that fail in materials or installations within 3 years after substantial completion. The 3 parties jointly and separately are responsible for the installation for the warranty period.
- B. Failure of materials or installation shall include, but not be limited to, excessive leakage or air infiltration, excessive deflections, faulty operation of sash, deterioration of finish or

metal in excess or normal weathering, and defects in hardware and weather-stripping, failure of glass seal, including interpane dusting or misting.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Missile Impact Resistant Louverless Windows, Thickness as indicated on the Plans, using certified missile impact resistant glass.
  - 1. Sol-A-Trol Aluminum Products.
  - 2. Traco Windows
  - 3. EFCO Corp.
  - 4. Winco Window Co.
  - 5. Innovative Window Concepts (IWC).
  - 6. Kawneer Company, Inc.
  - 7. Trulite Window and Door Solutions
  - 8. Construction Glass Industries (CGI).
  - 9. YKK AP America Inc.
  - 10. ES Windows
  - 11. Florida Impact Windows
  - 12. RC Aluminum Industries Inc.
  - 13. International Window Corporation (IWC)
  - 14. CRL-US Aluminum Industries
  - 15. Other A/E Accepted equivalent.

### 2.2 MANUFACTURED UNITS

- A. Missile Impact Resistant Louverless Windows:
  - 1. Impact resistant windows shall comply with Miami-Dade County NOA or Florida Product Approval requirements.
- B. Emergency Rescue Openings, where designated on the drawings, shall comply with FBC, ADA and NFPA 101.

### 2.3 COMPONENTS

- A. Aluminum Extrusions: 6063-T5, commercial alloy, minimum 22,000 psi ultimate tensile strength and minimum 0.062" thickness at any location for main frame and sash members.
- B. Assembly shall have current Miami-Dade County NOA for impact resistance (both large and small missile impact) and comply with wind pressures as required by drawings, FBC, and ASCE 7. Assembly shall bear a permanent label affixed to the product according to FBC.
- C. Air Infiltration: System shall have an air intrusion less than 0.3 cf/min/sq. ft. @ an inward test pressure of 6.24 PSF (300 Pa), when tested according to AAMA/WDMA 101/I.S.2/NAFS.
- D. Locks shall be of compatible materials that are corrosion resistant and sufficient strength to pass AAMA 1302.5 forced entry test. Locks shall be readily accessible for service.

- E. Unit shall have minimum 3/4" wide aluminum flange around 100% of the perimeter. Unit shall be set in a full bed of sealant against the 3/4" lip in the masonry opening.
- F. Windows:
  - 1. Aluminum Windows: Extruded aluminum frame and sash, factory fabricated, factory finished, with operating hardware, related flashings, and anchorage and attachment devices.
    - a. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for operating hardware and imposed loads.
    - b. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
    - c. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
    - d. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
  - 2. Sizes and Profiles:
    - a. Fabricate to sizes and profiles indicated on final shop drawings.
    - b. Details in drawings are based upon standard details by one or more manufacturers.
    - c. Similar details by other manufacturers will be acceptable, provided they comply with size requirements, minimum/maximum profile requirements, and referenced performance standards and are approved by the A/E and M-DCPS.
  - 3. Glass and Glazing:
    - a. Windows shall be factory glazed.
    - b. Glass color to be determined by A/E.
    - c. Glass assembly shall comply with Miami-Dade County NOA and/or Florida Product Approval, as necessary to meet specified Design Pressures and Missile Impact requirements.
    - d. Comply with requirements of Section 08800, in addition to requirements of ANSI/AAMA 101.
    - e. Glazing compound shall be structural silicone as recommended by window manufacturer.
  - 4. Provide subframes with anchors for window units as shown, of profile and dimensions indicated (minimum 0.062" thickness extruded aluminum) with mitered or coped corners, welded and dressed smooth or with concealed mechanical joint fasteners. Finish to match window units. Seal joints on inside with sealant.
  - 5. Fabricate components with smallest possible clearances and shim spacing around perimeter of assembly that will enable window installation and dynamic movement of perimeter seal.
  - 6. Provide internal drainage of glazing spaces to exterior through weep holes.

G. Fasteners:

1. Aluminum, nonmagnetic stainless steel, or other materials warranted by manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components of window units.
  2. Reinforcement: Fasteners screw-anchored into aluminum less than 0.125" thick, shall have interior reinforced with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard non-corrosive pressed-in splined grommet nuts.
  3. Exposed fasteners, when the window is in a closed or opened position, shall be tamperproof.
  4. Do not use exposed fasteners except for application of hardware.
  5. Exposed fasteners shall match finish of adjoining metal.
- H. Anchors, Clips and Window Accessories: Depending on strength and corrosion-inhibiting requirements, fabricate units of aluminum, nonmagnetic stainless steel, or hot-dip zinc coated steel complying with ASTM A123. Exposed items shall match the window frame color.
- I. Compression Glazing Strips and Weather-stripping: Molded neoprene gaskets complying with ASTM D2000 designation 2BC415 to 3VC620, or molded expanded neoprene gaskets complying with ASTM C509, Grade 4.
- J. Sealant:
1. Seal frame joints, completely filling voids, flush with exposed surfaces. Provide type recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking, and non-migrating.
  2. Comply with Section 07900 for materials and installation of sealants.
  3. Color shall be as selected by A/E.
- K. Friction Shoes: Nylon or other non-abrasive, nonmetallic, non-staining, non-corrosive durable material.
- L. Balance Mechanism:
1. Spring loaded, with adjustable tension control.
  2. Balances shall be high performance balances, of appropriate size and capacity to hold sash in position in accordance with AAMA 101 and AAMA 902.
  3. Balances shall meet all minimum AAMA 902 Class 5 requirements.
  4. Balances shall be attached to a locking carrier that slides on extruded rails in the jamb channels.
- M. Mullions:
1. Provide mullions and cover plates as shown, matching window units, and complete with anchors for support and installation.
  2. Allow for erection tolerances and provide for movements of window units due to thermal expansion and building deflections.
- N. Finish for Windows and Window Components:
1. At locations within one mile from a saltwater coastline: AAMA 2605 PVDF (polyvinylidene fluoride) coating with 70 percent resin, such as Kynar 500, or Hylar 5000. Color to be as selected by A/E.

2. At locations greater than one mile from a saltwater coastline: Anodized: NAAMM AA-C2241, Class I, minimum 0.7 mils, natural aluminum color (or color to be as selected by A/E).

## PART 3 EXECUTION

### 3.1 MOCK-UP

- A. Prior to fabrication of windows and as early in the Project as possible, agree with M-DCPS and A/E on a location to provide a full-window Mock-up. Window Mock-up shall include windows and components of one full opening from block wall to block wall and include Mid Mullions, sills and all other components required for a full installation.

### 3.2 INSPECTION

- A. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, and are in accordance with approved shop drawings.

### 3.3 INSTALLATION

- A. Install windows according to manufacturer's printed instructions, Miami-Dade County NOA or Florida Product Approval and accepted shop drawings, under direct supervision of manufacturer's representative.
- B. Bed windows with sealants, mastic, or glazing tapes to masonry lip, concrete/precast lip, or wood buck as applicable and secure according to Miami-Dade County NOA or Florida Product Approvals.
- C. Separate aluminum from masonry and ferrous metals by use of bituminous coating or gasketing to eliminate possibility of corrosion from electrolytic action.
- D. Erect windows plumb, level, and true.
  1. Do not distort windows by erection screws or fittings.
  2. After window erection, apply an even spray coat of liquid wax to window surfaces for protection against stains and scratches.
- E. Protect work from corrosion. Prime coat concealed steel stiffeners, anchors, brackets, fasteners, and the like before installation and seal joints between window frames and building tightly and continuously.
- F. Maintain wire or clips holding ventilators closed in place until windows are completely erected and hardware is attached.
- G. Touch-up nicks and scratches on window frames, using manufacturer's approved touch-up coating matching finish color of frame.

### 3.4 FIELD QUALITY CONTROL

- A. A "Window Field Leak Test" shall be conducted by the Contractor at no cost to M-DCPS. Leak test shall be performed by a qualified testing agency certified in the State of Florida.

Contractor shall notify the A/E and the M-DCPS Project Manager present. The “Window Field Leak Test” sequence that shall be conducted as follows:

1. The initial test series shall be performed after the first factory-glazed operable window assembly has been installed at the site. The window assembly and its installation shall follow all of the requirements in the Contract Documents. After the assembly and installation have met all of the requirements for the “Window Field Leak Test” and been approved, it shall be used as the “standard” window mock-up.
2. The goal shall be to determine, as early as possible, if the installation is being done correctly and to let the installer apply what is learned to succeeding window installations. The test will identify leaking within the window and leaking between the window and the surrounding construction. An outside consultant or an M-DCPS Test Lab are not required to conduct the test. The Contractor and the installer shall conduct the Window Field Leak Test. The A/E and M-DCPS Project Manager will witness and report the test results. A hose and a nozzle shall be utilized to conduct the test.
3. The Contractor shall conduct the initial test and as many re-tests of the initial window assembly as needed, until a leak-free assembly and installation is attained. After the second failed test, the Contractor may be back-charged for all M-DCPS expenses generated by further tests, at the discretion of M-DCPS Project Manager.
4. At the start of the initial test the glazed window assembly shall have been shimmed and fastened in the opening over blocking bedded in sealant as required by the window specifications. The flange at the perimeter of the window frame shall be set in a full bed of sealant. All interior finishes, such as the gypsum board and window stool, shall not yet have been installed against the window frame so that all water intrusions can be identified.
5. A representative from the Contractor, window installer, window producer, M-DCPS Project Manager, and the A/E shall be present during the testing. The Contractor or window installer shall operate the hose nozzle for the testing.
6. The test will be performed in two 5-minute phases with a brief conference between phases. A 5/8-inch garden hose and straight, adjustable brass nozzle shall be used for the test. Set the nozzle to produce an 8 in. to 10 in. diameter pattern at an 8 ft to 10 ft distance from the window. Ascertain and note the water pressure where water from a public source enters the hose, preferably 45 PSI to 55 PSI. If a permanent water source is not available at the time that the test needs to be conducted the contractor shall supply equipment to achieve the required 45 PSI to 55 PSI. The contractor shall spray water against the window while the M-DCPS PM instructs the nozzle holder. The A/E shall observe and note any leaks or other signs of water intrusion at the interior side of the window. Other parties may observe the testing.
  - a. For two minutes, spray the perimeter of the window opening, moving slowly, for 2 circuits, directing slightly more than half of the hose stream just within the window perimeter.
  - b. For one minute, spray the joints within the window opening, moving slowly along the vent joints, and the mullion joints.
  - c. For one minute make another circuit around the perimeter and along all joints.
  - d. Shut off the nozzle while the M-DCPS PM and the A/E confer in presence of other parties to review what the test has revealed. If the test is inconclusive it shall be repeated.
7. The test shall be adjusted to meet the actual window size. The test procedure above is designed for window assemblies/units that are 24 sf to 40 sf. When the window is less than 24 sf, reduce the 2 minutes to 1-1/2 minutes, and 1 minute to 45 seconds. If

the window is 40 sf to 70 sf, expand 2 minutes to 3 minutes, and 1 minute to 1-1/2 minutes. If the window is 70 sf to 120 sf, expand the time to 3-1/2 minutes, and 1-3/4 minutes.

8. If the mock-up window unit allows any water penetration the contractor shall remove the unit completely and re-install the entire window assembly again at no cost to M-DCPS. The Window Field Leak Test shall be repeated as many times as required to produce a result that is free of any water intrusion as determined by all parties.
  9. The mock-up must prevent any and all water intrusion before the installation of the remaining windows is permitted.
  10. The "Window Field Leak Test" shall continue when all of the window installations have been completed for a building elevation or section of a building. The A/E shall select 10% of the total window area from each building section or elevation to conduct the Window Field Leak Test. The 10% selected shall represent window assemblies from all of the floors and locations within the test zone. All of the procedures detailed above shall be followed when testing each window assembly selected by the A/E. If during the window leak-testing, the windows that are tested fail to keep water from entering the building, the A/E may direct the Contractor, at the Contractor's own expense, to perform the window field leak-test on additional windows beyond the 10% of the windows originally selected by the A/E, until all installations are free from any water intrusion.
  11. Comply with Section 08800 for cleaning and maintenance.
- B. Protection: Provide protection to prevent damage to window units.

### 3.5 ADJUSTING AND CLEANING

- A. Adjust operating sash and hardware to provide tight fit at contact points and at weather-stripping, and to ensure smooth operation and weather-tight closure.
- B. Cleaning:
1. Clean surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes.
  2. Remove excess glazing and sealant compounds, dirt, and other substances.
  3. Lubricate hardware and moving parts.
  4. Clean glass of pre-glazed units promptly after installation of windows, using methods acceptable to sealant and window manufacturer.
  5. Comply with Section 08800 for cleaning and maintenance.
- C. Protection: Provide protection to prevent damage to window units.

**END OF SECTION**



**FINISH HARDWARE & SCHEDULE**  
**SECTION 08710**

**PART I - GENERAL**

**1.01 WORK INCLUDED**

- A. The work in this section shall include furnishing of all items of finish hardware as hereinafter specified or obviously necessary to complete the building, except those items that are specifically excluded from this section of the specification.

**1.02 RELATED WORK SPECIFIED ELSEWHERE**

- A. Hollow Metal Doors and Frames
- B. Aluminum Doors and Frames
- C. Wood Doors and Frames

**1.03 DESCRIPTION OF WORK**

- A. Furnish labor and material to complete hardware work indicated, as specified herein, or as may be required by actual conditions at building.
- B. Include all necessary screws, bolts, expansion shields, other devices, if necessary, as required for proper hardware application. The hardware supplier shall assume all responsibility for correct quantities.
- C. All hardware shall meet the requirements of Federal, State and Local codes having jurisdiction over this project, notwithstanding any real or apparent conflict therewith in these specifications.
- D. Fire-Rated Openings:
  - 1. Provide hardware for fire-rated openings in compliance with A.I.A. (NBFU) Pamphlet No. 80, NFPA Standards NO. 101, UBC 702 and UL10C. This requirement takes precedence over other requirements for such hardware. Provide only hardware that has been tested and listed by UL for the types and sizes of doors required, and complies with the requirements of the door and door frame labels.
  - 2. Where panic exit devices are required on fire-rated doors, provide supplementary marking on door UL label indicating Fire Door to be equipped with fire exit hardware and provide UL label on exit device indicating "Fire Exit Hardware".
- E. Fasteners:
  - 1. Hardware as furnished shall conform to published templates generally prepared for machine screw installation.
  - 2. Furnish each item complete with all screws required for installation. Typically, all exposed screws installation.
  - 3. Insofar as practical, furnished concealed type fasteners for hardware units which have exposed screws shall be furnished with Phillips flat heads screws, finished to match adjacent hardware.
  - 4. Door closers and exit devices to be installed on wood or composite fire doors shall be attached with closed head through bolts (sex bolts).

**1.04 QUALITY ASSURANCE**

- A. The supplier to be a directly franchised distributor of the products to be furnished and have in their employ an AHC (Architectural Hardware Consultant). This person is to be available for consultation to the architect, owner and the general contractor at reasonable times during the course of work.
- B. The finish hardware supplier shall prepare and submit to the architect six (6) copies of a complete schedule identifying each door and each set number, following the numbering system and not creating any separate system himself. He shall submit the schedule for review, make corrections as directed and resubmit the corrected schedule for final approval. Approval of schedule will not relieve Contractor of the responsibility for furnishing all necessary hardware, including the responsibility for furnishing correct quantities.
- C. No manufacturing orders shall be placed until detailed schedule has been submitted to the architect and written approval received.

- D. After hardware schedule has been approved, furnish templates required by manufacturing contractors for making proper provisions in their work for accurate fitting, finishing hardware setting. Furnish templates in ample time to facilitate progress of work.
- E. Hardware supplier shall have an office and warehouse facilities to accommodate the materials used on this project. The supplier must be an authorized distributor of the products specified.
- F. The hardware manufactures are to supply both a pre-installation class as well as a post-installation walk-thru. This is to insure proper installation and provide for any adjustments or replacements of hardware as required.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Wrap, protect finishing hardware items for shipment. Deliver to manufacturing contractors hardware items required by them for their application; deliver balance of hardware to job; store in designated location. Each item shall be clearly marked with its intended location.

1.06 WARRANTY

- A. The material furnished shall be warranted for one year after installation or longer as the individual manufacturer's warranty permits.
- B. Overhead door closers shall be warranted in writing, by the manufacturer, against failure due to defective materials and workmanship for a period of ten (10) years commencing on the Date of Final Completion and Acceptance, and in the event of failure, the manufacture is to promptly repair or replace the defective with no additional cost to the Owner.

PART II - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. To the greatest extent possible, obtain each kind of hardware from one manufacturer only.
- B. All numbers and symbols used herein have been taken from the current catalogues of the following manufacturers.

PRODUCT	ACCEPTABLE MANUFACTURER	ACCEPTABLE SUBSTITUTE
1) Hinges	Ives	Hager, Stanley
2) Locks & Latches	Schlage Lock	Falcon, Sargent
3) Cylinders, Keys, Keying	Schlage Lock	NONE(owner preferred)
4) Exit Devices	Von Duprin	Falcon, Precision
5) Door Closers	LCN	Falcon
6) OH Stops/ HOLDERS	Glynn Johnson	Rixson
7) Wall Stops/Floor Stops, Flushbolts	Ives	Rockwood, Hager
8) Kick Plates	Ives	Rockwood, Hager
9) Threshold/ Weather-strip	Zero	National Guard, Pemko
10) Silencers	Ives	Rockwood, Hager
11) Key Cabinet	Lund	Key Control

- C. If material manufactured by other than that specified or listed herewith as an equal, is to be bid upon, permission must be requested from the architect seven (7) days prior to bidding. If substitution is allowed, it will be so noted by addendum.

2.02 FINISH OF HARDWARE:

- A. Exterior Hinges to be Stainless Steel (32D) and Interior hinges to be Satin Chrome (26D) Door Closers to be Aluminum, Locks to be Satin Chrome (26D). Exit Devices to be Satin Chrome (26D). Overhead Holders to be Satin Chrome (26D), Stainless Steel (32D) and the Thresholds to be Mill Finish Aluminum.

### 2.03 HINGES AND PIVOTS:

- A. Exterior butts shall be Stainless Steel. Butts on all out swinging doors shall be furnished with non-removable pins (NRP).
- B. Interior butts shall be as listed.
- C. Doors 5' or less in height shall have two (2) butts. Furnish one (1) additional butt for each 2'6" in height or fraction thereof. Dutch door shall have two (2) butts per leaf.

### 2.04 KEYING:

- A. Locks and cylinders shall be Schlage Lock. All bittings shall be issued by lock manufacturer in order to create a grand master key system.
- B. Locks and cylinders to be construction master keyed in a manner that does not require the cylinders to be removed.
- C. Provide Two (2) each change keys per lock and Six (6) each construction master keys.

### 2.05 LOCKSETS:

- A. Locksets shall be cylindrical type, unless specified otherwise, in "ND" series, lever design RHODES as manufactured by Schlage.

### 2.06 DOOR CLOSERS:

- A. All closers shall be LCN 4040xp series with slim cover having non-ferrous covers, steel arms separate valves for adjusting backcheck, closing and latching cycles and adjustable spring to provide up to 50% increase in spring power. Closers shall be furnished with parallel arm mounted on all doors opening into corridors or other public spaces and shall be mounted to permit 180 degrees door swing wherever wall conditions permit. Furnish with non-hold open arms unless otherwise indicated.
- B. Door closer cylinders shall be of high strength cast construction to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory.
- C. Door closers shall utilize temperature stable fluid capable of withstanding temperature ranges of 120 degrees Fahrenheit to -30 degrees Fahrenheit, without requiring seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with the standards UBC 7-2 (1997) and UL 10C.
- D. Door closers shall incorporate tamper resistant non-critical screw valves of V-slot design to reduce possible clogging from particles within the closer. Closers shall have separate and independent screw valve adjustments for latch speed, general speed, and hydraulic backcheck. Backcheck shall be properly located so as to effectively slow the swing of the door at a minimum of 10 degrees in advance of the dead stop location to protect the door frame and hardware from damage. Pressure relief valves (PRV) are not acceptable.

- 1. Acceptable Substitutions:
  - A. Falcon SC81

### 2.08 TRIM AND PLATES:

- A. Kick plates, mop plates, and armor plates, shall be .050 gauge with 32D finish. Kick plates to be 10" high, mop plates to be 4" high. All plates shall be two (2) inches less full width of door.
- B. Push plates, pull plates, door pulls, and miscellaneous door trim shall be shown in the hardware schedule.

### 2.09 DOOR STOPS:

- A. Door stops shall be furnished for all door to prevent damage to doors or hardware from striking adjacent walls or fixtures. Wall bumpers equal to Ives WS407 Series are preferred, but where not practical furnish floor stops equal to Ives FS436 or FS438 series. Where conditions prohibit the use of either wall or floor type stops, furnish surface mounted overhead stops equal to Glynn Johnson, 450 Series.

## 2.10 THRESHOLDS AND WEATHERSTRIP:

- A. Thresholds and weatherstrip shall be as listed in the hardware schedule.

## 2.11 DOOR SILENCERS:

- A. Furnish rubber door silencers equal to Ives SR64 for all new interior hollow metal frames, (2) per pair and (3) per single door frame.

## PART III - EXECUTION

### 3.01 INSTALLATION:

- A. All hardware shall be applied and installed in accordance with the Finish Hardware schedule. Care shall be exercised not to mar or damage adjacent work.
- B. Contractor to provide a secure lock-up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items that are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses both before and after installation.
- C. No hardware is to be installed until the hardware manufactures have provided a pre-installation class. This is to insure proper installation of the specified products.

### 3.02 ADJUSTING AND CLEANING:

- A. Contractor shall adjust all hardware in strict compliance with manufacturer's instructions. Prior to turning project to owner, contractor shall clean and make any final adjustments to the finish hardware.

### 3.03 PROTECTION:

- A. Contractor shall protect hardware as it is stored on construction site in a covered and dry place.
- B. Contractor shall protect exposed hardware installed on doors during the construction phase.

### 3.04 KEY CABINET:

- A. Not required for this project

### 3.05 HARDWARE SCHEDULE:

- A. The following schedule is furnished for whatever assistance it may afford the contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware group, provide door or item with hardware same as required for similar purposes. Quantities listed are for each pair of doors; or for each single door.
- B. This hardware schedule prepared by.
- C.

Allegion, PLC  
3451 Technological Ave, Suite 7  
Orlando FL 32817  
Ph: 407-571-2000  
Fax 407-571-2006

Door Numbers	HwSet#
1	1
2	1
3	2
4	1
5	5
6	4
7	6
8	6
9	6

**HARDWARE GROUP NO. 1**

For use on Door #(s): Public & Staff Restrooms

1                      2                      4

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	ND40S RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**MARBLE THRESHOLD BY OTHERS**

**HARDWARE GROUP NO. 2**

For use on Door #(s): Custodial Closet

3

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80PD RHO	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HARDWARE GROUP NO. 4**

For use on Door #(s):

6

Provide each BF door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	BI-FOLD TRACK KIT	9860-LAR X 9558 PULLS	AL	HAG

**HARDWARE GROUP NO. 5**

For use on Door #(s):

5

Provide each SL door(s) with the following:  
**HARDWARE BY DOOR MANUFACTURER**

**HARDWARE GROUP NO. 6**

For use on Door #(s):

7

8

9

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	HH-98-L-NL-06-299F- SNB	626	SCH
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	PERMANENT CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	SET	DOOR SWEEP	139A-S	A	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
1	SET	GASKETING	475AA-S	AA	ZER
1	EA	THRESHOLD	566A-223	A	ZER
1	EA	DOOR CONTACT	BYSECURITY PROVIDER	BLK	SCE

**SECTION 08800  
GLASS AND GLAZING**

1.1 SUMMARY

A. Related Sections:

1. 08110 - Steel Doors and Frames.
2. 08210 - Wood Doors.
3. 08510 - Steel Windows.
4. 08520 - Aluminum Windows.

1.2 REFERENCES

- A. Florida Building Code (FBC), latest edition.
- B. American Society of Civil Engineering (ASCE) 7 – latest edition.
- C. Flat Glass Marketing Association (FGMA): Glazing Manual, latest edition.
- D. CPSC Standard 16CFR 1201 Category II.
- E. American Society for Testing and Materials (ASTM) – latest edition of the following:
1. C1036 - Standard Specification for Flat Glass.
  2. C1048 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.
  3. C1172 - Standard Specifications for Laminated Architectural Flat Glass.
  4. E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
  5. E163 - Standard Methods of Fire Tests of Window Assemblies.
- F. ANSI Z97.1 - Safety Performance and Methods of Test for Safety Glazing Materials Used in Buildings.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's specifications, recommendations for setting blocks, spacers and edge clearance, and installation instructions.
- B. Color Charts: For preformed glazing materials and glazing sealant.
- C. Samples: For the indicated products, in the form of 12-inch square samples for glass and of 12-inch (300-mm) long samples for sealants. Install sealant samples between two strips of material representative in color of the adjoining framing system.
- D. Certification:
1. Certification of tempered and laminated glass complying with Consumer Product Safety Commission 16CFR 1201-CII.
  2. Certification of Miami-Dade County Notice of Acceptance (NOA) or Florida Product Approval demonstrating compliance with FBC missile impact criteria.

- a. Comply with calculations, signed and sealed by a Florida registered Professional Engineer, establishing wind velocity pressure values for the specific project according to FBC and American Society of Civil Engineers (ASCE) 7, and using Classification of Buildings Category III, Exposure Category "C", and a wind load Importance Factor of 1.15.

3. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with all requirements.

#### 1.4 QUALITY ASSURANCE

##### A. Labels:

1. Label each unit of glass with manufacturer's sticker showing quality, grade, thickness, and type of glass.
2. Labels shall remain in place until approval by the A/E.

##### B. Trademarks: Each panel of tempered glass shall bear the manufacturer's trademark.

##### C. Glass of each type shall be supplied by the same manufacturer.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

##### A. Missile Impact Resistant Glazing:

1. Saf-Glas by Security Impact Glass.
2. Accepted equivalent as per NOA or Florida Product Approval.

##### B. Glazing Sealant:

1. Dow Corning 999-A Silicone Building and Glazing Sealant.
2. General Electric Contractors 1000 Sealant.
3. Other A/E accepted equivalent per window manufacturer's recommendation.

##### C. Backer Rod: Dow Corning Ethafoam SB polyethelene cord or butyl rubber foam cord.

##### D. Edge Protection Tape for Laminated Glass: "Scotch Brand Cellopane Tape", manufactured by 3M Company.

##### E. Moisture-Resistant Paint for Frameless Mirror Glass: Palmer Products Corp., Mirro-Bac Paint.

##### F. Bond Sealer Coat for Mirrors: Palmer Products Corp., Mirro-Mastic Bond.

##### G. Mirror Adhesive: Palmer Products Corp., Mirro-Mastic.

#### 2.2 MATERIALS

##### A. Missile Impact Resistant Glazing:



1. Thickness: 0.060" (minimum) **or as indicated on drawings**, but not less than required to meet current FBC missile impact criteria for High Velocity Hurricane Zone (HVHZ), for window type, size, and configuration indicated on drawings.
  2. Clear interlayer between two heat-strengthened glass, clear inboard, outboard tint to be selected by A/E.
- B. Tint Color: To be selected by A/E from manufacture's full range of custom colors (grey, blue, green)
- C. Summer Daytime U-Value: 95 btu/sq. ft. x h x deg. F.
- D. Laminated Glass: Two sheets of equal thickness clear heat strengthened glass according to ASTM C1036, Type I, Class 1, Quality q3 permanently laminated with a 0.060 inch thick sheet of clear polyvinyl butyral.
- E. Glazing Materials:
1. Glazing Sealant: Curing type gunable elastomeric sealant complying with TT-S-001543A, Type II Class A. Color as selected by A/E.
    - a. Glazing sealants for use with insulating glass units shall be approved by the fabricator of the insulating glass units.
  2. Unshimmed Glazing Tape: Butyl-polyisobutylene with 20 to 30 "Shore A" hardness, self-sticking; Color as selected by A/E.
  3. Pre-Shimmed Glazing Tape: Butyl-polyisobutylene with built-in synthetic rubber spacer; 20 to 30 "Shore A" hardness, self-sticking.
  4. Setting Blocks: Solid neoprene, 80 to 90 Shore A durometer hardness; sizes as required.
  5. Edge Blocks: Solid neoprene, 60-70 Shore A durometer hardness; sizes as required.
  6. Shims: Solid neoprene, 40 to 60 Shore A durometer hardness; sizes as required.
  7. Glazing Gaskets: Compression gaskets, closed cell, neoprene, EPDM or silicone rubber composition designed to provide a water-resistant seal between glass and frame.
  8. Primers and Cleaning Agents: Type recommended by the sealant, glass, and glazing accessories manufacturer.

## PART 3 EXECUTION

### 3.1 INSPECTION

- A. Verify glazing frames are acceptable for the correct installation of glass and glazing accessories.

### 3.2 INSTALLATION

- A. Glass Cutting: Make cuts clean, only moderately convoluted, with flare or bevel not exceeding 1/8 of glass thickness.

1. Unacceptable defects:

- a. Impact chips, spalls, or nipped edges.
- b. Flake chips or shark teeth deeper than 1/4 of glass thickness.
- c. Serration hackle deeper than 1/8 of glass thickness.

- B. Comply with recommendations of FGMA Glazing Manual, glass manufacturer, manufacturer of sealant, and other glazing accessories.
- C. Do not attempt to cut, seam, nip, or abrade glass tempered or heat strengthened.
- D. Remove and replace glass broken, chipped, cracked, abraded, or damaged during construction.
- E. Install wall mirrors and fasten with non-corrosive, theftproof, concealed hangers and plywood backing according to standard practices. Fasten with mirror adhesive according to manufacturer's instructions.
- F. Manufacturer's label showing strength, grade, thickness, type, and quality of glass shall remain on each piece of glass until it has been set and inspected.
- G. Guarantee work to be waterproof.

3.3 CLEANING

- A. After glass has been inspected and approved, remove labels and wash and polish glass on both faces before the Board's approval of the project.
  - 1. Comply with glass manufacturer's recommendations for cleaning materials and methods.

**END OF SECTION**

**SECTION 09200**  
**METAL STUDS, METAL LATH, SUSPENSION CEILINGS, PLASTER, AND STUCCO**

**PART 1 GENERAL**

**1.1 SUMMARY**

**A. Section Includes:**

1. Non-load bearing steel studs.
2. Metal furring and lath.
3. Ceiling suspension system.
4. Portland cement plaster and stucco.

**B. Related Sections:**

1. 06100 - Carpentry.
2. 09900 - Painting of Unpainted Surfaces.

**1.2 REFERENCES**

**A. American Society for Testing and Materials (ASTM), latest edition:**

1. A641/A641M Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
2. A653/A653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. A924/A924M Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
4. C150/C150M Specification for Portland Cement.
5. C645 Specification for Nonstructural Steel Framing Members.
6. C754 Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
7. C841 Specification for Installation of Interior Lathing and Furring.
8. C897 Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters.
9. C926 Specification for Application of Portland Cement-Based Plaster.
10. C932 Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
11. C1007 Specification for the Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
12. C1063 Specifications for the Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster
13. D1784 Specifications for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
14. E119 Test Methods for Fire Tests of Building Construction and Materials.

**B. Florida Building Code (FBC)**

**C. Portland Cement Association (PCA), Portland Cement Plaster (Stucco) Manual.**

### 1.3 SUBMITTALS

- 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.
  - 2. Provide detailed shop drawings for metal support systems indicating load calculations, sizing of members, connections and anchorages for review by A/E. Shop drawings and calculations shall be signed and sealed by a Florida registered Professional Engineer and shall show compliance with FBC and ASCE 7.

### 1.4 QUALITY ASSURANCE

- A. Design Criteria:
  - 1. Fire-Resistance Ratings:
    - a. Where plaster systems with fire-resistance ratings are indicated, provide materials and installations identical with applicable assemblies tested per ASTM E119 by fire testing laboratories acceptable to authorities having jurisdiction.
    - b. Provide plaster for fire-resistance rated systems having same aggregate as specified for similar non-rated work, unless specified aggregate has not been tested by accepted fire testing laboratories.
    - c. Portland cement plaster/stucco shall not be used in areas requiring fire-rated construction. Use only accepted listed UL rated materials.
  - 2. Coordinate layout and installation of suspension system components for suspended ceilings with other work supported by or penetrating through ceiling.
  - 3. Clear bonding agents are not allowed.
  - 4. Metal corner beads are not allowed.
  - 5. Provide polyvinylchloride (PVC) trim accessories at corners, control and expansion joints as indicated on the Plans, and as may be required by industry standards and best practices,
  - 6. The use of prefabricated stucco reveals for the purposes of creating decorative score patterns is not allowed. Strike final stucco coat to achieve score patterns, and slope bottom edge of horizontal score lines to dispel water.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Metal Supports:
  - 1. Dale/Incor.
  - 2. Dietrich.
  - 3. Gold Bond Building Products Division.
  - 4. Unimast Inc. (USG Co.)

B. Accessories:

1. Dietrich.
2. Fry Reglet Corp.
3. Gold Bond Building Products Div.
4. Plastic Components Inc.
5. South Lath Inc.
6. United States Gypsum Co.
7. Vinyl Corp., Miami, FL.

2.2 MATERIALS

A. Metal Supports - Suspended and Furred Ceilings or Soffits:

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.
  - d. Provide galvanized channels for exterior installations.
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: 0.0179", 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: (at all exterior cmu walls)
- 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.

## PART 3 EXECUTION

### 3.1 INSTALLATION

#### A. Lath and Furring:

1. Interior Lath and Furring Installation Standard: Install lath and furring materials indicated for gypsum plaster to comply with ASTM C841.
2. Portland Cement Plaster/Stucco Lath and Furring Installation Standard: Install lath and furring materials indicated for Portland cement plaster to comply with ASTM C926.
3. Install supplementary framing, blocking, and bracing at terminations in work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work to comply with details indicated or, if not otherwise indicated, to comply with applicable published recommendations of gypsum plaster manufacturer or, if not available, of Gypsum Construction Handbook, latest edition, published by United States Gypsum Co.
4. Isolation:
  - a. Where lath and metal support system abuts building structure horizontally, and where partition/wall work abuts overhead structure, isolate work from structural movement sufficiently to prevent transfer of loading into work from building structure.
  - b. Install slip or cushion type joints to absorb deflection but maintain lateral support.
  - c. Frame both sides of control and expansion joints independently.
  - d. Do not bridge joints with furring and lath or accessories.

#### B. Ceiling Suspension Systems:

1. Preparation and Coordination:

- a. Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure inserts and other 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. Furnish concrete inserts and other devices indicated, to other trades for installations before time needed for coordination with other work.
  - c. Powder and pneumatic actuated (shot-type) fasteners shall not be used to provide support for construction elements located overhead.
- 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 referenced lath and furring 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.

C. 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. Loadbearing (axial and transverse) Stud Systems: Comply with ASTM C1007 and as indicated.
- 4. Steel Stud Systems to Receive Metal Lath: Comply with requirements of ML/SFA Specifications for Metal Lath and Furring applicable to each installation condition and type of metal system indicated.
- 5. Extend partition support systems to finish ceiling and attach to ceiling suspension members, unless otherwise indicated.

D. Vertical Metal Furring:

- 1. Metal Furring to Receive Metal Lath: Comply with requirements of ML/SFA Specification for Metal Lath and Furring applicable to each installation condition indicated.

3.2 ADJUSTING, CLEANING, AND PROTECTION

A. Cutting and Patching:

- 1. 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.
- 2. Sand smooth-troweled finishes lightly to remove trowel marks and arises.

B. Cleaning:

1. Remove temporary protection and enclosure of other work.
2. Promptly remove excess joint material from door frames, windows, and other surfaces.
3. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during joint material installation.
4. When joint material is completed, remove unused materials, containers, and equipment, and clean floors of debris.

**END OF SECTION**



**SECTION 09250  
GYPSUM WALLBOARD**

**PART 1 GENERAL**

**1.1 SUMMARY**

A. Related Sections:

1. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
2. 09310 - Ceramic Tile.

**1.2 REFERENCES**

A. American Society for Testing and Standards (ASTM), latest edition:

1. C11 Terminology Relating to Gypsum and Related Building Materials and Systems.
2. C36 Specification for Gypsum Wallboard.

**1.3 SUBMITTALS**

- A. Before starting work, provide product data and samples as directed by A/E.

**1.4 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 gypsum board. Surfaces judged to be unsuitable for finishing, even if finish has been applied, shall be rejected.
- B. The A/E will direct repair or replacement of rejected work.

**1.5 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 corner beads and trim.

**1.6 PROJECT CONDITIONS**

- A. Environmental Requirements: Proceed with installation of gypsum board materials only after building is weather tight.
1. Maintain temperature in areas receiving gypsum board materials between 55 degrees and 90 degrees F. during and after installation and provide adequate ventilation.

**PART 2 PRODUCTS**

**2.1 MANUFACTURERS**

- A. Gypsum Wallboard:

1. Gold Bond.
2. National Gypsum.
3. Georgia Pacific.
4. United States Gypsum Company (USG).

B. Accessories shall be by gypsum wallboard manufacturer.

## 2.2 MATERIALS

A. Gypsum Wallboard:

1. **High Impact Abuse Resistant Gypsum Board: USG Fiberock** - VHI Abuse-Resistant, 5/8" thick or other A/E accepted equivalent.

B. Fasteners: Type S Bugle Head by USG 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 gypsum wallboard manufacturer.

D. 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.

E. Tile Backer Boards:

1. **Aggregated Portland cement board with vinyl-coated, woven glass fiber embedded on both surfaces.**
2. Joint Reinforcement, Fasteners, Adhesives, and Grout: According to manufacturer's recommendation.

## PART 3 EXECUTION

### 3.1 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 gypsum 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. **Metal corner beads are not allowed. Use vinyl trim accessories only.**
  2. Treat trim 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.
  3. Apply trim at intersections where gypsum board abuts other materials, unless detailed otherwise, and at all other locations indicated. Neatly fit and secure corner beads over external corners.
  4. Install expansion joints as detailed.
  5. Install control joints as detailed.
- 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.

**END OF SECTION**

**SECTION 09285  
PLASTERFORM GLASSFIBER REINFORCED GYPSUM (GRG)**

**Part 1 – GENERAL**

**1.1 RELATED DOCUMENTS**

This specification is a general outline the Plasterform GRG requirements, as they pertain to the overall project design. In all cases, the Manufacturer's printed specifications shall govern the work of this section.

**1.2 SUMMARY**

A. Section Includes:

1. Furnish all materials, labor, equipment and services necessary for the supply and installation of Plasterform GRG components as indicated on the drawings and contract documents, all in compliance with local codes and/or ordinances.
2. Work shall include supply of GRG components, installation, and joint treatment.

B. Related Sections:

1. Section 05120 Structural Steel: Support framing for structural steel
2. Section 09900 Painting
3. Section 09250 Gypsum Board

C. Alternates

1. Manufacturers desiring to submit proposals other than Plasterform shall, at least 10 days prior to the bid date, submit to the Architect all descriptive information of the system. These Manufacturers must have a minimum of three years' experience with the system, provide photographs, and shop drawings of at least three projects similar in detail and scope with names, addresses and phone contacts of the respective Architects and Installation Contractors. Independent test data showing compliance with the specified system and three samples of similar details must also be submitted.

**1.3 References**

A. American Society for Testing and Materials (ASTM):

1. ASTM D638 Standard Test Method for Tensile Properties of Plastics
2. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
3. ASTM C947 Standard Test Method for Flexural Properties of Thin-Section Glass-Fiber-Reinforced Concrete (Using Simple Beam With Third-Point Loading)

4. ASTM D256 Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
5. ASTM D696 Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous Silica Dilatometer
6. ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
7. ASTM C472 Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete
8. ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products
9. ASTM D2583 Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
10. ASTM C840 Standard Specification for Application and Finishing of Gypsum Board

#### **1.4 SUBMITTALS**

- A. Submit a minimum of 3 - 8" x 8" Plasterform GRG flat samples to the Finishing Contractor for paint selection.
- B. Submit shop drawings for approval showing plans, sections, details, joint treatment, reinforcing, fastening devices and the relation of the Plasterform GRG components to the surrounding construction.

#### **1.5 RESPONSIBILITY**

- A. The Gypsum Board Contractor shall install and tape the work under this section and he will be responsible for coordinating the installation with drywall work and other trades.

#### **1.6 MOCK-UP**

- A. Prior to production, erect one proto-type component on-site or at the Plasterform plant, for review by the Architect. Once approved the proto-type will establish the standards by which the work will be judged.

#### **1.7 DELIVERY, STORAGE, HANDLING AND PROTECTION**

- A. Transport and handle units in a manner that avoids excessive stresses or damage.
- B. Components displaying obvious damage must be rejected at site at time of delivery.
- C. Store the components in a controlled environment, weather protected, on level surfaces, with temporary supports as required. Do not stack or lean.

#### **1.8 Warranty**

One year from substantial completion.

## **PART 2. – PRODUCTS**

### **2.1 MANUFACTURER**

- A. Plasterform by Armstrong World Industries, Inc.

### **2.2 MATERIALS**

1. Plasterform GRG components shall be prefabricated with high-density gypsum, free of resin and asbestos, reinforced with chopped strand fiber.
2. Plasterform components shall be reinforced with steel or wood.
3. No additives such as retards, accelerators or polymers are permitted.
4. Fabrication will be as per approved shop drawings and will not include assembly. If multiple components are required to complete design criteria as per contract drawings, additional site work under related section, installation or finishing may be required.
5. Plasterform GRG components shall be ready to receive primer and paint as specified under Section 09900.

### **2.3 TOLERANCES (FABRICATION)**

1. Dimensional - all directions +/- 1/8"
2. Thickness - skin +/- 1/16"
3. Thickness - total unit 1/8" - 3/16"
4. Warpage or Bowing +/- 1/16"/foot
5. Site conditions and normal manufacturing variations may require additional site work to maintain these tolerances.

### **2.4 PHYSICAL PROPERTIES**

- A. Shell Thickness 3/16"
- B. Weight (depending on reinforcing) 2 - 3 lbs/sq.ft
- C. Density 103 - 112 lbs/cu.ft
- D. Flexural Strength (ASTM C-947-89 MOD.) 4,820 psi.
- E. Compressive Strength (ASTM C-472-90 MOD.) 13,800 psi.
- F. Modulus of Elasticity - In flexure (ASTM C-947-89 MOD.) 3.38 x 10<sup>6</sup> psi.
- G. Tensile Strength (ASTM D-638-94 b MOD.) 1,810 psi.
- H. Impact Strength (ASTM D-256 notched) 3.26 ft.lb/ in. of notch
- I. Impact Strength (ASTM D-256 unnotched) 8.0 ft.lb/ in<sup>2</sup>.
- J. Hardness – Barcol (ASTM D-2583-93) 54
- K. Fiber Content 5 - 6% by weight
- L. Humidified Deflection (ASTM C-473-95) 1/32" deflection/in.
- M. Coefficient of Expansion (ASTM D-696-91) 0.98 x 10<sup>-5</sup> in./in./ °F
- N. Fuel Contribution (ASTM E-136-98a) 0
- O. Flame Spread (ASTM E-84-94) 0, Class A

- P. Smoke Index (ASTM E-84-94) 0, Class A
- Q. Fastener Withdrawal
  - 1. - drywall screw embedded in wood 329 lbs
  - 2. - drywall screw embedded in steel 764 lbs
  - 3. - steel cable embedded in steel insert 1,050 lbs

## **2.5 INSPECTION**

- A. The Architect or his representative shall have access to the manufacturing facilities, either prior to contract award or thereafter, to inspect or verify compliance with the above specifications.

## **3.0 EXECUTION**

### **3.1 PRE-INSTALLATION RESPONSIBILITY**

- A. Field Measurements: Prior to manufacturing, the Installer will be responsible for obtaining all field dimensions for inclusion on the Manufacturer's shop drawings.
- B. Coordination: The Installer will be responsible for the co-ordination of the installation with related sections, within the tolerances specified in the respective articles.
- C. Discrepancies: Prior to installation, the Installer shall check job site dimensions and conditions. Any discrepancies between design and field dimensions shall be brought to the attention of the General Contractor and the Architect.

### **3.2 INSTALLATION**

- A. Components shall be lifted/handled with suitable devices.
- B. Components shall be installed plum and true. Shim where necessary.
- C. Fasten components with self-drilling, self-tapping bugle head screws through face or back as indicated on shop drawings.
- D. Where components are suspended, use as a minimum 12 gauge galvanized steel wire and the suspension points indicated on the shop drawings.
- E. Framing, hangers, etc. as specified for Gypsum Board.
- F. Butt joints are to be adhered together using "Liquid Nail" or equivalent.

### **3.3 FINISHING**

- 1. Refer to Painting Section of the Specifications.
- 2. The Paint Contractor shall comply with ASTM C 840-79 Specifications.



## **NOTES**

1. Plasterform GRG components shall be used for Interior Applications only.
2. Unfinished GRG may exhibit slight imperfections, normally hidden by textured or mat finishes. To obtain satisfactory results with Gloss Finishes, additional filling, sanding, priming and painting may be required.
3. Improper sealing, more than crowning, can cause tape joint read-through after painting. This is due to the difference in porosity between joint compounds and GRG therefore, ensure that the Painting Contractor seals all surfaces properly prior to finishing.

**END OF SECTION**

**SECTION 09310  
CERAMIC TILE**

**PART 1 GENERAL**

**1.1 SUMMARY**

**A. Related Sections:**

1. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
2. 09250 - Gypsum Wallboard.
3. 10800 - Toilet Room Accessories.
4. 15421 - Drains and Cleanouts.
5. 15440 - Plumbing Fixtures, Trim, and Supports.

**1.2 REFERENCES**

**A. American National Standards Institute, Inc. (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 Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
3. A108.10 Installation of Grout in Tilework.
4. A118.1 Dry-Set Portland Cement Mortar.
5. A118.6 Ceramic Tile Grouts for Tile Installation.
6. A137.1 Specifications for Ceramic Tile.

**B. Tile Council of North America, Inc. (TCNA): Handbook or Ceramic Tile Installation, latest edition.**

**1.3 SUBMITTALS**

**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.

**1.4 QUALITY ASSURANCE**

**A. Tile shall conform to requirements of ANSI A137.1, Standard Grade.**

**1.5 MAINTENANCE**

- A. Attic Stock/Maintenance Materials:** At the job site, provide 2 unopened boxes of each color and type of tile installed.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

#### A. Ceramic Tile:

1. American Olean Tile Company.
2. Dal-Tile.
3. Florida Tile Industries.
4. Interceramic USA.
5. Mannington Ceramic Tile Company.
6. Mosa USA
7. US Ceramic Tile Company.

### 2.2 MATERIALS

- A. Slip-Resistant Ceramic Mosaic Floor Tile: 2 inches x 2 inches x 1/4" thick, unglazed, plain face, cushioned edges, having a minimum of 0.42 Dynamic Coefficient of Friction (DCOF) factor, when wet, without use of abrasive impregnation.
- B. Glazed Wall Tile: Nominal 4" x 4" x 5/16" thick, matte or crystalline face, cushioned edges.
- C. Color and Pattern:
1. Colors and patterns shall be as selected by A/E
  2. A/E's range of color selection shall not be limited to colors stocked locally but by entire color line of specific manufacturer as determined by samples in A/E's office.
- D. Trim and Special Shapes: Provide the following trim units and special shapes of same material and finish as ceramic 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-buffed square with square in-corner base and top trim special shapes.
- E. Marble Thresholds: 2-1/4" wide, 3/4" thick, White Georgia or Madre Cream Alabama marble with exposed edges beveled and honed finish on exposed surfaces.
- F. Setting Materials:
1. Modified Dry-Set Mortar (Thinset) in accordance with ANSI A118.4.
  2. Basis of Design - Laticrete 254 Platinum, or approved equivalent certified by tile manufacturer licensed by TCNA, indicating product is suitable for the type of tile and application.
- G. Grout:
1. High-Performance Tile Grout in accordance with ANSI A118.7.
    - a. Basis of Design: Laticrete Permacolor Dry-Set Grout or approved equivalent certified by tile manufacturer licensed by TCNA, indicating product is suitable for the type of tile and application.

2. Water-Cleanable Epoxy Grout in accordance with ANSI A118.3, with a VOC content of 65 g/L or less.
    - a. Basis of Design: Laticrete SpectraLock Pro Series Epoxy Grout or approved equivalent certified by tile manufacturer licensed by TCNA, indicating product is suitable for the type of tile and application.
  3. Colors as selected by A/E.
- H. Tile Cleaner: Biscayne Chemical Laboratories, Inc., "Blue Boy" or other A/E accepted equivalent.

## PART 3 EXECUTION

### 3.1 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 tile ceilings occur, install ceramic 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 Tile Installation.
  - b. Locate movement joints:

- 1) At 20 to 25 feet on center and at all interior locations as required in A108.108.01-3.7.2. Interior areas exposed to direct sunlight shall have expansion joints spaced at 8 to 12 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 ceramic 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 Ceramic Tile With Modified Dry-Set Mortar (Thinset):
1. Concrete Substrate:
    - a. Set ceramic tile according to applicable requirements of ANSI A108.5.
    - b. Set tile with modified 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. Ceramic mosaic floor tile: Use commercial latex Portland cement grout.
  2. Glazed ceramic wall tile - Non-Kitchen Food Prep Areas: Use dry-set grout.
  3. Glazed ceramic wall tile - Kitchen Food Prep Areas): Use epoxy grout.
  4. Force grout into joints to fill solid.
    - a. Remove and re-grout discolored joints. Fill voids in joint grout.
- D. Thresholds: Set marble thresholds where indicated or at dissimilar floor finishes with the same material used for setting ceramic mosaic floor tile.
- 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.
- 3.2 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.

**END OF SECTION**

**SECTION 09412 (09 66 00)**  
**EPOXY TERRAZZO FLOORING**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Thin-set Epoxy Terrazzo Flooring including preparation of substrates..
  - 2. Thin-set precast epoxy terrazzo tread or tread & riser units.
  - 3. Thin-set pre-cast epoxy terrazzo wall base units.
  - 4. Related accessories.
- B. Related Sections
  - 1. Section 03300 - Cast-In-Place Concrete.
  - 2. Section 07920 - Joint Sealants.

**1.3 SUBMITTALS**

- A. Manufacturer's product data for each type of terrazzo and accessory. System will be evaluated on the basis of standards. For tests not listed in published data, manufacturer shall supply missing data according to standard referenced.
  - 1. Physical properties.
  - 2. Performance properties.
  - 3. Specified tests.
  - 4. Material Safety Data Sheet.
  - 5. Manufacturer's standard warranty.
- B. LEED Submittals
  - 1. Product Data for Credit MR 4.1 for aggregates indicating percentages by weight of postindustrial recycled content.
    - (a) Include statement that indicates cost for each product having recycled content.
  - 2. Product Data for Credit MR 5.1: For products manufactured within a 500-mile radius of the project.
  - 3. Product Data for Credit EQ 4.1: For adhesives, including printed statement of VOC content and chemical components.
- C. Shop Drawings. Include terrazzo installation requirements. Include plans, elevations, sections, component details and attachments to other work. Show layout of the following:

1. Divider strips.
  2. Control-and expansion-joint strips.
  3. Base and border strips.
  4. Abrasive strips.
  5. Stair treads, risers and landings.
  6. Precast terrazzo joints and edge configurations including anchorage details.
  7. Terrazzo patterns.
- D. Samples for Initial Selection color plates showing the full range of colors and patterns available for each terrazzo type indicated.
- E. Samples for Verification: Match Architect's samples for each type, material, color and pattern of terrazzo and accessory required showing the full range of color, texture and pattern variations expected. Label each terrazzo sample to identify manufacturer's matrix color and aggregate types, sizes and proportions. Prepare samples of same thickness and from same material to be used for the Work in size indicated below:
1. Epoxy Terrazzo: minimum 6" x 6" (152.4 mm x 152.4 mm) sample of each color and type of terrazzo.
  2. Precast Epoxy Terrazzo: minimum 6" x 6" (152.4 mm x 152.4 mm) sample of each color and type of terrazzo.
  3. Accessories: 6" length (152.4 mm) of each kind of divider strip, stop strip and control joint strip required.
  4. Stair Treads: 12" length (304.8mm) wide sample combination tread/riser with cast-in nosing.
- F. Manufacturer Experience:
1. Submit proof of Associate membership in NTMA.
  2. Furnish a list of at least (5) five epoxy terrazzo projects using material being submitted for this project installed during the last five (5) years of the same scope, complexity and at least 50 percent of the square footage.
- G. Qualification Data: For qualified Installer.
1. Submit proof of Associate membership in NTMA.
  2. Furnish a list of at least (5) five epoxy terrazzo projects using material being submitted for this project installed during the last five (5) years of the same scope, complexity and at least 50 percent of the square footage.
- H. Material Test Reports: For moisture and/or relative humidity of substrate.
- I. Maintenance Data: Submit one copy of NTMA maintenance recommendations and one copy of manufacturer's instructions.

#### **1.4 WARRANTY SUBMITTALS WITH BID**

- A. Installation Warranty:
1. Bidder shall submit written warranty agreeing to promptly correct defective workmanship for a period of (2) two years after the Date of Substantial Completion of each Purchase Order, upon written notice from the Project Manager, and at no cost to County.

2. Manufacturer shall guarantee that each batch of polymer will provide an acceptable consistent commercial color match.
3. Submit written warranty from the Bidder agreeing to repair or replace any areas, determined by an independent inspector, to be deficient relevant to the requirements.
4. The installer and the manufacturer shall furnish a standard guarantee of the Epoxy Thin Set Terrazzo Flooring System for a period of two years after installation. The labor and material guarantee shall include loss of bond and wear through the concrete substrate from normal use, and delaminating caused by vapor transmission. The guarantee shall be issued by the manufacturer and installer, and shall be on a joint and several basis, covering materials and labor on the system.
5. Not included in the warranty are damage due to structural design deficiencies including but not limited to slab cracking from lateral, vertical or rotational movement, and gouging or other damage due to fork lifts, other equipment, Acts of God, or other elements beyond the scope of protection of this system nor causes not related to the system materials.
6. In case of a warranty claim, the County will notify the manufacturer and installer in writing within 30 days of the first appearance of the problems covered under this warranty. The County will provide free and unencumbered access to the area for warranty rework. Property protection is also the County's responsibility. Remedy is limited to direct repair of the Terrazzo Flooring System.

## 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who is acceptable to Design-Build Professional and epoxy terrazzo manufacturer to install manufacturer's products.
  1. Engage a terrazzo contractor with at least (5) five years of satisfactory experience in installation of epoxy terrazzo. Terrazzo contractor shall demonstrate experience during last (5) five years of at least (5) five projects of comparable scope and complexity of at least 50 percent of the total square footage of this project.
  2. Engage an installer who is a contractor member of NTMA.
  3. Approved Installers:
    - (a) The David Allen Company, Frank Ney, 305-858-2969
    - (b) Creative Terrazzo, John Calderbank, 305-418-9893
    - (c) Artistic Surfaces, Harvey Namm, 954-968-1700
    - (d) Any other installer that meets all qualification criteria must be approved by the Design-Build Professional.
- B. Source Limitations:
  1. Obtain primary Epoxy Terrazzo Flooring System materials including membranes, primers, resins and hardening agents from a single manufacturer with proof of NTMA membership.
  2. Obtain aggregates, divider strips, sealers, cleaners from a source recommended by primary materials manufacturer.
- C. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Section 01310 – Project Management and Coordination. Review methods and procedures related to terrazzo including, but not limited to, the following:



1. Inspect and discuss installation procedures, joint details, jobsite conditions, substrate specification, vapor barrier details and coordination with other trades.
  2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment and facilities needed to make progress and avoid delays.
  3. Review special terrazzo designs and patterns.
  4. Review dust control procedures.
  5. Review plans for concrete curing and site drying to enable timely achievement of suitable slab moisture conditions.
- D. NTMA Standards: Comply with NTMA's "Terrazzo Specifications and Design Guide" and with written recommendations for terrazzo type indicated unless more stringent requirements are specified.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockups for terrazzo including accessories.
    - (a) Size: Minimum 100 sq. ft. (9.3 sq. m.) of physical poured-in-place flooring condition for each color and pattern in locations directed by Design-Build Professional.
    - (b) Approved mockups may become part of the complete Work if undistributed at time of Substantial Completion.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to Project site in supplier's original wrappings and containers, labeled with source's or manufacturer's name, material or product brand name and lot number if any.
- B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures and humidity.
1. Storage temperatures should be between 50 degrees F to 80 degrees F.

## **1.7 PROJECT CONDITIONS**

- A. Terrazzo contractor shall, prior to surface preparation:
1. Evaluate slab condition, including slab moisture content and extent of repairs required, if any. Bidder shall be responsible for reducing vapor transmission to a level acceptable by the polymer manufacturer. Include in base bid square footage pricing for vapor transmission reduction, as well as other items required to correct concrete substrate.
  2. Maintain the ambient room and floor temperature at 50 degrees F or above for a period extending 72 hours before, during and after floor installation. Concrete to receive epoxy terrazzo shall have cured for at least 28 days and be free of all curing compounds. Test concrete substrate to determine acceptable moisture levels prior to installation. Testing should be conducted according to ASTM F2170 (determining relative humidity in concrete slabs using in situ probes).

- B. Prior to and during each day of installation, the terrazzo contractor shall verify that the dew point is at least 5 degrees F (-15 degrees C) less than the slab and air temperature.
- C. Acceptable Substrates:
  - 1. Level tolerance: Concrete sub-floor shall be level with maximum variation from level of ¼" in 10 feet. Any irregularity of the surface requiring patching and/or leveling shall be done using an epoxy fill and selected aggregates as recommended by manufacturer.
  - 2. Concrete floor shall be prepared mechanically by shot blasting or by grinding with diamonds in accordance with ICRI Guideline No. 03732. Specifically, surface preparation results should achieve a CSP3-CSP5 profile.
  - 3. Concrete floor shall receive a steel trowel finish.
  - 4. Concrete shall be cured a minimum of 28 days. No curing agents are to be used in areas to receive terrazzo.
  - 5. Concrete slab shall have an efficient moisture vapor barrier (suggested minimum: 15 mils thickness) directly under the concrete slab. Moisture barrier shall NOT be punctured.
  - 6. Saw cutting of control joints must be done between 12 and 24 hours after placement of the structural concrete and at a frequency compatible to ACI recommendations.
- D. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.
- E. Provide protection from other trades prior to final acceptance by County.

## **PART 2 PRODUCTS**

### **2.1 EPOXY TERRAZZO**

- A. Products: Subject to compliance with requirements. Products that may be incorporated into the Work include the following:
  - 1. The Basis of Design is Terroxy Resin Systems Epoxy Matrix by Terrazzo & Marble Supply Companies, Wheeling, IL ([www.tmsupply.com](http://www.tmsupply.com))
  - 2. Quadrant Chemical Corporation; Quadset Epoxy Terrazzo.
  - 3. RBC Industries; Hallemite.
  - 4. Owner approved equal.
- B. Materials:
  - 1. Primer: Primer and/or Moisture Vapor Primer as recommended by manufacturer.
  - 2. Flexible Reinforcing Membrane: Epoxy or cement membrane, for substrate crack preparation and reflective crack reduction.
    - (a) Reinforcement: Fiberglass scrim.
  - 3. Epoxy Matrix: Epoxy matrix and in color required for mix indicated.
    - (a) Physical properties without aggregates. All specimens cured for 7 days at 75 degrees F plus or minus 2 degrees F and 50 percent plus or minus 2 percent RH. This product shall meet the following requirements:

Property	Test Method	NTMA Requirements	Terroxy Thin-set Epoxy Terrazzo Typical Results
Hardness	ASTM D-2240 using Shore-D Durometer	60-85	75-85
Tensile Strength	ASTM D-638	3,000 psi min.	4,800 psi min.
Compressive Strength	ASTM D-695 Specimen B cylinder	10,000 psi min.	12,000 psi min.
Flexural Strength	ASTM D-790	Not specified	4,500 psi min.
Chemical Resistance	ASTM D-1308 seven days at room temperature by immersion method	No deleterious effects: <ul style="list-style-type: none"> <li>• Distilled water</li> <li>• Mineral oil</li> <li>• Isopropanol</li> <li>• Ethanol</li> <li>• 0.025 Detergent Solution</li> <li>• 1% Soap Solution</li> <li>• 10% Sodium Hydroxide</li> <li>• 10% Hydrochloric Acid</li> <li>• 30% Sulfuric Acid</li> <li>• 5% Acetic Acid</li> </ul>	No deleterious effects: <ul style="list-style-type: none"> <li>• Distilled Water</li> <li>• Mineral oil</li> <li>• Isopropanol</li> <li>• Ethanol</li> <li>• 0.025 Detergent Solution</li> <li>• 1% Soap Solution</li> <li>• 10% Sodium Hydroxide</li> <li>• 10% Hydrochloric Acid</li> <li>• 30% Sulfuric Acid</li> <li>• 5% Acetic Acid</li> </ul>

(b) Physical properties without aggregates. For Epoxy Matrix blended with three volumes of Georgia White Marble blended 60% #1 chip and 40% #0 chip, ground and grouted with epoxy resin according to Installation Specifications, finishing to a nominal ¼" thickness. All specimens cured for 7 days at 75 degrees F plus or minus 2 degrees F and 50 percent plus or minus 2 percent RH. This finished Epoxy Matrix shall meet the following requirements.

Property	Test Method	NTMA Requirements	Terroxy Thin-set Epoxy Terrazzo Typical Results
Flammability	ASTM D-635	Self-extinguishing, extent of burning 0.025 inches max.	Self-extinguishing, extent of burning 0.025 inches max.
Thermal Coefficient of Linear Expansion	ASTM D-696	25x10 <sup>-6</sup> inches per inch per degrees to 140°F	25x10 <sup>-6</sup> inches per inch per degrees to 140°F
Bond Strength	ACI COMM 403, Bulletin 59-43 (pages 1139-1141)	300 psi (100% concrete failure)	300 psi (100% concrete failure)

4. Aggregates should comply with NTMA gradation standards for mix indicated and containing no deleterious or foreign matter. Five colors are selected by Design-Build Professional from domestic quarries. Thin-Set Epoxy Terrazzo Aggregates to be: **45% marble chips: 30% mother of pearl and/or crushed mirror chips and 25% colored glass chips.**

- (a) Abrasion and Impact Resistance: Less than 40% loss per ASTM C 131.
  - (b) 24-Hour Absorption Rate: Less than 0.74 percent.
  - (c) Dust Content: Less than 1.0 percent by weight.
5. Finishing Grout: Epoxy matrix or clear resin as recommended by manufacturer.
- C. Mix: Comply with NTMA's "Terrazzo Specifications and Design Guide" and manufacturer's written instructions for matrix and aggregate proportions and mixing.
- 1. Color and Pattern Schedule: Refer to Floor Pattern Drawing and Finish Schedule in order to provide specified terrazzo matrices matching architect's samples.

**2.2 STRIP MATERIALS**

A. Thin-set Divider Strips: L-type

- 1. Material: Brass and/or Aluminum as specified by Design-Build Professional.
- 2. L-type divider strips' sizes (height and width) as specified by Design-Build Professional.
- 3. Guide for commonly used L-type divider strips for Thin-set Epoxy Terrazzo systems:

System Height	Strip Height	Strip Width
1/4" System	1/4"	16 gauge
3/8" System	3/8"	1/8"
		1/4"

- B. Control-Joint Strips: Single L-type angle, positioned adjacent to the joint. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
- C. Construction-Joint (Cold-Joint) Strips: Separate double L-type angles back to back with minimum 1/8" width between. Fill joint and area between strips with flexible joint filler. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
- D. Expansion-Joint Strips: Separate double L-type angles, positioned back to back with minimum 1/8" width between. Fill area between strips with flexible joint filler. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
- E. Accessory Strips: Match divider strip width, material and color unless otherwise indicated. Use the following types of accessory strips as required to provide a complete installation:
  - 1. Base-bead strips for exposed top of terrazzo base.
  - 2. Edge-bead for exposed edges of terrazzo.
  - 3. Nosings for terrazzo stair treads and landings.

**2.3 MISCELLANEAOUS ACCESSORIES**

- A. Strip Adhesives: 100% solids epoxy resin adhesive recommended by manufacturer.

1. Use adhesive that has a VOC content of 50g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Anchoring Devices:
1. Strips: Provide mechanical anchoring devices for strip materials as required for secure attachment to substrate.
  2. Precast Terrazzo: Provide mechanical anchoring devices as recommended by Terrazzo Contractor for proper anchorage and support of units for conditions of installation and support.
- C. Patching and Fill Material: Epoxy fill and selected aggregates as recommended by manufacturer.
- D. Joint Compound: Epoxy joint filler, color to be selected by Design-Build Professional to match/compliment terrazzo.
- E. Cleaner: A neutral cleaner with pH factor between 7 and 10 specifically designed for terrazzo.
- F. Sealer: Slip- and stain-resistant sealer that is chemically neutral with a pH factor between 7 and 10; does not affect physical properties of terrazzo and complies with NTMA's "Terrazzo Specifications and Design Guide."

## 2.4 PRECAST TERRAZZO

- A. Precast Terrazzo Units: Precast epoxy terrazzo (base, stair tread, threshold, bench and planter units).
1. Manufacturers: Subject to compliance with requirements, provided products acceptable to Design-Build Professional.
- B. Precast Terrazzo Base Units: ¼" (6.4 mm) thick, cast in maximum lengths possible, but not less than 36" (900 mm).
1. Type: as per drawing.
  2. Height: as per drawing.
  3. Outside Corner Units: With finished returned edges at outside corner.
  4. Color and Pattern: to be selected by Design-Build Professional.
- C. Terrazzo Cover Base:
1. Option 1: Epoxy matrix poured-in-place cove base with ¾" (19 mm) radius, (4" (10.12 cm), 6" (15.24 cm) or 8" (20.32 cm)) high as specified in drawings.
- D. Precast Terrazzo Stair Treads: Thickness indicated, with cast-in nosing.
1. Tread/Riser: ½" (12.7 mm) thick epoxy, Type \_\_\_\_\_ with abrasive pattern \_\_\_\_\_.
  2. Color and Pattern to be selected by Design-Build Professional.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and areas, with Terrazzo Contractor present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions, including level tolerances, have been corrected.

### **3.2 PREPARATION**

- A. Clean substrates of substances, including oil, grease and curing compounds, that might impair terrazzo bond. Provide clean, dry and neutral substrate for terrazzo application.
- B. Concrete Slabs:
  - 1. Provide sound concrete surface free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil and other contaminants incompatible with terrazzo.
    - (a) Prepare concrete mechanically by shot blasting or by grinding with diamonds. Surface preparation results should achieve a CSP3-CSP5 profile according to International Concrete Repair Institute Guideline No. 03732.
    - (b) Repair or level damage and deteriorated concrete according to manufacturer.
    - (c) Repair cracks and non-expansion joints greater than 1/16" (1.6 mm) wide according to manufacturer.
  - 2. Verify that concrete substrates are visibly dry and free of moisture.
  - 3. Moisture Testing:
    - (a) Test for moisture according to ASTM F2170 (determining relative humidity in concrete slabs using in situ probes).
    - (b) Proceed with installation only after substrates have a maximum relative humidity measurement reading less than 80%. If relative humidity measurement reading is greater than or equal to 80%, provide appropriate moisture barrier as per manufacturer's recommendations.
- C. Protect other work from dust generated by grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations.
  - 1. Erect and maintain temporary enclosures and other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

### **3.3 EPOXY TERRAZZO INSTALLATION**

- A. General:
  - 1. Comply with NTMA's written recommendations for terrazzo and accessory installation.

2. Place, rough grind, grout, cure grout, fine grind and finish terrazzo according to NTMA's "Terrazzo Specifications and Design Guide."
  3. Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint-strips.
  4. Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.
- B. Thickness: 3/8" (9.5 mm)
- C. Prior to System Application: Treat cracks with Terrozy Iso-Crack Epoxy Membrane and fill substrate irregularities with Terrozy Fill as described in the Execution section. Fill referenced joints with Terrozy Joint Filler. Seal system with appropriate Terroxy sealer.
- D. Remove and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo, or repair panels according to the flooring manufacturer's and NTMA's written recommendations, as approved by Design-Build Professional.
- E. Flexible Reinforcing Membrane
1. Cracks: Fill cracks greater than 1/16" (1.6 mm) with Iso-Crack Membrane. Place 25-30 mil detail coat so that Membrane extends at least 9" (22.86 cm) to 12" (30.48 cm) to 12" (30.48 cm) on each side of crack or joint. After Membrane has leveled, lay precut Terroxy Fabric into wet Membrane. Smooth cloth with a flat steel trowel, allowing cloth to be encapsulated but remain exposed on the surface of Membrane. Light abrade or solvent wipe treated cracks prior to applying primer. Allow in base bid for above crack detailing as follows: 10% of lineal footage of total project square footage for combined Type 1 & 2, and 5% of lineal footage of Type 3. {i.e., a 10,000 sq ft (92.9 sq. m) project would allow for a combined 1000 lineal feet of Type 1 & 2 repairs and 500 lineal feet of Type 3 repairs.}
- F. Primer: Apply to terrazzo substrates according to manufacturer's Product Data Sheet.
- G. Strip Materials:
1. Divider and Accessory Strips:
    - (a) Install strips in adhesive setting bed without voids below strips or mechanically anchor strips as required to attach strips to substrate.
    - (b) Control-Joint Strips: Single L-type angle, positioned adjacent to the joint. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
    - (c) Construction-Joint (Cold-Joint) Strips: Separate double L-type angles back to back with minimum 1/8" width between. Fill joint and area between strips with epoxy joint filler. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
    - (d) Expansion-Joint Strips: Separate double L-type angles, positioned back to back with minimum 1/8" width between. Fill area between strips with epoxy joint filler. Match material, thickness and color of divider strips and depth required for topping thickness indicated.
- H. Placing Terrazzo:

1. Mix epoxy matrix with chips and filler in ratios directed by manufacturer.
  2. Trowel apply terrazzo mixture over epoxy primer to provide a dense flat surface to top of divider strips. Allow to cure per manufacturer's recommendations before rough grinding.
- I. Rough Grinding: Grind with 24 grit silicon carbide or D-36 Diamond matrix stones until all Terrazzo strips and marble chips are uniformly exposed.
- J. Grouting:
1. Cleanse floor with clean water and rinse.
  2. Remove excess rinse water by wet vacuum, dry and fill voids with epoxy matrix or clear resin.
  3. Allow grout to cure. Grout may be left on terrazzo until other trades work is completed.
- K. Polishing: Grind with 120 grit or finer stones until all grout is removed from surface. Repeat rough grinding, group coat and polishing if large terrazzo chip voids exist after initial polishing. Produce surface with minimum of 70 percent aggregate exposure.
- L. Remove scratches using 120 resin pads.
- M. Final polish using 220 resin pads prior to sealing.

### **3.4 PRECAST TERRAZZO INSTALLATION**

- A. Install precast units using method recommended by NTMA and manufacturer unless otherwise indicated.
- B. Seal joints between units with joint sealants.

### **3.5 CLEANING AND PROTECTION**

- A. Cleaning: Remove grinding dust from installation and wash all surfaces with a neutral cleaner including a pH factor between 7 and 10 and specifically designed for terrazzo. Terra Clean product recommended.
- B. Sealing: Apply Terroxy Acrylic, WB Acrylic, WB Urethane or Penetrating sealer in accordance Terroxy Resin Systems Product Data Sheets. Products are not to be used with natural finish.
- C. Protection: Upon completion, the Work shall be ready for final inspection and acceptance by the County and Design-Build Professional. Provide final protection and maintain conditions, in a manner acceptable to Terrazzo Contractor, that ensure terrazzo is without damage or deterioration.

## **END OF SECTION**



**SECTION 09510  
ACOUSTICAL CEILINGS**

**PART 1 GENERAL**

**1.1 SUMMARY**

**A. Related Sections:**

1. 09200 - Metal Studs, Lath, Suspension Ceilings, Plaster, and Stucco.
2. 09310 - Ceramic Tile.
3. 09520 - Acoustical Wall and Ceiling Treatment.
4. Divisions 15 and 16: Items of Mechanical and Electrical work to be installed in acoustical ceiling grids.

**1.2 REFERENCES**

**A. American Society for Testing and Materials (ASTM), latest edition:**

1. A653 Standard Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-iron Alloy-coated (Galvannealed) by the Hot-dip Process.
2. C635 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
3. C636 Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
4. E84 Standard Test Method for Surface Burning Characteristics of Building Materials
5. E1264 Standard Classification for Acoustical Ceiling Products.

**B. Ceiling and Interior Systems Contractors Association (CISCA) publication (latest edition):  
Acoustical Ceilings - Use and Practice.**

**C. Underwriters Laboratories (UL) fire rating listings and classifications.**

**D. Florida Building Code (FBC).**

**1.3 SUBMITTALS**

**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 A/E. Coordinate grid erection drawings with lighting fixtures, air-conditioning outlets, access panels, sound system, and other openings and irregularities.**

**C. Samples: Submit two identified samples of each of the following for review and selection by A/E:**

1. Exposed grid suspension system, including main runners, cross runners, and edge trim.
2. Acoustical lay-in panel, 12 inches square piece.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units and suspension system components to Project site in original, unopened packages.
  - 1. Store in a clean dry fully enclosed space and protect against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

#### 1.5 QUALITY ASSURANCE

- A. Installer: Company with three years minimum documented experience.
- B. Fire Performance Characteristics: Provide acoustical ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM test method indicated, by the UL or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate marking of applicable testing and inspecting agency.
- C. Surface Burning Characteristics: As follows, tested per ASTM E84.
  - 1. Flame Spread: 25 or less.
  - 2. Smoke Developed: 50 or less.
- D. Tolerances for Ceiling Grid Installation:
  - 1. Free of irregularities and level to within 1/8 inch in 12 feet.
  - 2. Maximum deflection: 1/360 of span.
- E. Installation of Acoustical Ceiling Suspension Systems: ASTM C635.

#### 1.6 SEQUENCING and SCHEDULING

- A. Do not install acoustical ceilings until building is enclosed, air conditioning is working, dust-generating activities have terminated, and overhead work is completed, tested and approved.
- B. Schedule installation of acoustic units after interior wet work is dry.

#### 1.7 EXTRA STOCK

- A. Furnish extra materials described below matching installed products, packaged with protective covering for storage, and are identified with labels describing contents.
  - 1. Acoustical Ceiling Units: Full size units equal to 1% of amount installed.

## PART 2 PRODUCTS

### 2.1 MATERIALS

#### A. Acoustical Lay-in Panels, Mineral Fiber Type:

1. 24 inches x 24 inches.
2. Complying with ASTM E1264, Class A, Type III, Form 2, square edged.
3. Nominal Thickness: 5/8".
4. Finish: Factory applied, washable white.
5. Manufacturers:

##### a. Directional Panels:

- 1) Armstrong: Minaboard #756 Fissured lay-in panels.
- 2) CertainTeed: Hytone FH-157 Fissuretone II lay-in panels.
- 3) USG Interiors: Auratone #560 Fissured lay-in panel.

##### b. Non-directional Panels:

- 1) Armstrong: Cortega #770 Fissured lay-in panels.
- 2) CertainTeed : Baroque Fissured lay-in panels.
- 3) USG Interiors: Auratone Radar #2110 Fissured lay-in panel.

#### B. Acoustical Lay-in Panels, Fire Rated Mineral Fiber Type:

1. 24 inches x 24 inches.
2. Complying with ASTM E1264, Fire Rated, Class A, Type III, Form 2, square edged.
3. Nominal Thickness: 5/8".
4. Finish: Factory applied, washable white.
5. Weight: 1 pound per square foot minimum.
6. Manufacturers:

##### a. Directional:

- 1) Armstrong: Minaboard #896 Fissured Fire Guard lay-in panels.
- 2) CertainTeed: II PFH-157 Protectone lay-in panels.
- 3) USG Interiors: #585 Fissured Fire Code lay-in panels.

##### b. Non-directional:

- 1) Armstrong: Cortega #824 Fissured Fire Guard lay-in panels.
- 2) CertainTeed: Performa School Board PFFSB-157 Protectone lay-in panels.
- 3) USG Interiors: Radar #2115 Fissured Fire Code lay-in panels.

#### C. Vinyl Faced Lay-in Panels, Gypsum Type:

1. 24 inches x 24 inches.
2. Gypsum, complying with ASTM E1264, Class A, Type III, Form 2.
3. Nominal Thickness: 1/2".
4. Finish: Factory applied 0.002" vinyl, washable white.
5. Manufacturers:

- a. CertainTeed: Performa Vinylrock 1142-CRF-1 lay-in panels.
- b. USG Interiors: Clean Room #3260 Stipple pattern lay-in panels.

D. Acoustical Lay-in Panels, Wood Fiber Type:

- 1. Wood fiber, complying with ASTM E1264, Class A, Type XX, square edge.
- 2. Minimum Thickness: 1-1/2".
- 3. Size: 23-3/4" x 47-3/4".
- 4. Finish: Factory applied, white.
- 5. Manufacturers:
  - a. Tectum Inc. "Tectum".
  - b. Or other A/E accepted equivalent.

E. Hangers: 12 gage (0.109" diameter) annealed steel wire, galvanized.

F. Exposed Suspension Grids for Acoustical Lay-in Panels:

- 1. 2 feet x 2 feet grid pattern with steel caps for exposed 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.

\*\*\*\*\*  
*SPECIFIER: Use one of the 3 following suspension systems at cafeteria kitchens, salad bars, snack bars, and serving areas.*  
 \*\*\*\*\*

- 2. 2 feet x 2 feet grid pattern, complying with ASTM C635, hot-dipped galvanized steel tee and cap, painted cap, and stainless steel clips.
- 3. 2 feet x 2 feet grid pattern, complying with ASTM C635, hot-dipped galvanized steel tee, painted aluminum cap, and stainless steel clips.
- 4. 2 feet x 2 feet grid pattern, complying with ASTM C635, aluminum tee, painted aluminum cap, and stainless steel clips.
- 5. Manufacturers:
  - a. Armstrong.
  - b. CertainTeed.
  - c. ROCKFON, LLC.
  - d. USG Donn, by USG Interiors, Inc.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Powder and pneumatic actuated (shot-type) fasteners shall not be used to provide support for construction elements located overhead.
  - 1. Coordinate and provide inserts, anchors, bolts, hangers, or other means to support ceilings suspended from structure.

2. If inserts have been omitted from the concrete structure, drill structure as needed to support equipment only with A/E's prior approval for drilling locations.
- 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.
- G. Textured or Patterned Acoustical Panels: Install in pattern in one direction including grain of panels with alternating grain, unless otherwise directed in writing by A/E.
- 3.2 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.

END OF SECTION

**SECTION 09681  
RUBBER BASEBOARD**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. This Section includes provision for the installation of rubber base and preparation of the substrate surface over which these materials will be installed

**1.2 REFERENCES**

- A. American Society for Testing and Materials (ASTM), latest version:
  - 1. F1861 Standard Specification for Resilient Wall Base.
- B. NSF International - NSF/ANSI 140, minimum Gold Level of Achievement.
- C. Florida Building Code (FBC).
- D. American with Disabilities Act (ADA).
- E. All references indicating to follow manufacturer's instructions shall imply using the latest manufacturer's published information.

**1.3 QUALITY ASSURANCE**

- A. Installer Qualifications: Certified (or trained and approved) by the rubber base manufacturer and with at least 5 years demonstrable experience in the installation of rubber base

**1.4 SUBMITTALS**

- 1. Manufacturer's installation instructions, including special procedures.
- B. Selection Samples:
  - 1. Submit full size samples of rubber base, in the range of colors, for selection by the A/E.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver all materials to the installation site in the Manufacturer's original packaging. Packaging to contain Manufacturer's name, product name and identification number and other related information.
- B. Store Materials: Comply with CRI 104 and manufacturers written instructions.

## 1.6 MAINTENANCE EXTRA STOCK

- A. Provide in manufacturer's unopened boxes. Provide minimum of 2% of rubber base, but no less than 1 full box of each color. Obtain signature of the M-DPLS Project Manager on the transmittal letter to confirm receipt of the carpet tile.

## PART 2 PRODUCTS

### 2.1 RUBBER BASE

- A. Description: Rubber (not vinyl / PVC).
  - 1. Provide rubber base in long rolls cut to fit, to reduce number of joints.
  - 2. Height: 4 in. unless 6 in. is shown on the Drawings.
  - 3. Outside and inside corners. Do not use premolded corner pieces.
  - 4. Color: As selected for each tile color by A/E from the manufacturer's standard color palette.
  - 5. Base adhesive: Waterproof, non-toxic, low-VOC, light-colored, formulated for maximum adhesion of rubber base.
- B. Standard: ASTM F1861, Type TS, Group 1, Cove, except where Group 2, Straight, is noted.
- C. Product / Manufacturer: Burke Mercer, Flexco, Johnsonite, Roppe or Mannington.

## PART 3 EXECUTION

### 3.1 INSTALLATION OF RUBBER BASE

- A. Adhere base tight to wall surfaces.
- B. Fit joints tightly and make vertical.
- C. Permanently form corners with no joint within 4 in. of corner. Miter internal corners. At external corners, V-cut back of base strip to 2/3 of its thickness and fold.
- D. Cleaning: Remove excess adhesive from surfaces of base and any other affected surfaces without damage.

**END OF SECTION**



**SECTION 09900  
PAINTING**

**PART 1 GENERAL**

**1.1 SUMMARY:**

**A. Section Includes:**

1. Painting of previously painted, interior and exterior surfaces
2. Field painting of exposed and covered pipes, ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work, except as otherwise indicated.
3. Six (6) year warranty for labor and materials from the paint manufacturer.

**B. Related Section:**

1. 07900 - Joint Sealers.

**1.2 REFERENCES**

**A. American Society for Testing and Materials (ASTM), latest edition:**

1. D3359 - Test Methods for Rating Adhesion by Tape Test.
2. D4262 - Test Method for 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.**

**D. Master Painters Institute (MPI) - "Architectural Painting Specifications Manual", latest edition.**

**1.3 SUBMITTALS**

**A. General Requirements:**

1. Paint Submittals shall comply with MDPLS Section 01330 - "Submittals" and all the requirements stated in this document.
2. Provide five (1) complete hard copies of Submittals to the A/E, and one (1) complete copy to MDPLS, for their review and approval.
3. One complete copy of each approved Submittal shall be kept at the job site, easily available for use by the A/E and MDPLS Staff.

**B. Paint Submittals shall follow the following FORMAT:**

Date: \_\_\_\_\_

General Contractor: \_\_\_\_\_

Painting Sub-Contractor: \_\_\_\_\_

Project Number: \_\_\_\_\_

Library Name: \_\_\_\_\_

Library Address: \_\_\_\_\_

For each SUBSTRATE TYPE and LOCATION (i.e., Exterior Stucco, Interior Drywall, Interior Ceiling, Interior Metal Hand-Railings, etc.) provide the following:

SUBSTRATE TYPE and LOCATION):

Prime Coat:

Tradename: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Identification Number: \_\_\_\_\_

Intermediate Coat:

Trade name: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Identification Number: \_\_\_\_\_

Final (Finish) Coat:

Tradename: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Identification Number: \_\_\_\_\_

Provide trade name, and manufacturer of other paint work related materials:

Caulking Compound (gun grade):

Tradename: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Patching Compound:

Tradename: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

This is to certify the previously listed paint materials have been accepted by the A/E and MDPLS EFCC-SBCI Paint Staff for use on the specified project as designated.

SIGNED: \_\_\_\_\_ DATE: \_\_\_\_\_  
Painting Contractor

SIGNED: \_\_\_\_\_ DATE: \_\_\_\_\_  
MDPLS Staff

SIGNED: \_\_\_\_\_ DATE: \_\_\_\_\_  
A/E

Five signed copies are required. All five copies shall be returned to the A/E's office for acceptance and distribution.

- C. 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.
- D. Samples:
  - 1. Color C
    - a. Before starting work, furnish the A/E color chips from approved manufacturer's color fan. Color chips shall comply with approved colors selected by the A/E.
    - b. Use representative colors when preparing samples for review.
- E. 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 MDPLS, from the authorized paint manufacturer representative, a signed and notarized letter stating that the surfaces painted have met all the conditions for paint adhesion.
  - 4. Warranties require acceptance by A/E and MDPLS Staff.

#### 1.4 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: Paint applicator shall provide a certification attesting to having worked on projects similar in scope to this project for a minimum of 5 years. Paint applicator not providing such documentation or not having the required experience will be removed from the project and replaced by the Contractor.
- C. Only paint materials approved by the A/E and MDPLS Staff are allowed at the worksite. Any Deviation from this requirement will be sufficient grounds, at the discretion of the A/E or MDPLS, for the rejection of all completed paint work. In such cases the Contractor shall properly prepare and repaint surfaces previously painted, to the satisfaction of A/E and MDPLS, at no additional cost to MDPLS.
- D. 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 the A/E and MDPLS Staff.
- E. Pre-Painting Coordination Meeting: Prior to commencing any painting work, the Contractor shall coordinate a site meeting with the A/E, MDPLS Project Manager and Staff, Painting Subcontractor, Paint Manufacturer's representative and other parties involved in the work of this section. The agenda for this meeting shall include but not be limited to the following:
  - 1. Review painting materials to be used in this project to ensure they are in compliance with project specifications.

2. Discuss 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.
3. 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 A/E and MDPLS and to all other parties present at the preconstruction meeting.
4. Discuss mockup requirements.
5. Review procedures, on-site tests, observation, and supervision by Materials Manufacturer's Representative according to requirements of this section, to enable the manufacturer to issue the required warranty.
6. Review all warranty requirements for this section.
7. Contractor shall make a written record of all items discussed at this meeting, and provide the A/E, MDPLS Project Manager and Staff a copy of this information in the form of Meeting Minutes.

F. Mockups:

1. After coordinating and receiving approval for application onto designated mockup sample walls, apply the approved paint samples.
2. Duplicate painted finishes of prepared samples on actual wall surfaces and other exterior and interior building components.
3. Provide full coat finish samples on at least 100 sq.ft. of surface, as directed, until required sheen, color, and texture are obtained. Simulate finished lighting conditions for review of in-place Work. Final acceptance of colors will be from samples applied on mockup
4. A/E and MDPLS Staff will test the mockup sample according to MPI standards to determine if the mockups meet the requirements of these specifications. If the test fails, any retesting by A/E and MDPLS Staff 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 designated in schedules. **All wood surfaces to be painted/stained color as selected by A/E.**
2. If color or finish is not designated, coordinate with A/E for selection.
3. Paint (red), using stencils, identifications and warnings, following text specified in other sections.
4. 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, laminated doors and cabinetry, architectural woodwork and casework, elevator entrance doors and frames, attached signs, elevator equipment, finished mechanical and electrical equipment, light fixtures, switchgear, and distribution cabinets.
2. Concealed Surfaces: Painting is not required, unless noted otherwise on the Drawings, of concrete or masonry surfaces such as walls or ceilings in concealed and

areas of limited access, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts, and elevator shafts.

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.
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. Shop Priming:

1. Shop priming of ferrous metal items is included under various sections for structural steel, metal fabrications, hollow metal work, and similar items.
2. Shop priming of fabricated components such as architectural woodwork, wood casework, and shop-fabricated or factory-built mechanical and electrical equipment or accessories are included under other sections of these specifications.

- J. 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.

1.5 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 all paint material per manufacturer written recommendations.
2. Store materials that are not in actual use, in tightly covered containers.
3. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
4. Protect from freezing or extreme heat.
5. Keep storage area neat and orderly.
6. When flammable materials are to be left on-site during the Work, store the tightly covered materials in cabinets meeting the requirements of NFPA 30 and have FM and UL labeling.

1.6 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 in rain, fog, or mist, or 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. Apply paint only to dry, clean, and adequately prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.
5. Do not perform work where plaster or cement is being applied or is in the curing process.
6. Do not apply paint unless minimum lighting level, as recommended by MPI, is provided on surfaces to be painted.
7. 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 space.

1.7 SEQUENCING AND SCHEDULING

- A. Phase the project to allow reasonable time for the inspection and written approval at each phase of the work by all relevant personnel including but not limited to the A/E, MDPLS Staff, and the Paint Manufacturer's Representative.

1.8 WARRANTY

- A. Provide a written warranty, co-signed jointly and severally by the Painting Subcontractor and Materials Manufacturers, against, but not limited to, cracking, peeling, flaking, chalking, and mildew on interior painted surfaces, and additionally against erosion and unreasonable fading on exterior surfaces, for 6 years from the date of Substantial Completion; agreeing to repair and repaint surfaces affected by such defects, at no cost to MDPLS including necessary removal or protection of other work, without limit, within 30 days after notification by MDPLS, and to perform such work based on the provisions of this section.

1.9 ADDED STOCK

- 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

### 2.1 MANUFACTURERS

- A. All paint materials shall be listed in the latest edition of the *MPI* "Approved Product List" and shall be from a single manufacturer for each system used.
- B. All materials, preparation and workmanship shall conform to the standards contained in the latest edition of the Master Painters Institute (*MPI*).

### 2.2 MATERIALS

- A. Paint systems used for the project shall be selected by the Painting Sub-contractor with collaboration from the paint manufacturer and shall meet all the performance criteria and Warranty requirements specified in this document.
- B. Primers, Undercoats, Intermediate and Finish Coats: Use materials from same manufacturer when such materials are applied on same surface.
- C. Color Selection:
  - 1. Color selection made by A/E is to determine basic color required for surface.
  - 2. Select colors from approved manufacturer's color fan.
  - 3. If color is not listed for a specific area or item, Contractor is not relieved of responsibility for providing colors subsequently selected.
  - 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 mock-up approved by A/E.
- D. 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

### 3.1 INSPECTIONS and TESTING

- A. **Prior to bidding, the Contractor, the Painting Subcontractor and the Paint Manufacturer's Representative shall assess, examine, and test as required, all surfaces scheduled to be painted, and perform the following:**
  - 1. Evaluate surface conditions of areas to be painted.
  - 2. Determine the Degree of Surface Deterioration (DSD) of existing area to be repainted, using assessment criteria indicated in MPI manual.
  - 3. Develop corrective and surface preparatory work necessary to ensure that selected paint systems meet the performance criteria and Warranty requirements specified in this document.
  - 4. Provide a copy of all findings and test results to the A/E and MDPLS Staff during the Pre-Painting Coordination Meeting indicated in Part 1 of this document.

- 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 a manner acceptable to the A/E and MDPLS Staff.
- C. Start of painting operations implies contractor's acceptance of the surface conditions and responsibility for required standards of quality and appearance.

### 3.2 PREPARATORY WORK –

- A. **Prepare all surfaces scheduled to be painted in accordance with MPI requirements.**
- B. **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 A/E. Protect items and surfaces that cannot be removed or that do not interfere with the painting and leave clean and completely free of paint.**
- C. **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.**
- D. **Fill nail holes, route-out and fill cracks, open joints, and other defects to match existing surface areas.**
- E. **Allow all coats to dry thoroughly before applying succeeding coats. Comply with paint manufacturer's recommendations.**
- F. **Prime un-finished metal not shop-coated when delivered to the job or as soon as possible after delivery. Back prime all woodwork to be erected against masonry or concrete before erection. Protect the tops and bottoms of all wood doors with a heavy coat of varnish before installation.**
- G. **Clean surfaces between coats as recommended by the paint manufacturer.**
- H. **Special Preparatory and Corrective Work on Previously Painted Surfaces: As a minimum, in addition to the general requirements specified above, and as may be recommended by the paint manufacturer, perform the following work on existing painted surfaces before starting application of new materials:**
  - 1. **Interior and Exterior: 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 prime and/or finish coats if required to obtain uniform finish in color and sheen.**
  - 2. **Additional Exterior Surface Requirements: Pressure clean according to surface preparation requirements indicated by MPI "Degree of Surface Degradation (DSD) criteria. Use abrasive blasting on surfaces where pressure cleaning cannot produce the required surface for new paint application.**



### 3.3 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. When painting over existing painted surfaces that have a well bounded acrylic finish, the elimination of transition primer requires prior acceptance by the A/E, MDPLS Staff and the paint manufacturer.

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 from MDPLS Staff and the A/E.

C. Apply finish coat to give an even, solid color. For deep tone finish colors, use deep base or monochromatic gray 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, A/E and MDPLS Staff.
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 straight and clean cut.

E. Dry Film Thickness:

1. Comply with manufacturer's specifications for minimum and maximum dry film thickness.

### 3.4 FIELD QUALITY CONTROL

A. Notify A/E, material manufacturer's representatives, and MDPLS Staff 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 MDPLS Staff, A/E, or material manufacturer representatives:

1. Pressure cleaning or abrasive blasting of exterior surfaces.
2. Removal of existing paint.
3. Surface patching and preparation.
4. Sealing of surfaces.
5. Application of primer and transition coats. Adhesion testing of transition coats may be required.
6. Intermediate and finish coats.

### 3.5 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 MDPLS's property.

### 3.6 IDENTIFICATION OF SURFACES AND PAINTING SCHEDULE

- A. Material designations shall follow format established by MPI "Approved Products List" and "Listing Manufacturers".
  - 1. Submit requests for substitutions originating from the materials manufacturers at the Pre-Construction meeting specified in Part 1 of this section.
  - 2. Such substitutions will be considered only to allow manufacturers to meet the terms of the warranty requirements and will be subject to approval by the A/E and MDPLS Staff.
  - 3. Substitutions from other sources will be considered as provided in Instructions to Bidders and General Conditions.
- B. Special Notes:
  - 1. Sand surfaces normally smooth before application of paint materials.
  - 2. Preparation not completed or overlooked before application of first coat of paint shall be accomplished between coats of paint, regardless of acceptance on original preparation.
  - 3. Severely corroded metal, if not specified for replacement, may need sandblasting according to MPI "Architectural Painting Specifications Manual", to achieve a warrantable surface for paint.

### C. INTERIOR AND EXTERIOR SURFACES PAINT SCHEDULE

- 1. Follow the Paint Schedule indicated on the Contract Documents.

**END OF SECTION**

**SECTION 10170  
SOLID PLASTIC TOILET PARTITIONS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Toilet partitions and urinal screens, complete with hardware.

**1.2 REFERENCES**

- A. American Society for Testing and Materials (ASTM), latest edition:
  - 1. E84 Test Method for Surface Burning Characteristics of Building Materials.

**1.3 SUBMITTALS**

- A. Product Data:
  - 1. Show details of construction, assembly and anchorage to building construction, manufacturer's specifications including description of hardware, and maintenance instructions.
  - 2. Include test reports confirming Class C and toxicity requirements.
- B. Shop Drawings:
  - 1. Provide dimensioned partition plans, elevations, details, swing of doors, color, and location of hardware items and required wall blocking.
  - 2. Label components and fully describe anchorage devices and substrates.
  - 3. Show relationship to plumbing fixtures.
- C. Samples:
  - 1. 6-inch by 6-inch samples of panel material in both stock and custom colors.
  - 2. Include sample of fastener and shield for wall bracket anchorage.
- D. Copy of manufacturer's standard 15-year warranty submitted with shop drawings, guaranteeing against material defects or faulty fabrication, assembly, and installation.

**1.4 QUALITY ASSURANCE**

- A. Installer Certification: Provide documentation from the toilet partition manufacturer that installers have been factory-trained in the installation of these partitions.
- B. Mock-Up: If required by A/E, install mockup of stall in area designated by A/E. Approval by A/E is required before ordering, production, or delivery of remaining partitions.
- C. Gravity cam or integral hinges are not allowed.

**1.5 PRODUCT DELIVERY, HANDLING, AND STORAGE**

- A. Ship components with protective wrap. Store and handle according to manufacturer's printed instructions.

## 1.6 WARRANTY

- A. Upon completion of installation, submit warranty for 15-years starting at date of substantial completion, stating that failed products or installation shall be replaced at no additional cost to the Board.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Solid Plastic Toilet Partitions:
  1. Ampco Products, Hialeah, FL: High Density Polyethylene.
  2. Scranton Products, Scranton PA: Hiny-Hiders - High Density Polyethylene.
  3. Other product of equal quality and performance as approved by the A/E.

### 2.2 MATERIALS

- A. Panels, pilasters, and doors of 1-inch thick seamless high-density polyethylene (HDPE) resin compound. A/E shall select color from manufacturer's stock or custom colors. All edges shall be machined to a 0.250" radius. Phenolic resin construction is not acceptable.
  1. Plastic material shall comply with the following:
    - a. Flame Spread of less than 200 and Smoke Developed of less than 450 when tested according to ASTM E84.
    - b. Products of combustion of "no more toxic" than those from burning wood when tested according to NBS-TOX, 48.1.
    - c. Integral color shall be uniform throughout panel and all panels shall match.
- B. Hardware:
  1. Headrails: Extruded aluminum alloy with a clear anodized finish; anti-grip design, with stainless steel headrail brackets.
  2. Hinges: Continuous hinge, aluminum, self-closing spring-loaded barrel, snap-on covers, and tamper resistant sex bolts, 54 inches long.
    - a. Model A19 by Santana.
    - b. 400 Series by Markar Products, Lancaster NY.
    - c. Or Other A/E accepted equivalent.
  3. Wall Brackets: Solid plastic to match type and color of plastic panels and full panel length. Through-bolt brackets to panels and pilasters with tamper resistant sex bolts. Wall brackets shall be used for panel and pilasters, pilaster to wall, and panel to wall connections.
  4. Pilasters: Solid plastic to match type and color of plastic panels with leveling bolts.
  5. Shoes and Fasteners: Solid plastic shoes to match type and color of plastic panels. Use tamper resistant sex bolts.
  6. Door Pulls, Door Strikes, and Door Stops: Heavy chrome-plated Zamac or stainless steel.

7. Door Latches: Stainless steel or heavy-duty aluminum housing, slide bolt, and button. Use tamper resistant sex bolts.
8. Provide clear anodized aluminum bars fastened to bottom edge of panels and doors with theft-proof countersunk screws. Bars shall be flush with faces of panels.
9. Finish of exposed portion of screws, bolts, and nuts shall match finish of attached hardware item. Sex bolts shall be stainless steel barrel nut and shoulder screw design with tamperproof head. Color to match bracket.

C. Anchorages:

1. Connection to wall shall provide a rigid and durable anchorage to wall construction. Use expansion bolts or "butterfly" type bolts. Finish of exposed portions shall match finish of wall brackets.
2. Plastic shields will not be accepted unless partition manufacturer can demonstrate that they will not work loose in wall or cause a less than rigid and durable anchorage and be guaranteed by the partition manufacturer and the partition installer against pullout or loosening.

## 2.3 FABRICATION

- A. Fabricate compartments to the following configuration. Dividing panels and doors shall be minimum 55 inches high x length required and with bottom edge of panels 14 inches above the floor. Top of pilasters shall be 82 inches above finish floor and fastened to 3-inch high shoes of same material as pilaster.
- B. Fabricate urinal screens to the following configuration. Dividing panels shall be 42 inches x 24 inches long and with bottom edge of panels 18 inches from the floor. Provide ceiling support and fasten to floor shoes.
- C. Using template provided by toilet accessories manufacturer, provide cutouts for recessed items.
- D. Compartments for handicapped use shall be fabricated according to the latest accessibility code requirements.
- E. Stall doors shall be self-closing.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Verify dimensions at areas to receive partitions and plumbness of walls and soundness of wall surfaces that would affect installation of holding brackets. Verify blocking is installed in stud walls to receive partition anchorages.
- B. Verify spacing of plumbing fixtures to assure compatibility with installation of partitions.
- C. Do not begin installation of partitions until conditions are satisfactory.

### 3.2 ERECTION

- A. Install partitions rigid, straight, plumb, and level. Follow partition manufacturer's printed installation instructions and final approved shop drawings.

- B. Provide uniform clearance of not more than 1 inch between panels and walls, and clearance of not more than 1/4" at vertical edges of doors uniform from top and bottom.
- C. Locate wall brackets with holes for wall anchorages occurring in masonry or tile joints wherever possible.
- D. Conceal evidence of drilling, cutting, and fitting.

### 3.3 ADJUSTING AND CLEANING

3.4 Perform final adjustments to leveling devices and hardware.

3.5 Clean exposed surfaces of partitions, hardware, fittings, and accessories.

- 1. Avoid soiling other adjacent finishes.
- 2. Follow partition manufacturer's printed cleaning instructions.

**END OF SECTION**

**SECTION 10284  
ELECTRIC HAND DRYERS**

**PART 1 GENERAL**

**1.1 RELATED REQUIREMENTS**

- A. Coordinate electric hand dryers with work before and after. See especially: wall structure and finish sections, and electric power sections.
- B. Provide dryers from one producer for this project.

**1.2 SUBMITTALS**

- A. Product Data: Include items such as noise level, motor and sensor data, wiring.
- B. Shop Drawings: Show dimensions and method of fastening for maximum vandalism and pull-out resistance
- C. Dryer Mockup: Mount and hook up 1 dryer in place at the project site for demonstration and approval before starting the rest of installation. The mockup dryer, if in good condition, may be installed in the work after A/E's approval.

**1.3 WARRANTY**

- A. Replace electric hand dryers that show manufacturing defects, from the time of installation until 5 years after date of Substantial Completion.

**PART 2 PRODUCTS**

**2.1 ELECTRIC HAND DRYERS**

- A. Description: ADA compliant projection beyond face of wall, blowing hot air in one direction, with outlet not easily accessed for abuse, electric motor activated by sensor only, and with automatic drying cutoff time and high-temperature cutoff.
- B. **Shape of dryer: Top surface sharply down-sloping or curving down, with no projections from which clothing, bookbags, or persons can hang or be hung.**
  - 1. Maximum projection from wall: ADA Compliant.
  - 2. Wall-mount Type: **Semi-recess-mounted.**
  - 3. Motor / fan / sensor case: Galvanized steel, 18 ga or heavier, with conduit knockouts on opposite sides, back or bottom, and 4 mounting brackets at face for fastening with No.12 toggle bolts or screws to steel framing or to masonry inserts.
  - 4. Internal splash guards: Provide at sensor, switches, heater, and motor to minimize effects of any liquid intrusion.
  - 5. External case: 18 ga stainless steel, brush or satin chrome finish on 18 ga steel, with edges beveled 40° to 50° or curved less than quarter-round, designed to resist prying-off and to not allow effective applying of force vertically or sideways.
  - 6. Case fasteners: Heavy tamper-resistant (TR) screws. Deliver one TR screw bit to owner for each project.

7. Air outlet: Recessed, with sturdy grille or other guard to resist access to sensor, heating element, fan and motor. Outlet shall not be rotatable or adjustable by users.
  8. Operation: By automatic infrared sensor only, inconspicuous and located out of view of users; no pushbuttons.
  9. Maximum noise level in operation: 70 dB.
  10. Sensor: Solid state electronic infrared, without relays or moving parts, turning off 2 sec maximum after hands are removed, or 40 sec after start, whichever is earliest.
  11. Airflow: At least 150 ft<sup>3</sup>/min, at a velocity that effectively dries hands in a maximum of 20 seconds.
  12. Motor: Lowest rpm (to reduce noise) that will produce specified airflow, permanent lubrication, with automatic-reset thermal protection, and circuit breaker; no fuses.
  13. Motor power consumption: 10 to 18 A at 110/120 V AC.
  14. Heater: Nickel/chromium wire to heat without wire glow, thermally protected to cut out at 90 °C / 130 °F., not accessible by users through the air outlet.
- C. Standard: Product shall be listed by an OSHA approved Nationally Recognized Testing Laboratory (NRTL).
- D. Product / Producer.
1. Xlerator XL, by Excel Dryer, Inc.
  2. PDC-R10, by Pinnacle Dryer Corp.
  3. Equal product in quality and performance as reviewed and approved by A/E

## PART 3 EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Coordinate and verify the mounting and opening heights, the size of openings, and the providing of 20 ga steel studs / furring and cats to receive heavy-duty screws or toggle bolts for mounting dryers.
  1. If dryers are shown to be placed within 60 in. of plumbing fixtures, notify A/E so that proper protection for users can be accomplished.
- B. Verify that field conditions and opening preparation, as well as electric service are acceptable and are ready to receive dryers.

### 3.2 INSTALLATION OF ELECTRIC HAND DRYERS

- A. Install dryers following producer's current published directions and recommendations, except as more stringently specified herein.
- B. Fasten dryer motor cases and room cases so as to be pry-resistant and to withstand a withdrawal force of 200 lb at each fastener.

Demonstrate each dryer to be in good working order. Protect dryers until date of Substantial Completion. Leave clean and in good operating condition.

**END OF THIS SECTION**



## SECTION 10400 IDENTIFYING DEVICES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes: Labor and materials required for installation for toilet rooms

#### 1.2 SUBMITTALS

- A. Submit properly identified manufacturer's literature before starting work.
- B. Shop Drawings:
  - 1. Submit a full-scale shop dwgs for each type of sign
- C. Samples: Submit 2 samples of raised-image laminated signs to the A/E for review and approval before fabrication.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. Raised-Image Laminated Signs:
  - 1. Locations:
    - a. Provide room identification sign at each entry and exit point to all spaces indicated on the drawings.
    - b. Signs shall include room name, room number and Braille as scheduled on drawings.
  - 2. Comply with Florida Building Code (FBC) for accessibility requirements.
  - 3. Signs shall be 1/8" thick minimum plastic laminated material with 0.008" thick minimum plastic face layer, of sizes, quantity, colors, with raised numbers, letters, Braille, or symbols as indicated on Drawings or as specified in this section for accessible signage, room identification, and life safety signage. Tape applied or glued raised text, Braille, or symbols are not allowed.
    - a. Manufacturers:
      - 1) Andco Industries Corp., Greensboro, NC.
      - 2) A&J Signs Corp., Hialeah, FL.
      - 3) ASE (Architectural Signs and Engraving) Inc., Orofino, ID.
      - 4) Best Sign Systems, Montrose, CO.
      - 5) Industrial Frames, Inc., Miami, FL.
      - 6) Mohawk Sign Systems, Schenectady, NY.
  - 4. 1/32" Raised Images:

- a. Letters and numbers: Size, according to Drawings or as follows:
    - 1) For all other signs 1 inch high, Helvetica Regular.
  - b. Braille: Tactile Grade II. Adhered labels are not allowed.
  - c. Symbols: Use Braille, letters, numbers, and Group One symbols sized per requirements of standard spacing.
5. Sizes:
- a. Accessible Signage, Room Identification, and Life Safety Signage: Minimum 9" wide x 9" high
  - b. Symbol Signage: minimum 9 inches x 9 inches or as custom designed.
  - c. Directional Signage: minimum 9 inches x 9 inches or as custom designed.
6. Mountings:
- a. Mount using tamperproof screws, shields, and double face tape or adhesives to hold signage in place.
7. Colors:
- a. White raised text, symbols and Braille with background color as selected by A/E indicated on drawings for the following:
    - 1) Interior/exterior room names, room numbers and building numbers signage.
    - 2) Accessible egress signage.

## 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. Mounting of Laminate Plastic Signs:
  - 1. Mount laminated signs with centerlines at 3'-6" and 5'-0" above finish floor according to FBC and as indicated on drawings with tamperproof fasteners and predrilled holes and double face tape or adhesives.
  - 2. Signage shall be left clean and without any rough edges. Signage shall be left without any defects concerning installation from plumb and level, concerning material quality or any other discrepancy in mounting.

**END OF SECTION**

**SECTION 10522  
FIRE EXTINGUISHERS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Section Includes: Fire extinguishers and cabinets including necessary accessories.
- B. Related Sections:
  - 1. 09900 - Painting
  - 2. 10400 - Identifying Devices
  - 3. 15300 - Fire Protection

**1.02 SUBMITTALS:**

- A. Product Data: Properly identified product data for fire extinguisher cabinets, mounting brackets and fire extinguishers.
- B. Shop Drawings:
  - 1. Shop and erection drawings for review indicating materials, dimensions, fasteners, and installation methods.

**1.03 QUALITY ASSURANCE:**

- A. Comply with applicable standards of:
  - 1. National Fire Protection Association (NFPA).
  - 2. Florida Department of Education, Office of Educational Facilities - State Requirements for Educational Facilities - 1999 (SREF).
- B. Equipment, accessories, materials, and quality of construction shall have a 5 year warranty against defects.
- C. Fire extinguishers for "Low Hazard Areas" shall be in fire extinguisher cabinets.

**1.04 SOURCE QUALITY CONTROL:**

- A. Manufacturer: Provide equipment manufactured by one manufacturer except where otherwise noted, uniform throughout as to method and type of construction used.
- B. Nameplates: Identify the manufacturer with appropriate nameplates, UL labels, manufacturer's labels, and model numbers.
- C. Pack each extinguisher with a hanging bracket acceptable for wall mounting with a latching metal, retainer strap around the cylinder, ready for installation, in a sturdy cardboard box labeled to identify contents fully when delivered to the site.

- D. Store product in manufacturer's original protective packaging in a dry protected space until installed.
- E. State Fire Marshall Tag Requirements: Size 2-1/4" x 5 1/4".
  - 1. Notice not to remove.
  - 2. Serial number of extinguisher and type of extinguisher.
  - 3. Name of person who serviced the extinguisher.
  - 4. Permit number of person who serviced the extinguisher.
  - 5. Type of service performed.
  - 6. Month and year the service was performed.

1.05 WARRANTY

- A. Provide a 5-year warranty against defects for equipment, accessories, materials and quality of construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Extinguishers:

- 1. Dry Chemical Type:
  - a. General Fire Extinguisher Corp.
  - b. Larsen's, MP and DC series.
  - c. Potter Roemer, 3000 and 3300 series.
  - d. J-L Industries, Cosmic and Galaxy series.

- B. Fire Extinguisher Cabinets, aluminum:

- 1. Larsen's: Architectural series.
- 2. Potter Roemer: Alta series.
- 3. J-L Industries: Academy series.

- C. Extinguisher Brackets:

- 1. General Fire Extinguisher Corp. Model MVCP-5.
- 2. Accepted equivalent.

2.02 EQUIPMENT

- A. Fire Extinguisher Cabinets and Supports:

- 1. Fire extinguishers in "Low Hazard Areas" shall be contained in an aluminum, fully recessed fire extinguisher cabinet.
- 2. Fire extinguisher brackets for ABC type models shall be provided in places where cabinets are not called for.

B. Fire Extinguishers: Dry chemical and ABC type multi-purpose with fog nozzle attached to a hose.

1. Types of Fire Extinguishers:

a. Hazardous Areas: 4A-60BC.

- 1) Woodworking shops.
- 2) Storage rooms where paper products are stored.
- 3) Class C fire areas.

b. Flammable Areas: (Sodium Bicarbonate) 40BC.

- 1) Air handling rooms.
- 2) Flammable storage areas.

c. Low Hazard Areas: 2A-10BC.

- 1) Hallways and remaining rooms.
- 2) Class A or B fire areas.

2. For use where wall brackets are specified (Hazardous Areas):

- a. The extinguisher shall be a multi-purpose, dry chemical stored pressure type with a corrosion-resistant reusable metal cylinder with a durable red finish.
- b. The extinguisher shall have a squeeze type valve, handle, and operating lever of corrosion-resistant metal having no plastic parts.
- c. The extinguisher shall have a valve locking pin with a pull ring at one end of stainless steel or hard aluminum and shall not be removable without breaking the metal or plastic seal. One end of a metal chain shall be fastened to the valve lock pin pull ring with the other end securely attached to the extinguisher.
- d. The extinguisher shall have a screw-in type visual pressure gage and discharge hose.
- e. Each extinguisher shall have a securely attached nameplate or band bearing complete operating instructions, the name or mark of Underwriters Laboratories, Inc., a control number, the words "Listed", "Dry Chemical Fire Extinguisher", and the manufacturer's name and extinguisher model number. The classification shall also be indicated on the nameplate or band and shall indicate a minimum UL classification of 4A-60BC.
- f. The extinguisher shall not exceed an overall height of 19-1/4", a cylinder diameter of 5-3/4" and an overall width of 9 inches.

3. For use where extinguisher cabinets are specified (Low Hazard Areas):

- a. The extinguisher shall be a multi-purpose, dry chemical stored pressure

- type with a corrosion-resistant reusable metal cylinder of 5-pound capacity with a durable red finish.
    - b. The extinguisher shall have a squeeze type valve, handle, and operating lever of corrosion-resistant metal having no plastic parts.
    - c. The extinguisher shall have a valve locking pin with a pull ring at one end of stainless steel or hard aluminum and shall not be removable without breaking the metal or plastic seal.
    - d. The extinguisher shall have a screw-in type visual pressure gage and a discharge hose.
    - e. Each extinguisher shall have a securely attached nameplate or band bearing complete operating instructions, the name or mark of Underwriters Laboratories, a control number, the words "Listed", "Dry Chemical Fire Extinguisher", "Classification 2A-10BC", and the manufacturer's name and extinguisher model number.
  - 4. Each type of extinguisher shall arrive on site, ready for use, charged with non-toxic, multi-purpose, silicon-treated ammonium phosphate type dry chemical and dry nitrogen gas.
  - 5. Cabinet Door: Panel with full tempered glass, catch, and no lock.
  - 6. Each 2A-10BC extinguisher shall also be at least the equal of the General Fire Extinguisher Corp. extinguisher Model TCP-5JH fitted with a discharge hose and provided with a Model MVCP-5 hanging bracket.
- C. Fire Extinguishers: Alkaline dry chemical with a minimum UL classification of 20BC.
- 1. For Use With Wall Brackets (Flammable Areas):
    - a. The extinguisher shall be an alkaline dry chemical stored pressure type with a corrosion-resistant reusable metal cylinder with a durable red finish.
    - b. The extinguisher shall have a squeeze type valve, handle, and operating lever of corrosion-resistant metal shall have no plastic parts.
    - c. The valve locking pin with a pull ring at one end shall be of stainless steel or hard aluminum and shall not be removable without breaking the metal or plastic seal. One end of a metal chain shall be fastened to the valve lock pin pull ring with the other end securely attached to the extinguisher.
    - d. The extinguisher shall have a screw-in type visual pressure gage and discharge hose. Provide a discharge nozzle consisting of a 15 inch minimum hose assembly.
    - e. Each extinguisher shall have a securely attached nameplate or band bearing complete operating instructions, the name or mark of Underwriters Laboratories, Inc., a control number, the words "Listed", "Dry Chemical Fire Extinguisher", and the manufacturer's name and extinguisher model number. The classification shall also be indicated on the nameplate or band and shall indicate a minimum UL classification of 20BC.
    - f. The extinguisher shall not exceed an overall height of 19-1/4", a cylinder diameter of 5-3/4" and an overall width of 9".
    - g. Each extinguisher shall be ready for use, charged with an alkaline dry chemical, such as sodium bicarbonate or potassium bicarbonate, with a

hanging bracket acceptable for wall mounting.

**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 installation instructions and with approved shop drawings.
- B. Verify rough openings for cabinets are correctly sized and located.
- C. Install extinguisher cabinets accurately, without warpage, true to line, plumb and level at a maximum of 4'-6" height to the top of the fire extinguisher in the cabinet.
- D. Install extinguishers using wall mount brackets true to line plumb and level at a maximum of 4'-6" height to the top of the fire extinguisher.

**3.03 ADJUSTING AND CLEANING**

- A. Adjust extinguisher cabinets to provide tight fit at contact points and to ensure smooth operation, closure, and locking.
- B. Cleaning:
  - 1. Clean aluminum surfaces and glass promptly after installation exercising care to avoid damage to protective coatings and finishes.
  - 2. Remove excess glazing and sealant compounds, dirt, and other substances.
  - 3. Lubricate hardware and moving parts.

**3.04 PROTECTION**

- A. Initiate and maintain protection and other precaution required to ensure that all units will be without damage or deterioration until time of acceptance.

**END OF SECTION**

**SECTION 10800  
TOILET ROOM ACCESSORIES**

**PART 1 GENERAL**

**1.1 SUMMARY**

**A. Related Sections:**

1. 06100 - Carpentry.
2. 09310 - Ceramic Tile.
3. 10170 - Solid Plastic Toilet Partition.

**1.2 SUBMITTALS**

**A. Product Data:** Submit manufacturer's technical data and installation instructions for each toilet accessory before starting work.

**B. Samples:**

1. Submit full-size samples of units to A/E for review of design and operation.
2. Acceptable samples will be returned and may be used in work.

**C. Setting Drawings:** Provide setting drawings, templates, instructions, and directions for installation of anchorage devices.

**1.3 QUALITY ASSURANCE**

**A. Coordination:**

1. Inserts and Anchorages: Furnish inserts and anchoring devices to be set in concrete or built into masonry. Coordinate delivery with other work to avoid delay.
2. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

**B. Source Quality Control:**

1. Products: Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas, unless otherwise acceptable to A/E.

**PART 2 PRODUCTS**

**2.1 MANUFACTURERS**

**A. Toilet Room Accessories:**

1. A&J Washroom Accessories.
2. American Specialties Inc. (ASI).
3. Bobrick.
4. Gamco.



## 2.2 MANUFACTURED UNITS

### A. Toilet Paper Dispenser:

1. Surface mounted, multi-roll, stainless steel with theft resistant spindles and tumbler lock keyed like other bathroom accessories.
2. Manufacturers:
  - a. A&J Washroom Accessories: Model U840.
  - b. American Specialties Inc. (ASI): Model 0030.
  - c. Bobrick: Model B-2888.
  - d. Gamco: Model TTD-5.

### B. Grab Bars:

1. Lengths and configurations as indicated on Construction Documents and as specified in this section.
2. Heavy duty with peened non-slip gripping surface, 1-1/2" diameter, stainless steel, with 1-1/2" wall clearance and with theft-proof concealed fasteners with snap flange cover.
3. Straddle bars, wall to floor with socket and horizontal grab bars according to manufacturer's model/series numbers.
4. Manufacturers:
  - a. A&J Washroom Accessories: UG Series.
  - b. American Specialties Inc.(ASI): 3500 Series.
  - c. Bobrick: B-6806 Series.
  - d. Gamco:150 S Series.

### C. Mirrors: Toilet Rooms:

1. Size: 18" W x 36" H.
2. One-piece roll formed frame of stainless steel angle with corners heliarc welded, ground and polished smooth, complete with minimum 20 gage galvanized steel back.
3. Tempered glass mirror electrolytically copper plated, No.1 quality, guaranteed against silver spoilage for a minimum 15 years.
4. Mirrors shall be mounted with concealed theft-proof fasteners and appropriate wall-backing according to manufacturer's requirements.
5. Manufacturers:
  - a. A&J Washroom Accessories: Model U711T-1836.
  - b. American Specialties Inc. (ASI): Model 0600-A-1836.
  - c. Bobrick: Model B-290-1836.
  - d. Gamco: A Series-1836.

### D. Feminine Napkin/Tampon Disposal:

1. Stainless steel, single recessed or dual access, self-closing doors, with tumbler lock keyed like other bathroom accessories.
2. Manufacturers:
  - a. A&J Washroom Accessories: Models U581 (single) or U580 (dual).

- b. American Specialties Inc. (ASI): Models 0473 (single) or 0472 (dual).
- c. Bobrick: Models B-353 (single) or B-354 (dual).
- d. Gamco: ND-4. (single) or ND-6 (dual).

E. Soap Dispensers, Wall Mounted:

- 1. Surface mounted, stainless steel container, liquid type, with refill indicator, and with 40 oz. stainless steel soap container and tumbler lock keyed like other bathroom accessories.
- 2. Manufacturers:
  - a. A&J Washroom Accessories: Model U124.
  - b. American Specialties Inc.(ASI): Model 0342.
  - c. Bobrick: Model B-2112.
  - d. Gamco: G-58AP.

**F. For Electrical Hand Dryers refer to section 10284**

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. Install toilet room accessories at locations shown on the Construction Documents, according to manufacturers' printed installation instructions.
- B. Secure toilet room accessories to supporting substrate with fasteners and anchors of types necessary for rigid anchorage to substrate construction.
- C. Install toilet room accessories plumb and true with horizontal lines level.
  - 1. Conceal evidence of drilling or fitting in adjacent surfaces.
- D. Special Tools or Keys:
  - 1. Deliver properly identified special tools or keys of each type required for theftproof fasteners and for refilling dispensers or emptying receptacles.
- E. Cleaning:
  - 1. After installation, clean toilet room accessories in a manner not to damage finish and leave in conditions satisfactory to A/E.

**END OF SECTION**

**SECTION 12510  
WINDOW TREATMENT  
(All Windows)**

**PART 1 GENERAL**

**1.1 SUMMARY**

**A. Related Sections:**

1. 09510 - Acoustical Ceilings.
2. 09900 - Painting of Unpainted Surfaces.
3. 11062 - Theater Curtains and Tracks.

**1.2 REFERENCES**

**A. American Society for Testing and Materials (ASTM), latest edition:**

1. E2180 Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) In Polymeric or Hydrophobic Materials.
2. G21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

**1.3 SUBMITTALS**

**A. Samples: Submit samples for color and pattern selection by A/E.**

**PART 2 PRODUCTS**

**2.1 WINDOW CURTAINS**

**A. Materials.**

1. Fabric:
  - a. Opaque, vinyl fabric, 9-gage before embossing, with seams electronically welded.
  - b. Fabric shall be flameproof and comply with Florida Building Code (FBC).
  - c. Color and pattern will be selected by A/E from manufacturer's stock color and pattern selection.
2. Traverse Track: With baked enamel finish complete with draw cord, ball-bearing tension pulleys, and all necessary mounting hardware.

**B. Fabrication.**

1. Fabricate window curtains at 25 percent fullness with maximum 6-inch overlap at window sills and jambs where possible and 4-inch overlap at window heads where possible.
  - a. Coordinate window curtain overlaps with door entrances, cabinets, countertops, and the like.

2. Provide the necessary pulley hardware to offset a curtain pull where it would interfere with the chalkboards and tackboards.

## 2.2 WINDOW SHADES

### A. Manufacturers:

1. ABI Verticals Miami, FL., (305)962-0758
2. NHDH Interiors, Miami, FL., (305) 216-7136
3. New Image Blinds, Miami, FL., (904) 328-5321
4. Ford Shutters Shades and Draperies, Miami, FL., (305) 945-5516

### B. Fabric.

#### 1. Manufacturers/Fabricators:

- a. Enduris Glass Core by Mermet Corp, Cowpens, SC
- b. Supreme by Levolor.
- c. Tontine shade fabric by Vy Tech Industries, Anderson, SC.
- d. Butler Printing and Laminating Inc.

2. Fabric Composition: Fiberglass fabric core laminated 3-ply vinyl (25% Fiberglass/75% vinyl film) with matte finish.
3. Fabric Weight: 12 oz/yd<sup>2</sup>.
4. Fabric Thickness: 12.0 mil (+/- 2%)
5. Breaking Strength: 240 Warp Direction / 960 Warp fill direction.
6. UV Opacity: 100% Blackout.
7. Fabric Thread Count: 60 yarns per sq./in.
8. Lead Free, compliant with ASTM D4834.
9. GreenGuard – Gold Certified.
10. Flame resistance shall comply with FS CCC-C521E and NFPA 701.
11. Shade fabric shall inhibit microbial and fungal growth, compliant with ASTM E2180 and ASTM G21.
12. Color: As selected by A/E

### C. Roller Operation:

#### 1. Clutch Operation.

##### a. Manufacturers:

- 1) R Shade and clutch controller by Levolor.
- 2) R8 clutch controller by Rollease, Stamford, CT or other A/E accepted equivalent.

- b. Shade Roller: Aluminum, 1-1/4" minimum diameter.
- c. Aluminum weight bar with hemmed stitching and tailored pocket.
- d. Reverse roll fabric.
- e. Provide 10 to 12 inches of additional fabric length beyond length required to cover opening.
- f. #10 steel beaded chain with bead stop

- g. Include necessary mounting hardware as recommended by the window shade manufacturer.

### 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. In existing facilities, remove existing window shades, window curtain fabric, traverse track, and hardware as indicated on drawings and install new shades, window curtain fabric, traverse track, and hardware as specified in this section or indicated on drawings and as recommended by window shade, window curtain, and traverse track manufacturers.
- B. Install new traverse track and window shade brackets, complete with curtains and shades, plumb and level, securing to walls and ceilings to form a neat and rigid installation.

**END OF SECTION**

## SECTION 15010

### GENERAL PROVISIONS

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Substitutions and Product Options:

1. Products List: 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.
- c. Contractor may submit a request for substitution for any product or manufacturer not specifically named according to Instructions to Bidders and General Conditions.

###### 3. Substitutions:

- a. The A/E will consider written requests from the Contractor for substitution of products for 45 days after contract award date.
- b. Submit a separate request for each product, supported with complete data, with drawings, and appropriate samples, including, in addition to the requirements of the General Conditions, the following:
  - 1) Comparison of qualities of proposed substitution with product specified.
  - 2) Changes required in other elements of the work because of proposed substitution.
  - 3) Effect on construction schedule.
  - 4) Cost data comparing proposed substitution with product specified.
  - 5) Any required license fees or royalties generated by the proposed substitution.
  - 6) Availability of maintenance service and source of replacement materials.
- c. The Board's decision on approval or rejection for substitution will be final.

###### 4. A request for a substitution is a representation that the Contractor:

- a. Has investigated proposed product and determined it is equal for less cost to or superior for equal cost in all respects to product specified.
- b. Provides the same warranties or bonds for the proposed substitution as for the product specified.
- c. Will coordinate installation of any accepted substitution into work and make other changes as may be required to make work complete.

- d. Waives all claims for additional costs, under Contractor's responsibility, that may become apparent.
  - e. Has verified the proposed product qualifies for FPL Commercial/Industrial Energy Conservation Programs Standards rebates by meeting or exceeding FPL specified qualifications.
5. A/E will review requests for substitutions with reasonable promptness, and notify the Contractor, in writing, of the Board's decision to accept or reject requested substitution.

## 1.2 SUBMITTALS

- A. Submit shop and detail drawings, factory certified prints, brochures, and materials lists for items specified according to Instructions to Bidders and General Conditions.
- 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:
    - a. Keep 1 complete set of prints on file at job site for sole purpose of recording "record" data. Mark changes in red on the prints as work progresses.
    - b. Update "record" prints before each requisition for payment for review and acceptance by A/E.
    - c. Deliver completed set of "record" prints to A/E before request for final payment.

## 1.3 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.
- C. Substantial Completion Submittal Requirements:
  - 1. If quality of work of any such specially qualified worker creates reasonable doubt as to skill, A/E may require worker to be removed and replaced.

D. Tradesperson Qualifications:

1. Contractor shall provide or cause to be provided by the appropriate subcontractors in the plumbing trades for all work required by this Division 15 a ratio of one licensed master or journeyman for every three trainees at all times as those terms are defined by Chapter 10 of the Miami-Dade County Code. No other workers shall be allowed.
2. Where the work of these trades is subcontracted:
  - a. The contractor shall include this requirement in those subcontracts.
  - b. The subcontractor shall show capacity to bond the subcontracted work. The decision to require such bond to be issued remains with the general contractor.

E. Tradesperson Qualifications:

- F. To ensure compliance with the above tradesperson qualifications requirement, the General Contractor shall require the trade subcontractor to submit with each draw request, and shall in turn submit with the General Contractor's draw request, a certified payroll identifying each tradesperson employed for the work of this section during the payroll period, the qualification level of each tradesperson, and where licensed as a Master or Journeyman the license number of each individual.

1. This certified payroll shall also reflect the number of hours spent on this project performing the work of this section and shall reflect the appropriate ratio of qualified tradespersons as required by this section.
2. Failure to comply with this section either in providing the appropriate number of required licensed personnel or failure to submit the appropriate certified payroll information as required herein shall be a major breach of the contract and shall result in rejection of the payment application where the breach occurs and be cause for termination of the contract.

1.4 WARRANTY

- A. Furnish copies to the Board of guarantees for equipment or materials as specified in Instructions to Bidders and General Conditions.
- B. The Contractor shall respond to repair of compressors, pumps, and other routine warranty service requests by completing repairs within 24 hours of service request by the Board.
- C. The Contractor shall respond to emergency warranty service requests with the arrival of service technician at affected site within 4 hours of notification of emergency. Repairs shall be expedited to bring system online as soon as possible. Emergencies include, but are not limited to failures of controls, cooling towers, and any other component causing system failure.



- D. If problem is not correctable within specified time frames, the Contractor shall provide in writing an expected completion date to the Board.
- E. Inspections at End of Warranty:
  - 1. At the end of the 1 year warranty period, the Board will decide if the warranty items cited during the course of the warranty period have been completed to the satisfaction of the Board.
  - 2. Meet on-site with M-DCPS Warranty Section and A/E before the end of the 1 year warranty period and address unresolved warranty items to the satisfaction of the Board.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Provide new materials, free from defects, of domestic manufacture unless otherwise noted.

### 2.2 EQUIPMENT

- A. Use equipment scheduled in the Construction Documents to determine space and service requirements.

## PART 3 EXECUTION

### 3.1 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.
  - 1. Touch-up factory finishes marred in construction with factory touch-up kits.
- C. Provide starters, required control items, and wiring diagrams for motors specified under this Division, unless otherwise noted.
- D. Electrical items furnished shall conform to the requirements of Division 16.

### 3.2 FIELD SUPERVISION

- A. Verify measurements at building site before starting work. Submit discrepancies and differences to A/E 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 A/E 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.

### 3.3 FIELD QUALITY CONTROL

- A. Work will be inspected by A/E during construction.
- B. HVAC systems shall be operational and maintain  $75 \pm 2$  degrees F. and a constant  $55 \pm 2$  percent relative humidity for a period of at least 3 days (72 hours) before installation of specified interior finishes. These conditions shall be maintained at all times until interior finish installations are completed and accepted by M-DCPS. Record conditions at least every 4 hours and provide supplemental temporary air-conditioning or dehumidification if HVAC is not operating at specified conditions. 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. Air-conditioning units shall be leveled.
    - c. Control system components shall be installed and tested for function.
    - d. System testing and balancing shall be completed.

### 3.4 DEMONSTRATION

- A. As a condition for substantial completion and after systems have been tested and checked as complete and operational, Upon the Board's request and at no cost to the Board, provide on-site training of the operation of systems to the Board's maintenance and administrative staff.
- B. Furnish a minimum of 8 hours or as needed to provide adequate in-service training. These sessions will be broken into segments to facilitate the training of individuals in operating the equipment. Operating manuals and user's guides shall be provided at training sessions.
- C. The completion of such training shall be documented to the satisfaction of the Board.

END OF SECTION

## SECTION 15023

### CODES AND STANDARDS

#### PART 1 GENERAL

##### 1.1 REFERENCES

A. Comply with current adopted edition of the following codes and standards:

1. Florida Building Code (FBC).
2. Florida Building Code (FGC) - Gas.
3. Florida Building Code (FMC) - Mechanical.
4. Florida Building Code (FPC) - Plumbing.
5. National Electrical Code - 2014 (NFPA 70).
6. National Fire Protection Association – current adopted edition (NFPA). NFPA 101 and other NFPA codes as applicable, except NFPA 101 10-2.2.7 and 10.2.2.7 Exit Passageways and where exceeded by SREF.
7. American National Standards Institute (ANSI) A117.1,
8. American Society of Civil Engineers (ASCE) 7-98.

##### 1.2 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

END OF SECTION

## SECTION 15044

### GENERAL COMPLETION

PART 1 NOT USED

PART 2 NOT USED

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

A. Construction, satisfactory testing, adjustments, balancing, start-up, and required instruction periods 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 misaligned equipment.

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: Complete.

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.

END OF SECTION

## SECTION 15047

### IDENTIFICATION

#### PART 1 GENERAL

##### 1.1 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).

##### 1.2 SUBMITTALS

- A. Submit properly identified product and technical data including printed installation instructions before starting work.

##### 1.3 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

##### 2.1 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 appropriate 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
Gas	Yellow	Black
Refrigerant	Yellow	Black
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.
3. Valve Identification:
  - a. Identify location and system under valve control with a color coded thumb tack under valve and lay-in ceiling tile.

E. Underground Tapes:

1. Electrical Warning Tape: 6 mil, 3 inches wide polyethylene.
  - a. BURIED ELECTRICAL LINE BELOW - No.37236 by Seton or accepted equivalent.
2. 2" Metallic Detection Tapes:
  - a. BURIED SEWER LINE BELOW - No.37220 by Seton or accepted equivalent.
  - b. BURIED WATER LINE BELOW - No.37222 by Seton or accepted equivalent.

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.
- B. Verify surfaces are clean and dry before application of identification signage.

### 3.2 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 A/E.

#### 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 'T' Joints: Provide pipe markers and directional arrows at each riser and 'T' 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 arrow head 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:

1. Electrical Warning Tape: Install warning tape 8 inches below finish grade on all underground outside electrical lines.
2. 2" Metallic Detection Tapes: Install metallic detection tape 4 inches to 6 inches below finish grade on all underground outside plumbing and air-conditioning lines.



END OF SECTION

**SECTION 15090**  
**SUPPORTS, ANCHORS, AND SEALS**

**PART 1 GENERAL**

**1.1 SUMMARY**

**A. Related Sections:**

1. 15410 - Piping (Plumbing).
2. 15430 - Piping Specialties (Plumbing).

**1.2 REFERENCES**

- A. Pipe Supports: ANSI B31.1, Power Piping.**

**1.03 SUBMITTALS**

- 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 plug 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. Floor Support:
  - a. Pipe Sizes to 4 Inches and All Cold Pipe Sizes: Cast iron adjustable pipe saddle, locknut nipple, floor flange and concrete pier to steel support.
  - b. Hot Pipe Sizes 6 Inches and Over: Adjustable cast iron roll and stand, steel screws and concrete pier or steel support.
6. 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. Flashing:
  - 1. Steel flashing: 26 gage stainless steel.
  - 2. Safes: 5 pounds per square foot sheet lead or 8 mil thick neoprene.
  - 3. Caps: Stainless steel, 22 gage minimum except 16 gages at fire resistant structures.
- D. 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. Inserts:
  - 1. Use inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams wherever practicable.
  - 2. Where concrete slabs form finished ceiling, furnish inserts flush with slab surface.
- B. Supports:
  - 1. Support riser piping independently of connected horizontal piping where practical.
- C. Priming: Prime coat exposed steel (not galvanized) supports.
- D. Flashing: Flash and counter lash where mechanical equipment passes through weather or waterproofed walls, floors, and roofs.
- E. 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.

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.
9. D2241-96 PVC Pressure Rated Pipe.
10. D2564-96a Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.

**1.3 SUBMITTALS**

**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.**

- B. Threaded Cast Iron Drainage Pipe:
  - 1. Uncoated service weight, ANSI A40.5.
- C. Copper Tubing:
  - 1. Type K or L: Seamless hard drawn or annealed, ASTM B88.
  - 2. Type DWV: Seamless hard drawn, ASTM B306.
- D. Steel Pipe: Seamless or welded steel, Schedule 40, black or galvanized threaded, ASTM A53 seamless Grade A.
- E. Ductile Iron Pipe: ANSI/AWWA C151/A21.51.
- F. Polyvinylchloride Pipe (PVC):
  - 1. Threaded.
  - 2. Non-Threaded.
- G. 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.
  - 4. Underground: ASTM C1277, cast iron couplings with neoprene compression gasket and stainless steel bolts.
- H. Cast Iron Threaded Drainage Fittings: Recessed pattern ANSI B16.12.
- I. Cast Iron Threaded Fittings: Standard weight unless noted otherwise, ANSI B16.4.
- J. Malleable Iron Fittings: Standard weight, threaded banded 150 pounds ANSI B16.3. Galvanized or black to match piping.
- K. Cast Iron Fittings and Flanges:
  - 1. Standard Weight: ANSI B16.1, unless otherwise noted.
  - 2. Extra Heavy: ANSI B16.2.
- L. Steel Flanges: 150 psi and 300 psi Class, ANSI B16.5, Grade 1.
- M. 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.

- N. 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. Accepted equivalent.
- O. Polyvinylchloride (PVC) Solvent Cement: ASTM D2564.
- P. Compression Gaskets, Cast Iron Soil Pipe: ASTM C564.
- Q. Solder Metal:
  - 1. Similar to silver-tin-copper alloy ASTM B32.
  - 2. All solder shall be certified no-lead.
- R. Joint Compound: Tite-Seal or accepted equivalent.
- S. Unions: As specified in Section 15430.
- T. Protective Coating: Cabot's Flexi-Black or accepted equivalent.
- U. Vent Flashing: Provide flashing for vents through the roof for installation as specified in Section 07600.
- V. Vandalproof Ventstack Caps: Provide vandalproof ventstack caps,
  - 1. Vandalproof hood (threaded) and counter flashing (threaded) cast iron with standard rust resistant prime coating for installation under this section. No.1530-3 hood and 1520-2 counter flashing by Stoneman.
  - 2. Vent extension/flashing by Vent Extensions, Inc., Wellington, FL.
  - 3. Vandalproof cap, 18 gage, type 304 stainless steel by S.B.C., North Miami, FL.

**PART 3 EXECUTION**

**3.1 INSTALLATION**

- 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, switchboards 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 Board.
- 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. Provide at least 20 feet of bitumen coated type "K" copper pipe for exterior underground domestic water at each service entering the building.
- K. 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.



L. 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.
2. Lay storm drainage pipes to 1/8" per foot minimum, unless otherwise noted on drawings.

M. Exposed Piping:

1. Install horizontal runs maximum 4 inches below adjacent structure and run parallel or perpendicular to walls, ceilings, beams, and columns unless otherwise noted on Construction Documents.

N. Piping Materials by System:

1. Sanitary Soil, Waste, and Vent Piping:
  - a. Aboveground: PVC, service weight no-hub cast iron pipe and fittings, DWV copper pipe with cast brass or wrought copper solder joint drainage fittings. No PVC may be used in plenums.
  - b. Under Ground Floor Slabs:
    - 1) Cast iron bell and spigot pipe and fittings.
    - 2) Cast iron no-hub pipe and fittings with corrosion resistant couplings and neoprene compression gaskets.
2. Vandal proof 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. Underground Exterior:

- 1) PVC.
- 2) Copper Tubing Type K:

- a) Soft tempered copper with cast bronze or soldered joint fittings coated with bitumen.

- c. 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.

- 4. Storm Drainage Piping: Same as for sanitary systems.

- 5. Condensate Drainage Piping:

- a. Aboveground: DWV copper pipe with cast brass or wrought copper solder joint drainage fittings.
- b. Underground: PVC pipe and socket type plastic drainage fittings.

- O. Joints and Methods of Connections:

- 1. Cast Iron Bell and Spigot Pipe:

- a. Compression Gaskets:

- 1) Gasket and pipe by same manufacturer.
- 2) Install according to manufacturer's instructions.

- 2. Cast Iron No-Hub Pipe:

- a. Aboveground: Joint with neoprene rubber sleeve and stainless steel ring clamp according to manufacturer's instructions.
- b. Underground: Joint with cast iron coupling, neoprene gasket, and stainless steel bolts according to manufacturer's instructions.

P. Pipe Cleaning Systems:

- 1. Domestic Water Piping: Flush clean domestic water distribution systems for cold water before placing in service.

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 A/E and perform tests in A/E's presence.

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.

END OF SECTION

## SECTION 15421

### DRAINS AND CLEANOUTS

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Related Sections:

1. Division 7 - Thermal and Moisture Protection.
2. 15410 - Piping (Plumbing).

##### 1.2 SUBMITTALS

###### 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

##### 2.1 MANUFACTURERS

###### A. Model numbers are taken from Josam.

1. Accepted equivalents:
  - a. Jay R. Smith Mfg. Co.
  - b. Blucher-Josam.
  - c. Wade.
  - d. Zurn.

##### 2.2 MATERIALS

###### A. Drains:

###### 1. Toilet Room:

- a. Same as Shower Stall above except for primer trap.
- b. Josam No.30000-6S-50-X by Josam or accepted equivalent.

###### 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 or accepted equivalent.
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 or accepted equivalent.
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 or accepted equivalent.
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 or accepted equivalent.
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 or accepted equivalent.
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 or accepted equivalent.

C. Wall Access:

1. Cast bronze, polished chrome plated square frame and cover, 12" X 12"

2. minimum opening or larger, as required.  
No.58640 by Josam or accepted equivalent.

PART 3 EXECUTION

3.1 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.
- D. Exterior Unfinished Grade Mounted:
  1. Cast iron, inside caulk outlet, bronze internal recessed plug mounted flush with grade. Surround cleanout with concrete doughnut.
- E. Exterior Finished Grade Mounted:
  1. Ductile iron scoriated heavy duty cover, flush with walkway or floor. No.56040-15 by Josam or accepted equivalent.

END OF SECTION

## SECTION 15430

### PIPING SPECIALTIES (PLUMBING)

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Related Section:

1. 15410 - Piping (Plumbing).

##### 1.2 REFERENCES

###### A. American Society for Testing and Materials (ASTM):

1. A126-95 Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

##### 1.3 SUBMITTALS

###### 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. Strainers.
8. Firestop Devices.
9. Backflow Preventors.
10. Water Hammer Arrestors.

#### PART 2 PRODUCTS

##### 2.1 EQUIPMENT

###### A. Backflow Preventors:

1. Reduced pressure zone, with 2 quarter turn, full ported, bronze ball valves, upstream strainer, and flanged adaptor ends. By Watts or accepted equivalent.

###### 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.

2. Copper shell at individual toilet rooms and isolated fixtures. By Josam 75000-S or accepted equivalent.

C. Water Hammer Arrestors:

1. Sioux Chief Mfg. or accepted equivalent.

D. Vacuum Breakers:

1. Hose Bibb Vacuum Breaker: Non-removable. No 8A by Watts Regulator Co. or accepted equivalent.
2. Atmospheric Type: No.288A by Watts Regulator Co. or accepted equivalent.
3. For Plumbing Fixtures: As specified under 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.

H. 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. Fee and Mason or Elcen Metal Products are also accepted manufacturers.
  - 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 Steel and PVC Piping:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Clamp or Hanger Maximum Spacing</u>
Up to 1-1/4"	3/8"	8 feet
1-1/2 and 2 inches	3/8"	10 feet
2-1/2 and 3 inches	1/2"	12 feet
4 and 5 inches	5/8"	12 feet
6 inches	3/4"	15 feet
8 inches & larger	1 inch	15 feet

4. 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

5. 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

6. Wall Support:

- a. U-clamps as accepted.
- b. Unistrut supports.

7. Vertical Support: Steel riser clamps.

I. Insulation Protection Shield: Fig.167.

J. Access Panels (Wall or Ceiling): As specified in Section - 08305.

## PART 3 EXECUTION

### 3.1 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. Flashing:
1. Flash and counter flash where mechanical equipment passes through exterior or waterproofed floors, walls, or roofs.
- C. 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.
- D. Pipe Hangers and Supports:
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 Section 09900. 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 and PVC 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. Plastic Pipe: Provide roll hangers and install loose to allow for contraction and expansion.
  5. 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.
  6. 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 gages galvanized sheet metal covering, minimum 12 inches long.
    - c. Provide support saddles for insulated piping over 2 inches in diameter.
  7. Special Supports: Clamps, hangers, and supports required by equipment manufacturers shall be installed according to equipment manufacturer's recommendations.
  8. Plumbers tape, straps, chain, wire hangers, or perforated bar are not allowed for hanging pipe.
- E. 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.
- F. Unions and Flanges: Provide at connections of equipment and at strainers and control valves.
- G. Escutcheons: Fit and firmly secure escutcheons to pipes passing through finished floors, ceilings and walls.

END OF SECTION

## SECTION 15440

### PLUMBING FIXTURES, TRIM, AND SUPPORTS

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Related Sections:

1. 10800 - Toilet Room Accessories
2. 11600 - Laboratory Equipment.
3. 15410 - Piping (Plumbing).
4. 15430 - Piping Specialties (Plumbing).

##### 1.2 SUBMITTALS

###### 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.

##### 1.3 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

##### 2.1 MANUFACTURERS

###### A. Fixtures:

1. American Standard.
2. Acorn Engineering.
3. Bradley.
4. Fiat.
5. Elkay.
6. Kreolab.
7. Kohler.
8. Toto.

B. Fittings:

1. American Standard.
2. Chicago Faucets.
3. Fiat.
4. Elkay.
5. Powers Process Controls.
6. Symmons Industries.
7. Sloan.
8. T & S Brass.
9. Toto.
10. Zurn.

C. Equipment:

1. Guy Gray.
2. Haws.
3. Halsey Taylor.
4. Oasis.

2.2 FIXTURES

A. Water Closets:

1. Floor Mounted Water Closet (for replacement at existing conditions only) (WC):
  - a. White vitreous china, top spud, siphon jet flush action, 1.6 gpf, and elongated bowl.
    - 1) Madera EL 1.6 - 3461.001 by American Standard.
    - 2) Wellcomme Lite K-4350 by Kohler.
    - 3) CT705 by Toto.
  - b. Bolt Caps: 481310-100 by American Standard or accepted equivalent.
  - c. Flush Valve: Sloan Royal 111 or accepted equivalent by Sloan Regal, Toto, or Zurn.
  - d. Flush Valve for Remote Activation: Sloan Series 900 or accepted equivalent by Sloan Regal or Zurn.
  - e. Seat: Elongated, open front less cover.
    - 1) 95 by Olsonite.
    - 2) Lustra K-4670-C by Kohler.
    - 3) 50ESS by Sperzel.
    - 4) SC514 by Toto.
  - f. Seat, HC Accessible: 3" or 4-5/8" high seat lift, elongated, closed front, hollow core heavy duty plastic, vinyl coated offset mounting bracket by Bemis or accepted equivalent.

2. Floor Mounted Water Closet, ADA HC Accessible (for replacement at existing conditions only) (WC):
  - a. White vitreous china, top spud, siphon jet flush action, 1.6 gpf, and elongated bowl. ADA compliant, 16.5" height.
    - 1) Madera 17 inches high, EL 1.6/FV 10 inch rough - 3043.102 by American Standard.
    - 2) Highcliff Lite K-4368 by Kohler.
    - 3) CT705L by Toto.
  - b. Bolt Caps: 481310-100 by American Standard or accepted equivalent.
  - c. Flush Valve: Sloan Royal 111 or accepted equivalent by Sloan Regal, Toto, or Zurn.
  - d. Flush Valve for Remote Activation: Sloan Series 900 or accepted equivalent by Sloan Regal or Zurn.
  - e. Seat: Elongated, open front less cover.
    - 1) 95 by Olsonite.
    - 2) Lustra K-4670-C by Kohler.
    - 3) 50ESS by Sperzel.
    - 4) SC514 by Toto.

B. Urinal (UR):

1. Siphon Jet Flush Action: Wall hung, 1.0 gpf, vitreous china, 3/4" top inlet spud.
  - a. Allbrook 1.0 6541.132 by American Standard.
  - b. Dexter K5016-T by Kohler.
2. Flush Valve: Oscillating non hold open handle. 186-1 by Sloan Royal, or accepted equivalent by Sloan Regal or Zurn.

C. Service Sink (SS):

1. Enameled cast iron, 22 inches x 18 inches, plain back, rim guard.
  - a. Lakewell 7692.023 by American Standard.
  - b. Rollins 242-0120 by Eljer.
  - c. Bannon K-6718 by Kohler.
2. Fitting: Exposed yoke, wall mounted, vacuum breaker, top brace, stops in shanks.
  - a. Heritage 8344.111 by American Standard.
  - b. Knoxford K-8904-RP by Kohler.
3. "P" Trap: Strainer, outlet to wall.



- a. 7798.176 by American Standard.
- b. K-6673 by Kohler.

D. Mop Receptor (MR ):

- 1. Molded resin, 24 inches x 24 inches x 10 inches, rim guards, center drain.
  - a. Model MSR-2424 by Florestone.
  - b. Model MSB-2424 by Fiat.
- 2. Fitting: Exposed yoke, wall mounted, vacuum breaker, top brace, stops in shanks.
  - a. Heritage 8344.111 by American Standard.
  - b. Knoxford K-8904-RP by Kohler.
  - c. Model 830-AA by Fiat.

E. Lavatories:

- 1. Wall Hung LAV/HC Lav (L):
  - a. Enameled cast iron, 20 inches x 18 inches, 3 holes, 4 inch centers, with lug holes for concealed carrier arms.
    - 1) Hudson K-2867 by Kohler.
    - 2) Bucknell 052-0198 by Eljer.
  - b. Cold Water Fitting, accessible: Single lavatory fitting, self closing metering, adjustable time cycle, push handle, vandal resistant aerator.
    - 1) 1340.000 by American Standard.
    - 2) 333-669 by Chicago Faucets.
    - 3) K-7504-C by Kohler.
    - 4) 8884 by Moen.
    - 5) S-72 by Symmons.
  - c. Hot and Cold Water Fitting, accessible: 4 inch centers, 4 inch spout, 2-1/2" lever handles, 2 gpm flow maximum, vandal resistant aerator.
    - 1) 2350.120 by American Standard.
    - 2) 802-369 by Chicago Faucets.
    - 3) K-7404-KE/K-16010-4 by Kohler.
  - d. HC Hot Water Guard:
    - 1) Manufacturers:

- a) Handi Lav-Guard Insulation Kit 102/105 - white, by Truebro.
      - b) Handi-Shield Original Series - white, by Plumberex, Palm Springs, CA.
    - 2) Use manufacturer's vandal resistant fasteners.
  - e. Supply Pipe: 3/8" rigid riser with loose key control. By McGuire or accepted equivalent.
  - f. "P" Trap: Adjustable offset with tubing drain to wall, cleanout plug and wall escutcheon. By McGuire or accepted equivalent.
  - g. Grid drain: Perforated, chrome plated, 1-1/4" offset tailpiece. By McGuire or accepted equivalent.
  - h. Floor Mounted Carrier Arms: Josam 17100-M-628 or accepted equivalent.
2. Countertop Mounted Lav/HC Lav (LAV ):
- a. White enameled cast iron, 19 inches x 16 inches, self rimming, 4 inch centers.
    - 1) Ledgelyn 3211.000 by American Standard.
    - 2) Farmington K-2904 by Kohler.
  - b. Cold Water Fitting: Single lavatory fitting, self closing metering, adjustable time cycle, push handle, vandal resistant aerator.
    - 1) 1340.000 by American Standard.
    - 2) 333-669 by Chicago Faucets.
    - 3) K-7504-C by Kohler.
    - 4) 8884 by Moen.
    - 5) S-72 by Symmons.
  - c. Hot and Cold Water Fitting: 4 inch centers, 4 inch spout, 2-1/2" lever handles, 2 gpm flow, vandal resistant aerator.
    - 1) 2350.120 by American Standard.
    - 2) 802A-369 by Chicago Faucets.
    - 3) K-7404-KE/K-16010-4 by Kohler.
  - d. Supply Pipe: 3/8" rigid riser with loose key control. By McGuire or accepted equivalent.
  - e. "P" Trap: Adjustable with tubing drain to wall, cleanout plug and wall escutcheon. By McGuire or accepted equivalent.
  - f. Hot Water Guard:
    - 1) Manufacturers:
      - a) Handi Lav-Guard Insulation Kit 102/105 - white, by

- b) Truebro.  
Handi-Shield Original Series - white, by Plumberex, Palm Springs, CA.

2) Use manufacturer's vandal resistant fasteners.

- g. Grid drain: Perforated, chrome plated, 1-1/4" tailpiece. By McGuire or accepted equivalent.

F. Single Compartment Stainless Steel Sink with Bubbler (Classroom Service Center):

1. (SK ) 25 inches x 17 inches, ( ) inches deep, 18 gage, Type 302 stainless steel, self-rimming, double ledge.
2. (SK ) 25 inches x 17 inches, 7.5 inches deep, 18 gage, Type 302 stainless steel, self-rimming, double ledge.
  - a. DRKAD-2517 by Elkay.
  - b. Accepted equivalent.
3. Bubbler: With flexible guard and HC accessible push button valve.
  - a. LK-1141 by Elkay.
  - b. Accepted equivalent.
4. Fitting: Gooseneck faucet, vandal resistant aerator.
  - a. 7100.251H by American Standard.
  - b. LK-2085-13-L by Elkay.
  - c. 350 by Chicago Faucets.
5. Tailpiece: Offset with grid strainer, chrome plated P-trap with swivel joint, chrome plated flexible supplies with loose key stops: McGuire or accepted equivalent.
6. Soap dispenser with stainless steel container, lavatory mounted, 4 inch spout, 5 pound operating pressure, 20 ounce container. B-8221 by Bobrick or accepted equivalent.

G. Double Compartment Stainless Steel Sink (SK):

1. 33 inches x 22 inches, 8 inches deep, 18 gage, Type 302 stainless steel, self-rimming.
  - a. LR-3322 by Elkay.
  - b. Accepted equivalent.
2. Cold Water Fitting: Gooseneck faucet, single hole inlet, 8 inch swing spout, vandal resistant aerator, 2-1/2" lever handle.

- a. 350-GN8A-E12VP-369 by Chicago Faucets.
  - b. Accepted equivalent.
3. Hot and Cold Water Fitting: Gooseneck faucet, 8 inch centers, 8 inch spout, vandal resistant aerator, 2-1/2" lever handles.
- a. 6275.000/0000.172V by American Standard.
  - b. 201-GN8A-E12VP-369 by Chicago Faucets or accepted equivalent.

H. Electric Water Coolers (EWC):

- 1. Wall Mounted, Hi-Lo, bi- level 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. See Fixture Schedule on plumbing plans.
- 2. Manufacturers:
  - a. Halsey Taylor
  - b. Haws: Model
  - c. Oasis: Model
- 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.

2.3 CARRIERS

- A. All carriers shall be fully bolted to floor and installed as recommended by manufacturer.
  - 1. Lavatory/Lavatory HC:
    - a. Rectangular structural steel uprights with integral welded heavy steel foot, cast iron concealed arms. Model 17100 by Josam or accepted equivalent.
  - 2. Urinal:
    - a. Rectangular structural steel uprights with integral welded steel foot, hanger bracket, lower bearing plate. Model 17810 by Josam or accepted equivalent.
  - 3. Water Closet:
    - a. 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 accepted equivalent.

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.

3.2 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.

END OF SECTION

## SECTION 15821

### FANS

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Related Sections:

1. 15841 – Low Pressure Ductwork.
2. 15910 – Duct Accessories

##### 1.2 SUBMITTALS

- ###### A. Submit properly identified manufacturer's catalog cuts and technical data before starting work.

##### 1.3 QUALITY ASSURANCE

- ###### A. Fans shall be constructed and rated according to AMCA Standards.

#### PART 2 PRODUCTS

##### 2.1 MANUFACTURERS

###### A. Ceiling Mounted Fans, Centrifugal Type:

1. Nutone Co.
2. Penn Ventilator Co.

###### B. Curb Mounted Exhaust Fans:

1. Cook.
2. Greenheck.
3. Hill Fan Co.
4. ILG.
5. Penn Ventilator Co.

##### 2.2 EQUIPMENT

###### A. Ceiling Mounted Fans, Centrifugal Type:

1. Enclose in an acoustically insulated housing and provide with an integral back draft damper and aluminum inlet grille.
2. Provide capacities and electrical requirements as shown in schedule.
3. Statically and dynamically balance fan wheels at factory.

B. Curb Mounted Exhaust Fans:

1. Weatherproof Housing: Heavy gage galvanized steel with integral roof curb and weather protected intake hoods with filter finished with 2 coats of off-white epoxy enamel inside and out.
  - a. Top of housing shall be removable for service access.
2. Forward curved centrifugal wheel and scroll housing fabricated of galvanized steel (direct) (adjustable belt) drive assembly (single) (two) speed motor all mounted on common (direct) (adjustable belt) base plate, complete with vibration suspension system.
  - a. Provide adjustable pitch motor pulley and quick adjust belt tension and alignment system.

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. Install according to the manufacturer's recommendations and accepted Shop Drawings.

END OF SECTION

## SECTION 15841

### LOW PRESSURE DUCTWORK

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Related Sections:

1. 07270 - Firestopping and Fire and Smoke Barrier Caulking.
2. 15260 - Vibration Isolation.
3. 15280 - Thermal Insulation (HVAC).
4. 15855 - Air Handling Units.
5. 15910 - Duct Accessories.
6. 15940 - Outlets (HVAC).
7. 15990 - Tests (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):

###### C. National Electrical Code - 1999 (NEC) - 70.

###### D. American Society of Heating, Refrigerating, and Air-conditioning Engineers, Inc. (ASHRAE) 62 - Ventilation for Acceptable Indoor Air Quality.

##### 1.3 SUBMITTALS

###### A. Ductwork:

1. Provide 1/4" scale composite Shop Drawings. Shop Drawings shall be coordinated with other trades before submitting.
2. Catalog Cuts: Low 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. Joint sealing.



3. Elbows, vaned and radius.
4. Transitions and Offsets.
5. Taps and outlet frames.
6. Branch connections and tees.

D. Duct Hanger System: Catalog cuts and shop drawing.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

A. Flexible: Genflex or Flexible Technologies.

B. Ductwork and Fittings:

1. Metalaire.
2. Semco.
3. Spiramatic.
4. United Sheet Metal.

C. Ductwork Adhesive Sealing Compound:

1. Interior:
  - a. Benjamin Foster #30-02.
  - b. 3M Hardcast.
2. Exterior:
  - a. Flexomastic No.210 with fiberglass membrane for weatherproofing as manufactured by Weatherproofing Products, Inc. or accepted equivalent.

### 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 1600 fpm for rectangular and 2,000 fpm for round ductwork. 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. Minimum gauge for all ductwork shall be 24 gauge.

1. Ductwork gages shall comply with the following:

<u>Greatest Dimension</u>	<u>US Gage</u>
0" to 12"	24
13" to 30"	24
31" to 60"	22
61" to 90"	20
over 90"	18

2. Ductwork dimensions shown on the drawings are clear inside dimensions.

C. Splitters and Dampers:

1. Provide as shown and as necessary for proper regulation of air distribution system.
2. Locate dampers to be easily adjustable after work is completed. Provide a set screw locking device for each splitter or damper. On insulated ducts, place locking device on a bracket so set screw is on surface of insulation and is easily operable. Provide Armaflex plug. Use Ventlock or Young Regulator.
3. Sheet Metal Gage: Construct splitters and dampers of galvanized steel 1 gauge heavier than duct where installed.

D. The following ductwork and plenums shall be insulated, unless noted otherwise.

1. Outside air ductwork at air handler's closet.

E. 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. Minimum R=6 insulating value.
2. Flexible Collar Connections: Make connections to and from units with collars not less than 4 inches long, secured by peripheral strap iron, using 30 ounce neoprene coated glass fabric by Ventglas or accepted equivalent. Collar connections from rectangular ductwork to flexible ductwork shall be "Low Loss".
3. Manufacturers:
  - a. Atco Rubber Products.
  - b. Genflex.

- c. Thermaflex II.
  - d. Venture Type VTKC.
  - e. Wiremold Co.
- F. 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.
- G. 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.
- H. Thoroughly clean ductwork before attempting test and balance.
- I. Where interferences arise during construction, make transition or division of ductwork on a basis of pressure drop equivalent to the original size. Obtain acceptance from A/E before fabrication.
- J. Seams And Joints at Exhaust, Supply, Return and Outside Air Distribution Systems: All joints shall be sealed whether longitudinal or transverse Make airtight as possible. Seal joints with 4 inch wide cloth tape with adhesive sealing compound, except ductwork exposed to weather shall have joints sealed with specified joint sealant.
- K. Apply Flexomastic weatherproofing with smooth finish to joints of ductwork exposed to weather as recommended by joint sealant manufacturer, with at least 2 final coats of No.210.
- L. Sound Levels: Discharge sound levels for occupied areas shall not exceed a rating of RC 35 as defined in ASHRAE.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Install ductwork as shown on drawings.
- 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 A/E 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. In case of conflict with these specifications, the most restrictive shall govern.
- B. Seams and joints in all ductwork shall be made airtight. Seal duct joints with sealer as specified for field sealing of high pressure ductwork. Make exhaust ducts passing through return air chases airtight.
- C. 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 8 feet. Duct shall be adequately supported to prevent kinks and sharp bends. Install according to manufacturer's recommendations and as shown on drawings.

### 3.3 DUCTWORK SUPPORTS AND HANGERS

- A. Provide support and hangers according to SMACNA HVAC Duct Construction Standards.
  - 1. Hangers: Hang horizontal ducts at intervals not exceeding 8 feet, with hangers of 16 gage by 1 inch wide galvanized band iron on ducts up to and including 30 inches wide and 12 gage by 1-1/2" wide galvanized band iron on ducts over 30 inches wide. Extend hangers down and fasten underneath duct in addition to both sides of duct.
- B. Hanger straps shall be 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.

### 3.4 DUCT PENETRATIONS TO FLOOR AND FIRE WALLS

- A. Joints around duct penetrations shall be packed with fire safing insulation and sealed with fire and smoke barrier caulk as specified in Section 07270, Firestopping and Fire and Smoke Barrier Caulking.

END OF SECTION

**SECTION 15910**  
**DUCT ACCESSORIES**

**PART 1 GENERAL**

**1.1 SUMMARY**

**A. Related Sections:**

1. 15890 - Ductwork.
2. 15900 - Controls and Instrumentation.
3. 15940 - Outlets (HVAC).
4. 15970 - HVAC Control System.

**1.2 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.

**1.3 SUBMITTALS**

- A. Duct Access Doors: Catalog cuts.
- B. Volume Dampers: Shop drawings.
- C. Fire Dampers: Catalog cuts.
- D. Low Pressure Ductwork Round Fittings: Shop Drawings or catalog cuts.
- E. Flexible Connections: Catalog cuts.
- F. Test Holes: Pipe couplings, catalog cuts, and proposed installation locations.

**PART 2 PRODUCTS**

**2.1 EQUIPMENT**

**A. Volume Dampers:**

1. Dampers shall be manual or automatic as indicated on drawings. Dampers furnished with automatic actuators shall be furnished under Section 15900 and 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. Motor Operated Dampers:

1. Motor operated dampers for 100 percent outside air and smoke shall be minimum leakage Arrow-Foil Damper No.OBDAF-207 as manufactured by the Arrow Louver and Damper Corp., Maspeth, NY 11378.
2. Frames and blades shall be minimum 12 gage (0.081") extruded aluminum: Blades shall be single unit Arrow-Foil design, 6 inches wide, with Pin-Lock an integral section within the blade core.
3. Frames shall be a combination of 4 inch extruded aluminum channel and angle with reinforcing bosses and groove inserts for vinyl seals.
4. Minimum size dampers shall have 2 inch X 5/8" aluminum frames.
5. Pivot rods shall be 1/2" diameter extruded aluminum, Pin-Lock design interlocking into blade section. Bearings to be "Double-Sealed" type with Celcon inner bearing on rod riding in Merlon Polycarbonate bearing inserted in frame so outer bearing cannot rotate.
6. Rod bearings shall be designed with no metal-to-metal or metal-to-bearing riding surfaces. Interconnecting linkage shall have a separate Celcon bearing to eliminate friction in linkage.
7. Blade linkage hardware shall be installed in angle or channel frame section out of air stream. Hardware shall be of non-corrosive reinforced material or cadmium plated.
8. Dampers shall be engineered for minimum air leakage by means of overlapping design and by extruded vinyl seals to fit into integral ribbed grooved inserts in both frames and blades. All dampers over 10 square feet free area shall have reinforced corners by means of gusset plates.
9. Opposed blade dampers, when closed, shall have less than 3/4 of 1 percent leakage at 5 inches and less than 1 percent at 9 inch WG static pressure.

- C. Flexible Connectors: Size flexible connections at a minimum of 4 inches between connected items. Provide 30 ounce glass fabric fire retardant and air tight, coated with neoprene on both sides. Ventglass by Ventfabrics, Inc. or Neoprene Fabriduct by Elgen.

- D. Fire Dampers: Provide approved fire dampers where indicated on drawings. Dampers shall be constructed and installed according to requirements of NFPA 90A, and each damper shall be provided with fusible link designed to melt at 165 degrees F. Damper blades shall be stacked outside of air stream.
1. Manufacturers:
    - a. Action Air Incorporated.
    - b. Air Balance.
    - c. National Control Air.
    - d. United Sheet Metal Company, Series 200.
- E. Combination Smoke and Fire Dampers:
1. Damper shall bear a 1-1/2 hour UL fire damper label. Dampers shall be constructed of steel, with parallel blades.
  2. Damper shall meet requirements specified for fire dampers and include operating shaft able to rotate 90 degrees and cause damper to operate between closed and open. Operating shaft and damper combination shall be suitable for linking to and operation by any standard pneumatic damper operator having sufficient torque characteristics.
  3. Dampers shall be installed in 14 gage steel sleeves.
- F. Duct Access Doors:
1. Access doors shall be hinged except where sliding or removable type is required and shall be insulated except in non-insulated ductwork and casings. Access doors shall be sized for proper access but shall not be less than 16 inches X 12 inches in size, except in small ductwork where a smaller door may be used.
  2. Access doors for high pressure ducts shall be galvanized steel with dogs or cams, solid neoprene gaskets, moisture resistant and airtight. Provide door frames to extend over casing or duct insulation. Doors shall operate from outside. Size and construct for high pressure application.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Flexible connections shall be provided as shown on drawings. Lengths shall be between 3 feet and 8 feet.
- B. Fire Dampers:
1. Fire dampers shall be furnished and installed in duct openings and return air

- openings through fire partitions and as shown on drawings.
2. Seal around fire dampers with therma-fiber at walls per UL and NFPA requirements.
  3. Install dampers as shown on drawings and according to manufacturer's recommendations.
- C. Low pressure ductwork round fittings shall be installed as shown on drawings and according to manufacturers recommendations.
- D. Provide test holes at mains and main branches and as required by test and balance contractor.
- E. Duct Access Doors:
1. Airtight, hinged access door with catch shall be installed next to fire dampers and shall be sized for easy inspection or maintenance of dampers. Minimum access door size shall be 18 inches X 18 inches, except in smaller ductwork where a smaller door may be used.
  2. Do not obstruct access doors with piping, conduits, hangers, braces, and other ducts.
  3. Required ceiling access panels for areas other than removable ceilings shall be furnished under this section for installation under the general construction work.
  4. Provide access doors on linkage side of automatic dampers, including fire and smoke dampers.

END OF SECTION



## SECTION 15940

### INLETS AND OUTLETS (HVAC)

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Related Sections:

1. 15910 - Duct Accessories.

##### 1.2 SUBMITTALS

- 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

##### 2.1 MANUFACTURERS

###### A. Air Outlets:

1. Air Guide.
2. Anemostat.
3. Carnes.
4. Krueger.
5. Metalaire.
6. Price.
7. Titus.
8. Warren Technology.

##### 2.2 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 A/E.
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 louvered 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. Linear diffusers for wall mounting shall be fixed bar type. Bars shall be 1/8" thick with an extruded shape to provide 0 degrees or 15 degrees air deflection as indicated. Bar spacing shall be 1/2". Construction shall be aluminum, primed to accept finish paint.
- H. Linear diffusers for ceiling mounting shall be Titus Modulinear with sizes as indicated. These devices shall be installed with end caps and alignment strips as required for a complete and finished installation.

- I. 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.
- J. 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.
- K. 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

3.1 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.

3.2 INSTALLATION

- A. Install and connect light troffer diffusers provided under Section 13500.

END OF SECTION

## SECTION 15991

### TESTING AND BALANCING

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes:

1. Test and Balance Agency: The Board's contracted firm shall perform test and balance services required for this project.

#### PART 2 PRODUCTS

##### 2.1 EQUIPMENT

- ###### A. Testing and balancing equipment and instruments will be provided by the Test and Balance Agency.

#### PART 3 EXECUTION

##### 3.1 TESTING AND BALANCING:

- ##### 3.2
1. The Testing and Balancing contractor shall have up to date certification by Associated Air Balance Council (AABC), the National Environmental Balance Bureau (NEBB), or the Testing, Adjusting, and Balancing Bureau (TABB).

- ##### 3.3
2. Factory representatives be present for startup of all major equipment, such as packaged rooftop units and automatic control systems.

- ##### 3.4
3. Provide all the Adjusting and Balancing all necessary tests for air and water, vibration isolation. Tests shall confirm the successful and proper installation of the specified equipment.

##### 3.5

- ###### A. Test and Balance Agency shall provide periodic inspection during construction and will provide air distribution test and balance.

##### 3.6 CONTRACTOR'S RESPONSIBILITY

- ###### A. Furnish to Test and Balance Agency 1 complete set of approved equipment submittal data and the latest, approved mechanical drawings or Shop Drawings.

- B. Test and measure existing air flow, GPM, temperatures, static pressures prior to demolition or modification of existing mechanical system pertinent to the scope. Provide test results for future reference.
- C. Before and during construction assist Test and Balance Agency with inspection and pre-completion requirements.
- D. Perform a preliminary balance to verify components and systems are operational and ready for test and balance agency.
- E. Provide sufficient notice and time before final completion date to enable testing and balancing be completed within project schedule.
- F. Prerequisite to Substantial Completion Inspection: Construction, starting, adjustment, testing and balancing, and instruction shall have been completed.
- G. Provide at no additional cost to the Board, labor, materials, and tools necessary to make corrections when required without undue delay.
- H. Put applicable systems into full operation and continue operation during each working day until testing and balancing is complete.
- I. Test and Balance Agency shall be kept informed of any major changes made to the system during construction and shall be provided with a complete set of "record" Construction Documents.
- J. Prepare and T&B air side for balancing in following manner:
  - 1. Fans, blowers, and air handling equipment shall be mechanically checked and available to operate under design conditions.
  - 2. Splitters, volume dampers, fire dampers, and vanes shall be in neutral positions.
  - 3. Controls: Electronic, electric, or pneumatic, or any combination thereof, shall be mechanically checked and available to operate under design conditions. Provide a written letter attesting the controls are installed and operating per design requirements.
  - 4. Provide and install filters with design static drops for clean filters acceptable to the Test and Balance Agency.
  - 5. Locking devices at dampers shall be marked to represent the position of the dampers.
  - 6. Make whatever adjustments necessary.
  - 7. Change pulleys, belts, and dampers, as required for correct balance as requested by Test and Balance Agency.
  - 8. Check variable air volume boxes in operation to verify no loose linkages, damper blades, etc. and all parts move freely.
  - 9. Check safety and operating controls of electric strip heaters and verify heaters

- operate at minimum air flow conditions.
10. Provide fixed diameter pulleys in place of adjustable pulleys at supply fans and at return air fans after test and balance has been completed. Pulley size shall be as directed by the Test and Balance Agency. Install new belts as required and as directed by the Test and Balance Agency.
  11. Provide to the Test and Balance Agency a start-up report including rated nameplate volts and amps and actual volts and amps on HVAC equipment.
  12. Provide scaffolding as required for Test and Balance.
- K. Prepare and T&B water side for balancing as follows:
1. Open valves to full position; including coil stop valves, close bypass valves, and open return line balancing cocks.
  2. Strainers shall be cleaned.
  3. Examine water and system to verify a clean and treated system.
  4. Check pump rotation.
  5. Check system is full of water.
  6. Set temperature controls to have coils call for full cooling.
  7. Check operation of automatic bypass valves.
  8. Provide scaffolding as required for Test and Balance Agency.

END OF SECTION

## SECTION 16023

### CODES AND STANDARDS

PART 1 GENERAL

1.1 REFERENCES

A. Comply with the following:

1. State Requirements for Educational Facilities - 1999 (SREF).
2. Florida Building Code (FBC 2017 6<sup>th</sup> Edition).
3. National Electrical Code - 2014 (NEC), (NFPA 70).
4. National Fire Protection Association (NFPA), 2015. NFPA 101 and other NFPA codes as applicable.

1.2 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.
- B. Comply with latest FPL Commercial/Industrial Energy Conservation Program Standards, if FPL is the available utility company.
- C. A maximum of 3 helpers to 1 journeyman are allowed according to Metropolitan Dade County.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

## SECTION 16100

### BASIC MATERIALS AND METHODS

#### PART 1 GENERAL

##### 1.1 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, aqua stats, 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. Seal penetrations through fire rated floors or walls with fire resistant compound as specified in electrical plans.
6. Connect electrical equipment and devices as parts of the equipment or furniture furnished under other sections.
7. Comply with provisions of Instructions to Bidders and General Conditions.

###### B. Tradesperson Qualifications:

1. Contractor shall provide or cause to be provided by the appropriate subcontractors in the electrical trade for all work required by this Division 16, a ratio of one licensed master or journeyman for every three trainees at all times as those terms are defined by Chapter 10 of the Miami-Dade County Code. No other workers shall be allowed.



2. Where the work of these trades is subcontracted:
  - a. The contractor shall include this requirement in those subcontracts.
  - b. The subcontractor shall show capacity to bond the subcontracted work. The decision to require such bond to be issued remains with the general contractor.
- C. To ensure compliance with the above tradesperson qualifications requirement, the General Contractor shall require the trade subcontractor to submit with each draw request, and shall in turn submit with the General Contractor's draw request, a certified payroll identifying each tradesperson employed for the work of this section during the payroll period, the qualification level of each tradesperson, and where licensed as a Master or Journeyman the license number of each individual.
  1. This certified payroll shall also reflect the number of hours spent on this project performing the work of this section and shall reflect the appropriate ratio of qualified tradespersons as required by this section.
  2. Failure to comply with this section either in providing the appropriate number of required licensed personnel or failure to submit the appropriate certified payroll information as required herein shall be a major breach of the contract and shall result in rejection of the payment application where the breach occurs and be cause for termination of the contract.

## 1.2 SUBMITTALS

- A. Manufacturer's 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. Record Drawings.
  2. Warranties.
  3. Operating Instructions, maintenance manuals, and parts lists.
  4. Point-to-point wiring diagrams.

1.3 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 A/E.

B. Replacement: In case of damage, pilferage, or other loss, make immediate repair or replacement of materials necessary to obtain approvals of A/E, without cost to the Board.

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

END OF SECTION

**SECTION 16112**  
**RACEWAYS AND CONDUIT**

**PART 1 GENERAL**

**1.1 SUMMARY**

**A. Related Sections:**

1. 16120 - Wire and Cable.
2. 16131 - Outlet, Pull, and Junction Boxes.

**1.2 DEFINITIONS**

- A. Refer to NEMA Standard VE 1 for definitions of cable tray terminology used in this section.

**1.3 SYSTEM DESCRIPTION**

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

**1.4 SUBMITTALS**

- A. Product Data: Manufacturer's literature including printed installation instructions and recommendations before starting work. Submit samples if requested.

**B. Shop Drawings:**

1. Layout floor plans and elevations showing cable tray system.
2. Designate components and accessories for cable trays including clamps, brackets, hanger rods, splice plates connectors, expansion joint assemblies, straight lengths, and fittings.
3. Show accurately scaled components and spatial relationships to adjacent equipment. Show cable tray types, dimensions, and finishes.

- C. Quality Control Submittal: Certified copies of factory test reports performed according to NEMA Standard VE 1 on cable trays of types and size specified for this project.

**1.5 QUALITY ASSURANCE**

- A. UL and NEMA Compliance: Cable trays and components shall be listed and labeled by UL. Comply with NEMA Standard VE 1, "Cable Tray Systems".
- B. Electrical Component Standard: Components and installation shall comply with NFPA 70 - National Electrical Code - 2014 (NEC).

- C. Single-Source Responsibility: Cable tray components shall be the products of a single manufacturer.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

#### A. Cable Tray Manufacturers:

1. B-Line Systems, Inc.
2. The George-Ingraham Corp.
3. GS Metals Corp.
4. Square D Co.

#### B. Fibrated Emulsion Conduit Coatings:

1. Karnak Chemical Corp., 220 Fibrated Emulsion.
2. Monsey Products Co., Monsey Asphalt Emulsion Roof Coating Fiber.
3. Sonneborn Building Products, Hydrocide 700B.

### 2.2 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. Rigid Conduit:

1. Galvanized Rigid Steel Conduit (GRS): Hot dip galvanized or electro-galvanized, with corrosion resistant coating on the inside, threaded, standard weight steel conduit complying with ANSI C80.1-1990, and Article 346 of the NEC.
2. Intermediate Metal Conduit (IMC): Hot dip galvanized or electro-galvanized, threaded, steel conduit complying with ANSI C80.6-1986 and Article 345 of the NEC.
3. Rigid Non-Metallic: Schedule 40, PVC plastic 90 degrees C. complying with ANSI/UL 651-1989, and Article 347 of the NEC.

#### C. 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.

D. 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.

E. Conduit Fittings:

1. Rigid Steel Conduit and Intermediate Metal Conduit: Zinc or cadmium plated steel or galvanized malleable iron complying with ANSI C80.1 and C80.3. Fittings shall be threaded type. Die cast zinc alloy fittings are not allowed.
2. Rigid PVC conduit: 90 degrees C., PVC fittings UL listed. Fittings shall match conduit and complying with ANSI/UL 651-1989.
3. 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.
4. 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.
5. 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.
6. Expansion Fittings and Sealing Fittings: UL listed with ground continuity means.

F. 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 equivalent to Unistrut P-3000 Series. 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.

G. Conduit Coatings: Steel conduit buried directly in the earth shall receive a factory applied PVC coating or 2 coats of fibrated emulsion conduit coating. Comply with

manufacturer's application recommendations.

H. Surface Raceways: Only where specifically indicated. UL listed and comply with Fed.Spec.W-C-582, and Articles 352 and 353 of the NEC.

1. Manufacturers:

- a. Walker, Division of Butler Manufacturing Co.
- b. Wiremold.

2. Pull Wires: Galvanized steel or nylon rope of sufficient strength to pull in the maximum size conductors through trade size conduit. Minimum strength shall be 200 lbs.

I. 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.

Exterior locations shall have weather tight gasketed covers, joints, and drip-proof rain shields. Paint after installation with exterior enamel paint.

2. Wireways and gutters shall comply with Articles 362 and 374 of the NEC.

## PART 3 EXECUTION

### 3.1 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.

### 3.2 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 rigid conduit, 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 Board.
- 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 Board.
  - 1. Exterior Raceways:
    - a. Below Grade:
      - 1) Below Grade Direct Buried:
        - a) Galvanized rigid steel (GRS), painted or PVC jacketed.
        - b) PVC Schedule 40, as noted on plans.
      - 2) Below Grade Concrete Encased:
        - a) GRS.
        - b) PVC Schedule 40.
    - b. Exterior Exposed:
      - 1) GRS conduit.
      - 2) IMC conduit.

- 3) PVC flexible conduit, PVC jacketed with liquid tight fittings.
  - 4) Gutters, wireways, and troughs of the gasketed, rain tight type.
2. Interior Raceways:
- a. Under Slabs on Grade:
    - 1) GRS (painted or PVC coated).
    - 2) PVC Schedule 40, with 12 inches clear to bottom of slab.
  - b. Embedded in Concrete Walls or Floor On or Below Grade: PVC or GRS with threaded or concrete tight steel fittings.
  - c. Embedded in Concrete Walls or Floors Above Grade:
    - 1) PVC Schedule 40.
    - 2) GRS or IMC with threaded or concrete tight steel fittings.
    - 3) EMT with concrete tight steel fittings.
  - d. Concealed in Masonry Walls:
    - 1) GRS or IMC with steel fittings.
    - 2) EMT with concrete tight fittings.
  - e. Concealed in dry wall construction, or in suspended ceilings: EMT or flexible metal conduit with steel fittings.
  - f. Interior Exposed:
    - 1) GRS or IMC at 8 feet or less above finish floor.
    - 2) EMT with steel fittings more than 8 feet above finish floor.
    - 3) Option: EMT installed below 8 feet from floor in electrical, mechanical, and telephone rooms.
3. Sealing fittings shall be installed at the following points and as otherwise indicated:
- a. Where conduits enter or leave hazardous areas and enclosures for explosion-proof lighting fixtures, switches, receptacles, etc., use sealing compounds according to NEC to be of a type approved for the conduits.
  - b. Where conduits pass from warm locations to cold locations, such as refrigerated spaces and air conditioned spaces use to prevent passage of water vapor.
  - c. Where required by the NEC.
4. PVC conduit shall not be used indoors either exposed or concealed, except embedded in concrete or under slabs on grade.



- a. The depth of conduits under interior slabs shall be based on the minimum allowable bending radii of stub-ups.
- b. Stub-ups on exterior and exterior walls shall be GRS, with transitions from PVC to GRS occurring below grade. Curves to stub-ups shall be GRS.

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 Board, and shall be subject to A/E 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 A/E to determine the type of construction containing the concealed conduits and the space available for such conduits.
- d. Unless otherwise shown on the Drawings, conduit may be run exposed on unfinished walls, on unfurred basement ceilings, in mechanical rooms and in penthouses, attics, and roof spaces.

3. Roof Conduit:

- a. Avoid running conduit on the roof wherever possible.
- b. If absolutely necessary, roof mounted conduit shall be GRS or IMC, a minimum of 16 inches above roof on galvanized steel struts, securely

supported, horizontally and vertically with pitch pans as required, on supports and conduit penetrations.

4. Conduits Penetrating Waterproof Membranes Under Floor Slabs on Grade:
  - a. Coordinate installation of conduits before installation of waterproof membrane.
  - b. Membrane to be sealed waterproof to conduits as specified in Section 07120 before pouring of slab over membrane.
  - c. Provide Schedule 40 galvanized steel pipe sleeves for conduits penetrating floor slabs as specified in Section 01043.
5. Conduits Penetrating Waterproof Membranes on Walls: Provide properly coordinated Schedule 40 galvanized steel pipe sleeves for conduits in concrete forms as specified in Section 05500. Membrane to be sealed waterproof to conduits as specified in Section 01043.
6. Conduit Embedded in Concrete:
  - a. Conduit embedded in poured concrete shall be of the specified type, unless otherwise indicated.
  - b. EMT shall not be installed underground, in slabs on grade, in wet locations, in hazardous areas, or for circuits operating at more than 600 volts.
  - c. Metallic conduit buried in the ground shall be of the specified type.
  - d. The outside diameter of any conduit buried in concrete shall not exceed one-third of the thickness of the structural slab, wall or beam in which it is placed. The conduit shall be located entirely within the middle third of the member whenever possible.
  - e. Lateral spacing of conduits buried in concrete slabs shall be not less than three diameters except where drawings indicate the concrete slab has been specially designed to accommodate a closer spacing of conduits entering signal or electric closets, panelboards, etc., or the arrangement is accepted by the A/E.
  - f. In general, conduits shall not be run through beams, except where clearly indicated on Drawings, specified, or where allowed by the A/E.
  - g. No vertical conduit passing through horizontal concrete beams shall interfere with reinforcing. Where accepted by the A/E, horizontal conduit may pass through beams, provided they are not closer than 6 inches clear and are confined to upper half of beam section.
  - h. Properly support conduit to be embedded to maintain correct location and spacing during concreting operations. If necessary, provide suitable metal supports for this purpose.
  - i. Where a concrete embedded conduit passes through an expansion or contraction joint in the structure, install the conduit at right angles to the joint, and provide an approved conduit expansion fitting at the joint

installed according to the manufacturer's instructions. Paint the conduit with an approved bituminous compound for 1 foot on either side of the expansion joint.

- j. Conduits concealed in slabs on grade shall be installed over vapor barrier. Underground rigid conduit not encased in concrete shall receive the specified conduit coating.
- k. Factory applied plastic resin or epoxy coated metal conduit and fittings may be used, provided that coating holidays and abrasions to coating are repaired with compatible mastic.
- l. At any 1 point, not more than 2 lines of conduits shall intersect in any portion of slab.
  - 1) In all such cases, any additional conduit shall be rerouted through other areas, or run under the slab and stubbed through the slab at the required locations.
  - 2) Conduits and pipes shall have a minimum cover of 1 inch of concrete.
  - 3) Do not install conduit in slabs 3 inches thick or less.
  - 4) Under no conditions shall aluminum conduit be buried in concrete slabs.
  - 5) Slab installed conduit shall be stubbed within webbing of block and shall be extended vertically concurrently with laying of block.
  - 6) Determine centerline of block partitions measured from column centerlines.

7. 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 conduit 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 other accepted 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 lodgement 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.
8. 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 rigid conduit, an additional locknut shall be provided, 1 inside locknut and 1 outside locknut.
    - 2) In EMT or flexible metal conduit, the 1 locknut shall be made wrench-tight.
    - 3) 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.
    - 4) Locknuts and bushings or self-locking adapters will not be required where conduits are screwed into tapped connections.
    - 5) 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. Plastic conduit joints shall be made by brushing a plastic solvent cement on the inside of the plastic coupling fitting and on the outside of the conduit ends. Slip together the conduit and fitting, until seated, with a slight twist to set the joint tightly, and the conduit then rotated one-half

turn to distribute the cement evenly. Remove excess cement built-up on the surface of the conduit.

- c. 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.
- d. 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.
- e. Install conduit to drain any moisture, collecting in the conduit, to the nearest outlet or pull box, where possible.
- f. Where metallic conduit is exposed to different temperatures, seal the conduit to prevent condensation and passage of air from one area to the other.
- g. 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. Ground cable trays to the conduit system.

9. 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, as specified in Section 07270.
- c. Roof penetrations shall be made using approved flashings and counter flashings. Do not penetrate cant strips or expansion joint covers with conduits. Do not run conduits up through roof nearer than 12 inches from toe of cant strip. Where conduits penetrate exterior walls near flashings, penetration shall be at least 3 inches above the flashing reglet.
- d. 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.
- e. Where unused sleeves or slots are provided for future installation of conduit, etc., they shall be suitably identified if not readily recognizable.

- f. 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. Run conduits exposed in unfinished spaces, mechanical equipment spaces, where specifically indicated on the Drawings, or with the expressed permission of the A/E.
- 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) Wood hangers and perforated sheet metal hanger straps are not allowed.
  - 5) Spacing of conduit supports shall not exceed 7 feet.
  - 6) Horizontal feeder conduit banks shall have their hangers fastened to the building structure by approved means.
  - 7) Hangers for banks consisting of 1 or 2 conduits may be fastened from inserts in the slab.
  - 8) 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 A/E and the Contractor.
  - 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.

10. Fittings:

- a. Expansion Fittings: Each buried conduit in or rigidly secured to the building construction on opposite sides of a building expansion joint and each long run of exposed conduit that may be subject to excessive stresses shall be provided with an expansion fitting. Expansion fittings shall be made of hot dip galvanized malleable iron and shall have a factory installed packing that will prevent the entrance of water, a pressure ring and a grounding ring.
- b. In addition to the grounding ring, a separate external copper bonding jumper secured by grounding straps on each end of the fitting shall be provided.
- c. Sealing Fittings: Sealing fittings for use with rigid steel conduits shall be of the threaded, zinc or cadmium coated, cast or malleable iron type. Fittings used to prevent passage of water vapor shall be of the continuous drain type.
- d. Sealing fittings shall be installed and sealed according to the manufacturer's recommendations at suitable, approved, accessible locations. In concealed work, each fitting shall have an access door or panel to allow access to the fitting.
- e. Compression fittings shall be made up tight according to manufacturer's recommendations. No screw type fittings are allowed.

11. Conduit Fastening: Fasten raceways as follows:

- a. To Wood: Wood screws, sheet metal screws, or screw type nails.
- b. To Hollow Masonry: Toggle bolts or expansion bolts as required. Holes not used to be filled.
- c. To Concrete or Solid Brick Masonry: By expansion bolts. Holes drilled to a depth of more than 1-1/2".
- d. To Steel Work: Machine screws, welded threaded studs, or spring-tension clamps. Raceways or pipe straps shall not be welded to steel structures.
- e. 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.
- f. Nail-type nylon anchors with lock washers and nuts may be used instead of expansion bolts or machine screws.
- g. Explosive charge setting devices are not allowed for any type of fastening on the project.
- h. Conduits, tubing, or raceways shall be continuous from outlet to outlet, cabinet, junction box, or pull box.
- i. Surface Wireways and Auxiliary Gutters: Fasten according to manufacturer's directions with fastenings appropriate for surface as specified.
- j. Cable Supports in Vertical Raceways: According to NEC Article 300-19.

12. 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) Exterior locations.
  - 2) Moisture or humidity laden atmosphere where it is possible for condensation to accumulate.
  - 3) Corrosive atmospheres.
  - 4) Where water or spray due to wash-down operations is frequent or possible.
  - 5) 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.

13. Surface Raceways:



- a. Surface metal raceways shall be used where noted on Drawings. Surface metal raceways shall be securely grounded to outlet boxes or to back-plates and fixtures by means of bolts, screws, or other approved means. Ends of raceways shall be provided with bushings at entrances to boxes or canopies. A separate green ground conductor shall be installed in the raceway from the junction box supplying the raceway to receptacle or fixture ground terminals.
  - b. Fasten surface raceways to surface in manner similar to methods specified.
  - c. Each surface metal raceway outlet box with an attached lighting fixture shall be of sufficient diameter to provide a seat for the fixture canopy.
  - d. Where a surface metal raceway is used to supply a fluorescent lighting fixture having central stem suspension with a back plate and a canopy, with or without extension ring, the backplate and canopy will serve as the outlet box and no separate outlet box need be provided.
  - e. A surface metal raceway outlet box shall be provided, in addition to the backplate and canopy, at the feed-in location of each fluorescent lighting fixture having end stem suspension.
  - f. Where a surface metal raceway extension is made from an existing outlet box on which a lighting fixture is installed, a backplate slightly smaller than the fixture canopy shall be provided and no additional surface mounted outlet box need be installed.
14. 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.
15. Painting: Paint exposed conduit to match the surrounding wall or ceiling it is mounted against according to Section 09900 Painting.

### 3.3 FIELD QUALITY CONTROL

- A. Grounding: Test cable trays to ensure electrical continuity of bonding and grounding connections.

3.4 ADJUSTING AND CLEANING

- A. Upon completion of installation of cable trays, inspect trays, fittings, and accessories, remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, and abrasions.

END OF SECTION

**SECTION 16120**  
**WIRE AND CABLE**

**PART 1 GENERAL**

**1.1 SUMMARY**

**A. Related Sections:**

1. 16112 - Raceways and Conduit.

**1.2 SYSTEM DESCRIPTION**

- A. Performance Requirements:** Materials shall bear Underwriters Laboratories (UL) labels.

**1.3 SUBMITTALS**

- A. Submit product data and descriptive literature before starting work.**

**PART 2 PRODUCTS**

**2.1 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 Board.
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 may be stranded in sizes No.10 AWG and smaller, and concentric strand Class B for conductors No.8 AWG and larger.
2. Stranded copper conductors may be used for final connections to individual recessed lighting fixtures, devices, and for control and signal circuit wiring only

with crimp-on type terminations.

3. Do not use stranded wire for wiring to receptacles, unless insulated crimp-on connectors are installed on the wiring ends.

C. Wiring Insulation shall be as follows:

1. For Feeders and Motor and Equipment Power Circuits: Type THW-75 degrees C., XHHW-75 degrees C., or THWN-75 degrees C. in wet or dry locations, and THHN-90 degrees C. or XHHW-90 degrees C. only at dry locations.
2. For Branch Circuit Wiring for Lighting and Power Circuits: Type THW-75 degrees C., 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, THW, THWN, or THHN. Sizes larger than No.8 may be factory color coded or color coded with 3M tape or accepted equivalent. 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 - Brown  
Phase B - Red  
Phase C - Blue  
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 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".
3. For No.8 AWG and Larger: T&B "Locktite" connectors, Burndy "Versitap" connectors, or OZ-Gedney 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.
6. Cable Ties: T&B "Ty-Rap" or Burndy "Unirap".
7. Cable Identification: Branch circuits wire markers 3M "Scotch Code" or accepted equivalent. For feeder sizes, non-ferrous metal stencil tags.
8. Thermal Fusion Connections: "Catalytic thermal weld" by Cadweld or accepted equivalent.

## 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. 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.

END OF SECTION



**APENDIX – A**  
**EV- CHARGER**  
**LC-RENO-23-R1**

## **CT4000 Level 2 Commercial Charger, dual port, bollard set up by ChargePoint**

### ***Public Facing EV Charger:***

- Connector Type: Each DCFC charging port must be capable of charging any CCS-compliant vehicle and each DCFC charging port must have at least one permanently attached CCS Type 1 connector. Each AC Level 2 charging port must have a permanently attached J1772 connector and must charge any J1772-compliant vehicle.
- Power Level: DCFC charging ports must support output voltages between 250 volts DC and 920 volts DC. Each AC Level 2 charging port must have a continuous power delivery rating of at least 6 kW and the charging station must be capable of providing at least 6 kW per port simultaneously across all AC ports.
- Availability. must be available for use and accessible to the public at least as frequently as the business operating hours of the site host.
- Payment Methods/Customer Service.
  - shall include a contactless payment method that accepts major debit and credit cards, and either an automated toll-free phone number or a short message/messaging system (SMS) that provides the EV charging customer with the option to initiate a charging session and submit payment.
  - Not require a membership for use.
  - Not delay, limit, or curtail power flow to vehicles based on payment method or membership; and
  - Provide access for users that are limited English proficient, specifically including Spanish and Haitian Creole, and accessibility for people with disabilities. Automated toll-free phone numbers and SMS payment options must clearly identify payment access for these populations.
  - ensure that EV charging customers have mechanisms to report outages, malfunctions, and other issues with charging infrastructure.
- Equipment Certification. DCFC shall be certified by an Occupational Safety and Health Administration Nationally Recognized Testing Laboratory. All AC Level 2 chargers shall be ENERGY STAR certified; certification for DCFC is encouraged. DCFC and AC Level 2 chargers should be certified to the appropriate Underwriters Laboratories (UL) standards for EV charging system equipment.
- Customer Data Privacy. Charging station operators must collect, process, and retain only that personal information strictly necessary to provide the charging service to a consumer, including information to complete the charging transaction and to provide the location of charging stations to the consumer. Chargers and charging networks should be compliant with appropriate Payment Card Industry Data Security Standards (PCI DSS) for the processing, transmission, and storage of cardholder data. Charging Station Operators must also take reasonable measures to safeguard consumer data.
- Interoperability of electric vehicle charging infrastructure.
  - Charger-to-EV Communication. Chargers must conform to ISO 15118-3 and must have hardware capable of implementing both ISO 15118-2 and ISO 15118-20. Charger software must conform to ISO 15118-2 and be capable of Plug and Charge. Conformance testing for charger software and hardware should follow ISO 15118-4 and ISO 15118-5, respectively.
  - Charger-to-Charger-Network Communication. Chargers must conform to Open Charge Point Protocol (OCPP) 1.6J or higher. Chargers must conform to OCPP 2.0.1.
  - Charging-Network-to-Charging-Network Communication. Charging networks must be capable of communicating with other charging networks in accordance with

Open Charge Point Interface (OCPI) 2.2.1. Charger locations must also be reported to the United States Department of Energy Alternative Fuels Data Center.

- Network Switching Capability. Chargers must be designed to securely switch charging network providers without any changes to hardware.
- Communication of Price. The price for charging must be displayed prior to initiating a charging transaction and be based on the price for electricity to charge in \$/kWh. Any other fees in addition to the price for electricity to charge must be clearly displayed and explained. The price for charging displayed and communicated via the charging network must be the real-time price (i.e., price at that moment in time). The price at the start of the session cannot change during the session.
- Minimum Uptime. Each charging port must have an average annual uptime of greater than 97%.
- Should include supplementary battery storage and solar energy systems, where practical.
- EV charging stations must comply with applicable accessibility standards adopted by the Department of Transportation into its ADA regulations (49 CFR part 37) in 2006, and adopted by the Department of Justice into its ADA regulations (28 CFR parts 35 and 36) in 2010 Miami-Dade County retains authority to approve the Vendor's rate structure.
- Contractor must design the required loads and provide a separate feeder and meter for the EV charging station. The contractor is responsible for the design and engineering, coordination, installation, payment and providing the required documents for this work with FPL. All costs associated must be included in the line item and no additional compensation will be provided for this work.
- All work must comply with the current FBC, NFPA, NEC, OSHA, and all applicable codes.
- The charging station system must be expandable for future EV charger installation.
- Selected manufacturer must include a 5-year service contract with the specific bid line item.
- Contractors must submit a substitution form during the bid process and get approval before submitting the bid form. All the requirements as stipulated in the substitution section.

The basis of the design is ChargePoint CT4000 Level 2 Commercial Charger, dual port, bollard set up; however, Contractors have the option to submit a substitution during the bid process as follows:

1. For convenience in designation in the Contract Documents, certain materials, articles, or equipment may be designated by a brand or a trade name or the name of the manufacturer, together with catalog designation or other identifying information. When Contract Documents specifically disallow substitution, the specified product shall be provided. Alternative material, article, or equipment that is of equal quality and of the required characteristics for the purpose intended may be proposed for use. The Contractor shall submit a substitution request during the bidding period in order not to impair the project schedule.

2. No request for substitution will be considered unless accompanied by complete information and descriptive data necessary to determine the quality of the proposed materials, articles, or equipment. Samples shall be provided when requested by the Owner. The burden of proof as to the comparative quality or suitability of the proposed materials, articles or equipment shall be upon the Contractor. The Owner's decision in such matters shall be final. If the Owner rejects the use of such substitute materials, articles, or equipment, then one of the products designated by brand name shall be provided.

3. The Owner will examine and review the Substitution request and select the bidder accordingly. If the final decision accepts either an equal or a substitution, the acceptance must

also contain the Owner's written acceptance. When requested by the Owner, the Contractor shall resubmit such Design Drawings, Specifications, Shop Drawings, descriptive data, and samples as may be required.

4. If any mechanical, electrical, structural, or other changes are required for the proper installation and fit of alternative materials, articles, or equipment, or because of deviations from the Contract Documents such changes shall be shown in the substitution request and such changes shall be made without additional cost to the Owner.

5. Acceptance on another project, by the Owner, of a product other than that specified for this Project does not constitute evidence of its equality with the product specified, or its suitability for this Project.

6. Contractor must use the enclosed form to submit the substitution during the bid process and before the bid price submittal. No substitution will be accepted after the contract is awarded.

## Substitution Form

Project Name: \_\_\_\_\_  
Project Number: \_\_\_\_\_ Equipment cost: \_\_\_\_\_

Product Substitution Request \_\_\_\_\_

Product: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_  
Model: \_\_\_\_\_

Substitution for: \_\_\_\_\_

Product: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_  
Model: \_\_\_\_\_

Provide a complete information and descriptive data necessary to determine the quality of the proposed materials, articles, or equipment. Include drawings, specifications, product year's in the market and performance data.

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If any mechanical, electrical, structural, or other changes are required for the proper installation and fit of alternative materials, articles, or equipment, or because of deviations from the Contract Documents such changes shall be shown in the substitution request and such changes shall be made without additional cost to the Owner.

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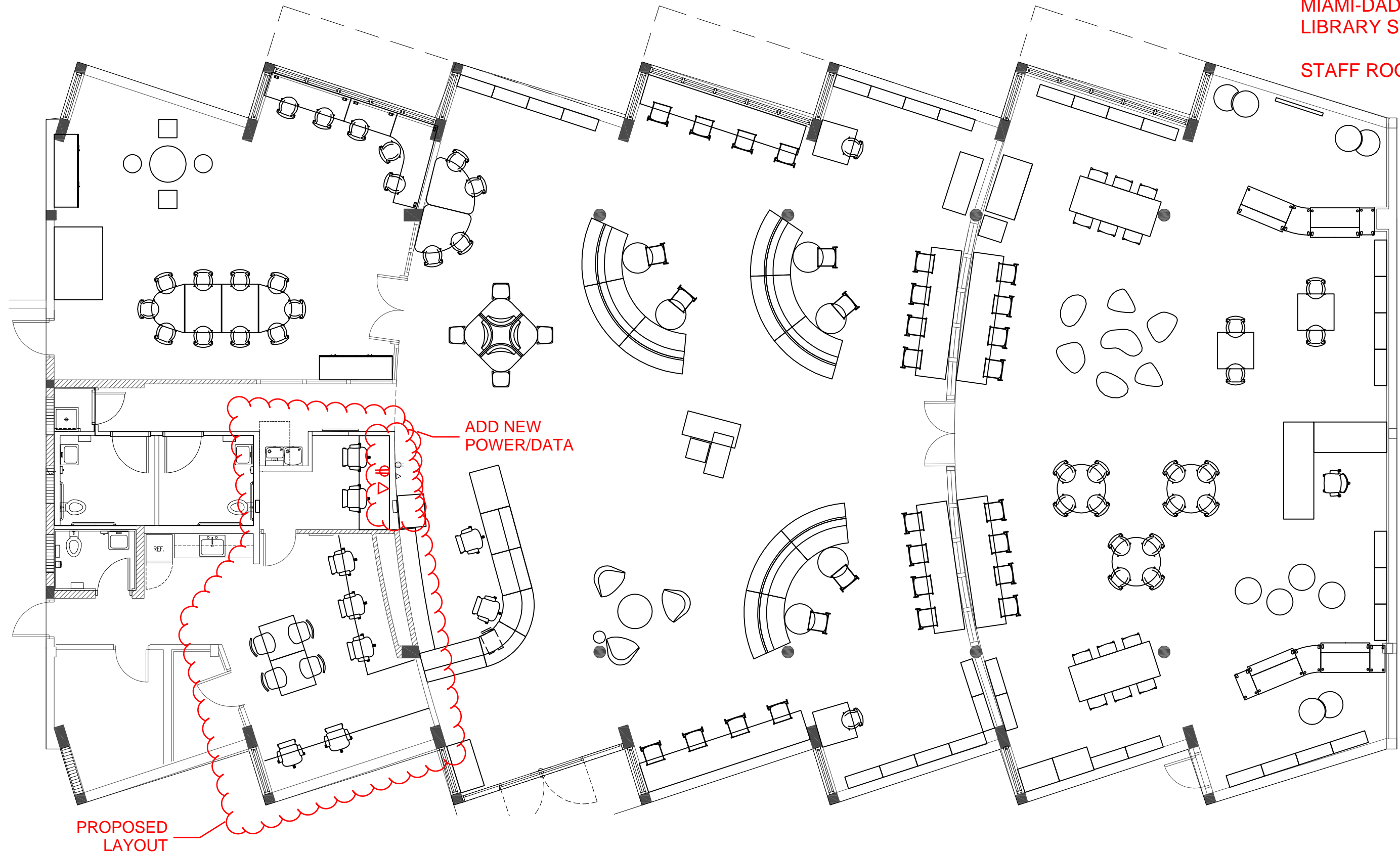
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The burden of proof as to the comparative quality or suitability of the proposed materials, articles or equipment shall be upon the Contractor. The Owner's decision in such matters shall be final. In the event that the Owner rejects the use of such substitute materials, articles, or equipment, then one of the particular products designated by brand name shall be provided.

Acceptance on another project, by the Owner, of a product other than that specified for this Project does not constitute evidence of its equality with the product specified, or its suitability for this Project.

Product Warranty (years): _____  Service Information: _____ _____ _____	Product Substitution form submitted by: _____ Contractor Name _____ Company Name _____ Submittal date
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**APENDIX – B**  
**SKETCHES**  
**LC-RENO-23-R1**



PROPOSED  
LAYOUT

ADD NEW  
POWER/DATA

# Lemon City Library

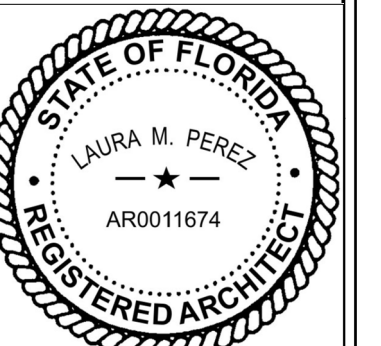
Revised Workstations 10.16.23

12/12/2023

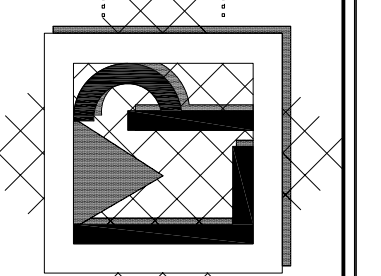
MIAMI-DADE PUBLIC LIBRARY SYSTEM

RESTROOM SKETCH SK-2

date	4-26-2021
scale	AS SHOWN
drawn	
job	
file	
revisions	
REV.	OWNER REV. - 05/05/2023



**LAURA M. PEREZ & ASSOCIATES, INC.**  
 ARCHITECTS - PLANNERS - INTERIOR DESIGNERS  
 LIC. AA C001864  
 2401 N.W. 7th STREET MIAMI, FLORIDA 33125  
 PH: 305-642-9494 FAX: 305-642-0889 E-MAIL: lmp@lmpic.com



**LEMON CITY BRANCH LIBRARY**  
 ADA RENOVATION  
 430 NE 61st STREET  
 MIAMI FL, 33137

FF&E FLOOR PLAN (N.I.C)

sheet  
**A-1.2**  
 NEW SHEET

**NOTE:**  
 Contractor to buy and install all kitchenette accessories/appliances and restroom plumbing fixtures and accessories

**Staff Lounge -**  
 •Fridge/microwave specs

- Fridge: Frigidaire - 10.1 Cu. Ft. Top-Freezer Refrigerator - Brushed Steel Model:FFET1022UV
- Microwave – Kitchenaid Model:KMCS3022GSS

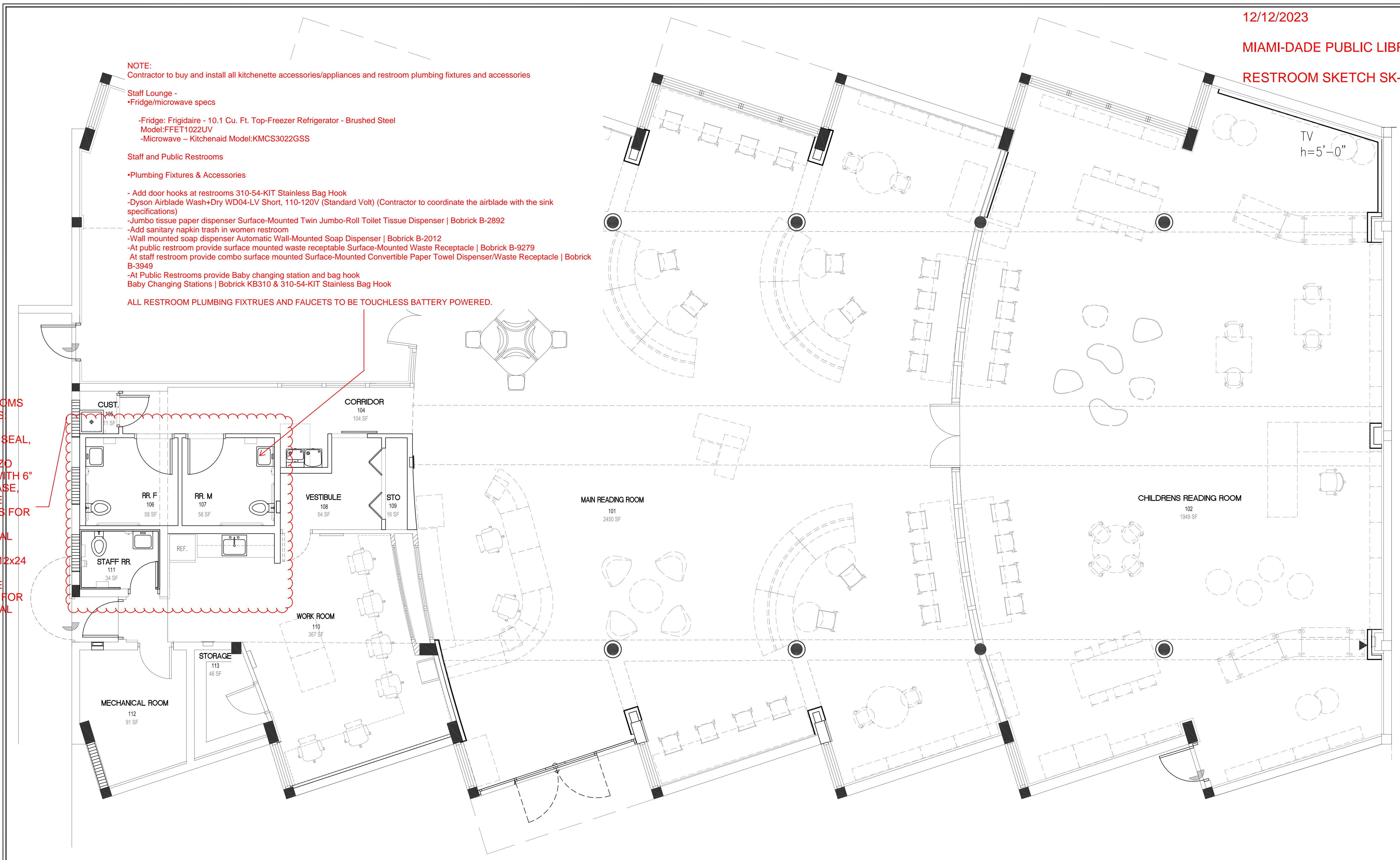
**Staff and Public Restrooms**

•Plumbing Fixtures & Accessories

- Add door hooks at restrooms 310-54-KIT Stainless Bag Hook
- Dyson Airblade Wash+Dry WD04-LV Short, 110-120V (Standard Volt) (Contractor to coordinate the airblade with the sink specifications)
- Jumbo tissue paper dispenser Surface-Mounted Twin Jumbo-Roll Toilet Tissue Dispenser | Bobrick B-2892
- Add sanitary napkin trash in women restroom
- Wall mounted soap dispenser Automatic Wall-Mounted Soap Dispenser | Bobrick B-2012
- At public restroom provide surface mounted waste receptacle Surface-Mounted Waste Receptacle | Bobrick B-9279
- At staff restroom provide combo surface mounted Surface-Mounted Convertible Paper Towel Dispenser/Waste Receptacle | Bobrick B-3949
- At Public Restrooms provide Baby changing station and bag hook
- Baby Changing Stations | Bobrick KB310 & 310-54-KIT Stainless Bag Hook

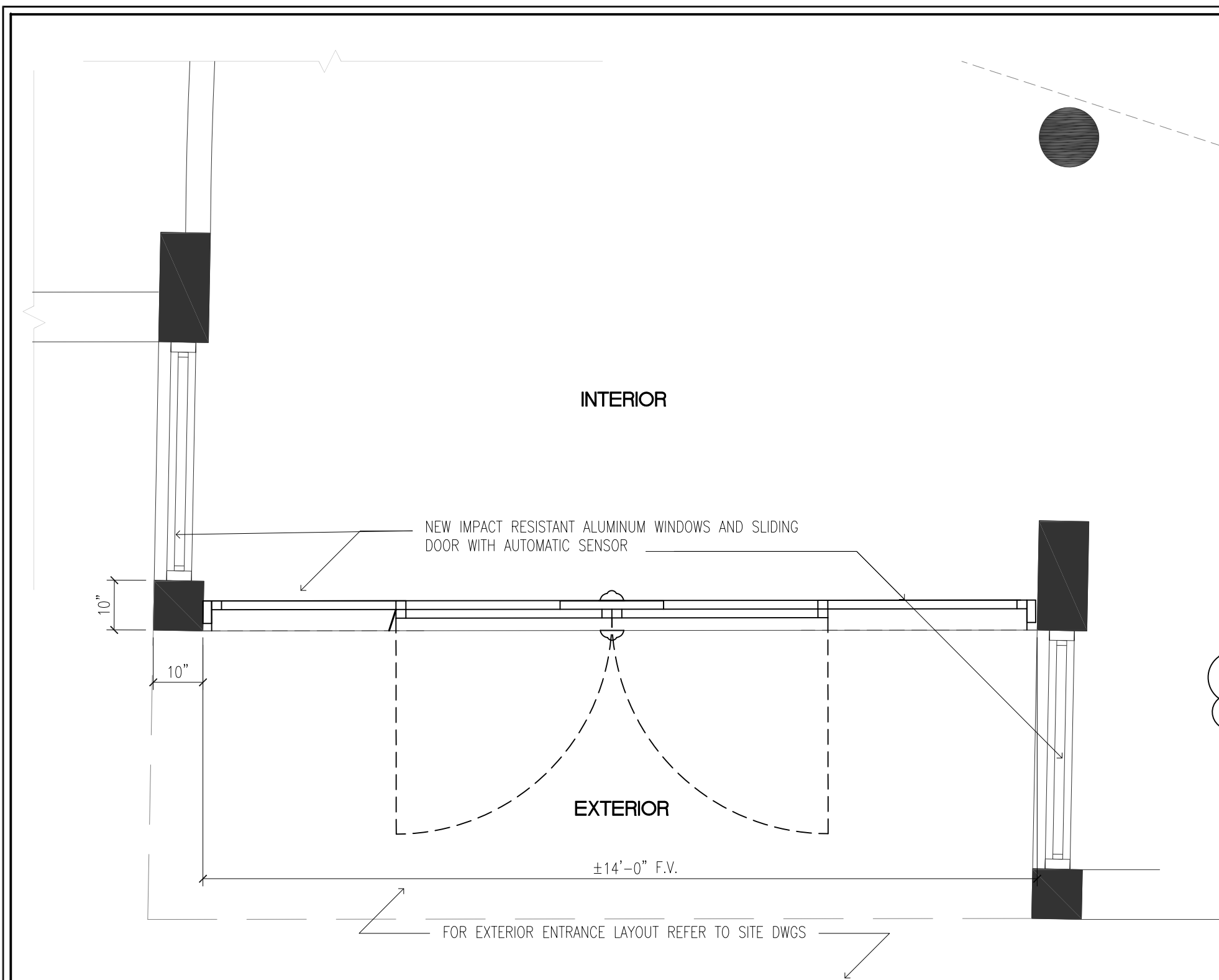
ALL RESTROOM PLUMBING FIXTURES AND FAUCETS TO BE TOUCHLESS BATTERY POWERED.

**RESTROOMS FINISHES:**  
 FLOOR - SEAL, HONED, TERRAZZO FINISH WITH 6" COVE BASE. PROVIDE SAMPLES FOR COLOR APPROVAL  
 WALLS- 12x24 TILE PROVIDE SAMPLE FOR APPROVAL



**FF&E FLOOR PLAN**  
 N.I.C SCALE: 1/4"=1'-0"





**B ENLARGED FLOOR PLAN**  
STOREFRONT SCALE: 1/2"=1'-0"

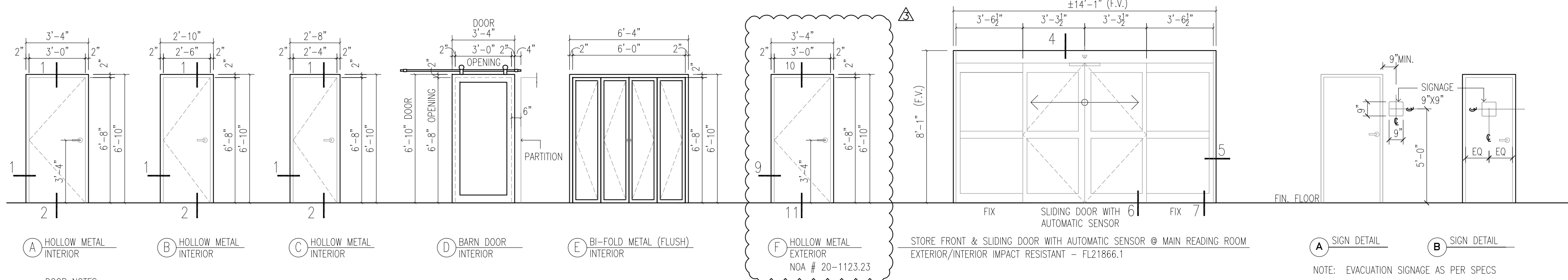
BARN-DOOR SPECIFICATIONS, SUBMIT SHOP DWG AS FOLLOWS:  
PROVIDE INDUSTRIAL BARN-DOOR AND HARDWARE BY RUSTICA AND/OR APPROVED EQUAL

- SYSTEM:** STANDARD  
**FINISH:** DOOR "SUPER WHITE" FINISH  
ALL HARDWARE "BRUSHED SS OR ALUMINUM"  
**TRACK:** 3'-4" MIN - FLAT TRACK WITH PRE DRILLED HOLES  
**DOOR:** FULL - 1'-3/4" D X 6'-10" H X 3'-4" W  
SUPER WHITE FINISH  
**DOOR GUIDE:** FLOOR MOUNT ADJ U CHANNEL "BRUSHED SS OR ALUMINUM"  
**SOFT CLOSE:** PROVIDE SOFT CLOSE  
**STOP:** STANDARD "BRUSHED SS OR ALUMINUM"  
**HANDLE:** CONCORD, FRONT AND BACK 14" "BRUSHED SS OR ALUMINUM"

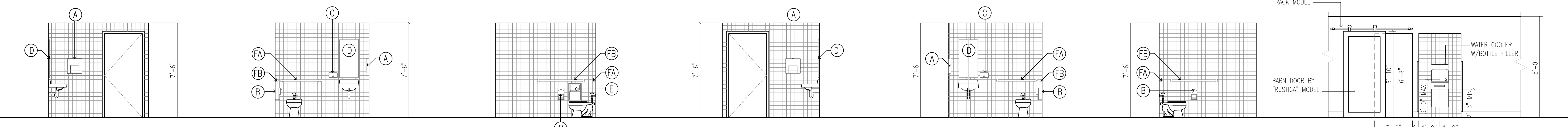
ROOM FINISH SCHEDULE															
RM No.	ROOM NAME	SF	FLOOR BASE		WALLS								CEILING		NOTES
			NORTH MAT.	EAST FINISH	NORTH MAT.	EAST FINISH	SOUTH MAT.	SOUTH FINISH	WEST MAT.	WEST FINISH	MAT.	FINISH	HEIGHT		
	FEMALE R.R.		CT	CT	BB	CT	BB	CT	BB	CT	BB	CT	MRGYP	PT	+7'-6"
	MALE R.R.		CT	CT	BB	CT	BB	CT	BB	CT	BB	CT	MRGYP	PT	+7'-6"
	CUSTODIAL		CT	CT	BB	PT	ETR	PT	BB	PT	BB	CT	MRGYP	PT	+7'-6"
	WORK ROOM		ETR	RB	GYP	PT	GYP	PT	-	-	GYP	PT	TME	PT	TME
	CORRIDOR		RFT	RB	ETR	PT	ETR	PT	GYP	PT	GYP	PT	MRGYP	PT	+7'-6"/+8'-0"
	STAFF R.R.		CT	CT	BB	CT	CMJ	CT	CMJ	CT	CMJ	CT	MRGYP	PT	+7'-6"
	VESTIBULE		RFT	RB	GYP	PT	GYP	PT	ETR	PT	GYP	PT	GYP	PT	+8'-0"
	STORAGE		RFT	-	GYP	PT	GYP	PT	ETR	PT	GYP	PT	GYP	PT	+8'-0"

- GENERAL ABBREVIATIONS**
- ACT - ACOUSTICAL CEILING TILE
  - APL - ACOUSTICAL PLASTER
  - BB - BACKER BOARD
  - CT - CERAMIC TILE
  - CONC - CONCRETE
  - ETR - EXISTING TO REMAIN
  - HDWR - HARDWARE
  - GYP - HIGH IMPACT GYPSUM BOARD
  - VPL - VENEER PLASTER
  - CPL - CEMENT PLASTER
  - RB - RUBBER BASE
  - RFT - RESILIENT FLOOR TILE
  - CAR - CARPET
  - TME - TO MATCH EXISTING
  - PT - PAINT
- FLOOR FINISHES TO BE CLASS II, 0.22 WATTS/CM<sup>2</sup> OR GREATER.  
WALL & CEILING FINISHES AT ROOMS AND ENCLOSED SPACES TO BE CLASS C, FLAME SPREAD INDEX 76-200; SMOKE DEVELOPED INDEX 0-450  
WALL & CEILING FINISHES AT CORRIDORS TO BE CLASS B, FLAME SPREAD INDEX 26-75; SMOKE DEVELOPED INDEX 0-450

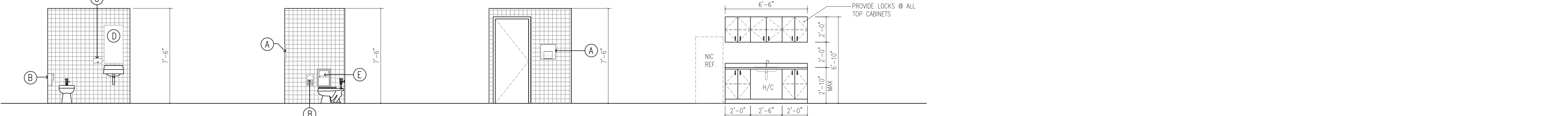
DOOR SCHEDULE																				
RM No.	ROOM NAME	No.	DOORS						FRAME						RATING	NOA	HDWR	NOTES		
			TYPE	WIDTH	HEIGHT	THK	MAT	GLZ	LOUVER	QUA	TYPE	WIDTH	HEIGHT	HEAD					JAMB	THRSH
107	MALE R.R.	01	A	3'-0"	6'-8"	1 3/4"	ST	-	-	1	5 3/4"X2"	3'-4"	6'-10"	1/A-4.0	1/A-4.0	2/A-4.0	-	-	1	SELF-CLOSING
106	FEMALE R.R.	02	A	3'-0"	6'-8"	1 3/4"	ST	-	-	1	5 3/4"X2"	3'-4"	6'-10"	1/A-4.0	1/A-4.0	2/A-4.0	-	-	1	SELF-CLOSING
105	CUSTODIAL	03	B	2'-6"	6'-8"	1 3/4"	ST	-	-	1	5 3/4"X2"	2'-10"	6'-10"	1/A-4.0	1/A-4.0	2/A-4.1	-	-	2	
111	STAFF RR.	04	C	2'-4"	6'-8"	1 3/4"	ST	-	-	1	5 3/4"X2"	2'-8"	6'-10"	1/A-4.1	1/A-4.0	2/A-4.2	-	-	1	SELF-CLOSING
108	VESTIBULE	05	D	3'-4"	6'-8"	-	ST	-	-	1	-	-	-	1/A-4.1	1/A-4.0	2/A-4.2	-	-	5	BARN DOOR
113	STORAGE	06	E	6'-0"	6'-8"	-	ST	-	-	1	-	-	6'-4"	6'-10"	-	-	-	-	4	BI-FOLD DOOR (METAL)
103	MULTI PURPOSE	07	F	3'-0"	6'-8"	1 3/4"	ST	-	-	1	6'X2"	3'-4"	6'-10"	10/ A-4.0	9/ A-4.0	11/ A-4.0	-	-	6	MAG SWITCH
110	WORK ROOM	08	F	3'-0"	6'-8"	1 3/4"	ST	-	-	1	6'X2"	3'-4"	6'-10"	10/ A-4.0	9/ A-4.0	11/ A-4.0	-	-	6	MAG SWITCH
102	ADULT READING	09	F	3'-0"	6'-8"	1 3/4"	ST	-	-	1	6'X2"	3'-4"	6'-10"	10/ A-4.0	9/ A-4.0	11/ A-4.0	-	-	6	MAG SWITCH



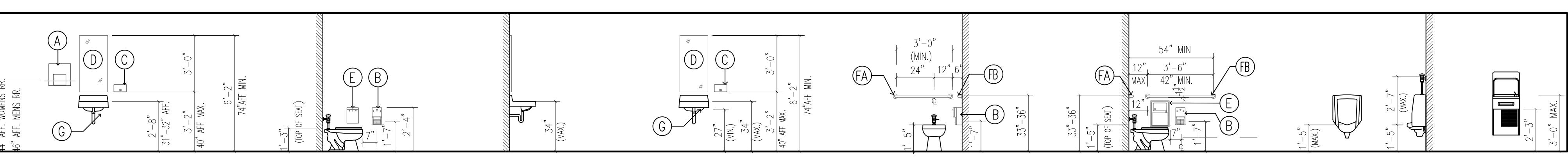
- DOOR NOTES:**
- INSTALLATION OF IMPACT RESISTANT DOORS SHALL BE AS PER MIAMI-DADE COUNTY PRODUCT CONTROL APPROVAL NOTICE OF ACCEPTANCE (NOA), OR FLORIDA PRODUCT APPROVAL.
  - NOA'S OR FLORIDA PRODUCT APPROVAL FROM ONE OF THE SPECIFIED MANUFACTURERS PRIOR TO COMMENCEMENT OF WORK WITH THE APPROVAL OF THE A/E OF RECORD.
  - VERIFY DOORS OPENINGS ON SITE PRIOR TO MANUFACTURING.
- FOR ALL DOOR DETAILS REFER TO SHEET A-4.0



**A INTERIOR ELEVATION** R.R. FEMALE SCALE: 1/4"=1'-0"  
**B INTERIOR ELEVATION** R.R. FEMALE SCALE: 1/4"=1'-0"  
**C INTERIOR ELEVATION** R.R. FEMALE SCALE: 1/4"=1'-0"  
**D INTERIOR ELEVATION** R.R. MALE SCALE: 1/4"=1'-0"  
**E INTERIOR ELEVATION** R.R. MALE SCALE: 1/4"=1'-0"  
**F INTERIOR ELEVATION** R.R. MALE SCALE: 1/4"=1'-0"  
**G WATER COOLER ELEVATION** SCALE: 1/4"=1'-0"



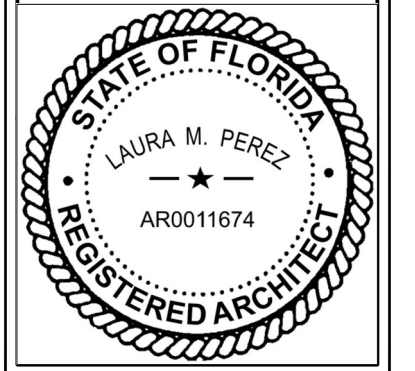
**H INTERIOR ELEVATION** STAFF RR. SCALE: 1/4"=1'-0"  
**I INTERIOR ELEVATION** STAFF RR. SCALE: 1/4"=1'-0"  
**J INTERIOR ELEVATION** STAFF RR. SCALE: 1/4"=1'-0"  
**K INTERIOR ELEVATION** WORK ROOM-CABINET SCALE: 1/4"=1'-0"



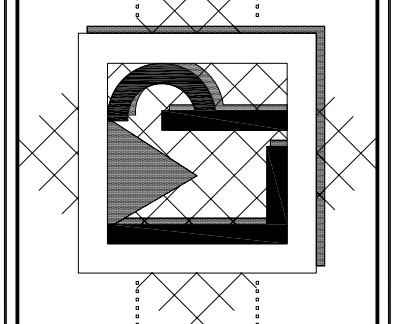
REGULAR REGULAR ADA ADA ADA ADA  
**TYPICAL INSTALLATION REQUIREMENTS**

LEGEND		GENERAL NOTES		SIGNAGES SCHEDULE			
(A)	RECESSED HAND DRYER	• CM TO SUBMIT WITH SHOP DRAWINGS ALL REQUIRED TILE TRIMS AS INDICATED ON SPECS.  *NOTE: SEE SPECIFICATIONS FOR TOILET ACCESSORIES SELECTIONS	#	SIZE	COLOR	SIGN	
(B)	TOILET PAPER HOLDER		1	9"X9"	BLACK/TEXT	FEMALE H/C	
(C)	SOAP DISPENSER		2	9"X9"	BLACK/TEXT	MALE H/C	
(D)	18"x36" WALL MOUNTED STAINLESS STEEL MIRROR		3	9"X9"	BLACK/TEXT	RESTROOMS AND WATER COOLER	
(E)	SURFACE RECESS SANITARY NAPKIN DISPOSAL UNIT		4	9"X9"	BLACK/TEXT	FIRE EXTINGUISHER	
(FA)	GRAB BAR 1 1/2" OUTSIDE DIA X 36"	5	9"X9"	BLACK/TEXT	CUSTODIAL		
(FB)	GRAB BAR 1 1/2" OUTSIDE DIA X 42"						
(G)	WALL MOUNTED LAVATORY						

date	6-02-2021
scale	AS SHOWN
drawn	
job	
file	
revisions	
REV. 1	BLDG. DEPT. : 09/27/2021
REV. 2	OWNER REV. : 05/05/2023

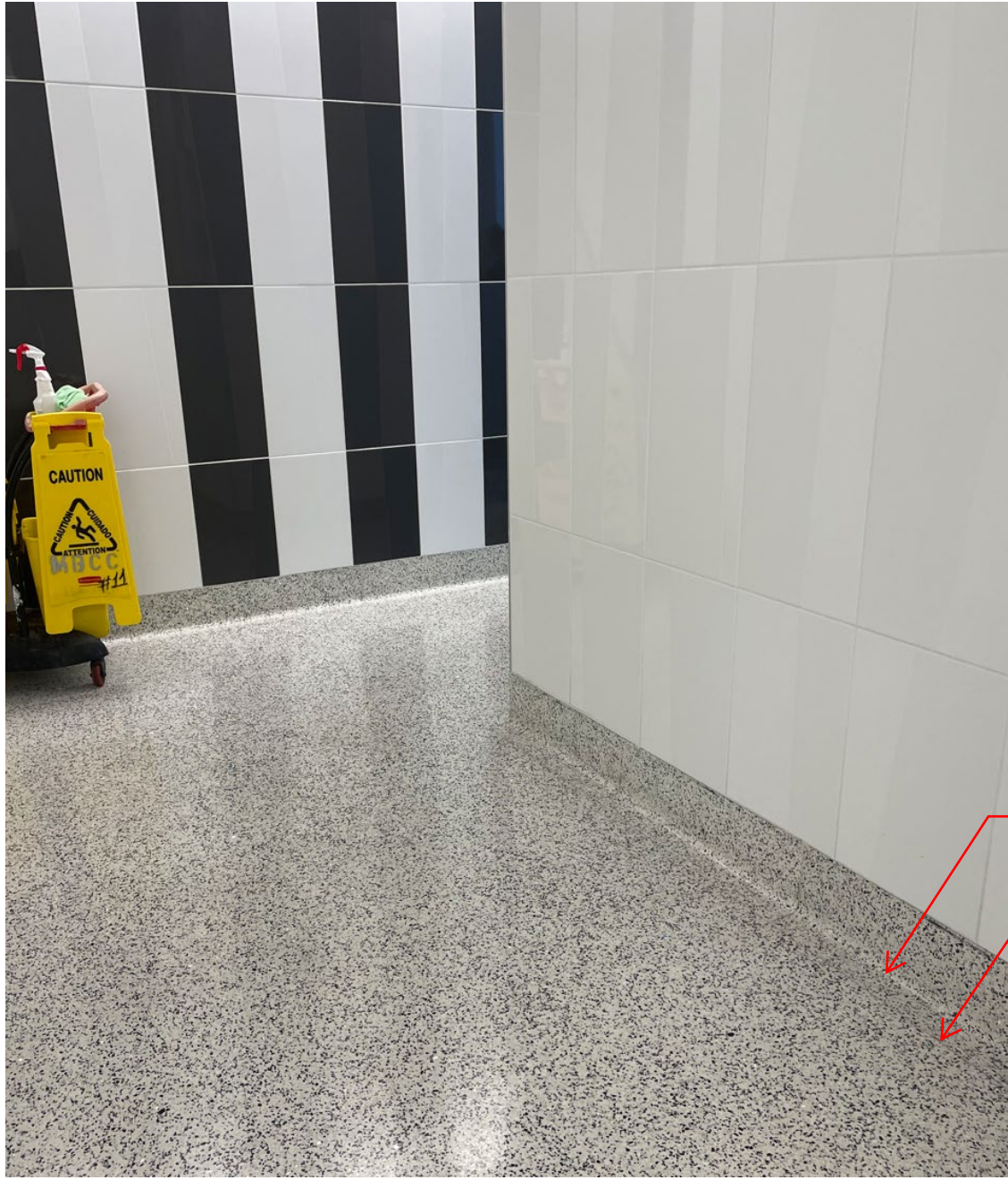


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**LEMON CITY BRANCH LIBRARY**  
ADA RENOVATION  
430 NE 61st STREET  
MIAMI FL, 33137

INTERIOR ELEVATIONS  
DOOR ELEVATION &  
SCHEDULES

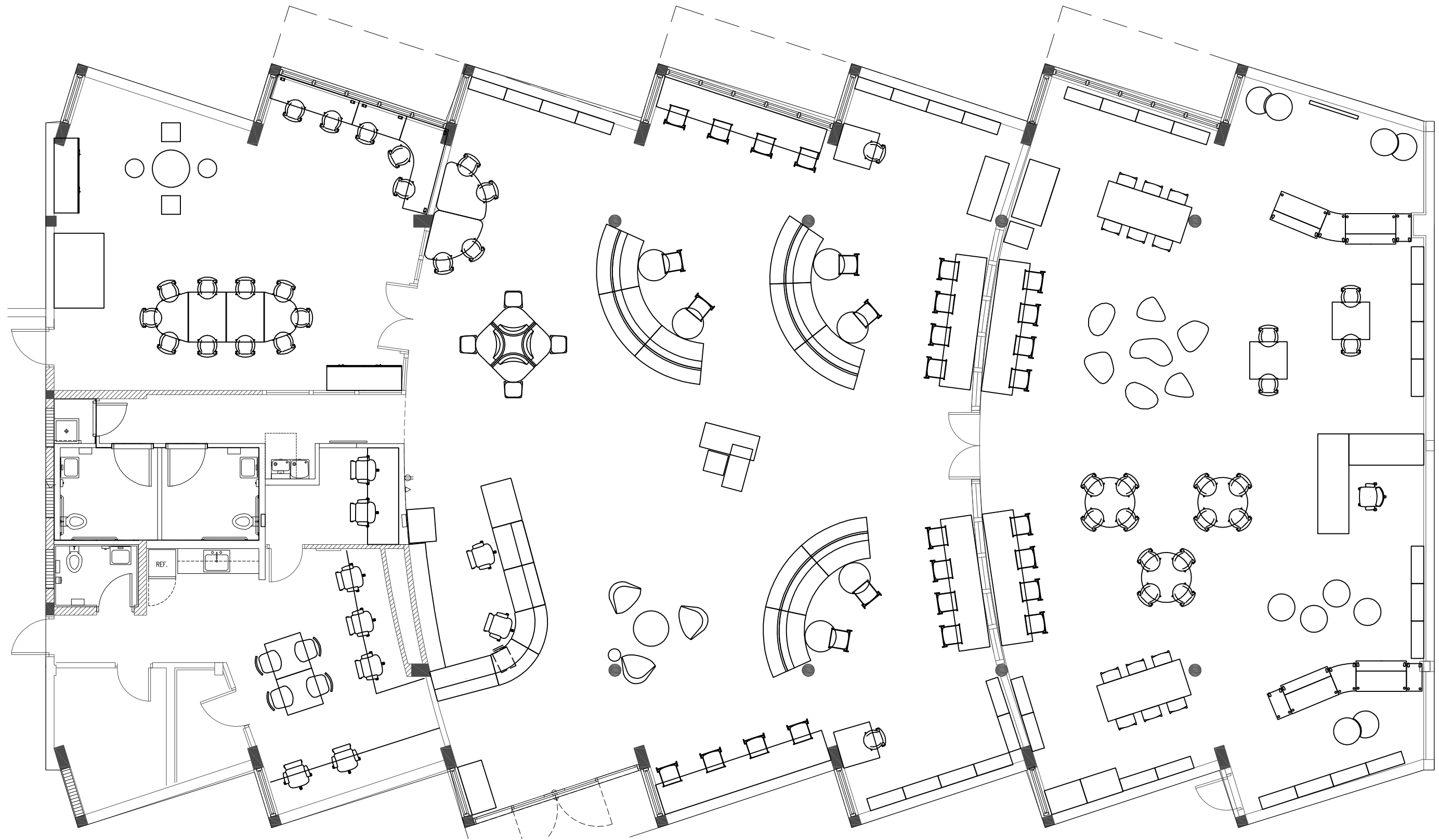


TERRAZZO  
COVE BASE  
DETAIL

CONTROL  
JOINT



FLOOR JOINTS  
DETAIL



# Lemon City Library

Revised Workstations 10.16.23

This furniture layout is provided for coordination of floor outlet locations and final furniture layout. Contractor is responsible to coordinate with the Architect and Furniture Vendor for all low voltage power requirements.