ELECTRONIC DOCUMENTS DISCLAIMER

1. Electronic copies of the solicitation documents are made available on this website solely for the convenience of prospective bidders (whether as a prime contractor or sub-contractor) on the Project, and are not considered part of the Contract Documents. No representation or warranty is made, either expressed or implied, with regard to the accuracy or suitability of these electronic copies for any purpose whatsoever. In the event of discrepancies or conflicts between the County's originally published document(s) and any other version distributed or submitted by other parties, the County's original hard copy version shall prevail.

2. Miami-Dade County Department of Transportation and Public Works (DTPW) does not track or monitor downloads of Project documents from this website. Therefore, prospective bidders who choose to use this method of distribution shall also be responsible for monitoring the site and downloading any applicable addenda or supplemental information. DTPW will distribute hard copy addenda or supplemental information only to those persons or firms who we have purchased a hard copy of the original solicitation documents.

3. Miami-Dade County shall not be responsible for errors and omissions occurring in the transmission or downloading of any documents or specifications from this website. In the event of any discrepancy between information obtained from this website and the DTPW hard copy solicitation documents and specifications, the terms of the hard copy documents will prevail.

4. Miami-Dade County does not guarantee continuous, uninterrupted or secure access to this or other related websites. Operation of this website may be affected from time to time by numerous factors outside of our control. In the event that we are notified of any problems in a timely manner we will do our best to assist with those problems that fall within our control. For assistance, contact us at 305-375-2930. Solicitation documents are removed from this website as soon as possible after the due date.

5. DTPW does not accept facsimile or electronic bid responses of any kind. All bids must be submitted in writing, on the forms provided by the County, to the address designated in the bid package. It is the bidder's responsibility to ensure that their submittals are received at the designated location, complete and on time. Bids received after the due date will be rejected, even if the solicitation is still appearing on this site.

6. With regards to Miscellaneous Construction Contracts (MCC) 7040 Plan Request for Price Quotations:
    a. Only bidders included on the Project’s Bidders List, provided by the Internal Service Department, Procurement Management Division to the DTPW, can submit a bid.
    b. Only timely bids received from bidders included in the Project’s Bidders List will be considered.

7. These documents shall not be altered in any manner. Utilization or viewing of these electronic documents shall constitute implicit acknowledgement and acceptance of these provisions. Failure to comply with these provisions may result in rejection of your bid.

CONTRACT SPECIFICATIONS

DEPARTMENT OF TRANSPORTATION
AND PUBLIC WORKS

BID DOCUMENTS

METRORAIL 3RD RAIL ISOLATION DISCONNECT SWITCHES REPLACEMENT

CONTRACT No. IRP338-DTPW23-CT

PROJECT No. IRP338

VOLUME II OF II

MANUALS & TECHNICAL SPECIFICATIONS

FEBRUARY 2024

CONTRACT No.: IRP338-DTPW23-CT

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

BID DOCUMENTS

METRORAIL 3rd RAIL ISOLATION DISCONNECT SWITCHES REPLACEMENT

PROJECT NO. RIP338

CONTRACT NO. RIP338-DTPW23-CT

MANUAL AND TECHNICAL SPECIFICATIONS

VOLUME II OF II MANUALS:
Miami-Dade Transit Construction Safety Manual & Requirements
Background Check for Contractors ID Procedures
Department of Transportation and Public Works Adjacent Construction Manual
Technical Specifications

MIAMI-DADE COUNTY

Miami-Dade Transit

Construction Safety Manual

MIAMI-DADE TRANSIT

MIAMI, FLORIDA

CONSTRUCTION SAFETY MANUAL

Revision No. 6

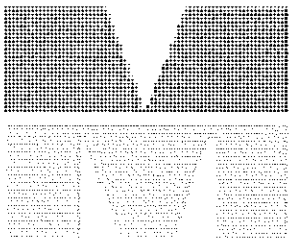
May 2012

6/4/2012
Date

Approved By:
James A. Sumoski
Construction Manager 3
MDT Construction

6/7/12
Date

Approved By:
Eric Muntan
Chief, MDT
Office of Safety and Security



MIAMI–DADE
TRANSIT

111 Northwest 1st Street, Suite 910, Miami, Florida 33128-1999

Policy Statement

It is the policy of the Miami-Dade Transit (MDT) and Miami-Dade County (MDC) to maintain a safe working environment for all employees and the public. The Construction Safety Program has been designed in accordance with the William-Steiger Occupational Safety and Health Act of 1970. The success of the safety program requires the full support of every employee and contractor working on the MDT system.

Regardless of the urgency or monetary cost of a job; all safety precautions must be observed. Prevention of personal injury or damage to property and equipment must always remain paramount in the minds of every employee and contractor.

PREFACE

THE CONSTRUCTION SAFETY MANUAL (CSM) is one of the Miami-Dade County (MDC) Contract Documents. Contractors are required to assure that all employees, subcontractors, and their suppliers / vendors, while on the work site and in the conduct of MDC contractors, comply with the provisions of the CSM and the minimum standards set forth under the William-Steiger Occupational Safety and Health Act of 1970 and as amended, the Construction and General Industry Standards (29CFR1926/1910), and all other applicable Federal, State and Local laws. The Contractors are expected to be familiar with the contents applicable to their operations. The provisions set forth in this CSM will be strictly enforced. Non-compliance with the CSM will be treated the same as non-compliance with any contract provision. Willful or repeated noncompliance shall result in the suspension of part or all work.

Safety at the work site shall be the sole responsibility of the Contractor. The CSM shall be used as a guide in developing the Contractor's Accident Prevention Program. The Contractor shall assume full responsibility for compliance with all applicable Federal, State and Local safety related regulations and for complying with this Construction Safety Manual during the performance of all activities.

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Appendices

A. DEFINITIONS

The following definitions apply for the purpose of this Construction Safety Manual.

ACCIDENT – An unforeseen event or occurrence which causes death, injury or damage to property.

ACCIDENT PREVENTION PROGRAM (APP) - A program designed to provide for the protection to life and health of employees and other persons; and for the prevention of damage to property, materials, supplies and equipment. The Contractor's APP shall be developed by the Contractor using the Contractor's Safety Manual as a guide. Once approved by MDC, the Contractor's APP shall be used by the Contractor and his subcontractors to insure the safe prosecution of the work.

ALARM CONDITION - Any abnormal condition that requires the attention or intervention of responsible personnel or an individual monitoring the transit system operations.

ANOMALY - Deviation from nominal performance, which does not cause a significant, effect on system performance but does warrant investigation and/ or repair.

AUDIT - Formal or official examination and verification.

AUTOMATIC - A term applied to a system, subsystem, or device which has the inherent capability to function without direct manual participation.

CENTRAL CONTROL - That place where train control or train supervision is accomplished for the entire Metrorail and Metromover system, the train command center.

CENTRAL DISPATCH - That place where bus, rail or mover supervision or dispatcher is accomplished for the entire transit system.

COMPETENT PERSON – A person who is capable of identifying existing or predicting hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them.

CONSTRUCTION SAFETY - The optimum degree of safety within the constraints of construction effectiveness, time and cost through specific application of safety management throughout all phases of the construction.

CONSTRUCTION SAFETY MANUAL (CSM) - This manual, issued as a contract document by the Miami-Dade Transit (MDT), to be used as a guide by the Contractors in developing the Accident Prevention Program.

CONTRACTOR'S AUTHORIZED SAFETY REPRESENTATIVE - The person designated as authorized safety representative who will be responsible for work site safety and for reporting all insurance claims. On contracts of over $5 million in award amount this person shall have full-time safety responsibility, unless deemed by the Office of Safety and Security that due to the nature of the work, part-time oversight is adequate. On contracts of under $5 million award amount, the person may have part time safety responsibility, unless deemed by the Office of Safety and Security that the nature of the work necessitates full-time safety oversight. Whether part-time or full-time, this person shall NOT report to the Contractor's superintendent.

CONTRACT DRAWINGS - The plans, profiles, typical cross-sections, general cross-section, elevations, schedules and details which show locations, character and dimensions of the work.

CONTRACTING OFFICER - The Director, Miami-Dade Transit.

CONTRACTOR - The individual, firm, partnership, corporation, or combination thereof, private, municipal, or public, including joint ventures which, as an independent contractor, has entered into a contract with MDC, who is referred to throughout the Contract Documents by singular in number and masculine in gender.

DEGRADATION - Falling from an initial level to a lower level in quality or performance.

EMERGENCY - A situation which is life threatening or which can cause serious damage on or in the immediate vicinity of any transit facility, structure, bus or train.

EMPLOYEE - A person employed by the Contractor or Subcontractor.

ENGINEER - MDC or its authorized representatives, including but not limited to the Resident Engineer; the Contracting Officer's Representatives and the Engineer of Record.

EQUIPMENT FAILURE - The state in which equipment no longer meets the minimum acceptable specified performance and cannot be restored through operator adjustment or control.

FTA - Federal Transit Administration, formerly UMTA.

FAILURE - An inability to perform an intended function.

HAZARD - Any real or potential condition that can cause injury or death; or damage to or loss of equipment or property.

HAZARD MANAGEMENT (LOSS CONTROL) - An element of the system safety management function that evaluates the safety effects of potential hazards considering acceptance, control, or elimination of such hazards with respect to expenditure or

resources. (The feasibility of hazard elimination must be considered in light of financial, legal, and human considerations).

HAZARD SEVERITY - A qualitative measure or the worst potential consequences that could be caused by a specific hazard.

Category I - Catastrophic. May cause death, serious injury/illness or major system loss.

Category II - Critical. May cause injury/illness, or major system damage.

Category III - Marginal. May cause minor injury/illness, or minor system damage.

Category IV - Negligible. Will not result in injury/illness, or system damage.

HAZARD INDEX - A quantitative measure, combining the numerical probability of occurrence with a hazard severity.

HAZARD RESOLUTION - The analysis and subsequent actions taken to reduce, to the lowest level practical, the risk associated with an identified hazard.

HAZARD PROBABILITY - The probability that a hazard will occur during the planned life of the system. Hazard probability may be expressed in quantitative or qualitative terms. An example of a hazard probability ranking system is:

A	Frequent
B	Probable
C	Occasional
D	Remote
E	Improbable

IMMINENT DANGER - Refers to any condition or practice where there is reasonable certainty that a danger exists that can be expected to cause death or serious physical harm and/or serious property damage immediately or before the danger can be eliminated through normal enforcement procedures.

INCIDENT - An unforeseen event or occurrence which does not necessarily result in injury or property damage.

MAINTENANCE - All actions necessary for retaining an item in or restoring it to an operable condition.

MALFUNCTION - Any anomaly or failure wherein the system, subsystem, or component fails to function as intended.

MDC - Miami-Dade County - the Board of County Commissioners of Dade County, Florida, a political subdivision of the State of Florida, and MDT, and office under the

County Manager of Miami-Dade County, Created March 1, 1974, by Administrative Order No. 3-8, under the authority of Sections 4.01 and 4.02 of the Miami-Dade County Charter – and any authority, board, body, commission, official or officials to which or to whom the powers now belonging to MDT in respect to the location, construction, equipment, maintenance and operation of transit facilities shall, by virtue of any act or acts, hereinafter pass or appertain.

MDT - Miami-Dade Transit, Miami-Dade County, located at 111 NW 1st Street, Suite 910, Miami, Florida 33128.

MISHAP - An unplanned event or series of events that result in death, injury, occupational illness, or damage to or loss of equipment or property. (See also ACCIDENT).

OFFICE OF SAFETY AND SECURITY (OSS) - Miami-Dade Transit, Miami-Dade County, located at 111 NW 1st Street, 4th Floor, Miami, Florida 33128.

OPERATOR - That person having direct and immediate control of the movement of a vehicle or machinery.

OPERATING TIME - The time period between turn-on and turn-off of a system, subsystem, component or part during which time operation is as specified. Total operating time is the summation of all operating time periods.

OSHA - The Occupational Safety and Health Administration. An agency of the U.S. Government which sets standards to provide for the safety of employees in the workplace. The area office is located in Ft. Lauderdale, Florida, phone (305) 424-0242.

PERSONAL PROTECTIVE EQUIPMENT (PPE) - Equipment designed and worn to provide protection against hazard to some part of an employee's body. Example of PPE are safety glasses, respirators, hard hats, gloves etc. All PPE used at MDT work sites must comply with applicable OSHA standards.

POWER RAIL - A rail mounted on insulators alongside the running surfaces, which provides Metromover traction power for train propulsion.

PROCEDURES - Established methods to perform a series of tasks.

RELIABILITY - The probability that the system or subsystem will perform satisfactorily for a given period of time when used under stated conditions.

REPAIR - The maintenance activity, which restores a failed item to operable state.

RISK - An expression of possible loss over a specific period of time or number of operational cycles. It may by indicated in terms of hazard severity and probability.

RISK MANAGEMENT - The Risk Management Division, Miami-Dade County, General Services Administration, located at 111 NW 1st Street, Suite 2340, Miami, Florida 33128; phone 305-375-4280.

RULE - A law or order authoritatively governing conduct or action.

SAFE - Secure from danger or loss.

SAFETY - A reasonable degree of freedom from those conditions that can cause injury or death to personnel; damage to or loss of equipment or property; and freedom from danger.

SAFETY CHECKLIST - A list for examining the safety aspect of equipment, procedures and personnel.

SAFETY DEVICES - Protective devices, which do not alter the fundamental nature of a hazard but which, do control the extent of the hazard in some manner.

SAFETY CRITICAL - A designation placed on a system, subsystem, element component device, or function denoting that satisfactory operation of such is mandatory to assurance of patron, personnel, equipment, or facility safety. Such a designation dictates incorporation of special safety design features.

SAFETY MANAGEMENT - An element of management that establishes safety programs requirements and ensures the planning, implementation and accomplishment of task and activities to achieve work place safety.

SAFETY PROGRAM - The combined task and activities of safety management and safety engineering that enhance operational effectiveness by satisfying the safety requirements in a timely, cost-effective manner throughout all phases of the work.

SAFETY SUBCONTRACTOR - A subcontractor who satisfies the Florida Department of Labor and Employment Security Industrial Safety and Health Program, Chapter 38F-44, and is duly approved by MDC.

SECURITY PROGRAM PLAN (SPP) - A program designed to provide guidelines to implement security procedures and describe the contractors' commitments and specific actions proposed to provide a secure project site. The Contractor's SPP shall be developed by the Contractor using the Contractor's Safety Manual as a guide. Once approved by MDC, the Contractor's SPP shall be used by the Contractor and his subcontractors to insure the safe prosecution of the work.

SERVICE CONTRACTS/CONTRACTOR - Those operations that are providing any services, or repair, replacement or maintenance functions that are indigenous to the construction process on the work site.

STATE - The State of Florida.

SUBCONTRACTOR - Any person, firm or corporation, other than the employees of the Contractor, who contracts with the Contractor to furnish labor and/or materials under this Contract. The contractor shall be responsible for ensuring that their subcontractors comply with this manual.

SUPPLIER/VENDOR - Those entities whose sole responsibility to the project is the delivery of goods or materials, exclusive of direct labor.

SYSTEM – A composite of people, procedures and equipment operating in a specific environment to accomplished a specific mission or task.

THIRD RAIL - A rail mounted on insulators alongside the running rail which provides Metrorail traction power for train propulsion.

TRANSIT SYSTEM – A transportation system comprised of fleets of motor buses and electrically propelled transit vehicles and all of their operational/support personnel and systems (e.g. maintenance facilities, tracks, structures, etc.) utilized for the mass movement of passengers within a metropolitan area.

UNUSUAL OCCURRENCE – An unforeseen event or incident which does not necessarily result in injury or property damage.

UNSAFE CONDITIONS – Any condition which if not corrected will endanger human life or property.

WARNING DEVICES – Sensors that monitor or detect conditions and provide visible and/or audible alerting signals as desired for selected events.

WORK SITE - The area enclosed by the limit of work indicated in the Contract Documents and boundaries of local streets and public easements in which the Contractor is to perform the work under the Contract. It shall also include areas obtained by the Contractor for use in connection with the Contractor, when contiguous to the limit of work.

B. CONTRACTOR'S ACCIDENT PREVENTION PROGRAM (APP) & SECURITY PROGRAM (SPP) PLANS

1) OBJECTIVES OF THE ACCIDENT PREVENTION PROGRAM

- to achieve an injury-free experience for the Project.
- to achieve maximum property conservation.
- to reduce direct and indirect costs.

Accomplishing the above objectives will provide for:

a) A greater efficiency as a result of a safer working environment.

b) A reduction of the construction work interruptions which develop when unsafe environments are created and when accidents occur.

2) METHODS OF ATTAINING OBJECTIVES:

Effectiveness of the Accident Prevention Program depends on the comprehensive participation and cooperation extended by all participants in support of the basic requirements listed below.

The Contractor's Authorized Safety Representative shall be informed immediately of any recognized hazards or potential hazards, related to health & safety, which may impact on the effectiveness of the Project's Accident Prevention Program that cannot be handled promptly as set forth herein, and report such to the Engineer.

The major accident prevention requirements are:

a) Initiation and maintenance of programs, plans, training, etc. as necessary to comply with the requirements of this manual, and applicable Federal, State and Local standards.

b) Allocating manpower, as required, for professional safety personnel assistance.

c) Planning and coordinating all work to avoid personnel injury, property damage and loss of productive time.

d) Establishing and maintaining a system for prompt detection, reporting, and correction or control of unsafe practices and unsafe conditions.

e) Assuring the availability, and enforcing the use of appropriate personal protective equipment.

f) Establishing and maintaining an effective and comprehensive system of tools and equipment inspection and maintenance including records required by applicable regulations or internal directives. The tool and equipment inspection and maintenance program shall include all employee-owned items brought onto the work site.

g) Establishing and supporting an educational and job skill-training program designed to foster and maintain accident prevention knowledge and cooperation at all levels of employment by:

1. providing for new employee's orientations.

2. conducting targeted subject safety meetings.

3. posting adequate safety and health requirements for all operations.

4. maintaining a list of adequately trained and licensed employees authorized to operate specific equipment.

5. maintaining a list of the trained and certified crane operators.

6. maintain a list of employees who have been certified in accordance with Florida Department of Transportation to perform flagging operations and placement of traffic signs or devices (cones, barricades, warning signs, etc.).

7. maintain a list of "Competent Person" employees who satisfy OSHA standard requirements to perform specific functions under the OSHA standards. A partial list of standards that require a competent person is included in appendix G of this CSM.

8. investigating all accidents to determine causes (s) and taking prompt, reasonable and prudent necessary action to eliminate or control responsible factors.

h) Providing visitor control and hazard protection.

i) Providing work site security.

j) Establishment and maintenance of a first aid and/or medical facility.

k) Controlling the safe placement of materials or equipment received, or used, consistent with the traffic control pattern established and progression of construction on the work site.

l) Providing maintenance of traffic control plans and procedures consistent with the work to be performed in accordance with the Contract Documents.

m) Providing work site fire prevention/protection in coordination with local authorities and applicable standards.

n) Establishment and maintenance of an effective program in accordance with Federal, State and Local regulations for the storage, use, and disposal of hazardous substances.

o) Conducting accident/incident investigations.

3) **MDC AND THE ENGINEER:**

a) The Engineer will:

1. Receive from the Contractor an Accident Prevention Program and Security Program Plan no later than 25 days after approval of Award Recommendation by the Board of County Commissioners and no less that 15 days before the projected date for notice to proceed of the Contract. The Contractor shall assume full responsibility for compliance with all applicable Federal, State and Local safety related regulations and for complying with this Construction Safety Manual during the performance of all work performed prior to the approval of the Contractor's Accident Prevention Program and Security Program Plan. (See definition of Accident Prevention and Security Program).

2. verify that Contractor plans and executes the work in compliance with the stated objectives of the Accident Prevention Program, Security Program Plan and applicable regulations.

3. authorize work site inspections by MDC representatives to monitor Contractor compliance with this manual.

4. require prompt remedial action to correct substandard or illegal safety and/or health conditions reported or observed by MDC representatives.

5. verify that the Contractor has adequate fire prevention/ protection equipment; contained in ready-operating status at all times.

6. verify that the Contractor has temporary lighting and power systems during the construction phase set up and utilized in such a manner as to reduce hazards to a minimum.

7. ascertain that trained first aid personnel are available and certified for their work.

8. verify that good housekeeping procedures are maintained at all times by the Contractor and subcontractors.

9. establish procedures for the reporting of all fire incidents or damages as stated herein.

10. instruct the Contractor to establish an identification program for all employees at the work site.

11. verify that the Contractor reports all accidents immediately, as required by this manual and State and Federal regulations.

12. instruct the Contractor that employee access to unauthorized or restricted areas on Metromover or Metrorail property requires that the Contractor provide prior notification to, and receive authorization from Central Control.

13. establish procedures for timely reporting/notification to OSS for accidents and injuries.

4) **CONTRACTOR: The Contractor Shall:**

a) Submit in writing to the Engineer an Accident Prevention Program and Security Program Plan for approval no later than 25 days after approval of Award Recommendation by the Board of County Commissioners and no less than 15 days before the projected date for notice to proceed of the contract. Provide the name, qualifications, and a "24 hour" phone number of the Contractor's Authorized Safety Representative who shall devote his time to the work site as defined by the definitions section of this Construction Safety Manual. No work on the work site shall begin until MDC approves the Contractor's authorized safety representative. The Contractor shall assume full responsibility for compliance with all applicable Federal, State and local safety related regulations and for complying with this Construction Safety Manual during the performance of all work performed prior to the approval of the Contractor's Accident Prevention Program. (See definition of Accident Prevention and Security Program). For furnish and install equipment contracts (non-construction), the stated approval period will commence ten (10) days prior to the beginning of work on the work site.

b) Substantiate in writing to the Engineer that the Contractor's Authorized Safety Representative possesses at least two years of construction safety experience, is a managerial supervisory capacity, related to the work contemplated under this Contract.

c) Maintain responsibility for project safety on the work site for his own or subcontractor's employees at any time, under any circumstances.

d) After approval of the Contractor's Authorized Safety Representative, the Contractor, his Authorized Safety Representative and the Engineer will be required to attend a meeting with the MDT staff. At that time, a formal presentation and discussion of the Accident Prevention Program will be conducted.

e) Follow all of the requirements and procedures of the Accident Prevention Program.

f) Promptly provide the Engineer with a detailed written submission of the safety and/or health hazards not consistent to his work at the work site and a detailed program to control all such hazards. Such program must be consistent with the Accident Prevention Program and conform in all respects to all legal and safety requirements, including those of OSHA and Federal, State, and Local regulations. All such programs must be approved by the Engineer prior to the commencement of this work.

g) Require each new employee, before he starts work, to be oriented by his supervisor on the safety and health rules, procedures, and requirements established for the work task (s) to be performed and procedures to be adhered to. Tool-box safety meetings are not an acceptable substitute for new employee orientation. The name of the employee and orientation date shall be on record at the work site.

h) Provide an overall traffic control plan for pedestrians, vehicular traffic and construction operations; and establish a general visitor control program.

i) Set up and implement a program to protect persons and property in the event of emergencies.

j) Complete supervisory investigation reports of all injuries.

k) Require supervisory employees and subcontractors to attend monthly supervisor's safety meetings.

l) Schedule weekly "tool-box" safety sessions to be held by the job foremen for all employees. A record including date, employee attendance, and subject covered shall be kept of these meetings for the duration of the Construction

Project. The Engineer shall be advised of the time and location of the scheduled meetings. (See Appendix B for suggested format). The meeting should be used to review safety and health rules and procedures, applicable Federal, State or Local standards, and to discuss any problems related to safety at the work site. This would include information as to storage, use and disposal of hazardous materials at the work site.

m) Schedule and preside at safety meetings to be held monthly at which appropriate supervisory staff of the Contractor and subcontractors will be required to attend. The Engineer shall be advised of the time and location of the scheduled meetings.

n) Take immediate action to correct unsafe practices and unsafe conditions.

o) Report to the Engineer and observed conditions or violations of job safety regardless of weather they are within the observer's power or responsibility to correct.

p) Assure that supervisory employees at all levels have a good working knowledge of applicable safety and health standards as they pertain to their areas of supervisory control and encourage all supervisory personnel and employees to improve their accident prevention awareness.

q) Provide the establishment of first aid facilities for treatment of employees.

r) Obtain a personal copy of the OSHA Construction Industry Standards 29CFR1926 and OSHA General Industry Standards 29CFR1910 to be available for the Contractor's reference as required by this manual. (The OSHA standards may be obtained free, or at a minimal cost, by contacting the OSHA area office, phone (305) 424-0242, in Ft. Lauderdale).

s) Ensure that prior to accessing restricted areas on Metrorail or Metromover property; he has provided proper notifications to and received proper authorization from Central Control through the Engineer.

t) Ensure that during all times that employees are at the work site, an acceptable and reliable means of communication with local emergency response personnel is available.

u) In addition to complying with this manual, comply with all applicable safety & health governmental standards including the OSHA Construction Industry Standards 29CFR1926/1910, the Florida Right to Know Law, the Federal Hazard Communication Act, Florida Worker's Compensation Laws, etc. Maintain the necessary documentation, program, and/or training required by such standards.

v) Ensure all of his subcontractors, and subcontractor's employees, comply with the requirements of this Manual and applicable Federal, State and Local regulations.

w) Comply with the current edition of the Florida Building codes unless specifically exempt, in writing by the Engineer.

5) EMERGENCIES

For the purposes of the Accident Prevention Program, emergencies are classified as follows:

a) A fire, or major hazardous material leak or spill, requiring the response of the local fire or environmental protection department.

b) Unplanned collapse of equipment used in the course of construction.

c) Unplanned collapse of a substantial part of any structure at the work site.

d) Any serious accident involving an employee.

e) Any serious accident involving a member of the public.

f) Any other occurrence which would require immediate protection of life or property.

6) HOW TO REPORT AN ACCIDENT TO THE MDT ENGINEER:

a) The Contractor and all other participants in the Program shall instruct their employees and all other concerned personnel in how to report an accident which must include, at a minimum, the following procedures:

1. Report the matter immediately to the supervisor who shall arrange for first aid or other required emergency medical treatment.

2. In the event of serious injury or a death, in the absence of emergency first aid facilities on the work site, the supervisor of the injured employee is to arrange for necessary treatment. There shall be full compliance with all requirements of the Contractor's insurance carrier(s) with regard to accident reporting.

3. The emergency phone number is: **911**

4. In case of a death, or if five or more employees are seriously injured in the same accident, the Contractor's Authorized Safety Representative shall, not later than 24 hours after the occurrence report the same to:

    a. Office of the Area OSHA Director (305) 424-0242.

    b. State of Florida, Bureau of Industrial Safety and Health (305) 377-5373.

5. The employer of any injured employee shall be required to complete the Notice of Injury Form, as required by State of Florida Worker's Compensation Division. (See appendix A).

6. The employer of any injured employee shall be required to record all work related injuries on Form 301 (or equivalent), Form 300 and complete/post the summary (Form 300A) at the beginning of the calendar year as required by OSHA 29CFR1904. (See appendix A).

7. The supervisor of the injured employee shall be responsible to immediately report the injury to the Engineer, to fill out the Supervisor's Report of Accident (Appendix A), and make it and the notice of Injury report available to the Engineer.

8. All participants in this Accident Prevention Program shall cooperate fully in the investigation of any accident and/or occurrence.

    b) The contractors and other participants in the Accident Prevention Program shall instruct employees and all other concerned personnel of the following procedures if there is loss or damage to property of others, including damage to equipment or tools being used at he work site.

        1. Promptly report the loss or damage to the office of the Contractor's Authorized Safety Representative.

        2. In the event of a substantial loss or damage to the property of others, the Contractor is to immediately notify the Contractor's Authorized Safety Representative and the Engineer.

        3. There shall be full compliance with all requirements of the Contractor's insurance carrier (s) with regard to property loss and damages.

MDT SECURITY REQUIREMENTS

All Contractors are required to submit for review and approval a Security Program Plan (SPP), as defined in this Manual. This SPP shall provide guidelines to implement security procedures and describe the contractors' commitments and specific actions proposed to provide a secure project site. The Security Program Plan shall include, at a minimum:

- ✓ Procedures for inspecting perimeter security;
- ✓ Procedures for restricting who may visit the project site;
- ✓ Procedure for performing background checks;
- ✓ Procedure for overseeing security with respect to deliveries and other short-term visitors;
- ✓ Procedure for identification badges;
- ✓ Procedure for conducting periodic security meetings;
- ✓ Procedures for monitoring world-wide security threats and national security warnings and alerts;
- ✓ Emergency security procedures;
- ✓ Procedures for preparing, issuing and reporting security incidents.

MDT Contractor Identification Badges

All MDT contractors are to present identification along with documentation showing reason for visit. Following are the identification badge requirements for contractors.

1. Contractor's must be in possession of a photo identification card issued by MDT noting them as contractor's OR must be provided a VISITOR's BADGE upon the surrender of an approved government-issued photo identification.

2. All contractors under permanent, full-time assignment to MDT are required to display their MDT photo contractor identification. The identification is issued by the MDT Office of Safety and Security. A supervisory employee must be present with the contract employee for them to be issued identification.

3. All MDT employees who are involved in any way with contractor employees are to ensure that these security requirements are provided to those employees. MDT employees are to also assist contractors in meeting those requirements.

4. Contractor's requiring access to critical areas MUST BE ACCOMPANIED BY AN MDT EMPLOYEE WITH AUTHORIZED ACCESS TO THAT AREA AT ALL TIMES. AT NO TIME MAY A CONTRACTOR BE LEFT UNSUPERVISED IN ANY CRITICAL OR SENSITIVE AREA. These areas include, but are not limited to: bus and mover central control, bus dispatch, William Lehman Yard Tower,

traction power substations, switchgear rooms, train control rooms, electrical rooms, telephone rooms, computer server rooms, video monitoring areas, and communications rooms.

Visitor's to MDT Facilities

1. All visitors will be logged in before entering the premises.

2. Employees shall not allow any unauthorized persons to enter any MDT facility, including yard gates, buildings and other secure entrances. As necessary, MDT employees may direct visitor's to the security desk or, as necessary, request intervention by security personnel.

3. The employee entering the area is to ensure that each secured door is closed behind them and that no one else enters.

4. Any visitor who comes to our facilities for food delivery or any other personal type delivery will be met at the facility entrance by the employee who ordered the delivery. The delivery person shall not be allowed into the facility under any circumstances.

5. In instances where remote entry buttons are used at secure facilities, the entry button is not be used unless there is direct observation of the person entering. Direct observation includes visual observation and observation of closed circuit television monitors only.

   All appropriate MDT field staff will be familiar with each contractor's approved Security Program and will comply with specific requirements of the plan when carrying out their assigned tasks. The contractors have the primary responsibility for developing and implementing the program; however, the Engineer will monitor the contractors' compliance with each contractor's security program.

C. GENERAL SAFETY AND HEALTH PROVISIONS

1) The Contractor shall ensure employees do not work under conditions, which are unsanitary, hazardous, or dangerous to their health or safety.

2) The Contractor shall initiate and maintain such programs as may be necessary to comply with this manual, and all applicable government regulations.

3) Such programs shall provide for the frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons designated by the Contractors; and shall include a program for the

performance of work, to promote its orderly and expeditious progress and ensure its safe completion within the prescribed time.

4) The use of any machinery, tool, material or equipment not in good working order, or which has had a safety feature removed or tampered with, is prohibited. Such machine, tool, material or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from the work site.

5) The Contractors shall permit only those employees qualified by training or experience to operate equipment and machinery Applicable laws requiring employee to have a current license or certification (i.e., Class A Commercial Drivers License, etc.) to operate equipment are to be complied with.

6) The Contractor shall be solely responsible for the performance of the work in a manner, which will not create safety hazards, objectionable noise or other nuisance to the public.

7) Employees of the Contractor or subcontractors who are found to be intoxicated or appear to be under the influence of alcohol or drugs (other than as prescribed by a doctor) while on the work site shall be removed from the work site by the Contractor for the duration of the Contract. Employees who are found to be in possession of alcohol or drugs (other than as prescribed by a doctor) at the work site shall be removed from the work site by the Contractor for the duration of the Contract. An employee who is under a doctor's care and taking prescription drugs should inform his supervisor of same to determine if restrictions should be imposed.

8) Prior to the start of, and during the course of, any work, above or below ground level, the Contractor shall make a through survey of the entire work site to determine the type and locations of all utilities or other lines on the work site. The Contractors must verify this information by notifying the Underground Utilities Notification Center at 1-800-432-4770, other utilities not members of the Underground Utilities Notification Center, and notify the Engineer.

9) The Contractor shall instruct employees as to any precautions and procedures to be followed while working in the proximity of any utility or power line.

10) The Contractor shall develop and have readily available at the work site an emergency plan with the locations of any utility or line shut-offs or disconnects so that if any emergency arises, immediate action may be taken.

11) The Contractor will be required to identify and provide a notification procedure for all contingencies where cutting off a utility could adversely

affect any operation or render inoperative any protective apparatus in the surrounding area.

12) All structural repairs, alterations or reconstruction of any equipment used on the work site shall be certified in accordance with all applicable laws and regulations.
13) Portable toilets shall be chemical type or equal and shall be located convenient to work crews and maintained in proper sanitary conditions at all times.

14) Construction operations will normally be confined to those hours between dawn and dusk. Any work done other than during daylight hours must be approved by the Engineer. In requesting approval during other than daylight hours, the Contractor must present a written statement outlining the special precautions to be taken to control the extraordinary hazards presented by night work. This program shall include, but not limited to such items as supplementary lighting of work areas, illuminated barricades, proper supervision, availability of medical facilities, and security precautions.

15) Emergency lighting facilities, (i.e. battery operated or equivalent) shall be required in all construction areas where normal light failures would cause employees to be subjected to hazardous conditions. Such systems shall be maintained monthly.

16) Employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the precautions to take, and the use of protective and emergency equipment. The Contractor shall comply with all regulations applicable for working in dangerous or potentially dangerous areas.

17) The use of torpedo or salamander type heaters are prohibited.

18) No open burning of any kind shall be permitted without permits from appropriate local authorities and the Engineer.

19) Flammable storage cabinets shall be labeled in conspicuous lettering "Flammable – Keep Fire Away" and "No Smoking".

D. MEDICAL SERVICES AND FIRST AID

1) At least one person who has valid certificates in first-aid training from either the U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence, shall be available at the work site to render first-aid. Further, a minimum ratio of one such qualified person to 50 employees shall be maintained throughout the course of the

construction. A suitable emblem shall be affixed to the qualified person's hard hat, or other suitable means of identification shall be used.

2) First-aid supplies, approved by a physician licensed to practice in the State of Florida, shall be accessible for immediate use. One 16-unit first-aid kit (or equivalent) shall be provided for each 50 persons or fraction thereof.

3) First-aid kit (s) shall be provided in a weatherproof container with individual sealed packages for each type item. The kits shall be checked by the Contractor before being sent out on each job and at least weekly on each job to ensure that the expanded items are replaced.

4) A telephone shall be made available at the site before construction begins. Telephone numbers and locations of emergency facilities including emergency hospitals, physicians, ambulance service, police and fire department, as well as the complete street address of the work site, shall be posted in conspicuous locations at the work site, and at all telephone locations. The communication system for contacting necessary ambulance service or other emergency response personnel shall be operable at all times personnel are on the work site.

5) The location and number of approved stretchers provided for each contract shall be submitted to MDC for approval immediately after work commences on site. They will be maintained, properly protected and easily accessible at all times.

6) The Contractors, his supervisors and foreman, shall assure that any of his employees who suffers a job-related injury shall receive first aid and medical attention consistent with and as required by law.

7) The Contractor's first aid facility shall maintain a daily log of all injuries, both first aid and doctor cases. The log shall contain information to reflect the date, name of employee, employer, craft, supervisor, type of injury, how accident happened, time, disposition of patient and name of attendant.

8) The Contractor shall ensure that all OSHA and State of Florida record-keeping and reporting requirements are met.

E. DRINKING WATER

1) An adequate supply of potable water shall be provided in all places of employment.

2) Portable water containers shall be capable of being tightly closed and be equipped with a tap.

3) A common drinking cup is prohibited. Disposable cups shall be furnished.

4) Unused disposable cups shall be kept in a sanitary container, and a receptacle shall be provided for used cups.

5) All containers utilized for potable water shall be labeled as "Potable/Drinking Water Only".

F. PERSONAL PROTECTIVE AND LIFE SAVING EQUIPMENT

1) GENERAL

a) The Contractor is responsible for requiring and enforcing the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions.

b) The Contractors is to comply with all OSHA regulations (29CFR1926 Subpart E) regarding personal protection devices and life saving equipment.

c) All persons on the Work Site shall utilize the proper foot protection which meets ANSI Z41 (toe), Z41.2 (metatarsal) and Z41.4 (electrical) standards.

d) All persons on the Work Site shall utilize hand and body protection which meets ANSI/ISEA 105 and ASTM F23 standards.

2) HEAD PROTECTION

a) All persons on the Work Site shall be protected by NON-METALLIC protective helmets, which meet ANSI Z89.2 standards. Helmets for the protection of employees against impact and penetration of falling and flying objects shall meet the specifications contained in ANSI Z89.1 Safety Requirements for Industrial Head Protection. Bump caps are not acceptable.

b) All Work Sites shall have posted approved signs alerting all persons that hard hats are required on the site. The use of hard hats at the Work Site will be strictly enforced.

3) RESPIRATORY PROTECTION

a) Whenever feasible administrative and/or engineering controls fail or are inadequate to prevent harmful exposures to employees; the Contractor shall

provide and require the use of appropriate respiratory protective devices in accordance with OSHA, 29 CFR 1910.134.

b) Respiratory protective devices must be approved by the U.S. Bureau of Mines or acceptable to the U.S. Department of Labor for the specific contaminant to which the employee is exposed.

c) Employers must have a written respiratory protection program as defined in 29 CFR 1910.134.

d) Employees required to use respiratory protective equipment must be trained in the use and limitations of such equipment, fit tested annually and medically approved to wear respiratory protection as required by 29 CFR 1910.134.

e) Respiratory protective equipment shall be inspected regularly and maintained in good condition. Defective or worn parts shall be replaced.

4) HEARING PROTECTION

a) Feasible engineering or administrative controls shall be utilized to protect employees against sound levels in excess of those shown in the table below.

b) When engineering or administrative controls fail to reduce sound levels within the limits of the Table below, protective hearing devices in accordance with OSHA (29CFR1926.101) shall be provided and us.

c) Exposure to impulsive or impact noise should not exceed 140-db peak sound pressure level.

d) In all cases, where the sound levels exceed the values shown in the Table below, a continuing, effective hearing conservation program shall be administered.

e) PERMISSIBLE NOISE EXPOSURE TABLE (Source: OSHA, 29CFR1926.52)

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 –1/2	102

Duration per day, hours	Sound level dBA slow response
1	105
1 / 2	110
1 / 4 or less	115

f) Plain cotton is not an acceptable protective device. Hearing protection shall be used only when it meets OSHA requirements and is suitable to correct the exposure.

5. EYE AND FACE PROTECTION

a) Eye and face protection shall be provided and worn when machines or operations present potential eye or face injury.

b) Eye and face protective equipment shall meet the requirements of ANSI Z87. 1 – 2003, "Occupational and Educational Eye and Face Protection".

c) Employees involved in welding operations shall be furnished with a welding helmet with minimum grade 10 shade filter lens for shielded arc welding or cutting. Welding goggles with a minimum grade 4 shade filter lens may be worn only for oxyacetylene gas welding or burning.

d) Employees exposed to laser beams must be furnished suitable laser safety goggles, which will protect for the specific wavelength of the laser and be of optical density (0.0) adequate for the energy involved.

6. SAFETY NETS

a) Safety nets shall be provided when workplace are over roads, guideways, or more than 25 feet above other surfaces where the use of ladders, scaffold catch platforms, temporary floors, safety lines, or safety belts is impractical. Safety net systems shall conform to OSHA 29 CFR 1926 502.

b) Where nets are required, operations shall not be undertaken until the net is in place and has been tested & inspected by the Resident Engineer.

7. SAFETY BELTS, LIFELINES AND OTHER PERSONAL FALL ARREST SYSTEMS

a) Approved personal fall arrest systems (in accordance with OSHA; 29 CFR 1926.104 and 29 CFR 1926.502) shall be worn by those employees whose

work exposes them to falling from the perimeter of a structure or through shaftways and openings. Protection must also be provided for employees who are exposed to the hazard of falling into/onto dangerous equipment,

b) Employers must provide a training program for employees who might be exposed to fall hazards. The training shall include how to recognize such hazards and how the employees can minimize their exposure to such hazards. The training shall, at a minimum, comply with 29 CFR 1926.503. Re-training or refresher training must also be provided when necessary. Records of such training must be available for inspection by MDT.

8. WORKING OVER OR NEAR WATER

a) Employees shall be provided with a U.S Coast Guard approved life jacket or buoyant work vest.

b) Prior to and after each use, the buoyant work vest or life jacket shall be inspected for defects which would alter their strength or buoyancy. Defective units shall not be used and be removed from the job site.

c) Ring buoys with at least 90 feet of line shall be provided and available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.

d) At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water.

G. SIGNS, SIGNALS, BARRICADES AND TRAFFIC CONTROL

1) All traffic signs or devices used for protection of construction workmen or the public shall conform to the State of Florida Department of Transportation's "Roadway and Traffic Design Standards" and applicable permit(s) conditions. All work areas on or around highways, roads and streets shall follow approved maintenance of traffic plans.

2) Barricades, cones and/or similar protective devices shall be used whenever men or equipment are exposed to traffic or similar hazards.

3) When traffic lanes are closed due to work activity, advance warning signals and high level warning devices shall be used as described in the State of Florida Department of Transportation's "Roadway and Traffic Design Standards" and applicable permit(s) conditions. All work areas on or around highways, roads and streets shall follow approved maintenance of traffic plans.

4) Flagmen and signalmen will be properly trained, certified, wear high-visability clothing (as required by F-DOT FTDS600) and use appropriate procedures following the current F-DOT manual. Where flaggers are used, a flagger symbol or legend sign must als o be used.

5) All employees within 15 feet of the edge of the travelway and/or where employees are exposed to roadway traffic shall be required to wear a high visability vest vest/garment, per F-DOT manual.

6) Whenever and wherever possible and necessary, line voltage (12 volt) protected lights shall be used to mark fences and barricades and other such encroachments onto public streets or sidewalks. Warning lights shall be in accordance with F-DOT RTDS 600.

7) Where covered sidewalks are required they shall be provided with permanent lights to provide sufficient illumination for safe use by the public day or night. All bulbs shall be cage-protected.

8) Public walkways shall be kept clean and free of hazards at all times. When an existing pedestrian way or bicycle way is located within a traffic control work zone, accommodations must be maintained and include provisions for the disabled. Only approved temporary traffic control devices may be used to delineate a temporary traffic control zone for pedestrian and bicycle ways. Advanced notification af sidewalk closures and detours shall be provided by appropriate signs.

9) Where the Contractor is required to provide public walkway, they shall have abrasive, non-slip surface.

10) Where access to bus stop is disturbed or obstructed by the Contractors operations, safe access will be maintained or the bus stop relocated as directed by the Engineer. Coordination for maintaining or relocating bus stops with the appropriate agencies is the sole responsibility of the Contractors.

11) When steel plates or similar covers are used on public ways to cover excavations they shall be substantially secured to prevent movement imposed by traffic. Covers shall have non-slip surface, conforming to OSHA Specifications.

12) When such covers are located where there is pedestrian exposure, they shall be tapered at all sides with cut-back cold mix or similar material to eliminate tripping hazards. Covers shall have non-slip surface.

13) Free access shall be maintained to every fire extinguisher, fire hydrant, fire alarm box, fire escape and standpipe connection, street and traffic light control box. When required, hydrants shall be extended by suitable tube or piping to an

accessible point as approved by the Engineer. No obstructions shall be allowed at any time within 15 feet of a fire hydrant. Where materials are placed in the vicinity of a fire hydrant or a fire alarm box or fire extinguisher, and to such a height as to prevent the same from being readily seen, the position of such hydrant or fire alarm box or fire extinguisher shall be indicated by suitable signals, both day and night.

14) The Contractor shall erect and maintain fences and barricades to enclose the Contractor's work area, and provide watchmen where required to prevent unauthorized access.

15) No work shall be allowed above or below an active traffic lane. Contractor shall establish a work zone including appropriate lane closures following F-DOT RTDS 600 series.

H. MATERIAL HANDLING – (STORAGE, USE AND DISPOSAL)

1) All materials stored in tiers shall be secured to prevent sliding, falling or collapse.

2) Reinforcing steel shall not be used as a lifting ("Pick") point on any load nor as a guy line anchor.

3) Hooks, except special sliding choker hooks shall be securely moused when in use, or shall be provided with a functioning safety latch.

4) Scrap material of any kind, type or nature shall be placed daily into appropriate containers specifically supplied for this purpose. Containers shall be removed from the Work Site when full.

5) Loose material on open decks or other exposed locations shall be removed or secured at the end of each day to eliminate dislodgment by wind or other causes.

6) Compatibility of stored materials and storage methods will comply with all applicable OSHA, Fire Department and environmental agency standards.

7) Employees required to handle, use or dispose of hazardous materials shall be instructed regarding the safe handling, proper procedures, potential hazards, personal hygiene, and personal protective equipment required.

8) Disposal of materials shall be in accordance with all applicable Federal, State and Local regulations. All applicable recordkeeping and reporting requirements will be met by the Contractors.

I. TOOLS – HAND AND POWER

1) General

a) Keep the work area clear of clutter
b) Keep the work area well lighted
c) Maintain and keep tools sharpened, oiled and stored in a safe place
d) Supervisors instruct employees on using equipment and safe work practices before using equipment
e) Inspect tools, cords and accessories prior to use
f) Repair or replace problem equipment immediately
g) Use 3-prong electrical plugs, double insulated tools and safety switches
h) Machine guards must be in place and not removed
i) Do not wear loose clothing or jewelry when operating equipment
j) Install and repair equipment only if you are qualified to do so
k) Use the right tool for the job (i.e. do not use a pipe wrench as a hammer)
l) Carry a sharp tool pointed downward or place it in a tool belt/box
m) Protect sharp blades with a shield/sheath
n) Store tools in draws or chests with cutting edge down
o) Proper personal protective equipment shall be worn
p) All power hand tools shall be equipped with a "dead man" control where the power is shut down when the operator releases the tool
q) Never leave a running tool unattended
r) Tools of a non-sparking material and/or intrinsically safe tools must be used if fire or explosion hazards exist
s) All fuel operated tools shall be stoped and allowed to cool prior to being refueled, serviced, or maintained and proper ventiliating used when used in enclosed spaces
t) Power grinding machines shall have proper grounding. Work rests must be kept at a distance not to exceed 1/8" from the wheel surface
u) Avoid repetitive motion, hold tools in a neutral position

2) "Lock on" buttons on all hand held power drills are prohibited.

3) Powder Actuated Tools

a) High velocity tools are prohibited. Only low velocity piston drive tools are permitted.

b) Only employees who have been trained in the operation of the particular tool in use shall be allowed to operate a power actuated tool. ANSI STANDARD A10.3-1970.

c) Firing of the tools shall be dependent upon at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into firing position. The tool shall be so

designed so as not to be operable other than when being held against a work surface with a force of at least five pounds greater than the total tool weight. Caution must be exercised to ascertain that the proper color coded charge, for the materials involved, is utilized.

d) In case of misfire, the operator shall hold the tool in the operating position for at least 30 seconds. He shall then try to operate the tool a second time. He shall wait again 30 seconds, holding the tool in the operating position. Then he shall proceed to remove the explosive load in strict accordance with the manufacturer's instructions. Misfired cartridges shall be placed carefully in a metal container filled with water and returned to the supervisor for disposal.

4) Grinding wheels shall not be operated at speeds in excess of the manufacturer's RPM rating as labeled on the wheel.

5) Face and eye protection or safety goggles shall be worn by all employees using grinding wheels, jackhammering, slag chipping, powder actuated tools or similar operations.

6) Radial Saws

a) The upper hood shall completely enclose the upper portion of the blade down to a point that will include the end of the saw arbor. The slides of the lower exposed portion of the blade shall be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock.

b) Radial saw for ripping shall be provided with non-kickback finger or dogs approved by the manufacturer.

c) The saw and table shall be designed to prevent the blade from traveling beyond front of table.

d) Installation shall be in such a manner so that the front end of the unit be slightly higher than the rear, so as to cause the cutting head to return gently to the starting position when released by the operator.

7) Table saws shall be equipped with a functioning hood, guard, anti-kickback device and splitter.

8) Only power saws specifically designed by the manufacturer for cutting concrete block, or similar materials, shall be used for this purpose.

9) Cutting shall be done with water spray and the operator shall wear a face shield.

10) All hose couplings or any pneumatic or hydraulic equipment or tools shall be equipped with appropriate safety clips or retainers and shall be properly installed and maintained.

11) All appropriate machine and tool guarding devices shall be provided, shall be operational, and shall be use when the equipment is in operation.

J. WELDING AND CUTTING

1) Contractors shall instruct employees in the safe and proper use of cutting and welding equipment prior to using that equipment.

2) Oxygen and fuel gas pressure regulators, including their related gauges, shall be in proper working order while in use. Each regulator shall be provided with an anti-flashback device for protection against excessive oxygen back pressure in the fuel gas supply.

3) A minimum of one 10-pound all-purpose (ABC) dry chemical fire extinguisher shall be kept within 10 feet of any cutting or welding operation. The extinguisher shall be kept in a conspicuous place, free of any obstructions.

4) Proper personal protective equipment shall be worn while welding and cutting.

5) Welding screens shall be used in areas where prefabrication work is to be performed.

6) Oxygen and fuel gas regulators and hoses shall be maintained and in proper working order while in use.

7) All oxygen cylinders and fittings shall be kept free of grease and oil.

8) Do not weld without the approved goggles, hood and jacket/apron.

9) Always use approved gloves when welding.

10) Do not weld or burn in an area where fellow employees are working, without protective barriers, non-combustible flameproof screens/shields (blankets, covers, curtains etc.).

11) Do not weld where flammable or combustible material, such as waste, rags, paper, etc. can be ignited by the sparks or molten metal.

12) Do not weld in any location where open flame is not permitted.

13) Do not weld on a wooden bench or other structure that can burn.

14) Do not use leaky regulators, hose or other defective gas welding tools.

15) Do not use leaky gas cylinders.

16) Do not operate gas welding or cutting torches at pressure in excess of prescribed maximum.

17) Do not change or adjust pressure on regulators with torch valve closed.

18) Do not leave valves of gas cylinders open when not in use.

19) Do not leave valve key on gas cylinders when not in use.

20) Always remove all scale, rust, grease, protective surface coatings, oil and other foreign matter from metals before welding.

21) Always keep welding bench clear of dirt.

22) Always locate electric welding machine where it is protected from dirt, dust and harmful fumes.

23) Always see that the material being electrically welded is well grounded, and the ground connection from machine is tight.

24) Avoid fires on personal clothing from sparks or hot metal.

25) Always use protective clothing (welders legging, aprons, sleeves, jacket, etc.) when welding or burning.

26) Oxygen must not be used near flammable or combustible materials, such as grease, oil, etc., or any substance likely to cause fire.

27) Do not weld or cut in confined spaces without adequate ventilation.

28) Protect welding hose from being burned, trampled on or run over. Do not leave hose where it may be tripped over.

29) Valves on acetylene and oxygen tanks must be tightly closed when work is completed.

30) Carrying a lighted torch while climbing is forbidden.

31) Put rod stubs in a container. Stubs thrown on the floor become a slipping hazard.

32) Do not direct the flow of oxygen, from the torch, at clothing to remove dust, etc. This is a fire hazard.

33) Always have good ventilation when welding and gas cutting.

34) In the open air, when welding, cutting or heating metals having toxic substance(s), such as zinc, lead, cadmium, or chromebearing metals, approved respirator shall be used

35) When required have a certified fireguard while burning or welding. Fireguard must have a functional fire extinguisher present.

36) Use caution when removing eye protection. Hot slag may pop during cooling.

37) Remove manifold and replace protective caps on cylinders before storing welding unit (overnight, etc.).

38) Manifold hoses must be equipped with flash arrestors.

K. COMPRESSED GAS CYLINDERS

1) Valve protection caps shall be in place when compressed gas cylinders are transported, moved, or stored.

2) Cylinder valves shall be closed when work is finished and when cylinders are empty or are moved.

3) Compressed gas cylinders shall be secured in an upright position at all times, except when cylinders are actually being hoisted or carried.

4) Cylinders shall be kept at a safe distance or shielded from welding or cutting operations. Cylinders shall not be placed where they can contact an electrical circuit.

5) You are forbidden to lift or transport gas cylinders with hoisting equipment. Rough handling of loaded or empty gas cylinders is dangerous. Install protective caps onto cylinders before moving same. Transport cylinders on handcarts equipped with chains and secure the cylinder during movement. Do not accept cylinders, which do not have a protective cap.

6) Grease or oil on acetylene cylinders or oxygen cylinders is forbidden. It is extremely dangerous.

7) Avoid freezing acetylene cylinders.

8) Always remove leaky gas cylinders to open air, place them clear of flammable material or anything that might ignite them.

9) Always secure cylinders in an upright position. When a cylinder is empty, it must be marked "empty" and stored separately from full cylinders.

10) Protect cylinders from excessive heat. Do not store near steam pipes, furnaces, etc.

11) Oxygen cylinders should not be stored with acetylene or other highly combustible materials, including welding units. A minimum of 20 feet must be maintained from combustible and flammable gases.

12) All cylinders must be transported and stored with the protective cap securely in place. Never store cylinders with regulators/manifolds attached.

13) All cylinders must be clearly labeled as to content.

L. ELECTRICAL

1) Extension cords and temporary lighting electrical cords shall conform to the current edition of the National Electrical Code table 400.11. "Hard Usage" or "Extra Hard Usage", and shall be protected against all types of abrasion and damage.

2) All male plugs and female receptacle connections shall have cords physically interlocked to prevent accidental or unintentional separation and provide complete and positive continuity and grounding.

3) All power cords connected to panels of breaker boxes shall be connected using plugs. No direct wiring is permitted.

4) Temporary (extension) cords used to supply tools shall be limited to a maximum length of 200 feet, except that additional length may be used if supplemental positive equipment grounding is maintained within 200 feet of the tool or power use.

5) All portable power generators shall be grounded.

6) Ground-Fault Circuit Protection:

   a) Ground-Fault Circuit interrupters will be installed on all 120 volts, single-phase, 15 and 20 ampere receptacles, on the Work Site.

   b) An assured equipment grounding conductor program may be substituted for ground-fault circuit protectors, only after the following has been provided.

c) Submit a written program, developed by a licensed electrician, including specific procedures adopted by the Contractor to the Engineer and MDC Risk Management.

7) All Work Site conditions will comply with requirements in OSHA 1926 Subpart K.

8) Before starting work on electrical equipment and lines, inspections and tests must be made to determine if they are alive or dead.

9) Use only tools or devices provided and see that they are in good condition.

10) Never touch two parts at different potentials or a single exposed live part at a dangerous potential to ground unless employee is insulated from other conducting surfaces, including ground.

11) Standing with hands behind back, with back toward generator or switchboard, is prohibited.

12) Employees working near live equipment and lines must protect themselves from tripping, slipping or falling, or from touching equipment or lines with body, tools or material.

13) Work on or about electrical circuit, apparatus or equipment only if qualified and with a thorough knowledge of its operating voltage and service, and then only when authorized by the immediate supervisor.

14) Do not use appliance, device, tool, flashlight, material or equipment that is not designed and approved for the maintenance and operation of the circuit on which it is to be used.

15) Insulation, weather proofing or covering on electrical wire, apparatus or equipment must not be depended upon for protection against shock.

16) Do not use bolt, rivet, cotter key or other object as a jumper in place of fuse.

17) Do not place clothing, lunch, tools, clothes hanger, or other unauthorized items in or about the power or control cabinet, switch box, battery box or on top of electrical apparatus.

18) Place "DO NOT OPERATE" warning tag on switch, set to de-energize line, apparatus or equipment. "Lock Out" procedures are preferred where feasible. At all times, when working on equipment that has the potential to cause harm or create a hazard, "Lockout/Tagout projection Televisions" procedure shall be followed. Lockout/Tagout procedure requires each employee to place a lock (if possible) or a safety tag on the energy source of any equipment that has the

potential to cause harm if the equipment is activated while it is being worked on. Refer to OSHA Standard 1910.147, "Control of Hazardous Energy".

19) Consider every circuit to be alive.

20) Use extreme care when using "snakes" in preparation of installing wire or cable. The coiled "snake" may fly loose and strike a person or electrified equipment.

21) Do not allow wet clothing, raincoats, etc., to come in contact with electrified equipment.

22) Do not lubricate electrical apparatus with power on.

23) Do not use water to put out electrical fires.

24) Do not change any wire or connections with power on.

25) Do not shift brushes in electrical motors with power on.

26) Do not leave the secondary of a current transformer open-circuited, or open up the secondary with power on.

27) Never wear ring(s) or jewelry on fingers on person when working near or handling electrical equipment.

28) Inspect all temporary cords and plug equipment for damage prior to use. Cords with damaged insulation, covers, plugs or missing grounding pins are not to be used.

29) Do not pass temporary cords through door openings or other areas where they are likely to be cut.

30) When temporary cords are used, care must be taken to ensure a trip hazard is not created.

31) Portable extension lights shall be visually inspected by employees using them. Lamp guards must be in place on all extension lamps.

32) Electrical plugs of portable extension cords, or cords attached to any electrical apparatus, shall be disconnected by grasping the plug and not by pulling the cord.

LADDERS AND SCAFFOLDS

1) Ladders:

   a) The use of ladders with broken or missing rungs or steps, broken or split side rails, or with other faulty or defective construction is prohibited. When ladders with such defects are discovered, they shall immediately be withdrawn from service.

   b) Portable ladders shall be placed on a substantial base at a 4-1 pitch, have cleat access at top and bottom, extend a minimum of 36 inches above the landing, and be secured against movement while in use.

   c) Portable metal ladders shall not be used for electrical work or where they may contact electrical conductors.

   d) Job-made ladders shall be constructed for this intended use. Cleats shall be inset into side rails ½ inch, or filler blocks used. Cleats shall be uniformly spaced, 12 inches, top-to-top.

   e) Wooden ladders must not be painted. Split or rotted conditions would not be easily seen and constitute a hazard.

   f) The foot of a ladder shall be placed 1/4 of its length away from vertical plane of its support and must be secured to prevent all possibility of slipping.

   g) Before climbing ladders, see that your shoes are free and clean of slippery substances. Watch out for broken rungs.

   h) Face the ladder while climbing either up or down.

   i) Never place a ladder in front of an unlocked door.

   j) Employees must not reach out from a ladder more than an arm's length.

   k) Ladders must be inspected by employees using them daily. Defective ladders are to be marked and kept separate from serviceable equipment and must be repaired before using.

   l) Do not "walk" a ladder while on it.

   m) Do not jump from or slide down any portion of any kind of ladder.

n) When getting off a ladder, make certain of secure footing and avoid stepping on loose stones, debris or into a depression before releasing handhold on the ladder.

o) A stepladder must be fully opened and spread properly before being used. Never stand on the top step of a stepladder.

p) When carrying tools or other objects up a ladder presents a hazard, they should be raised with a rope and bucket.

q) Two or more persons should raise, extend, shorten or move extension ladders. Never use the top section of an extension ladder as a single ladder, since it has no safety feet.

r) Always rope off the area directly beneath ladders.

s) Never leave extended ladders unattended. Remove ladders when there is a temporary stoppage of work.

2) Scaffolds:

a) Platforms shall be tightly planked for the FULL width of the scaffold except for any necessary entrance opening. Platforms shall be secured in place, with proper guardrail and toe boards.

b) Workmen shall not be allowed to climb or stand in cross bracing, or scaffold bucks.

c) Adjustment screws on scaffold legs shall not be extended beyond the manufacturer's recommendations, or two-thirds of the threaded length, whichever is shorter.

d) Casters shall be properly designed for strength and dimensions to support four times the maximum intended load. All casters shall be provided with a positive locking device to hold the scaffold in position. Casters shall be provided with a positive means of attachment to the scaffold legs.

e) Scaffold support bearing shall not be comprised of concrete block or similar materials and footed securely or a solid, stable base.

f) Materials shall not be stored on scaffolds in excess of the suppliers needed for the immediate operation.

g) The edges of scaffolds shall be protected with railings and toe boards.

h) When using rollers for moveable scaffolds, lock or secure wheels.

i) Do not use bent or twisted members on scaffolds.

k) Always remove a scaffold as soon as there is no more need for it. A scaffold is a constant hazard.

l) Always rope off the area directly beneath scaffolds.

m) Use extreme caution and use approved fall protection equipment on elevated surfaces lacking side rail and/or approved guard.

FLOORS, WALL, OPENINGS AND STAIRWAYS

1) One-half inch mild plow steel cables or equivalent, or ¼ inch alloy steel chains may be used on bridge or guideway decks, open floor edges, and similar applications, in lieu of standard wooden top midrails. Such cables or chains shall be firmly anchored and kept taut. All connections or cables shall be looped and clamped. Standard toeboards shall be used in such instances.

2) Floor openings shall be guarded by a standard railing and toeboards or cover. In general, the railing shall be provided on all exposed sides, except at entrances to stairways. Temporary floor openings shall have standard railings.

3) Every open-sided floor or platform, six feet or more above adjacent floor or ground level, shall be guarded by a standard railing, or the equivalent, on all open sides except where there is entrance to a ramp, stairway, or fixed ladder.

4) Runways four feet or higher shall have standard railings on all open sides except runways more than 18 inches wide used exclusively for special purposes may have the railing on one side omitted where operating conditions necessitate.

RAILING

1) A standard railing shall consist of top rail, intermediate rail and posts, and have a vertical height of approximately 42 inches from upper surface of top rail to the floor, platform, etc.

2) The top rail of a railing shall be smooth-surfaced, with a strength to withstand at least 200 pounds. The intermediate rail shall be approximately halfway between the top rail and floor.

3) A stair railing shall be of construction similar to a standard railing, but the vertical height shall be not more that 34 inches nor less than 30 inches from upper surface of top rail of tread, in line with face of riser at forward edge of tread.

4) A standard toeboard shall be at least four inches in height, and may be of any substantial material either solid or open, with openings not to exceed one inch in greatest dimension.

CRANES, DERRICKS, HOISTS, ELEVATORS, PILE DRIVERS, & CONVEYORS

1) Prior to commencement of any work using any hoisting equipment on the Work Site, the Contractor will provide the Engineer with a valid certification of compliance for shore-based, or water borne equipment meeting all the provisions of OSHA 29CFR 1919.

2) Record Keeping Requirements:

   a) Supervision of all testing, examinations, inspections, heat treatments and record keeping procedures shall be carried out by such persons as are so designated in OSHA 29CFR 1919.

   b) Certificates issued by an accredited person (agency) shall be signed and all register entries made only by persons authorized by such accredited person (agency).

   c) Certification shall not be issued until all conditions cited for correction on the semi-annual certification report form have been corrected in a manner satisfactory to the certifying agency.

   d) In the event deficiencies remain uncorrected, no certification shall be issued.

   e) An accredited person (agency) shall maintain records of all work performed including reports of work or tests performed by others (nondestructive testing, heat treating, etc.), in relation to each certification. Such records shall be available for examination upon request by MDC Risk Management, the Engineer or their authorized representatives.

   f) A copy of each certificate relating to semi-annual examination and/or unit proof load test shall be available with each crane or derrick.

3) A checklist will be prepared and submitted to the Engineer by the Contractor for any lift where the load exceeds 80% of the load chart capacity for the crane or derrick, or, where the lift involves the use of two or more cranes. (See Appendix C).

a) No lifts meeting the above criteria will be made without prior submission of a Critical Lift Checklist.

b) Where erection drawings are prepared for submittal to the Engineer, Appendix C, will not be required if all the information contained therein is shown on the drawing submitted.

c) Prior to making the lift, the conditions shown on the drawing submitted will be verified by the Contractor's representative at the Work site. Any deviations from the erection drawing submitted will be reviewed and verified as safe by the Contractor's representative.

4) Operation of boom equipment, or other equipment such as forklifts, backhoes, and the handling of any load in the proximity of electrical transmission lines is forbidden within a minimum of 10 feet. Further, if such equipment is positioned so that it is possible by rotation or any other movement, whether anticipated or not, to possibly contact high voltage, de-energizing of the lines, restraints, "hold-backs", or other positive physical means will be required. (Note: "High Voltage" is defined as voltage in excess of 400 volts).

5) All cranes shall be equipped with spirit level, or equivalent, to indicate the level of the crane fore and aft, and across the width. As nearly as possible, the crane shall be operated in level position.

6) After normal working hours and during other extended periods of non-usage, crane booms shall be lowered to a horizontal position to minimize the chance of movement due to wind. If this cannot be accomplished, load lines shall be securely fastened to a substantial anchoring point.

7) Except for floor-controlled overhead track cranes, a bell or other effective audible warning signal shall be provided for each crane equipped with power traveling mechanism, which shall be automatically engage and immediately audible when the crane begins to travel.

8) All pinch points drive mechanisms, and other hazardous moving parts shall be effectively guarded. (See Appendix C for suggested checklist).

9) Conveyor Systems

a) Conveyor systems shall be equipped with an automatic audible warning signal sounded immediately **BEFORE** starting up the conveyor.

b) Whenever a conveyor is equipped with a catwalk, a safety cable shall be installed on the conveyor to stop it instantly in an emergency, so as it cannot be started until the actuating switch has been reset to the "On" position. The

cable shall not be less than 12 inches nor more than 18 inches above the conveyor belt and shall extend the entire length of the conveyor.

10) Catwalks shall be kept clean and free of tripping hazards.

11) Any anticipated use of helicopters for lifting operations shall require advance notice and approval by the Engineer and MDC Risk Management.

12) No person will be allowed to ride on a suspended load or hook for any reason.

13) No person shall be allowed to stand or pass under the elevated portion of any equipment whether loaded or empty.

14) Pile driving loftsmen shall use safety belts when working at elevations outside loft platforms. When the leads are to be rotated or moved, the loftsman shall descent from the leads.

15) Exhaust pipes, steam lines, and other hot surfaces, located where employees could contact them, shall be effectively guarded or insulated.

16) Do not operate cranes or hoisting machines unless qualified to do so.

17) Do not stand under load being moved by crane.

18) Always test crane brakes and limit switches before operating on your tour of duty.

19) Always be sure that path of crane travel is clear of people or alerted by signal alarm in advance of moving load and while crane is in motion.

20) Always be sure that hooks, chains or cables are secure and properly placed before raising load.

21) Always be sure that loose parts are removed from load before raising it.

22) Only the operator is permitted to be in the operators cab while crane is in operation, except when authorized maintenance is being performed or a new operator is being trained.

23) Hoisting hooks, chains or cables are to be visually inspected daily for flaws, cracks, etc., by employees using them and defects reported to their immediate supervisor. A monthly inspection with a certification record which includes the inspection date and signature of individual inspector must also be done.

24) Do not lift load with twists or kinks in the chain, rope or sling.

25) Operators of cranes that are moving loads in close proximity of exposed current carrying devices, are required to maintain a safe operating distance at least 10 feet from such devices to avoid contact with hoisting cables, blocks, hooks, etc.

26) Know the load rating of equipment when starting to raise an unusual or heavier than normal load (Load should not exceed limits of crane). Test brakes when load is a few inches from floor or ground.

27) When hoisting unusual material or machinery, attach a chain or cable well above the center of gravity to prevent the load from tilting or falling over when lift is made

28) When hoisting long shaped objects, a red tag line or other method of control is required to prevent load from turning end on end.

29) No employee shall ride or hang onto tongs, slings, hooks or load of hoisting equipment.

30) Before removing sling or chain from load, observe arrangement of load to be sure it has settled securely.

31) Keep from positioning yourself between the load being handled and a fixed object, (wall, stanchion or car) to avoid being pinned.

32) Leaving any hoisting equipment with a suspended load unattended, is forbidden.

33) Before hoisting a load, one (1) person must be designated to give signals, and all persons involved in the hoisting operation shall be notified who has been designated.

34) Before pulling a hoisting rope, wire, cable, chain or other such tackle, secure a firm footing, assume a braced position, and move clear in the event of adverse action.

35) Use both hands, when climbing into or leaving the crane cab. Lift tools and materials to the cab with a hand line.

36) If repairs to crane cause it to be laid up for a long period of time, lock the main switch in the open position to prevent use.

37) Make sure the controllers are in the "Off" position before opening or closing the main switch.

38) If power should go off, move the controllers to the "Off" position at once. Wait until power is restored before operating controllers again.

39)Never depend upon a limit switch to stop hoisting motor. Use your controls. Do not attempt to use two controls at the same time when approaching limits.

40)Whenever leaving the crane, place all controllers in the "Off" position, open the main switch and set the brakes.

41)When hoist operator's view is obstructed in the direction of movement, assign an employee to precede the hoist and warn others of its approach.

42)Do not shorten, repair or splice hoisting chain with wire, nails, bolts or other objects.

43)Use standard hoisting hand signals.

44)Do not make side pulls with a hoist, which will misalign the rope. It may cause the load to swing sideways or damage the rope itself.

45)Do not operate crane (move load) while the load is being raised or lowered.

46)Approved fire extinguishers are required in overhead cabs.

47)Any construction activity, including crane movement, occurring within 30' of the drip line of a Metromover or Metrorail guideway will also be subject to compliance with Miami-Dade Transit Adjacent Construction Manual requirements and OSS approval.

Q. WIRE ROPES, CHAINS, AND ROPES

1) Wire ropes, chains, ropes, and other rigging equipment shall be inspected prior to use and as necessary to assure their safety. Defective gear shall be tagged and removed from service.

2) Job or shop hooks and links, or makeshift fasteners, formed from bolts, rods, etc., or other such attachments, shall not be used.

5) The proper type of chain is to be used for the particular application (overhead lifting, transport, cargo securement, etc)

6) Any attachment, such as hooks or links, are to have a rated "working load limit" at least equal to the chain/rope with which it is used.

3) When U-bolts are use for eye splices, the U-bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

4) When U-bolt wire rope clips are used to form eyes, the following table shall be used to determine the number and spacing of clips.

NUMBER AND SPACING OF U-BOLT WIRE ROPE CLIPS

Improved plow steel, rope diameter inches	Number of clips Drop forged	Other material	Minimum Spacing (inches)
1/2.....	3	4	3
5/8	3	4	3-3/4
3/4.....	4	5	4-1/2
7/8.....	4	5	5-1/4
1.....	5	6	6
1-1/8.....	6	6	6-3/4
1-1/4.....	6	7	7-1/2
1-3/8.....	7	7	8-1/4
1-1/2.....	7	8	9

7) Slings are to be tagged for simple inclusion of sling type, working load limit, reach, serial number, chain size and grade.

8) State and federal regulations regarding size and number of chain systems required for securing loads on trucks are to be adhered too.

R. MOTOR VEHICLES AND MECHANIZED EQUIPMENT

1) All equipment that is left unattended adjacent to a roadway in normal use shall have appropriate lighted barricades placed around the location of the equipment

2) Loaders, backhoes, bulldozer and other similar equipment shall have their blades or buckets fully lowered and engines shut-off when left unattended.

3) All vehicles and equipment shall be checked at the beginning of each shift to ensure that the equipment is in proper operating condition and that accessories that affect safe operations are free from defects.

4) Heavy equipment, machinery, or parts thereof, shall be blocked to prevent falling or shifting before employees are permitted to work under or between them.

5) All equipment and vehicles with cabs shall have safety glass or equivalent windshields that are free of cracks and defects. Broken or cracked glass shall be replaced.

6) No person shall be allowed to ride in or on any equipment or vehicle except in seats, which are provided by the manufacturer.

7) Only trained, qualified and/or licensed persons are to operate equipment/vehicles.

8) All vehicles are required to have visual and audio back-up alarms.

S. EXCAVATION, TRENCHING AND SHORING

1) The Contractor shall call the Engineer who will call the Underground Utilities Notification Center at 1-800-432-4770 prior to any excavation regarding utilities. All initial excavation, which is done to expose all subsurface utilities, shall be done by hand to prevent damage. When exposed, they shall be protected at all times by suitable bridging, boxing, hangers or other supports during the prosecution of the work.

   a) To provide access in emergencies, and for routine inspections of valves on water, gas or other mains, and to electrical power, communications, signal alarm and other service boxes, junction boxes and manhole that are decked over; trap door of a suitable size with suitable identifying steel plates securely attached thereto, shall be provided at all times in the decking.

   b) The Contractors shall have a copy of the water main and gas drawings, clearly marked, to show the valves that control flow in the area and at the construction site. At least two valves in all directions outside the net lines shall be shown. The Contractor's superintendent shall mark and keep clear the location of valves for ready identification, should trouble develop.

2) Walkways shall be kept clean and free of all hazards at all times.

3) Internal combustion engines used in confined areas, such as in excavations or utility vaults where natural ventilation is limited, shall have exhaust fumes dispelled with forced ventilation or equivalent means.

4) All excavations and similar work areas where an exposure to the public or work personnel exists shall be promptly and completely fenced or barricaded, as shown in the Contact Drawings, except in those areas temporarily required to be open for the conduct of the work, then these openings shall be guarded to prevent access.

5) Adjustment screws on cross braces or trench jacks shall not be extended beyond the manufacturer's recommendations or 2/3 of the threaded length, whichever is more restrictive.

6) No one shall be permitted to climb or work from cross bracing.

7) Supervision – Excavation work shall at all times be under the immediate supervision of someone with authority to modify the shoring system or work methods, as necessary, to provide greater safety. He shall frequently examine the material under excavation and improve the shoring or methods beyond the minimum requirements, as necessary, to insure protection of workmen from moving material.

8) Removal of Shoring – No part of the shoring system of any excavation shall be removed until proper steps have been taken to avoid hazard to workmen from moving material. If a newly installed masonry or concrete wall is to be depended upon for this protection, it must have attained adequate strength to sustain resulting pressures.

9) Access and Egress – Convenient and safe means shall be provided for workmen to enter and leave the excavated area. This shall consist of a standard stairway, ladder, or ramp securely fastened in place at suitably guarded or protected locations where men are working and shall not require movement farther than 25 feet to reach such egress.

10) Blasting will not be permitted on the Work Site without prior approval of the Engineer and MDC Risk Management.

11) If any excavation (s) are required or requested to be left open by a utility company (s), municipality (s), or governmental agency, the excavations (s) will remain the sole responsibility of the Contractor for proper barricading and protection.

T. LASERS

1) Only qualified and trained employees shall be assigned to install, adjust, and operate laser equipment.

2) Employees shall wear proper eye protection where there is potential exposure to laser light greater than 0.005 watts (5 milliwatts).

3) Beams shutters or caps shall be utilized, or the laser turned off, when laser transmission is not actually required. When the laser is left unattended for a substantial period of time, such as during lunch hour, over-night, or at change of shifts, the laser shall be turned off and shall be secured in a manner, which will preclude indiscriminate or unauthorized activation.

4) Employees shall not be exposed to light intensities above: direct staring – 1 microwatt per square centimeter; incidental observing – 1 milliwatt per square

centimeter: diffused reflected light – 21/2 watts per square centimeter. Employees shall not be exposed to microwave power densities in excess of 10 milliwatts per square centimeter.

5) The Engineer shall be notified of the location, time and qualifications of person or persons operating the laser.

U. ROLLOVER PROTECTIVE STRUCTURES, OVERHEAD PROTECTION AND REVERSE WARNING ALARMS

1) On ALL rubber-tried or crawler scrapers, bulldozers, front-end loaders, backhoes, motor graders, industrial tractors and forklift trucks, Rollover Protective Structures (ROPS) and Falling Object Protective Structures (FOPS) are required. (Note: See OSHA for structural performance standards).

2) On equipment where ROPS are required (above), seat belts shall be installed and worn by operators.

3) In lieu of a signalman, all bi-directional earthmoving, haulage or compacting equipment, and all trucks with a body capacity of 1-1/2 yards or more used to haul dirt, rock, concrete or other material shall be equipped with an automatically operated reverse signal alarm (such as buzzer, horn or bell) which is audible from a distance of 100 feet from the rear of the vehicle in operation. It shall be the duty of the contractor to inform his suppliers of these requirements.

V. CONCRETE

1) All equipment and materials used in concrete construction and masonry work shall meet the applicable requirements for design, construction, inspection, testing, maintenance and operations as provided in OSHA.

2) Employees working more than six feet above adjacent working surfaces, placing and typing reinforcing steels in walls, piers, columns, etc., shall be provided with a personal fall arrest system (29CFR 1926.502), or equivalent device.

3) Employees shall not be permitted to work above vertically protruding reinforcing steel unless it has been protected to eliminate the hazard of implement.

4) Guying – Reinforcing steel for walls, piers, column and similar vertical structures shall be guyed and supported to prevent collapse.

5) Wire mesh rolls – Wire mesh rolls shall be secured at each end to prevent dangerous recoiling action.

6) Pumpcrete systems – Pumpcrete or similar systems using discharge pipes shall be provided with pipe supports designed for 100 percent overload. Compressed air hose in such systems shall be provided with positive fail-safe joint connectors to prevent separation of sections when pressurized. Safety chains shall be provided on all line two inches in diameter or larger.

7) Concrete buckets equipped with hydraulic or pneumatically operated gates shall have positive safety latches or similar safety devices installed to prevent aggregate and loose material from accumulating on the top and sides of the bucket.

8) Riding of concrete buckets for any purpose shall be prohibited, and vibrator crews shall be kept out from under concrete buckets suspended from cranes or cableways.

9) When discharging on a slope, the wheels of ready-mix trucks shall be locked and the brakes set to prevent movement. The use of chocks is also required.

10) Nozzlemen applying a cement, sand, and water mixture through a pneumatic hose shall be required to wear protective head and face equipment.

11) When temporary storage of reinforcing rods, materials, or equipment on top of formwork becomes necessary, these areas shall be strengthened to meet the intended loads.

12) The sills for shoring shall be sound, rigid, and capable of carrying the maximum intended load.

13) All shoring equipment shall be inspected prior to erection to determine that it is as specified in the shoring layout. Any equipment found to be damaged should not be used for shoring.

14) Erected shoring equipment shall be inspected immediately prior to, during, and immediately after the placement of concrete. Any shoring equipment that is found to be damaged or weakened shall be immediately reinforced or reshored.

15) Reshoring shall be provided when necessary to safety support slabs and beams after stripping or where such members are subjected to superimposed loads due to construction work done.

16) Metal tubular frames used for shoring shall not be loaded beyond the safe working load recommended by the manufacturer.

17) All locking devices on frames and braces shall be in good working order; coupling pins shall align the frame or panel legs; pivoted cross braces shall have

their center pivot in place; and all components shall be in a condition similar to that of original manufacture.

18) When checking the erected shoring frames with the shoring layout, the spacing between towers and cross brace spacing shall not exceed that shown on the layout, and all locking devices shall be in the closed position.

19) Devices for attaching the external lateral stability bracing shall be securely fastened to the legs of the shoring frames.

20) Formwork and shoring shall be designed, erected, supported, braced, and maintained so that it will safely support all vertical and lateral loads that may be imposed upon it during placement of concrete.

21) Working drawing showing the jack layout, formwork, shoring, working decks, and scaffolding, shall be available at the Work Site for review by the Engineer.

22) Stripped forms and shoring shall be removed and stockpiled promptly after stripping. In all areas which persons are required to work or pass, protruding nails, wire ties, and other form accessories not necessary to subsequent work shall be pulled, cut, or other means taken to eliminate the hazard.

23) Imposition of any construction loads on the partially completed structure shall not be permitted unless such loading has been considered in the design and approved by the Engineer.

24) Jacks and vertical supports shall be positioned in such a manner that the vertical loads are distributed equally and do not exceed the capacity of the jacks.

25) When checking the erected shoring towers with the shoring layout, the spacing between posts shall not exceed that shown on the layout, and all interlocking of tubular members and tightness of couples shall be checked.

26) All baseplates, shore heads, extension devices, or adjustment screws shall be in firm contact with the footing sill and the form material and shall be snug against the posts.

27) For stability, single post shores shall be horizontally braced in both the longitudinal and transverse directions, and diagonal bracing shall also be installed. Such bracing shall be installed as the shores are being erected.

28) All baseplates or shore heads of single post shores shall be in firm contact with the footing sill and the form materials.

29) Whenever single post shores are used in more than one tier, the layout shall be approved by the Engineer.

30) When formwork is at an angle, or sloping, or when the surface shored is sloping, the shoring shall be designed for such loading.

31) Adjustment of single post shores to raise formwork shall not be made after concrete is in place.

32) Fabricated single post shores shall not be used if heavily rusted, bent, dented, rewelded, or having broken weldments or other defects.

33) Timber shall not be used if it is split, cut, has sections removed, is rotted, or is otherwise structurally damaged.

34) Nails used to secure bracing or adjustable timber single post shores shall be driven home and the point of the nail bent over if possible. Double head nails will be permitted.

W. DEMOLITION

1) All sidewalks and walkways open to the public shall have abrasive non-skid surface and shall be kept clean and free of tripping hazards at all times.

2) "NO PARKING" zones with appropriate signs and barricades shall be displayed adjacent to buildings being demolished.

3) Water or other means of dust control shall be used where dust presents a health or environmental hazard, property damage potential, or nuisance.

4) See this Manual's section for Rollover and Falling Object Protection Structures, which also applies to demolition equipment.
5) Provide adequate protection to prevent damage to pipes, conduits, wires, cables, or structures above or below ground, which are not designated for removal.

6) Overhead protection shall be erected over sidewalks and shall extend at least ten feet beyond the building lines along direction of the sidewalks. Overhead planking shall be a minimum of three-inch full dimension lumber placed on adequately designed, metal or timber frames.

7) Substantial catch platforms shall be erected around all sides of the building prior to any demolition. Design must be approved by the Engineer.

8) Solid barriers of ¾ inch exterior fire rated B/D Plywood at least eight feet high shall be erected around the structure at ground or sidewalk level to protect the public. The barriers shall be framed with, at a minimum, 2"x3" fire rated studs 16" on center.

9) Full time flagman shall be provided to assist truck egress and ingress.

10) All mechanical, electrical, air conditioning, ducting, skylights, windows, and any other equipment, material or objects on roofs or walls of adjoining or adjacent structures to buildings under demolishment shall be adequately protected from falling material and activity of wrecking crews and equipment.

11) No mechanical equipment (i.e. headache ball, impact equipment other than hand held) shall be used within six feet of any adjoining structure.

12) Employees engage in the demolition or removal of any pipes, structures or machinery covered or insulated with asbestos shall conform with all federal, state and local codes, rules, regulations and requirements including but not limited to:

a) 29CFR 1926.1101

b) 40CFR 61, Subpart M

c) Florida Statue 469.001-469.099

d) Miami-Dade Department of Environmental Resource Management

13) Employees engage in the demolition, removal or disturbance of any listed hazardous substance shall conform with all applicable federal, state and local codes, rules, regulations and requirements.

X. ADVERSE WEATHER CONDITIONS

1) Disassemble all scaffolds, loose formwork, radio antennas and secure properly.

2) All items that cannot be secured shall be stored inside secured storage areas or buildings.

3) All crane booms shall be lowered to ground level and secured to prevent movement.

4) All office trailers shall be tied down in compliance with MDC Tie Down Ordinance No. 77-1 upon original installation. All tie down straps, ground anchors, piers, etc., shall be checked for condition and operation.

5) All exposed glass on the Work Site shall be protected by a solid, rigid covering.

6) All free standing walls shall be shored from both sides.

7) Before employees are dismissed from the Work Site, the Contractors shall make a thorough inspection to verify all necessary precautions have been taken, and report to the engineer for any further instructions.

8) All precautions for construction sites during hurricane conditions, as required by the Florida Building Codes (Appendix D) shall be met.

9) All contractors shall develop a project specific hurricane plan. This plan will include a detailed description of all hurricane preparation activities for each MDT phase of hurricane readiness including:

   a) Phase A – Pre-Season Preparedness

   b) Phase B – Hurricane Advisory (48 hours prior to landfall)

   c) Phase C – Hurricane Watch (24-48 hours prior to landfall)

   d) Phase D – Hurricane Warning (24 hours prior to landfall)

   e) Phase E – Landfall

   f) Phase F – Recovery/Post Hurricane

10) Progression through the MDT phases of hurricane readiness will be declared by the MDT Hurricane Disaster Preparedness Coordinator (Coordinator). The Coordinator may accelerate preparedness levels based on prevailing conditions and expectations. The time of day the storm is expected to arrive, along with the Miami-Dade Emergency Operations Center levels of activation, are some of the factors that are considered. The MDT readiness phase will be communicated through the Resident Engineer or other MDT contract representative.

Y. HOUSEKEEPING

1) All refuse piles shall be removed from the Work Site immediately.

2) Stored and stacked materials shall be kept orderly, properly stacked, choked, and secured.

3) Any protruding nails, etc., shall be bent, removed or clinched immediately.

4) Oil, grease, and water spills shall be cleaned up immediately.

5) Loose materials, tools, or equipment shall be kept off stairs, out of walkways, ramps, platforms at all times when not in use.

6) Depressions and pot-holes in vehicle or walkway surfaces on the Work Site shall be properly filled and graded immediately.

7) Walkways, vehicle travel ways, ramps, railings, and stairways, shall be kept free from debris, properly installed and maintained.

8) Smoking or the use of open flames within 25 feet of flammable storage areas or fueling areas shall not be permitted.

9) Flammable storage areas shall be properly posted **"NO SMOKING"**, provided with adequate fire extinguishers and free of combustible materials.

10) All sanitary facilities used on the Work Site shall be maintained on a daily basis.

11) All structures shall have a minimum of a 5-foot perimeter clearance that is to be free from any combustible debris or materials.

Z. HAZARDOUS SUBSTANCES

1) The Contractor shall develop, implement and maintain a written Hazard Communication/Right-to-Know Program and comply with all applicable requirements of OSHA Hazard Communication Standard 29CFR1910.1200.

2) The Contractor shall ensure that each container of hazardous substances in the workplace is labeled, tagged, or marked with the following information:

   a) identify of the hazardous substance (s) contained therein
   b) appropriate hazard warnings

3) The Contractor's written hazard communication program shall describe how the criteria for labeling; Material Safety Data Sheets (MSDS); employee information and training will be met and also include:

   a) A list of the hazardous chemicals known to be present and their locations at the Work Site.
   b) The methods the employer will use to inform employees of the hazards of non-routine tasks & the hazards associated with hazardous substances contained in unlabeled pipes in their work areas.

4) The Contractor shall maintain copies of the required Material Safety Data Sheet (MSDS) for each hazardous substance in the workplace, and shall ensure that they are readily accessible during each work shift to employees. (The Contractor may obtain the MSDS for a product by requesting it from the product's manufacturer, distributor, or importer.

5) Where employees must travel between workplaces during a workshift, i.e., their work is carried out at more than one geographical location, the MSDS may be kept at a central location at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

6) MSDS shall also be made readily available to fire & emergency response personnel, the Engineer and MDC Rick Management.

7) Contractors shall provide their employees with the following:

   a) Information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area.
   b) Any operations in there work area where hazardous chemicals are present.
   c) The location and availability of the written hazard communication program, including the required list (s) of hazardous chemicals and material safety data sheets.
   d) Information as to the employees' rights under the Florida Right-to-Know Law:

      1. The right to know of the listed toxic substances present in the workplace.
      2. The right to obtain a copy of the Material Safety Data Sheet for each listed toxic substance present.
      3. The right to refuse to work, under specified circumstances, with a listed substance, if not provided a copy of the Material Safety Data Sheet for that substance within 5 of the requesting employee's working days after submitting a written request to the employee's employer.
      4. The right to instruction, within 30 days of employment, and at least annually thereafter, on the adverse health effects of each listed toxic substance with which they work in the workplace, how to use each substance safety, and what to do in case of any emergency.
      5. The right to obtain further information on the properties and hazards of listed toxic substances from the Toxic Substance Information Center (1-800-367-4378).
      6. The right to protection against discharge, discipline, or discrimination for having exercised any of these rights.

8) The Contractor shall post the State of Florida Right-to-Know Poster at the Work Site. The poster and information/assistance in complying with the Right-to-Know Law is available from the Toxic Substance Information Center (1-800-367-4378). As soon as any environmental item is discovered, the Contractor shall immediately inform the Resident Engineer and the MDT Senior Professional Engineer (Environmental).

APPENDICES

Appendix A - State of Florida, First Report of Injury or Illness; Supervisor's Report; OSHA 300 & 300A

Appendix B - Tool Box Safety Meeting Document, Suggested Format

Appendix C - Safety Inspection Checklist For Crane Inspection & Critical Lifts

Appendix D - Special Hurricane Precautions

Appendix E - OSHA General Industry and Construction Standards Requiring a Competent Person

APPENDIX A

INSTRUCTION - FIRST REPORT OF INJURY OR ILLNESS
LES FORM DWC – 1

EMPLOYER -You are required by law to report all industrial accidents to the Division of Workers' Compensation within seven days of your first knowledge of the accident. A civil penalty of up to $500 is provided for failure. Fully complete this form, using the employee's description of the accident, signs it, have the employees sign it and mail the original to the Division. Copies marked for the employee and your carrier (insurance company) must be sent to them.

If, for any reason, the employee cannot or will not sign the notice, **do not delay your report.**

EMPLOYEE -You are required by law to report your accident to the Worker's Compensation Division. Enter your description of the accident on this form, have your employer complete the form, then both of you should sign. If your employer refuses to sign or complete the report you should complete it. Send the original to the division, a copy to your employer.

For assistance, or for answers to questions on Workers' Compensation, call the toll free number shown on the form.

DISTRIBUTION: Part 1 - Division Copy
Part 2 - Carrier Copy
Part 3 - Employer Copy
Part 4 - Employer Copy

FIRST REPORT OF INJURY OR ILLNESS

FLORIDA DEPARTMENT OF FINANCIAL SERVICES
DIVISION OF WORKERS' COMPENSATION

For assistance call 1-800-342-1741
or contact your local EAO Office
Report all deaths within 24 hours 1-800-219-8953 or (850) 922-8953

RECEIVED BY CLAIMS-HANDLING ENTITY	SENT TO DIVISION DATE	DIVISION RECEIVED DATE

PLEASE PRINT OR TYPE

EMPLOYEE INFORMATION

NAME (First, Middle, Last)

Social Security Number | Date of Accident (Month-Day-Year) | Time of Accident ☐ AM ☐ PM

HOME ADDRESS
Street/Apt #: ____
City: ____ State: ____ Zip: ____

TELEPHONE Area Code Number

EMPLOYEE'S DESCRIPTION OF ACCIDENT (Include Cause of Injury)

OCCUPATION

INJURY/ILLNESS THAT OCCURRED | PART OF BODY AFFECTED

DATE OF BIRTH ____/____/____

SEX ☐ M ☐ F

EMPLOYER INFORMATION

COMPANY NAME: ____
D.B.A.: ____
Street: ____
City: ____ State: ____ Zip: ____

TELEPHONE Area Code Number

FEDERAL I.D. NUMBER (FEIN) | DATE FIRST REPORTED (Month/Day/Year)

NATURE OF BUSINESS | POLICY/MEMBER NUMBER

DATE EMPLOYED ____/____/____

PAID FOR DATE OF INJURY ☐ YES ☐ NO

EMPLOYER'S LOCATION ADDRESS (If different)
Street: ____
City: ____ State: ____ Zip: ____
LOCATION # (If applicable) ____

LAST DATE EMPLOYEE WORKED ____/____/____

WILL YOU CONTINUE TO PAY WAGES INSTEAD OF WORKERS' COMP? ☐ YES

RETURNED TO WORK ☐ YES ☐ NO
IF YES, GIVE DATE ____/____/____

LAST DAY WAGES WILL BE PAID INSTEAD OF WORKERS' COMP ____/____/____

PLACE OF ACCIDENT (Street, City, State, Zip)
Street: ____
City: ____ State: ____ Zip: ____
COUNTY OF ACCIDENT ____

DATE OF DEATH (If applicable) ____/____/____

RATE OF PAY ☐ HR ☐ WK
$ ____ PER ☐ DAY ☐ MO

AGREE WITH DESCRIPTION OF ACCIDENT? ☐ YES ☐ NO

Number of hours per day ____
Number of hours per week ____
Number of days per week ____

Any person who, knowingly and with intent to injure, defraud, or deceive any employer or employee, insurance company, or self-insured program, files a statement of claim containing any false or misleading information commits insurance fraud, punishable as provided in s. 817.234. Section 440.105(7), F.S.
I have reviewed, understand and acknowledge the above statement.

____ EMPLOYEE SIGNATURE (If available to sign) ____ DATE

____ EMPLOYER SIGNATURE ____ DATE

NAME, ADDRESS AND TELEPHONE OF PHYSICIAN OR HOSPITAL

AUTHORIZED BY EMPLOYER ☐ YES ☐ NO

CLAIMS-HANDLING ENTITY INFORMATION

☐ 1(a) Denied Case - DWC-12, Notice of Denial Attached

☐ 1(b) Indemnity Only Denied Case - DWC-12, Notice of Denial Attached

☐ 2. Medical Only which became Lost Time Case (Complete all required information in #3)
Employee's 8[th] Day of Disability ____/____/____
Entity's Knowledge of 8[th] Day of Disability ____/____/____

☐ 3. Lost Time Case - 1st day of disability ____/____/____ Full Salary in lieu of comp? ☐ YES Full Salary End Date ____/____/____

Date First Payment Mailed ____/____/____ AWW ____ Comp Rate ____

☐ T.T. ☐ T.T. - 80% ☐ T.P. ☐ I.B. ☐ P.T. ☐ DEATH ☐ SETTLEMENT ONLY

Penalty Amount Paid in 1[st] Payment $____ Interest Amount Paid in 1[st] Payment $____

REMARKS:

INSURER NAME

CLAIMS-HANDLING ENTITY NAME, ADDRESS & TELEPHONE

INSURER CODE # | EMPLOYEE'S CLASS CODE | EMPLOYER'S NAICS CODE

SERVICE CO/TPA CODE # | CLAIMS-HANDLING ENTITY FILE #

Form DFS-F2-DWC-1 [illegible]

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20___

U.S. Department of Labor
Occupational Safety and Health Administration

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name __________

City __________ State ______

Identify the person			Describe the case			Classify the case: CHECK ONLY ONE box for each case based on the most serious outcome for that case				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness: (M)					
(A) Case no.	(B) Employee's name	(C) Job title (e.g., Welder)	(D) Date of injury or onset of illness	(E) Where the event occurred (e.g., Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g., Second degree burns on right forearm from acetylene torch)	Death (G)	Days away from work (H)	Remained at Work: Job transfer or restriction (I)	Remained at Work: Other record-able cases (J)	Away from work (K)	On job transfer or restriction (L)	Injury (1)	Skin disorder (2)	Respiratory condition (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
			month/day			☐	☐	☐	☐	__ days	__ days	☐	☐	☐	☐	☐	☐
					Page totals	__	__	__	__	__	__	__	__	__	__	__	__

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Injury (1) Skin disorder (2) Respiratory condition (3) Poisoning (4) Hearing loss (5) All other illnesses (6)

Page __ of __

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. [illegible]

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 20___

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

(G) Total number of deaths	(H) Total number of cases with days away from work	(I) Total number of cases with job transfer or restriction	(J) Total number of other recordable cases

Number of Days

(K) Total number of days away from work	(L) Total number of days of job transfer or restriction

Injury and Illness Types

Total number of . . . (M)			
(1) Injuries		(4) Poisonings	
		(5) Hearing loss	
(2) Skin disorders		(6) All other illnesses	
(3) Respiratory conditions			

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 50 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA, Office of Statistical Analysis, Room N 3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment Information

Your establishment name _____

Street _____

City _____ State ____ ZIP ____

Industry description (e.g., Manufacture of motor truck trailers)

_____

Standard Industrial Classification (SIC), if known (e.g., 3715)

____ ____ ____ ____

OR

North American Industrial Classification (NAICS), if known (e.g., 336212)

____ ____ ____ ____ ____ ____

Employment Information (If you don't have these figures, see the Worksheet on the back of this page to estimate.)

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ _____
Company executive Title

_____ _____
Phone Date

OSHA's Form 301
Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by ______________

Title ______________

Phone (____) ____-______ Date ____/____/____

Information about the employee

1) Full name ______________

2) Street ______________

City ______________ State ______ ZIP ______

3) Date of birth ____/____/____

4) Date hired ____/____/____

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional ______________

7) If treatment was given away from the worksite, where was it given?

Facility ______________

Street ______________

City ______________ State ______ ZIP ______

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the Log ______________ *(Transfer the case number from the Log after you record the case.)*

11) Date of injury or illness ____/____/____

12) Time employee began work ______________ AM / PM

13) Time of event ______________ AM / PM ☐ Check if time cannot be determined

14) **What was the employee doing just before the incident occurred?** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) **What happened?** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) **What was the injury or illness?** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) **What object or substance directly harmed the employee?** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) **If the employee died, when did death occur?** Date of death ____/____/____

Public reporting burden for this collection of information is estimated to average 22 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a current valid OMB control number. If you have any comments about this estimate or any other aspects of this data collection, including suggestions for reducing this burden, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

APPENDIX B
TOOL BOX SAFETY MEETING

FOREMAN/SUPERVISOR – PRINT NAME _____ Date and Shift _____

FOREMAN/SUPERVISOR – SIGNATURE _____ Section _____

TOPICS COVERED AT MEETING:

_____

_____

_____

Name(s) of Personnel Present for Meeting _____

Name (print)	Signature	Job Title

MDC AUDIT: _____
(name) (signature) (date)

Original must be filed for length of construction project.

APPENDIX C: SAFETY INSPECTION CHECKLIST
Page 1 of 3

TITLE: JOB SITE ERECTION – Crane Inspection

AREA INSPECTED: _____

INSPECTED BY: _____ DATE: _____

INSPECTOR SUGNATURE: _____

PCI SAFETY MANUAL REFERENCE SECTIONS: _____

* Check items to be inspected in your area – disregard others not applicable

*	OK	ITEM INSPECTED	NOT OK	COMMENTS
		The Crane Crew: Is the operator and crew properly trained and medically fit to perform their job?		
		Operating is a full time job – does the operator pay strict attention to his duties?		
		Do crane personnel wear hard hats when away from the crane?		
		Is the operator aware of the regulations involving working close to high voltage lines and electrical equipment?		
		High Voltage, even from a distance source, can be induced in metal parts of the crane. Is the operator aware of these situations?		
		Does the operator know the weight of each piece before he picks it?		
		Does the crane crew know the manufacturer's proper recommendations for making short moves on the job site?		
		Does the crew get help when lifting heavy items?		
		Does the crew periodically check for level?		
		Do they check outriggers for stability?		
		Do they check the boom angel indicator and other electronic load equipment for accuracy?		
		Does the operator allow anyone to ride the load or the hooks?		
		The Ground Crew (hooking up product) Does the ground crew have, maintain and use proper safety equipment?		
		Are they familiar with the product erection sequence?		

TITLE: JOB SITE ERECTION – Crane Inspection (continued)

AREA INSPECTED: _____

INSPECTED BY: _____ DATE: _____

INSPECTOR SIGNATURE: _____

PCI SAFETY MANUAL REFERENCE SECTIONS: _____

* Check items to be inspected in your area – disregard others not applicable

*	OK	ITEM INSPECTED	NOT OK	COMMENTS
		(Continue) Are they familiar with the crane signals and general operation of the crane?		
		Do they know how to properly hook pieces and provide aerial stability?		
		Do they know how to properly use tag lines?		
		Are tag lines in good condition, strong enough?		
		Long Enough?		
		Two-way communication between the operator and erection foreman are becoming more common to provide safety on the job. Does the crew know how to operator and maintain the system? Are spare parts available for quick repair?		
		Is the crane swing radius roped off to prohibit the crane (during swing) from causing damage or hurting someone? Is entire swing checked? Including counterweights?		
		The Machine: Is the crane operated within all capacities?		
		Is the machine inspected daily?		
		Are the required crane inspections recorded?		
		Are all controls properly identified?		
		Are warning devices operative?		
		Is an operator's manual available to the crew for easy reference?		
		Are load charts, operating signals and other important information posted and/or readily available?		

APPENDIX C: SAFETY INSPECTION CHECKLIST
Page 3 of 3

TITLE: JOB SITE ERECTION – Crane Inspection (continued)

AREA INSPECTED: _____

INSPECTED BY: _____ DATE: _____

INSPECTOR SIGNATURE: _____

PCI SAFETY MANUAL REFERENCE SECTIONS: _____

* Check items to be inspected in your area – disregard others not applicable

*	OK	ITEM INSPECTED	NOT OK	COMMENTS
		(continued) Are brakes within operating limits?		
		Are clutch and brakes surfaces dry?		
		Are all protective panels and guards in place?		
		Are electrical systems in good condition?		
		Are all of the sheaves properly aligned so as to reduce rope wear during work?		
		Is cable in good condition?		
		Are hooks in good condition?		
		Have hooks been inspected by magnetic particle inspection?		
		Are there safety latches on hooks?		
		Are fuel tanks in good condition and without leaks?		
		Are fire extinguishers available and routinely inspected?		
		Slings Are slings in good conditions? Is safety factor of 5 maintained?		
		Are slings stored properly?		
		Are sling inspected reports maintained?		
		Are "U" bolt wire rope clips correctly placed?		
		Are all other lifting devices in good condition?		

APPENDIX C (continued)
Page 1 of 2

CHECK LIST FOR CRITICAL LIFTS

NOTE: THIS FORM IS TO BE COMPLETED WHEN THE LOAD EXCEEDS 80% OF THE LOAD CHART FOR THE CRANE OR DERRICK OR WHERE THE PICK INVOLVES THE USE OF TWO OR MORE CRANES.

DATE:_____

(1) SUPERVISOR RESPONSIBLE FOR LIFT:_____

(2) DESCRIPTION OF ITEM TO BE LIFTED AND ESTIMATED WEIGHT:

_____

_____

(3) EQUIPMENT AND LIFT RELATIONSHIP:

(A) OPERATING RADIUS.....

(B) BOOM LENGTH.....

(C) ALLOWABLE LOAD (FROM LOAD CHART).....

(D) RATIO OF LIFT TO ALLOWABLE LOAD.....

(E) CLEARANCE TO SURROUNDING FACILITIES.....

(F) SLING ANGLE.....

(4) CONDITION OF HOISTING EQUIPMENT AND RIGGING:

(A) HAS ALL EQUIPMENT BEEN REINSPECTED FOR THIS LIFT? o YES o NO

(5) STABILITY OF GROUND AREA:

(A) CHECK SOIL BEARING ALLOWABLE LOAD (COMMENTS):

_____

_____

_____

(B) WILL MATS BE NEEDED? o YES o NO

CHECK LIST FOR CRITICAL LIFTS (cont.)

(B) ANY UNDERGROUND INSTALLATIONS NEEDING SPECIAL ATTENTION?

o YES o NO

(C) WILL IT BE NECESSARY FOR THE CRANE TO WALK WITH THE LOAD?

o YES o NO

IF THE ANSWER IS "YES", ANSWER QUESTIONS E, F, & G.

(E) IS AREA SURFACE LEVEL AND STABLE WHERE THE CRANE WILL BE WALKING

o YES o NO

(F) HAVE FACILITIES BEEN PROVIDED TO KEEP THE LOAD RADIUS FROM CHANGING?

o YES o NO

(G) HAVE ALL OVERHEAD FACILITIES BEEN CHECKED FOR CLEARANCE IN THE AREA WHERE THE CRANE WILL BE MOVING?

(6) DOES THE OPERATOR HAVE THE NECESSARY EXPERIENCE ON THE CRANE AND ON THIS TYPE OF LIFT?

o YES o NO

(7) IF LIFT INVOLVES USE OF TWO CRANES ANSWER THE FOLLOWING:

A) HAVE OPERATORS WORKED TOGETHER BEFORE? o YES o NO

B) WHO WILL COORDINATE INSTRUCTIONS TO OPERATORS?_____

_____

_____

BY: _____
CONTRACTOR'S SUPERINTENDENT

APPENDIX D

SPECIAL HURRICANE PRECAUTIONS

During such periods of time as are designated by the United States Weather Bureau as being a hurricane warning or alert, all construction materials or equipment shall be secured against displacement by wind forces; provided that where a full complement of personnel is employed or otherwise in attendance, or engaged for such protection purposes, normal construction procedures or uses of materials or equipment may continue allowing such reasonable time as may be necessary to secure such materials or equipment before winds of hurricane force are anticipated. Construction materials and equipment shall be secured by guying and shoring, by tying down loose materials equipment and construction sheds.

APPENDIX E

OSHA General Industry and Construction Standards Requiring a Competent Person

The following OSHA standards require a competent person to perform specific functions under the standard. Standards are arranged numerically within the categories of General Industry and Construction. This list of standards requiring a competent person is to be used as a reference tool and does not supercede OSHA requirements.

General Industry (1910)

- 1910.66, Powered platforms for building maintenance.
- 1910.66 App C, Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms, Personal Fall Arrest System (Section I - Mandatory; Sections II and III - Non-Mandatory).
- 1910.109, Explosives and blasting agents.
- 1910.139, Respiratory protection for M. tuberculosis.
- 1910.183, Helicopters.
- 1910.184, Slings.
- 1910.268, Telecommunications.

Construction (1926)

- 1926.20, General safety and health provisions.
- 1926.53, Ionizing radiation.
- 1926.62, Lead.
- 1926.101, Hearing Protection.
- 1926.251, Rigging equipment for material handling.
- 1926.354, Welding, cutting, and heating in way of preservative coatings.
- 1926.404, Wiring design and protection.
- 1926.451, Scaffolds.
- 1926.454, Scaffolds, Training requirements.
- 1926.500, Fall Protections, Scope, application, and definitions applicable to this subpart.
- 1926.502, Fall protection systems criteria and practices.
  1926 Subpart M App C, Personal Fall Arrest Systems - Non-Mandatory Guidelines for Complying with 1926.502(d).
- 1926 Subpart M App E, Sample Fall Protection Plan - Non-Mandatory Guidelines for Complying with 1926.502(k).
- 1926.503, Fall Protection, Training Requirements.
- 1926.550, Cranes and derricks.
- 1926.552, Material hoists, personnel hoists, and elevators.
- 1926 Subpart P App A, Excavations, Soil Classification.
- 1926 Subpart P App B, Excavations, Sloping and Benching.
- 1926.651, Specific Excavation Requirements.
- 1926.652, Excavations, Requirements for protective systems.
-

- 1926.705, Concrete and Masonry Construction, Requirements for lift-slab operations.
- 1926.752, Steel Erection, Bolting, riveting, fitting-up, and plumbing-up.
- 1926.800, Underground Construction.
- 1926.803, Underground Construction, Caissons, Cofferdams, and Compressed Air, Compressed air.
- 1926.850, Demolition, Preparatory operations.
- 1926.859, Mechanical demolition.
- 1926.900, Blasting and the Use of Explosives.
- 1926.1053, Ladders.
- 1926.1060, Stairways and Ladders, Training requirements.
- 1926.1101, Asbestos.
- 1926.1101 App F, Work practices and engineering controls for Class I Asbestos Operations - non-mandatory.
- 1926.1127, Cadmium.

Memorandum

MIAMI-DADE COUNTY

Date: June 25, 2015

To: Distribution

From: Eric J. Muntan, Chief
Office of Safety and Security

Subject: Background Checks for Contractors ID Procedures

Background Checks for Contractors: ID Procedures

Miami-Dade Transit (MDT) is implementing the following policies and procedures to govern both the issuance of new contractor and subcontractor ID cards, as well as renewal of currently existing contractor and subcontractor ID cards.

Procedures

All contractors and subcontractors are required to have a current ID card displayed while on MDT property at all times. In order to obtain a new or renewed Contract ID card, the following paperwork must be submitted in person:

- A completed, **original** contractor ID application, completed **in blue** ink, and signed by both the contractor/subcontractor and an MDT authorized representative.
- A completed, **original** fingerprint card.
- A completed, **original local** background check form with a proper raised seal from the issuing law enforcement agency.

All documents must be original, and can have no alterations or markings. Similarly, all documents must be produced in person. No emails, PDF files, or facsimiles will be accepted.

Copies

All copies of original documents will be maintained by an MDT inventory control specialist.

Ineligibility for issuance or renewal of contractor/subcontractor ID cards

Personnel may not be issued a new or renewed contractor or subcontractor ID if he/she currently or in the past has:

- Any felony, sexual, or domestic violence conviction
- Been discharged from the military under any conditions other than honorable
- Any history of irresponsible behavior including but not limited to an unreasonable driving record, or a problem employment record as determined by the county contract administrator or designee

- Any criminal activity listed in 49 US Code of Federal Regulations (CFR) section 1542.209, *Disqualifying Criminal Offenses* and 19 CFR 122.183, *Denial of Access*.

Display of ID card

All contractor and subcontractor personnel **must** at all times conspicuously display their contractor/subcontractor ID card. Prior to entry, and at all times while on MDT property, contract and subcontract personnel are subject to ID checks by any authorized MDT agent. Any personnel not in possession of their ID card will be denied access to MDT property, or if already on property will be immediately escorted off MDT property until such time as he/she can display proper ID.

All contract and subcontract personnel are subject to random ID checks while on MDT property, at any time for any purpose, by any authorized MDT agent.

Limit of Duration of Contractor/Subcontractor ID card

New or renewed contractor/subcontractor ID cards shall be valid for a time not to exceed one year. All issued contractor/subcontractor cards must be renewed prior to the completion of the one year period to maintain all contractor/subcontractor privileges included therein. Any contractor or subcontractor who fails to comply with the one year renewal requirement is strictly forbidden from entering any MDT property as a contractor/subcontractor until such time as the ID card is renewed and returned to valid status.

MIAMI-DADE COUNTY TRANSIT

Contractor/Subcontractor New or Renewal ID Checklist

Each of the following tasks **must** be completed prior to issuance of any new or renewed contractor or subcontractor ID cards. Successful completion of the below requirements will help prevent any unnecessary delays or obstacles in obtaining your new or renewed contractor or subcontractor ID card.

Did you remember to:	Completed?
Complete your contractor ID application in blue ink?	☐
Have your contractor ID application signed by an authorized MDT representative?	☐
Complete a fingerprint identification card?	☐
Complete an NCIC background check with proper seal?	☐
Bring only original documents, not photocopies, and refrain from sending any email, PDF, or faxed documents?	☐
Keep all original documents free of any unnecessary markings or alterations?	☐
Verify that you have no convictions for any listed criminal acts that prohibit issuance or renewal of an ID card?	☐
Read all requirements for obtaining, maintaining, and displaying your contractor/subcontractor ID card?	☐

Upon successful completion of all of the above listed items, you are permitted to turn in the necessary original documents to request issuance of either a new or renewed contractor/subcontractor ID card.

MDT CONTRACTOR IDENTIFICATION CARD APPLICATION

Company Name: _____ **Date:** _____
Company address: _____
City: _____ **State:** _____ **Zip:** _____ **24 hrs Contact #:** _____
Email Address: _____ **Fax #:** _____

Employee's Name: _____ **Phone #:** _____
Employee Address: _____
City: _____ **State:** _____ **Zip:** _____ **SS #;** _____

Certification: I hereby certify that all information made on this form is true to the best of my knowledge. Furthermore, I agree to abide by all County and MDT policies and procedure while on MDT property. I further agree that any identification cards and/or credentials issued to me are MDT property and shall be surrendered to MDT upon completion of any assignment/project at the property for which the identification was issued. I am aware if the ID is lost or stolen, the replacement fee will be $10.00 the first time and $20.00 every time there after. I further agree and understand that the MDT card is not to be used for free transportation on MDT Metrobus or Metrorail system.

Employee's Signature: _____ Print Name: _____

MDT accompanying Supervisor Statement: I hereby certify that all information made on this form is true to the best of my knowledge and that the applicant is a bona fide employee or sub-contractor of said Contractor.

MDT signature: _____ Print Name: _____
Title: _____ Phone #: _____

Contractor's Representative Statement: I hereby certify that all the information made on this form is true to the best of my knowledge and the applicant is a bona fide employee or sub-contractor of our company. I further agree that any identification cards/credentials issued to this person are MDT property and shall be surrendered to MDT upon completion of any assignment/project at the property for which the identification was issued.

Signature: _____ Print Name: _____
Title: _____ Phone #: _____

SECTION TO BE COMPLETED BY EMPLOYEE RELATIONS ONLY

Date: _____ Prox. Card #: _____ Station Card #: _____
Cyber Key #: _____ 311 Card #: _____
Expiration Date not to exceed 12 months after date of issue: _____

Identification given: License #: _____ Alien Card #: _____
Passport #: _____ Other: _____

ID in [ ] not returned [ ] Date: _____ Cyber key in [ ] not returned [ ] Date: _____
Station Card in [ ] not returned [ ] Date: _____ 311 Card in [ ] not returned [ ] Date: _____
Rev 10/9/15

APPLICANT
* See Privacy Act Notice on Back

FD-258 (REV.12-10-07)

LEAVE BLANK

TYPE OR PRINT ALL INFORMATION IN BLACK

LAST NAME NAM | FIRST NAME | MIDDLE NAME

FBI LEAVE BLANK

SIGNATURE OF PERSON FINGERPRINTED

ALIASES AKA

ORI

RESIDENCE OF PERSON FINGERPRINTED

DATE OF BIRTH DOB
Month Day Year

CITIZENSHIP CTZ | SEX | RACE | HGT. | WGT. | EYES | HAIR | PLACE OF BIRTH POB

DATE | SIGNATURE OF OFFICIAL TAKING FINGERPRINTS

YOUR NO. OCA

LEAVE BLANK

EMPLOYER AND ADDRESS

FBI NO. FBI

CLASS

ARMED FORCES NO. MNU

REF.

REASON FINGERPRINTED

SOCIAL SECURITY NO. SOC

MISCELLANEOUS NO. MNU

1. R. THUMB	2. R. INDEX	3. R. MIDDLE	4. R. RING	5. R. LITTLE
6. L. THUMB	7. L. INDEX	8. L. MIDDLE	9. L. RING	10. L. LITTLE

LEFT FOUR FINGERS TAKEN SIMULTANEOUSLY | L. THUMB | R. THUMB | RIGHT FOUR FINGERS TAKEN SIMULTANEOUSLY

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

BID DOCUMENTS

METRORAIL 3rd RAIL ISOLATION DISCONNECT SWITCHES REPLACEMENT

PROJECT NO. RIP338

CONTRACT NO. RIP338-DTPW23-CT

DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
ADJACENT CONSTRUCTION MANUAL

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July 2017

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OFFICE OF SAFETY AND SECURITY

MIAMI, FLORIDA

July 2017

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Date

Approved By:
Eric Muntan
Chief, DTPW
Office of Safety and Security

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1.0 Introduction

This manual was prepared in the interest and for the guidance of those who may want to construct a non-Department of Transportation and Public Works (DTPW) physical structure (incl. any excavation, demolition or use of DTPW real property) on, adjacent to, or over, an existing DTPW facility and/or property. The purpose of this Manual is to provide uniform minimum standards and criteria for the construction, development and maintenance of all properties that have or may enter the **Safety Zone** (defined in Appendix A and C) that has been established for all DTPW property and extending on either side of the Metrorail and/or Metromover systems. This includes any equipment, regardless of distance from the guideway, which static or operational failure could directly or indirectly affect DTPW operations or structures.

These standards are intended to provide the basic guidance for the construction, development and maintenance of property adjacent to the operating guideway systems so as to:

1. Protect the safety of the general public and DTPW Employees.
2. Protect the guideway system and the DTPW property from physical damage.
3. Preserve the level of service and operational schedules so as to cause the least disruption for the ridership and use of the DTPW system.

This manual outlines the design guidelines and criteria to follow for the design and submittal of construction plans and specifications to DTPW for review prior to construction of the project. It is the general policy of DTPW to review designs for construction projects adjacent to or on DTPW property on a case-by-case basis to ensure that DTPW facilities are not damaged by the proposed construction, and that DTPW operations are not impacted during or after the adjacent construction.

DTPW maintains half-size "as-built" drawings in its Engineering, Planning & Development (EP&D) Library. Half-size copies of any of the drawings on file are available at printing costs. The full-size drawings on file are available at printing costs. The full-size drawings are normally in archival storage. Full size drawings may be obtained by special request. The Manager, DTPW Document Control, may be contacted (telephone: (786) 469-5268) for an appointment to review the drawings and to order prepaid copies as required.

The criteria provided herein are general in nature and for the sole purpose of providing a selective overview of the design requirements. Specific designs performed in the past by DTPW's consultants may not necessarily be in total conformance with this manual. It is considered to be the Developer's responsibility to obtain the original design computations, where available, from DTPW to completely understand the original design intent in order to accurately assess the impact of their proposed construction on the DTPW structures and facilities. A map of the DTPW Metrorail and Metromover system is provided in Section 2.0 (below) for use in locating "as-built" drawings.

2.0 System Maps (Rail & Mover)

2.1 Metrorail System

2.2 Metromover System

3.0 General Procedures for Adjacent and Transit Right-of-Way Construction Activity

Developers or agencies contemplating any construction activity adjacent to or on Department of Transportation and Public Works (DTPW) facility, structure or property, including any excavation, maintenance, restoration, demolition or use of DTPW real property, should provide, for review, three (3) copies of their drawings and three (3) copies of their calculations, showing the relationship between their project and the DTPW facilities.

Sufficient drawings and details should be submitted to facilitate DTPW's review of the effects that the proposed project may or may not have on the DTPW facilities. A DTPW review requires internal circulation of the construction drawings to concerned departments. Drawings normally required for review are:

- Site Plan
- Drainage Area Maps and Drainage Calculations
- Architectural drawings (basement plans through top floor)
- Sections showing foundations and DTPW Structures
- Structural drawings (provide relative sections showing DTPW)
- Column load tables
- Pertinent drawings detailing an impact on DTPW facilities
- A copy of the geotechnical report

If uncertainty exits on the possible impacts a project may have on the DTPW facilities, and before making a formal application for a review of a construction project adjacent to the DTPW System, the developer or his agent may contact the **Chief, Right-of-Way and Utilities Division should be contacted at (786) 469-5244.**

Sheeting and shoring drawings should be accompanied by calculations. The drawings and calculations should contain comments, details, notes, and instructions describing the proposed sequence of construction.

When the design of foundations and site work of the project has progressed to the point considered complete and ready for review, the drawings and calculations, as applicable, should be sent to:

Chief
Right-of-Way and Utilities
Department of Transportation and Public Works
701 N.W. 1st Court, Suite 1500
Miami, FL 33136

A period of 15 working days should be allowed for review of the drawings and calculations. Fifteen (15) days should be allowed for each successive review as required. Additional review time may be required for complex projects.

Reimbursement is required for the cost of providing support services for adjacent construction and joint development projects where access is required into the operating Metrorail/Metromover system; or the system is impacted. As part of the review procedure, and before any work may proceed, the developer will be required to sign a letter accepting this obligation.

The applicant must receive written approval for the design of a given project by the DTPW Chief, Right-of-Way & Utilities or DTPW Fire/Life Safety Technical Committee Chairperson (as applicable), prior to the start of construction.

Project Documents shall be reviewed and accepted by the appropriate DTPW Divisions for possible impact on DTPW facilities and operations, including all elements associated with the construction of the project and any temporary protection system needed to preserve the system safety.

Each "Part" of the project's design shall be reviewed and approved by the DTPW Design and Engineering Division (DED). A few of the more common "Parts" of a project are considered to be sheeting and shoring, overhead protection, dust protection, dewatering, temporary use of public space for construction activities.

The DTPW review process is outlined in Figure 1 below

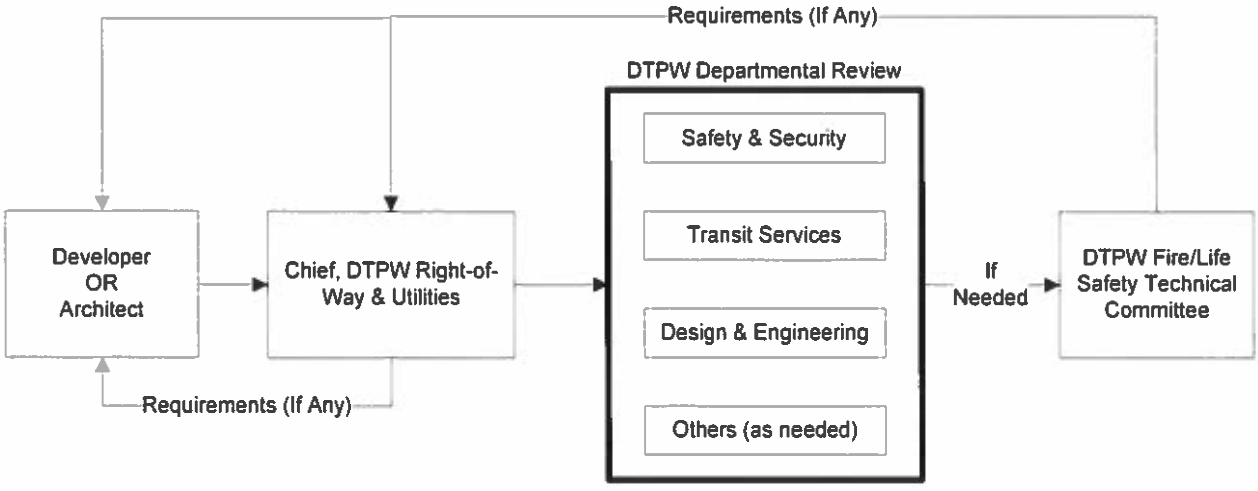


Figure 1

3.1 Fire/Life Safety

DTPW Office of Safety and Security is charged with the responsibility to chair the DTPW Fire/Life Safety Technical Committee which was formed in 1978 to guide Department of Transportation and Public Works (DTPW), rapid transit operations, in developing and following emergency procedures and operational procedures to ensure all fire/life safety related equipment is in proper order and all associated personnel are appropriately trained; to prescribe testing and inspection procedures for fire/life safety equipment in accordance with appropriate codes; to assist the DTPW in developing and implementing a comprehensive joint training program for fire/rescue personnel and DTPW employees; and, to interpret and apply fire/life safety codes, criteria and standards to the design of the fixed guideway systems.

The DTPW Fire/Life Safety Technical Committee acts on behalf of the DTPW Director in accordance with the above to interpret and apply fire/life-safety requirements incorporated in the Florida Building code; National Fire Protection Association Codes and Standards; State Statutes and Fire Marshal's Office; South Florida Fire Protection Code; DTPW Criteria and Standards; other applicable codes, standards and criteria; and, as required, to develop, and verify implementation of, design standards for the DTPW to protect life and property. The Committee works closely with Transit Engineering for design of fire/life safety features and test and maintenance of alarm systems. For test and maintenance of fire suppression systems, the Committee works with facilities maintenance organizations.

As required by the current System Safety Program Plan, the Fire/Life Safety Technical Committee addresses fire/life safety concerns, as described above, for all phases of DTPW Metrorail, Metromover, Metrobus and Special Transportation Services Operations. The Committee also serves as liaison with all Miami-Dade County jurisdictions for development and coordination of emergency response procedures and annual emergency response drills.

4.0 DTPW Review Policy

All design work will be reviewed based upon the assumption that the design will meet the applicable code adopted in the jurisdiction as well as the DTPW Design Criteria and DTPW Standard Specifications. The DTPW design concepts, as set forth herein, generally represent the design approach used by DTPW in the design of its facilities. The effect of adjacent construction upon DTPW structures should be examined based upon the same approach.

Permits, where required by the local jurisdiction, shall be the responsibility of the developer.

Monitoring of the temporary support of excavation structures for adjacent construction shall be required in all cases for excavations within the influence line of DTPW structures (Appendix B). The extent of the monitoring will vary from case to case. Structural design computations maybe required for the adjacent construction. When requested by DTPW, the calculations submitted for review shall include the following:

- A concise statement of the problem and the purpose of the calculation.
- Input data, applicable criteria, clearly stated assumptions and justifying rationale.
- References to articles, manuals and source material should be furnished with the calculations.
- References to pertinent codes and standards.
- Sufficient sketches or drawing references for the work to be easily understood by an independent reviewer. Diagrams indicating data (such as loads and dimensions) shall be included along with adequate sketches of all details not considered standard by DTPW.
- The source or derivation of all equations shall be shown where they are introduced into the calculations.
- Numerical calculations shall clearly show all English units.
- Identify results and conclusions.
- Calculations shall be neat, orderly, and legible.

Drawings should be drawn, to scale, showing the location and relationship of the proposed adjacent construction to existing DTPW structures at various stages of new construction along the entire adjacent alignment. The stresses and deflections induced in the existing DTPW structures should be provided.

The short-term and long-term effects of the new loading due to the adjacent construction on the DTPW structures should be provided. The soil parameters and other pertinent geo-technical criteria contained herein should be used to analyze the existing DTPW structures.

DTPW structures shall be analyzed for differential pressure loadings caused by dewatering the adjacent construction site.

A system of earth retaining structures is required for new excavations adjacent to DTPW structures. Design calculations and drawings stamped and prepared by a Registered Professional Engineer experienced in this type of work, and registered in the state where the work will be performed, are required.

All DTPW underground concrete structures are designed using the ACI Alternate Design Method (working stress design) to curtail excessive deflections and cracking. DTPW underground structures shall be fully reevaluated, for the effects caused by the adjacent construction, using working stress techniques.

4.1 REVIEW SUBMITTALS - DRAWING CRITERIA

General
All designs for the protection, support (sheeting and shoring) and underpinning of existing DTPW structures shall be reviewed by DTPW's Design and Engineering Division (DED). The investigation of the feasibility of various underpinning and dewatering schemes for structures constructed adjacent to DTPW facilities shall be investigated by the developer. The developer's engineer should make recommendations concerning the best underpinning design for a particular structure.

The developer's contract drawings and specifications shall require his construction contractor to maintain, protect and be responsible for the safety, stability and integrity of all adjacent DTPW structures which may be affected by his work.

Drawing Details
The following information shall be included in the drawings submitted for review of an adjacent construction project:

- Dimensioned clearances, both horizontal and vertical, between the adjacent developer's construction and DTPW structures, track, roadways, parking areas and utilities.
- Details of the proposed modifications to DTPW's roadways, parking areas, and busways. Include sections and details showing the relationship of existing facilities and proposed facilities.
- Cross sections with the existing and proposed contours and limits of grading work shown in relation to the property lines and the impact or lack thereof on DTPW facilities. Where grading changes are required in DTPW property, provide the dimensions and square footage of the area required for construction easements.
- Hydrologic and hydraulic calculations showing the impacts on the DTPW drainage system are required if storm drainage from the proposed development is to be discharged into the existing DTPW drainage system. Appropriate sedimentation

and erosion control measures should be included upstream of the discharge point onto DTPW property.

- Where modifications to DTPW utilities are required by adjacent construction, submit for review cross sections, plan and profiles, specifications and design calculations concerning the utility modifications. Details for maintaining electrical and water service to DTPW Stations should be shown when required.
- Where construction will impact a DTPW station entrance and the public, include in the submittal plans for temporary pedestrian and vehicular traffic circulation for the area around the station entrance. Where construction will be adjacent to or above a Metrorail/Metromover station entrance, protection will be required over the escalators in accordance with Section "Overhead Protection" of this Manual. Provide the construction plans, the shop drawings or the working drawings showing the phasing of adjacent construction as well as the construction details for overhead protection, pedestrian barricades, and sidewalk protection. Requests for relocation of bus stops and bus shelters shall be clearly shown on the plans. Barricades and signing necessary to direct the public through the construction zone will be required. Lighting will be required as part of all overhead protection structures.
- Provide construction protection details to preclude impacts on DTPW landscaping, street furniture, pylons, bus shelters and light fixtures.

5.0 DTPW Operational Requirements

DTPW shall have the right to stop any work or construction activities that effects the safety of the DTPW patrons and or facilities or normal DTPW operations. DTPW will exercise reasonable advance notice, except for any matters related to immediate system concerns which will require no advance notice.

Construction work which may have any impact on the Metrorail/Metromover Systems may be scheduled during the Non-Peak Operating Hours or Non-Passenger Hours. Non- Peak Operating Hours are defined as weekdays prior to 6:30 A.M. or after 7:00 P.M. and between 10 A.M. and 3 P.M.; and all day Saturday and Sunday. Non-Passenger hours are defined as Monday through Sunday 12:30 A.M. to 4:30 A.M. Passenger hours may change without notice.

Construction work that may impact weekend or special operational conditions will be limited. Schedule requirements will be addressed on a project by project basis where the individual scheduling need of the project can be evaluated with respect to the operations of the DTPW system.

5.1 General Conditions for Construction Adjacent to the Metrorail or Metromover Guideway/Facilities

A. Clear access is required on a 24 hour basis for ingress and egress for transit patrons, fire and rescue personnel, and maintenance personnel.

B. A contact person will be named by the Contractor to act as liaison with the DTPW Office of Safety and Security for all matters related to safety of the DTPW System. A contact person shall also be named (may be the same person) to act as liaison with the DTPW Metrorail/Metromover Operations Division for all matters related to operation of the Transit System.

C. DTPW shall have the right to review all plans and any construction with reasonable advance notice, except for any matters related to immediate system safety concerns which will require no advance notice.

D. No construction elevators or cranes will be erected on the Metrorail/Metromover guideway side of the building/structure being constructed or demolished.

E. The Metrorail/Metromover guideway shall not be used to support and/or brace construction scaffolding or equipment.

F. For any activity within the **Safety Zone**, the following requirements may apply pending DTPW review.

G. At least forty-eight hours notice describing the nature of the work shall be provided to the DTPW prior to commencement of work.

H. The contractor will provide special protection, such as netting, barricades, walks, screens, scaffolds, etc., acceptable to DTPW, to help ensure the safety

of DTPW property, patrons and employees. No work shall be permitted unless such protection is provided as determined necessary by DTPW.

I. Best efforts will be used to schedule all construction work which may have any impact on the Metrorail/Metromover System during the Non-Peak Operating Hours or Non-Passenger Hours. Non-Peak Operating Hours are defined as weekdays prior to 6:30 A.M.; after 7:00 P.M. and between 10 A.M. and 3 P.M.; and all Saturdays and Sundays. Non-Passenger Hours are defined as Monday through Sunday 12:30 A.M. to 5:00 A.M. or such other hours as may be designated by the County as Non-Passenger hours. Passenger hours will change as required by DTPW.

J. No crane lifts, other crane operations or any other operation shall be performed within the **Safety Zone** (Appendix A and C) without prior approval (in writing) from DTPW. This paragraph shall apply where any part of the load or crane (incl. counter weight), construction equipment or operation that is above the surface of the guideway running pad/rail.

K. For any construction activity within the **Safety Zone** (Appendix A and C) or that may encroach into the Safety Zone, DTPW may deem, as necessary, at the contractor's expense, a DTPW employee or DTPW authorized contractor or consultant (Monitor), to coordinate the contractor's activities with Central Control. This employee will be responsible for monitoring construction activities and communicating with DTPW Central Control. DTPW will determine, in the reasonable exercise of its discretion, the number of hours the above-mentioned employee is needed. The construction contractor will reimburse DTPW for costs arising from the provision of the above-mentioned employee which will be charged at the current rate.

L. DTPW may, at its discretion, modify any of the above conditions or impose additional conditions, to help ensure the safety of the public, and its patrons, employees or property.

5.2 DTPW Monitor and Contractor Coordination

A. Start-up

There will be continued meetings between representatives from DTPW, and Contractor/Developer's project manager, DTPW crane Monitors, the Contractor's crane operators and the form-work Contractor prior to the commencement of the phase work by the tower cranes and any other equipment or operation, adjacent to the DTPW Metromover/Metrorail Guideway System. In addition, DTPW Monitors and the contractor equipment/crane operators will continue to meet daily, at the beginning of the work day, of the project to establish a working relationship of the daily routines in and around the DTPW safety zone.

No construction work requiring a DTPW Monitor will commence until the Contractor provides the DTPW Monitor a functional Contractor radio, and sign off for same as per contractor procedures. Upon arrival at the project site, the DTPW Monitor will

immediately contact the DTPW Central Control Facility, to advise of his/her presence at the project site.

If, at any time during the construction project, a new crane operator is brought on-site to operate any crane, he/she must be apprised of all of the rules and regulations outlined in this Plan by the Contractor's/Developer's Project Manager.

B. Special Provisions – Pre-Task Plan

At the discretion of DTPW, based on construction project proximity to DTPW system and scope of work, DTPW may assign a DTPW manager to log in arrival of DTPW Monitor(s), at the construction site. The assigned DTPW manager will contact the Contractor Senior Superintendent to request and receive a Contractor radio and meet with the Contractor Senior Superintendent and Contractor trade partner /Superintendent or Foreman to go over planned work. The Contractor Senior Superintendent, Contractor Trade Superintendent/Foreman, the DTPW Monitor and the assigned DTPW manager will complete and sign the Contractor Pre-Task Plan (PTP) Form, as specified in the DTPW Adjacent Construction Manual. Until this revised PTP form is accurately and completely filled out, scheduled work warranting a DTPW Monitor shall not proceed. After the PTP form is completed, if PTP is deemed by DTPW, the assigned DTPW manager and the DTPW Monitor shall walk to the selected area to commence monitoring duties, performing a radio check with the operator or crew on the other end of the Contractor radio. If the radio check is successful, the DTPW Monitor will use the DTPW radio to communicate to the Rail Central Control Facility to advise that the Contractor will commence with construction work.

C. Commencement of Work

Once receiving authorization from the appropriate Rail Traffic Controller, the DTPW Monitor will use the Contractor radio to communicate to the work crew that it is now permissible to begin work. The Contractor representative and the DTPW Monitor will sign the provided Central Control log form (as specified in the DTPW Adjacent Construction Manual), with the corresponding approval code, to confirm hearing the verbal approval from the Rail Central Control Facility over the DTPW radio before commencing with work. This log records the code, date, time, location, equipment being used, person giving code and DTPW Monitor receiving code.

6.0 Construction Activity Considerations

The Contractor shall comply with the following requirements:

- The Contractor shall assume full responsibility for the compliance with all applicable Federal, State and local regulations and for complying with this Manual for construction adjacent to the right-of-way during the performance of all work.
- Provide an overall maintenance of traffic (MOT) control plan for pedestrians, vehicular traffic and construction operations. Establish a general visitor control program if required.
- Maintain responsibility for project safety on the work site for the company employees as well as its' subcontractor employees.
- Require each of the Contractor's personnel that may need access on the guideway, to attend the DTPW Orientation and Guideway Safety Class. The Contractor shall reimburse costs of these classes to the DTPW.

6.1 DTPW Personnel/Public/Property Safety & Security

6.1.1 Mechanical Criteria

Existing services to DTPW facilities, including chilled water and condenser water piping, potable and fire water, fire standpipes and storm and sanitary sewers, are not be interrupted nor disturbed without written approval of DTPW.

Clear access for the fire department to the DTPW fire standpipe system and guideways shall be maintained at all times. Construction signs shall be provided to identify the location of DTPW fire standpipes. Call **DTPW Office of Safety and Security (305-375-4240)** 48 hours in advance of any approved interruption to fire standpipe water service.

Modifications to existing DTPW mechanical systems and equipment, required by new connections into the DTPW System, will only be permitted with prior review and approval by DTPW.

The adjacent construction developer will be required to submit the design calculations, drawings, specifications, catalog cuts and any other information necessary to fully describe the proposed modification.

At the option of DTPW, the adjacent construction developer will be requested to perform the field tests necessary to verify the adequacy of the modified system and the equipment performance. Where a modification is approved, the developer shall be held responsible to maintain original operating capacity of the equipment and the system impacted by the modification.

6.1.2 Corrosion & Stray Current Protection

The developer should be aware that, since Metrorail/Metromover transit cars are powered by direct current (DC) electricity, direct current can enter the earth through

unintentional leakage from the DTPW negative ground return system. The leakage or stray current may flow to the discharge from underground metallic elements (i.e. steel reinforcing, pipelines, grounding systems, etc.) which are in contact with any electrolyte, including earth, in the vicinity of the DTPW System. Because stray current may be corrosive to metal at locations where it flows into an electrolyte, the developer is cautioned to investigate the site for stray current and to provide the means for stray current mitigation when warranted.

Further information concerning stray current mitigation can be obtained by contacting The National Association of Corrosion Engineers (NACE), P.O. BOX 218340, Houston, Texas 77812, telephone (713) 492-0535.

6.1.3 Electrical System Interference

No interference to existing DTPW duct banks for the following electrical services shall be allowed:

- 13.8 K.V. service from Florida Power & Light
- 480 V. Florida Power & Light or from DTPW substations
- 480 V service to lighting in Parking Lots, Kiss and Ride areas, and 120 V service to Bus Shelters.

If any of the listed duct banks are affected by the adjacent construction, all information shall be submitted to the DTPW and utility company for review and approval.

No interference to existing DTPW duct banks for the following services shall be allowed:

- Telephone cables from Bell South
- DTPW train control and communications cables

Redesign of Facilities

The design for relocation or modification to existing DTPW parking lots, or Kiss & Ride areas and bus shelters shall be done in accordance with DTPW Design Criteria, Directive Drawings and Standard Specifications. To minimize interruption of DTPW operations, a phasing plan shall be developed and submitted for approval.

Proposed relocation of light fixtures, if any, shall be submitted for DTPW approval.

Existing ground-grids and ground conductors from ground-grids to DTPW facilities shall not be disturbed. No digging or cutting into existing DTPW facilities (ductbanks, wall, floor or ceiling) shall be permitted.

Access to personnel and equipment hatches for underground facilities shall not be blocked. In case any structure is built over an equipment access hatch, adequate passageway for entry of a heavy truck and clearance for the use of a crane to lower equipment from the truck into the hatch shall be provided.

In case any structure is built adjacent to DTPW at-grade facilities (traction power substations, tiebreaker stations, train control or communications rooms), passageways for heavy trucks and adequate clearance for the use of cranes to move equipment from trucks into and out of the equipment hatches shall be provided.

Emergency access gates for at-grade or aerial sections of DTPW rail shall not be blocked. Adequate passage from the gates to public streets shall be provided.

6.1.4 Modifications/Direct Connections to a DTPW Station

Connections to Metrorail/Metromover Facilities shall be designed, built and paid for by the person requesting the connection in accordance with DTPW Design Criteria or through a Direct Connection Agreement. Below are the items that shall be considered in the design of the connections.

The connection shall have a bronze flexible gate installed between the two passageways. The gate or grate shall be keyed on both sides with separate locks. To open the gate both locks will have to be open. Where the connection has 24-hour manned security on the non-DTPW side of the connection, glass doors may be used in lieu of a gate. If doors are used, each door shall be locked from both sides.

When required, a Closed-Circuit Television (CCTV) will be installed at the developer's expense and connected to the DTPW Kiosk. Power for the cameras shall be run from the CCTV to the station power room. The existing conduit runs and spare breaker locations can be found in the DTPW "As Built" drawings. It is the developer's responsibility to have this research performed by a competent professional. Intrusion alarms shall be installed on the gate or door and control wires installed between the gate or door and the communications room by the developer's contractor. Final connection will be made by DTPW to the DTPW security system.

Finishes on the interior of the DTPW side of the connection shall be to DTPW standards and specifications.

Lights in the new passageway shall be run to the developer's power room and included in the development's emergency power panel.

In the event that a Direct Connection is to be maintained by DTPW then the design will be in accordance with DTPW Design Criteria and construction would be required to meet DTPW's standard construction specifications. Normally the Direct Connection passageway is designed to be compatible with the building of which they are constructed as a part.

Before removing the knock-out panel the contractor shall have an approved dust protection system in place and fully functional. Typically, a dust protection system shall consist of a stationary partition that isolates the knock-out panel from the station. The dust partition shall be constructed using only fire rated materials. All joints shall be sealed with tape. Construction of the partition shall be during non-passenger hours.

Adjacent construction with a connecting passageway(s) to DTPW facilities will require special features to isolate one facility from the other for fire-safety, and may include automatic fire doors and dampers, sprinkler systems, smoke removal and ventilation systems and detection and alarm systems as required by the local fire code.

6.1.5 Signs, Signals, Barricades and Traffic Control General Requirements

1. All traffic signs or devices used for protection of construction workmen or the public shall conform to the State of Florida Manual on Traffic Control and Safe Practices on Street and Highway Construction.

2. Barricades, cones and/or similar protective devices shall be used whenever men or equipment are exposed to traffic or similar hazards.

3. When traffic lanes are closed due to work activity, advance warning signals and high level warning devices shall be used as described in the State of Florida Manual on Traffic Control and Safe Practices on Street and Highway Construction.

4. Flagmen and signalmen will be properly trained and use appropriate procedures, using the current FDOT manual.

5. All employees working adjacent to traffic shall be required to wear reflective vest, per FDOT manual.

6. Whenever and wherever possible and necessary, line voltage (12 volt) protected lights shall be used to mark fences and barricades and other such encroachments onto public streets or sidewalks.

7. Where covered sidewalks are required they shall be provided with permanent lights to provide sufficient illumination for safe use by the public day or night. All bulbs shall be cage-protected.

8. Public walkways shall be kept clean and free of hazards at all times.

9. Where the Contractors are required to provide public walkway, they shall have abrasive non-slip surface.

10. Where access to bus stop is disturbed or obstructed by the Contractors operations, safe access will be maintained or the bus stop relocated as directed by DTPW. Coordination for maintaining or relocating bus stops with the appropriate agencies is the sole responsibility of the Contractors.

11. When steel plates or similar covers are used on public ways to cover excavations they shall be substantially secured to prevent movement imposed by traffic. Covers shall have non-slip surface, conforming to OSHA Specifications.

12. When such covers are located where there is pedestrian exposure, they shall be tapered at all sides with cut back cold mix or similar material to eliminate tripping hazards. Covers shall have non-slip surface.

13. Free access shall be maintained to every fire extinguisher, fire hydrant, fire alarm box, fire escape and standpipe connection, street and traffic light control box. When required, hydrants shall be extended by suitable tube or piping to an accessible point as approved by DTPW. No obstructions shall be allowed at any time within 15 feet of a fire hydrant. Where materials are placed in the vicinity of a fire hydrant or a fire alarm box or fire extinguisher, and to such a height as to prevent the same from being readily seen, the position of such hydrant or fire alarm box or fire extinguisher shall be indicated by suitable signals, both day and night.

14. The Contractor shall erect and maintain fences and barricades to enclose the Contractor's work area, and provide watchmen where required to prevent unauthorized access.

6.1.6 Material Handling (Storage, Use and Disposal) General Requirements

1. All materials stored in tiers shall be secured to prevent sliding, falling or collapse.

2. Reinforcing steel shall not be used as a lifting ("Pick") point on any load or as a guy line anchor.

3. Hooks, except special sliding choker hooks shall be securely moused when in use, or shall be provided with a functioning safety latch.

4. Scrap material of any kind, type or nature shall be placed daily into appropriate containers specifically supplied for this purpose. Containers shall be removed from the work site when full.

5. Loose material on open decks or other exposed locations shall be removed or secured at the end of each day to eliminate dislodgment by wind or other causes.

6. Compatibility of stored materials and storage methods will comply with all applicable OSHA, Fire Department and environmental agency standards.

7. Employees required to handle, use or dispose of hazardous materials shall be instructed regarding the safe handling, proper procedures, potential hazards, personal hygiene, and personal protective equipment required.

8. No explosive or flammable materials shall be stored under the guideways.

9. Disposal of materials shall be in accordance with all applicable Federal, State and Local regulations. All applicable recordkeeping and reporting requirements shall be met by the Contractors.

6.1.7 Adverse Weather Conditions General Requirements

1. Disassemble all scaffolds, loose formwork, radio antennas and secure properly.

2. All items that cannot be secure shall be stored inside secured storage areas or buildings.

3. All crane booms shall be lowered to ground level and secured to prevent movement.

4. All office trailers shall be tied down in compliance with MDC Tie-Down Ordinance No. 77-1 upon original installation. All tie down straps, ground anchors, piers, etc., shall be checked for condition and operation.

5. All exposed glass on the Work Site shall be protected by a solid, rigid covering.

6. All free standing walls shall be stored from both sides.

7. Before employees are dismissed from the Work Site, the Contractors shall make a through inspection to verify all necessary precautions have been taken.

8. All precautions for construction sites during hurricane conditions, as required by the Florida Building Code shall be met.

6.1.8 Housekeeping General Requirements

1. All refuse piles shall be removed from the Work Site immediately.

2. Stored and stacked materials shall be kept orderly, properly stacked, choked, and secured.

3. Any protruding nails, etc., shall be bent, removed or clinched immediately.

4. Oil, grease, and water spills shall be cleaned up immediately.

5. Loose materials, tools, or equipment shall be kept off stairs, out of walkways, ramps, platforms at all times when not in use.

6. Depressions and pot-holes in vehicle or walkway surfaces on the Work Site shall be properly filled and graded immediately.

7. Walkways, vehicle travel ways, ramps, railings, and stairways, shall be kept free from debris, properly installed and maintained.

8. Smoking or the use of open flames within 25 feet of flammable storage areas or fueling areas shall not be permitted.

9. Flammable storage areas shall be properly posted **"NO SMOKING"**, provided with adequate fire extinguishers and free of combustible materials.

10. All sanitary facilities used on the Work Site shall be maintained on a daily basis.

11. All structures shall have a minimum of a 5-foot perimeter clearance that is to be free from any combustible debris or materials.

6.1.9 Overhead Protection

Overhead protection from falling objects shall be provided over DTPW facilities whenever there is a possibility, due to the nature of a construction operation, that objects could fall in or around DTPW guideway, at- grade sections, DTPW facilities, DTPW station entrances and areas designated for public access to DTPW facilities. Erection of the overhead protection for these areas shall be done in strict accordance with the requirements of this Manual and applicable standards cited herein.

The design live load for all overhead protection shall be in compliance with the minimum required by the current Florida Building Code and/or other(s) enforceable code. Overhead protection design shall include provision for impact loading when located adjacent to demolition projects or construction / maintenance projects where it is foreseeable that construction debris could fall on or near DTPW Facilities. Overhead protection for impact loading must be designed for a minimum of 300 pounds per square foot and to resist the force of impact of the largest foreseeable member or building element as taken from the elevation of that element. All overhead protection shall be designed by a licensed professional engineer. The design wind load on the temporary structures shall be in accordance with the calculated loads for components and claddings per the latest edition of the ASCE 7 Code.

Overhead protection over sidewalks and pedestrian areas shall be constructed of fire resistant materials. The vertical clearance between walking surface and the lowest projection of the overhead protection shall be 6'- 8". Construction materials and equipment shall not be stored on the completed walkway and pedestrian areas of the overhead protection roofs. A clear path from any DTPW emergency exit to the public street shall be maintained at all times.

The contractor will provide special protection, such as netting, barricades, walks, screens, scaffolds, etc., acceptable to DTPW, to help ensure the safety of DTPW property, patrons and employees. No work shall be permitted unless such protection is provided as determined necessary by DTPW. Erection of protective structures shall not be done during normal passenger hours unless by written authorization through DTPW.

Lighting of overhead protection at sidewalks and pedestrian areas is required and shall be provided under the overhead protective to maintain a minimum level of ten (10) foot candles at the walking surface. The temporary lighting will be maintained by the contractor.

With written DTPW authorization, the Overhead or Fall Protection structure may be constructed over the right of way and the guideway, if designed for the use for which it is intended, as well as in accordance with the above minimum design load requirements. The shield shall be constructed or installed during non-passenger hours. Once installed, limited work may proceed above the overhead protection during non-passenger hours.

6.1.10 Cranes and Swing Stage Scaffolding

General Requirements

The erection or staging of cranes, construction elevators and man lifts, swing stage or scaffolding, debris chutes or gantries shall not be performed within the 30 feet of the guideway drip line during passenger hours, without an authorized DTPW "Monitor" under radio communication with Central Control, on site.

Crane lifts located within 30 feet of the DTPW guideway drip line are permitted during non-peak passenger operating hours only when coordinated by an authorized DTPW crane Monitor or DTPW authorized employee under radio communication with Central Control on site. Under no conditions will loads be permitted to be swung over or within 5 feet of the guideway.

Crane lifts and exterior building operation conducted from swing stage that are located within the DTPW Right of Way or within 30 feet of the guideway drip line are permitted only during non-peak operating hours and only when coordinated by an authorized DTPW Monitor under radio contact with Central Control.

No construction elevators or cranes will be erected on the Metrorail / Metromover guideway side of the building /structure.

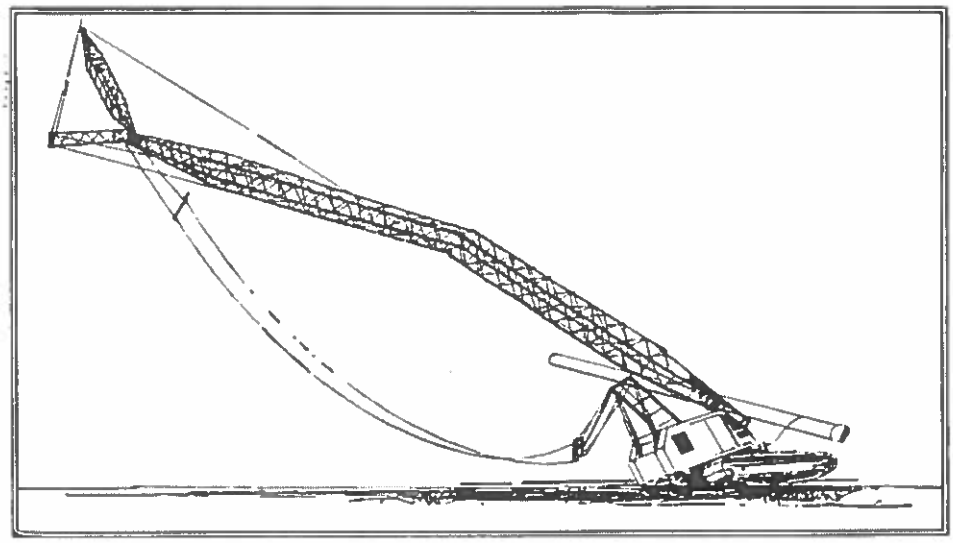
The contractor must ensure that all cranes are operated only by trained, experienced and competent operators who hold either an Operating Engineers, Local Union, Verification of Competence and Experience or equivalent licensure.

The contractor must also ensure that the men who direct, rig and handle loads are adequately trained, able to establish load weights, judge distance, heights and clearance and capable of selecting tackle and lifting gear suitable for the loads lifted.

All crane/scaffolding operations within the DTPW Right of Way and 30 feet of the guideway drip line are subject to inspection by the DTPW Design and Engineering Division, Metromover Maintenance Division and DTPW Office of Safety and Security. Cranes operated within DTPW Right of Way and Safety zones shall have complete maintenance, repair and inspection logs present on the machine and available for review. DTPW reserves the right to refuse the operation of any machine that the structural condition or stability of the machine is questioned regarding the task attempted by the contractor.

MOBILE CRANES

Over 50% of all Crane Accidents are "caused" when the machine is improperly set up.



The size, boom length and capacity of all cranes operated on projects within the DTPW Right of Way and Protective Safety Zones must be clearly shown on a site plan as part of an DTPW Access Permit application. The swing radius of the machine must be shown on the site plan with respect to the location of DTPW facilities.

Adequate care must be demonstrated by the contractor to DTPW representatives when setting up cranes and booms. Cranes shall be erected in strict conformance with the manufacturer's specifications and standard of good construction practice. Outriggers and support shall be adequately cribbed and blocked so as to properly brace the crane frame.

Adequate swing clearance shall be provided at the counterweight of the crane cab. At no time shall the counterweight swing clearance be less than 5 feet from the DTPW guideway drip line, without an authorized DTPW crane Monitor or employee under radio communication with Central Control on site. Overturning boom stops are required on all cranes when the boom angle exceeds 50 degrees from horizontal.

Mechanical swing limit switches and stops may be required to limit crane swing over and adjacent to the DTPW guideway and DTPW facilities. At no time will loads be allowed to be swung over the DTPW guideway, DTPW Stations or DTPW facilities.

Sheet pile and driven pile crane operations should be erected so that the crane and boom are situated perpendicular to the DTPW guideway. Staging and erection of piling should be adequately restrained or stayed such that the piling cannot topple into DTPW facilities during setup operations.

Tower Cranes

Tower cranes may be employed on projects that are adjacent to the DTPW facilities and guideway systems and that are tall enough, have sufficient jib length to reach a distance of 30 feet from the guideway drip line or that loads could be swung over DTPW facilities, are regulated by this manual. In general all tower cranes with base of tower located at a distance from the DTPW guideway drip line less than the height of the tower crane are subject to the restrictions in operation of this chapter.

Tower cranes are subject to wind movement and must be able to weather-vane during periods of high wind. Weather-vaning tower cranes, when cranes are not in use, are allowed to swing over DTPW guideway or facilities during passenger hours.

Tower cranes are subject to fatigue cracking and failure at the tower and jib connections. A certified structural inspection log of the Crane tower, jib, cables and haulage assemblies must be provided to DTPW on all tower cranes located in areas that they could affect DTPW facilities.

6.1.11 Excavations, Foundations and Sheet Piling

Until provisions for permanent support have been made, all excavations shall be properly guarded and protected so as to prevent the same from becoming dangerous to life and property and shall be sheet piled, braced and/or shored, where necessary, to prevent the adjoining earth from caving in; such protection to be provided by the person causing the excavation to be made. No excavation, for any purpose, shall extend within five (5) feet of the angle of repose of any soil bearing footing or foundation unless such footing or foundation is first properly underpinned or protected against settlement.

The design of all soils excavations, stabilization, modifications, underpinning or laterally protected with sheet piling shall be designed by a licensed professional engineer known to the Building Official to be qualified to evaluate the bearing capacity of soils. This design shall include a Geotechnical Soils investigation such that the registered Professional Engineer shall submit to the Building Official a letter attesting that the site has been observed and the foundation conditions are similar to those upon which the designed is based. The letter shall be signed and bear the impress seal of the engineer or architect, as applicable. Geotechnical soils sampling shall be conducted at sufficient frequency to ensure that the soils conditions on the project site are representative of the design conditions.

Angle of Repose

The angle of repose of all support soils within the DTPW Right of Way and safety zones shall be considered as 1:1 ratio. No excavation, for any purpose, shall extend within five (5) feet of the angle of repose of any DTPW soil bearing footing or foundation unless the design capacity of that footing is evaluated by the design Engineer of Record and his recommendations are approved by DTPW with respect to the design engineers modifications. Refer to Appendix B for clarification.

Pilings
Sheet pilings, driven pilings, auger cast pilings or other operations that create significant soils vibration shall be closely monitored with seismic accelerometers to verify the energy transmitted into the DTPW structures is less than 0.22 inches per second. Additional detailed survey analysis may be required to verify that no settlement has occurred in the course of the work.

Excavators
Excavation equipment operated within the DTPW Right of Way and Safety Zones must take extra care to avoid causing damage to DTPW facilities. Track excavators have similar swing geometry problems as mobile cranes and are capable of causing significant damage if improperly operated. Similarly, improper operation of wheel loaders, excavators, dump trucks and vibratory rollers can cause impact and vibration damage to structures.

The contractor must ensure that all heavy excavation equipment is operated only by trained, experienced and competent operators who hold either an Operating Engineers, Local Union, Verification of Competence and Experience or equivalent licensure.

Excavations may be conducted within the DTPW Right of Way and Safety Zones only during non-passenger hours. Excavation operations within the DTPW Right of Way and Safety Zones require a trained DTPW Monitor, in radio communication with DTPW Central Control, during all excavation operations.

Protection of underground site utilities is the responsibility of the contractor. All utilities must be located by an approved utilities locator service prior to the start of any excavation or piling activities.

DTPW may, at its discretion, modify any of the above conditions or impose additional conditions, to help ensure the safety of the public, and its patrons, employees or property.

6.1.12 Demolition
No Demolition of structures adjacent to DTPW facilities by blasting shall be permitted. During piece-by-piece demolition, it is essential that the DTPW escalators, and/or other DTPW equipment be protected from dust generated by the demolition. The DTPW equipment must be covered with polyethylene sheets during demolition to prevent dust from entering the equipment. Guideway protection diagrams and location plans shall be submitted by the contractor when appropriate or requested by DTPW. Such plans shall clearly show the alignment of the DTPW right-of-way together with the setback dimensions of the portions of the building to be demolished.

Application

This section is intended to apply to all activity on the exterior of buildings located within the Safety Zone including maintenance, inspections, probing, demolition operations and shall comply with the American National Standard (ANSI) A 10.6 standard for demolition

operations. In cases of practical difficulty and unnecessary hardship, or where other extenuating circumstances exist, DTPW may grant exceptions to the requirements stated herein, or may permit alternative methods, but only when it is clearly evident that equivalent protection is thereby secured.

Demolition Plan
The contractor must submit a detailed demolition plan to DTPW Engineering for review as part of the permit application package. This Demolition plan must include the scope of proposed demolition, location plan and building elevation of the proposed demolition work detailing the setback distance to DTPW facilities. Additionally the anticipated contractor means and methods, anticipated protective methods, equipment list including sizing of all demolition equipment should be supplied in the demolition submittal plan. The plan shall describe the type of construction (concrete, steel frame, masonry, etc.) and the overall construction configuration.

Guideway protection diagrams and location plans shall be submitted by the contractor when appropriate and requested by DTPW. Such plans shall clearly show the alignment of the DTPW right-of-way together with the setback dimensions of the portions of the building to be demolished.

Protection
During demolition, it is essential that the DTPW facilities be protected from dust generated by the demolition. The DTPW stations, escalators, train control and traction power rooms/buildings must be covered with polyethylene lined sheets during demolition to prevent dust from entering the DTPW switch gear and equipment.

Structural Condition and Analysis Survey
Prior to starting any demolition operation within the safety zone, an engineering survey of the structure shall be made to determine the condition at all locations of the exterior walls adjacent to the DTPW system. The purpose of the survey is to determine the condition of the framing, floors, and walls so that actions can be taken, if needed to prevent premature collapse of any portion of the structure. Such survey shall be made on the outside utilizing swing stages with full rail protection. The survey shall consist of documenting all locations displaying loose, cracked, and/or deteriorated stucco, tile, or other building facade materials in which such condition could result in falling debris.

An exterior crack survey may be required as part of the engineering survey of building to be demolished. A crack survey should be prepared locating all significant cracks including a location sketch, description, width, estimated recent activity, and the existence of previous repairs. Cracks of any significance shall be physically marked so that future observation may be made with telescopic equipment at the ground level. A stucco condition survey locating all significant irregularities in the stucco facade including bulges, micro/map cracking, hollow and de-bonded areas, discoloration due to water absorbance effervesce scaling, or other abnormalities should be included in the crack / engineering survey.

Guideway Protection Diagrams and Location Plans shall be submitted by the contractor when appropriate and requested by DTPW. Such plans shall clearly show the alignment of the DTPW right-of-way together with the setback dimensions of the portions of the building to be demolished.

Similarly a window / wall opening survey of the condition of window vents, plywood covers, sill stability, and other characteristics from which conclusions can be made as to the security of such openings. Where a hazard exists from fragmentation of glass or instability of the window frame/vent, all glazed openings shall be removed or protected.

Scheduling
Exterior building element demolition activities located within the safety zone are permitted only during non-passenger operating hours and only when coordinated by an authorized DTPW "Monitor" under radio communication with Central Control on site.

Protective Measures
Remove all loose materials by hand which are in imminent danger of falling. The removal of such loose materials must also include a temporary repair or stabilization at any location where the removal results in an opening or area, which can allow water to penetrate resulting in further or future deterioration.

Pedestrian Site Security and Safeguards
Prior to the engineering survey of the building exterior and other invasive activities, it is necessary to fully protect the public and in particular, DTPW facilities. Every sidewalk, train guideway, station platform, stairs, escalator, or public thoroughfare adjacent to or near enough to be affected by the operations on the building shall be closed, relocated or protected as specified in overhead protection above.

Demolition Observer
Provide a full time observer who is classified as a qualified person and who is capable of recognizing changes in the building facade and appearance. The purpose of this person is to provide warnings to the DTPW operators in the event of a sudden change in the building's outward appearance or stability so that service on a rail section may be discontinued. The observer and shall remain at the site at all times DTPW is in operation and providing service to the public

Periodic Demolition Reports
A certification shall be provided by a licensed engineer after each periodic inspection stating that the building components are secure and that it is safe to operate the DTPW system in that location.

Demolition Means and Methods
No wall sections shall be permitted to stand alone without lateral bracing. Additionally, all walls shall be left in a stable condition at the end of each shift. Masonry walls or other sections of masonry shall not be permitted to fall upon the floors of the building unless qualified persons have determined the impact of such masses will not exceed the safe carrying capacities of the floors.

Chutes
Materials shall be dropped only through chutes to any point lying outside the exterior walls of the building and chutes at any angle exceeding 45 degrees from the horizontal shall be entirely enclosed. Also, chutes shall be designed and constructed to eliminate hazards of impact of materials or debris

Particle Velocity and Seismograph Reports
When required, the contractor shall measure and furnish reports of particle velocity caused by impacts in accordance with provisions in Appendix E of this document.

Additional Requirements
DTPW may, at its discretion, modify any of the above conditions or impose additional conditions, to help ensure the safety of the public, and its patrons, employees or property.

6.1.13 Exterior Building Maintenance

Pressure Washing	Painting
Window Washing	Sandblasting
Stucco Damage Repair	Other Maintenance Operations
Structural/ Non-Structural Inspections	

General
In general, some routine maintenance activities associated with the exterior building envelope of buildings may not require a building permit. However, to adequately ensure the safety of the DTPW system, provisions are made in this manual detailing specific requirements and limitations of allowed building maintenance activities within the DTPW Safety Zone. A DTPW Access Permit is required on all exterior building maintenance activities for buildings located within the Safety Zone.

Access to exterior building components located within the Safety Zone including window cleaning operations and roofing operations is prohibited during DTPW passenger hours without a DTPW Monitor. The simple DTPW policy is that "there shall not be any exterior building maintenance activity at or above the elevation of the DTPW guideway during normal passenger operations without a DTPW Monitor".

Maintenance
This section is intended to apply to all activity on the exterior of buildings located within the Safety Zone including maintenance, inspections, probing, stucco repair, painting and waterproofing operations. In cases of practical difficulty and unnecessary hardship, or where other extenuating circumstances exist, DTPW may grant exceptions to the requirements stated herein, or may permit alternative methods, but only when it is clearly evident that equivalent protection is thereby secured.

Small Particle Protection
Routine exterior building cleaning is required to some extent on most structures. Much of this work is commonly accomplished by access to the building exterior via either swing stage or boson chair. Access on building exteriors located within the safety zones is prohibited during passenger hours without a DTPW Monitor.

Pressure cleaning and sandblasting activities produce over spray, dirt and particle fallout below the work area. DTPW guideway, stations and facilities must be adequately protected from the fallout of the dirt, particles, sand, loose paint, etc. prior to the start of any exterior building cleaning activity. Such protection may be in the form of polyurethane lines, canvas tarps or other catchment devices. Design of required protection must be approved by DTPW.

Stucco probing and repair, painting and waterproofing activities produce falling debris. DTPW guideway and DTPW Facilities must be adequately protected with overhead protection as described in this manual as part of the DTPW Work Order for stucco repair and painting activities.

DTPW may, at its discretion, modify any of the above conditions or impose additional conditions, to help ensure the safety of the public, and its patrons, employees or property.

DTPW Operations and Scheduling
DTPW shall have the right to stop any work or construction activity that affects the safety of DTPW patrons and or facilities or normal DTPW operations. DTPW will exercise reasonable advance notice, except for any matters related to immediate system safety concerns which will require no advance notice.

Construction work which may have any impact on the Metrorail/Metromover System may be scheduled during the Non-Peak Operating Hours or Non-Passenger Hours. Non- Peak Operating Hours are defined as weekdays prior to 6:30 A.M. or after 7:00 P.M. and between 10 A.M. and 3 P.M.; and all day Saturday and Sunday. Non-Passenger hours are defined as Monday through Sunday 12:30 A.M. to 4:30 A.M. or such other hours as may be designated by the County as Non-Passenger Hours. Passenger hours may change without notice as needed by DTPW.

Weekends / Holidays & Special Events
Construction work that may impact weekend or special operational conditions will be limited. Schedule requirements will be addressed on a project to project basis where the individual scheduling needs of the project can be evaluated with respect to the operations of the DTPW systems.

APPENDIX A: GLOSSARY

The following terms shall, for the purpose of this Manual, have the meanings respectively ascribed to them:

ACCIDENT - An unforeseen event or occurrence that causes death, injury or damage to property. Any abnormal condition that requires the attention or intervention of responsible personnel or an individual monitoring the transit system operation.

ALARM CONDITION - Deviation from nominal performance, which does not cause a significant, effect on system performance but does warrant investigation and/or repair. Sanctioned or accepted by the building official and Department of Transportation and Public Works.

AUTOMATIC - A term applied to a system, subsystem, or device, which has the inherent capability to function without direct manual participation.

CATCH PLATFORM - A temporary structure erected around or attached to, and abutting a building for the purpose of safeguarding the employees, and the public, by catching and retaining falling objects or debris.

CENTRAL CONTROL - That place where train control or train supervision is accomplished for the entire Metro-rail and Metro-mover system; the train command center.

CONSTRUCTION SAFETY - The optimum degree of safety within the constraints of construction effectiveness, time and cost through specific application of safety management throughout all phases of the construction.

CONSTRUCTION SAFETY MANUAL - Issued as a contract document by Department of Transportation and Public Works (DTPW), to be used as a guide by the Contractor in developing his Accident Prevention Program.

DTPW ACCESS PERMIT - Issued written authorization from DTPW for work in the DTPW Right of Way and DTPW Safety Zones. Construction Work Orders are specific with regard to the scope, extent, additional requirements or limitations, and allowable

schedule of approved work to be completed in the DTPW Right of Way and Safety Zones.

CONTRACT DRAWINGS - The plans, profiles, typical cross-sections, general cross-sections, elevations, schedules and details which show locations, character and dimensions of the work.

CONTRACTOR'S AUTHORIZED SAFETY REPRESENTATIVE - The person designated as authorized safety representative who will be responsible for work site safety and for reporting all insurance claims.

CONTRACTOR- The individual, firm, partnership, corporation, or combination thereof, private, municipal, or public, including joint ventures, which, as an independent contractor, has entered into a contract with MDC, who is referred to throughout the Contract Documents by singular in number and masculine in gender.

CHUTE- A trough or tube used to guide and transport sliding objects, materials, or debris from a higher to a lower level.

DEGRADATION - Falling from an initial level to a lower level in quality or performance.

DEMOLITION - Dismantling, razing, destroying, or wrecking any fixed building or structure or any part thereof.

EMERGENCY - A situation which is life threatening or which can cause serious damage on or in the immediate vicinity of any transit facility, structure, bus or train.

EMPLOYEE - A person employed by the Contractor or Subcontractor.

EQUIPMENT FAILURE - The state in which equipment no longer meets the minimum acceptable specified performance and cannot be restored through operator adjustment or control.

FTA - Federal Transit Administration, formerly UMTA.

FAILURE - An inability to perform an intended function within specified tolerances.

HAZARD - Any real or potential condition that can cause injury or death; or damage to or loss of equipment or property.

HAZARD MANAGEMENT (LOSS CONTROL) - An element of the system safety management function that evaluates the safety effects of potential hazards considering acceptance, control, or elimination of such hazards with respect to expenditure or resources. (The feasibility of hazard elimination must be considered in light of financial, legal, and human considerations).

HAZARD SEVERITY – A qualitative measure or the worst potential consequences that could be caused by a specific hazard.

Category I Catastrophic	May cause death, serious injury/illness or major system loss.
Category II Critical	May cause injury/illness, or major system damage.
Category III Marginal	May cause minor injury/illness, or minor system damage.
Category IV Negligible	Will not result in injury/illness, or system damage.

HAZARD RESOLUTION - The analysis and subsequent actions taken to reduce, to the lowest level practical, the risk associated with an identified hazard.

IMMINENT DANGER - Refers to any condition or practice where there is reasonable certainty that a danger exists that can be expected to cause death or serious physical harm and/or serious property damage immediately or before the danger can be eliminated through normal enforcement procedures

INCIDENT - An unforeseen event or occurrence that does not necessarily result in injury or property damage.

MAINTENANCE - All actions necessary for retaining an item in or restoring it to an operable condition.

MALFUNCTION - Any anomaly or failure wherein the system, subsystem, or component fails to function as intended.

MAY - A permissive condition. Where the work "may" is used, it is considered to denote permissive usage

MIAMI DADE COUNTY (MDC) - The Board of County Commissioners of Dade County, Florida, political subdivision of the State of Florida, and the DTPW, an office under the County manager of Miami Dade County, Created March 1, 1974, by Administrative

Order No. 3-8, under the authority of Sections 4.01 and 4.02 of the Miami Dade County Charter - and any authority, board, body, commission, official or officials to which or to whom the powers now belonging to DTPW in respect to the location, construction, equipment, maintenance and operation of transit facilities shall, by virtue of any act or acts, hereinafter pass or appertain.

DTPW - Department of Transportation and Public Works, Miami-Dade County, located at 701 N.W. 1st Court, Suite 1700, Miami, Florida 33136

DTPW RIGHT OF WAY- As defined by the legal description of the properties that the DTPW facilities occupy or are situated above and supportive easements. For the purpose of this manual the Right of Way shall be defined as those properties located within the drip lines of the DTPW rails, stations and facilities and include those properties used for access and egress to the DTPW facilities by the general public and normal DTPW operations.

MISHAP - An unplanned event or series of events that result in death, injury, occupational illness, or damage to or loss of equipment or property. (See also ACCIDENT).

MONITOR - An authorized DTPW employee, DTPW contractor or DTPW consultant monitoring the movement of construction equipment or materials that may infringe upon the 30' "Safety Zone" (that area of the Department of Transportation and Public Works Guideway (Metrorail and/or Metromover) that lies within 30' of the outermost edge of the superstructure) which has the potential to interfere with Department of Transportation and Public Works operations and/or maintenance. This person(s) shall ensure the safety of Department of Transportation and Public Works patrons, employees, property and the public. DTPW contractors and DTPW consultants shall be trained per DTPW Rail Services Metromover and Metrorail training packages before they perform duties as Monitors.

OPERATOR - That person having direct and immediate control of the movement of a vehicle or machinery.

OPERATING TIME - The time period between turn-on and turn-off of a system, subsystem, component or part during which time operation is as specified. Total operating time is the summation of all operating time periods

OSHA - The Occupational Safety and Health Administration. An agency of the U.S. Government which sets standards to provide for the safety of employees in the workplace. The local area office is located in Ft. Lauderdale, Florida, phone (305) 527-7292

PERSONAL PROTECTIVE EQUIPMENT (PPE) - Equipment designed and worn to provide protection against hazard to some part of an employee's body. Examples of PPE are safety glasses, respirators, hart hats, gloves etc. All PPE used at DTPW work sites must comply with applicable OSHA standards

POWER RAIL - Three separate rails center mounted on insulators on the guidebeam which provides traction power for vehicle propulsion. (Metromover)

PROCEDURES - Established methods to perform a series of tasks.

QUALIFIED PERSONS - Those who by possession of a recognized degree, certificate, or professional standing, or by extensive knowledge, training, and experience in the demolition industry have successfully demonstrated their ability to solve or resolve problems relating to the subject matter of demolition.

QUALIFYING BUILDINGS - Buildings located within 30 feet of DTPW Right of Way corridor, and greater than 35 feet, in height, that have a building
footprint located adjacent to a Safety Zone where the elevation of the building encroaches into the Vertical Safety Zone extensions as defined in Safety Zone above and at the rate of 1 foot horizontal offset per 4 feet of building height above DTPW facility. See the definition of Safety Zone above and attached drawing CZ-1 (Appendix C).

QUALIFYING STRUCTURES - Cranes whose boom swing infringes within the 30 feet Safety Zone or DTPW Right-of-Way corridor. Signs located within the safety zone. Temporary scaffolding or construction towers within the Safety Zone or DTPW Right of Way corridor with heights greater than 30 feet.

QUALIFYING WORK- Any construction, demolition, equipment operations or building maintenance activity performed on or in a building or structure which may be hazardous to persons or property within the DTPW Right of Way or protective safety zones.

RELIABILITY - The probability that the system or sub-system will perform satisfactorily for a given period of time when used under stated conditions.

REPAIR - The maintenance activity which restores a failed item to operable state.

RISK - An expression of possible loss over a specific period of time or number of operational cycles. It may be indicated in terms of hazard severity and probability.

RISK MANAGEMENT - The Risk Management Division, Miami Dade County, General Services Administration, located at III N.W. I" Street, Suite 2340, Miami, Florida 33128; phone 375-4280.

RULE - A law or order authoritatively governing conduct or action.

SAFE - Secure from danger of loss.

SAFETY - A reasonable degree of freedom from those conditions that can cause injury or death to personnel; damage to or loss of equipment or property; and freedom from danger.

SAFETY CHECKLIST - A list for examining the safety aspects of equipment, procedures and personnel.

SAFETY CRITICAL - A designation placed on a system, sub-system, element, component, device, or function denoting that satisfactory operation of such is mandatory to assurance of patron, personnel, equipment, or facility safety. Such a designation dictates incorporation of special safety design features.

SAFETY DEVICES - Protective devices which do not alter the fundamental nature of a hazard but which do control the extent of the hazard in some manner.

SAFETY MANAGEMENT - An element of management that establishes safety program requirements and ensures the planning, implementation and accomplishment of task and activities to achieve work place safety.

SAFETY PROGRAM - The combined task and activities of safety management and safety engineering that enhance operational effectiveness by satisfying the safety requirements in a timely, cost-effective manner throughout all phases of the work.

SAFETY SUBCONTRACTOR - A subcontractor who satisfies the Florida Department of Labor and Employment Security Industrial Safety and Health Programs, Chapter 38F-44, and is duly approved by MDC

SAFETY ZONE - Safety Zones are defined as a protective safety buffer zone adjacent to the DTPW Right of Way. Safety Zones include all lands public or private within 30 feet (horizontally) of the DTPW Right of Way measured from the drip line of the facility/guideway. No work is allowed at the exterior of any building located within the protective safety zone without an approved DTPW Access Permit.

SERVICE CONTRACTS/ CONTRACTOR - Those operations that are providing any services, or repair, replacement or maintenance functions that are indigenous to the construction process on the Work Site.

SHALL - A mandatory condition. Where certain requirement are described with the "shall" stipulation, it is mandatory that these requirements be met.

SHOULD - An advisory condition. Where the " should" is used, it is considered to be advisable usage, recommended but not mandatory.

STATE - The State of Florida.

SUBCONTRACTOR - Any person, firm or corporation, other than the employees of the Contractor, who contracts with the Contractor to furnish labor and/or materials under this Contract.

SUPPLIER/VENDOR - Those entities whose. sole responsibility to the project is the delivery of goods or materials, exclusive of direct labor.

SYSTEM - A composite of people, procedures and equipment operating in a specific environment to accomplish a specific mission or task

THIRD RAIL - A rail mounted on insulators adjacent to running rails which provides traction power for train propulsion. (Metrorail).

TRANSIT SYSTEM - A transportation system comprised of fleets of motor buses and electrically propelled transit vehicles and all of their operational / support personnel and systems (e.g. maintenance facilities, tracks, structures, etc.) utilized for the mass movement of passengers within a metropolitan area.

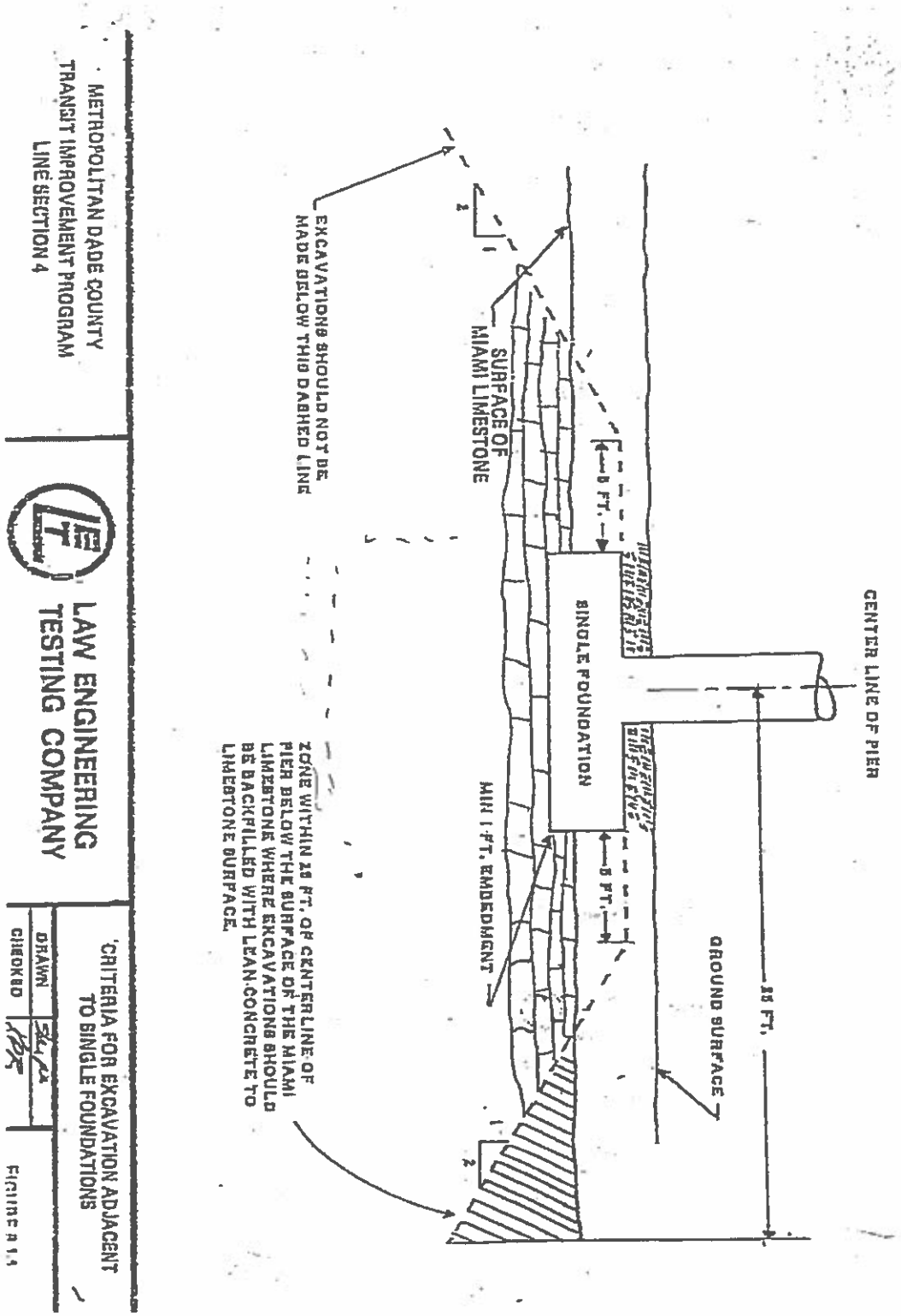
UNUSUAL OCCURRENCE - An unforeseen event or incident which does not necessarily result in injury or property damage.

UNSAFE CONDITION - Any condition which if not corrected, will endanger human life or property.

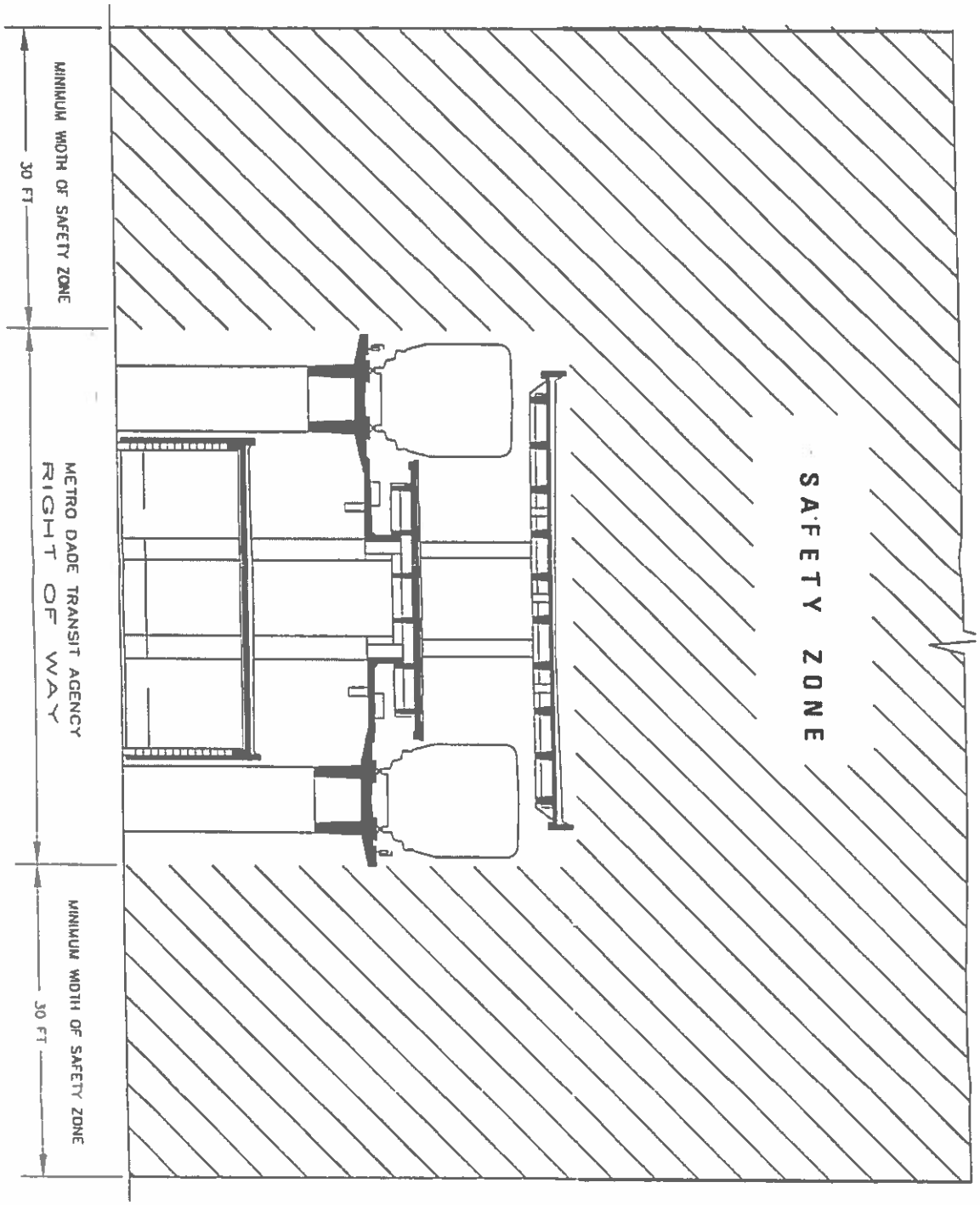
WARNING DEVICES - Sensors that monitor or detect conditions and provide visible and/or audible alerting signals as desired for selected events.

WORK SITE - The area enclosed by the limit of Work indicated in the Project Drawings and boundaries of local streets and public easements in which the Contractor is to perform the work under the Contract. It shall also include areas obtained by the Contractor for use in connection with the Contract, when contiguous to the Limit of Work.

APPENDIX B: CRITERIA FOR EXCAVATION ADJACENT TO SINGLE FOUNDATIONS



APPENDIX C: SAFETY ZONE CRITERIA



APPENDIX D: SAMPLE CRANE SAFETY INSPECTION CHECKLIST

CRANE SAFETY INSPECTION CHECKLIST

Location:

Area Inspected:

Inspected By: Date:

* Check Items to be inspected in your area - Disregard others as not applicable

*	OK	ITEM INSPECTED	NOT OK	COMMENTS
		THE CRANE CREW		
		Is the operator and crew properly trained?		
		Operating is a full time job—does the operator pay strict attention to his duties?		
		Do crane personnel wear hard hats when away from the crane?		
		Is the operator aware of the regulations involving working close to high voltage lines and electrical equipment?		
		High voltage, even from a distant source, can be introduced in metal parts of the crane. Is the operator aware of these situations?		
		Does the operator know the weight of each piece before he picks it?		
		Does the crane crew know the manufacturer's proper recommendations for making short moves on the job site?		
		Does the crew get help when lifting heavy objects?		
		Does the crew periodically check for level?		
		Do they check the outriggers for stability?		
		Do they check the boom angle indicator and other electronic load equipment for accuracy?		
		Does the operator allow anyone to ride the load or to the hooks?		
		THE GROUND CREW (HOOKING UP THE LOAD)		
		Does the ground crew have, maintain and use proper safety equipment?		
		Are they familiar with the product erection sequence?		
		Are they familiar with the crane signals and general operation of the crane?		
		Do they know how to properly hook pieces and provide aerial stability?		
		Do they know how to properly use tag lines?		
		Are the tag lines in good condition, strong enough and long enough?		

APPENDIX D: SAMPLE CRANE SAFETY INSPECTION CHECKLIST (CONT)

*	OK	ITEM INSPECTED	NOT OK	COMMENTS
		Is two way communication between the operator and the erection foreman being used? Does the crew know how to use and maintain the equipment? Are spare parts available for quick repair?		
		Is the crane swing radius roped off to prohibit the crane (during swing) from causing damage or hurting someone? Is entire swing checked including the counterweights?		
		THE MACHINE		
		Is the crane operated within all capacities?		
		Is the machine inspected daily?		
		Are the required crane inspections recorded?		
		Are all controls properly identified?		
		Are warning devices operative?		
		Is the manufacturer's rating plate visible?		
		Is the operator's manual available to the crew for easy reference?		
		Are load charts, operating signals and other important information posted and/or readily available?		
		Are brakes within operating limits?		
		Are clutch and brake surfaces dry?		
		Are all protective panels and guards in place?		
		Are electrical systems in good condition?		
		Are all of the sheaves properly aligned so as to reduce rope wear during work?		
		Is cable in good conditions?		
		Are hooks in good condition?		
		Have hooks been inspected by magnetic particle inspection?		
		Are there safety latches on the hooks?		
		Are fuel tanks in good condition and without leaks?		
		Are fire extinguishers available and routinely inspected?		
		SLINGS		
		Are slings in good condition/ Is safety factor of 5 maintained?		
		Are slings stored properly?		
		Are sling inspection reports maintained?		
		Are "U" bolt wire rope clips correctly placed?		
		Are all other lifting devices in good condition?		

APPENDIX D: CHECKLIST FOR CRITICAL LIFTS

CHECKLIST FOR CRITICAL LIFTS

This form is to be completed when the load exceeds 80% of the load chart for the crane or derrick or where the pick involves two or more cranes.

LIFT DATE: _____

1) Supervisor responsible for the lift: _____
2) Description of item to be lifted and estimated weight: _____

_____

_____

_____

3) Equipment and Lift Relationship:
   a. Operating Radius _____
   b. Boom Length _____
   c. Allowable Load (From Load Chart) _____
   d. Ratio of Lift to Allowable Load _____
   e. Clearance to Surrounding Facilities _____
   f. Sling Angle _____
4) Condition of Hoisting Equipment and Rigging
   a. Has all equipment been reinspected for this lift: ____Yes ____No
5) Stability of Ground Area:
   a. Check Soil/Ground Bearing Allowable Load (List Conditions) _____

_____

_____

   b. Will mats be needed? ____Yes ____No
   c. Any underground installations needing special attention? ____Yes ____No
   d. Will it be necessary for the crane to walk with the load? ____Yes ____No
   e. Is the surface level and stable where the crane will be walking?

____Yes ____No

APPENDIX D: CHECKLIST FOR CRITICAL LIFTS (CONT)

f. Have facilities been provided to keep the load radius from changing?

_____Yes _____No

g. Have all overhead facilities been checked for clearance in the area where the crane will be moving/operating? _____Yes _____No

6) Does the operator have the necessary experience on the crane and this type of lift?

_____Yes _____No

7) If the lift involves the use of two cranes answer the following:

a. Have operators worked together before? _____Yes _____No

b. Who will coordinate instructions to operators? _____

_____

_____

By: _____

Contractor's Superintendent

APPENDIX E: RECOMMENDED VIBRATION LIMITS

Seismological research by the U.S. Bureau of Mines, foreign investigative groups, and individual seismologists has established criteria relating the occurrence of structural damage to certain frequencies and levels of ground motion.

USBM Report of Investigations 8507[1] states that residential structures are most prone to damage as a result of vibration energy within the frequency range of 4-12 hertz. Within this range, a 0.5-inch per second maximum particle velocity is recommended to preclude 'threshold' damage to the plaster-on-wood-lath interior portions of older structures.

Threshold damage is defined by the USBM as the loosening of paint, small plaster cracks at joints between construction elements or the lengthening of old plaster cracks. A maximum of 0.75 inch per second is recommended for the protection of modern drywall interior construction. The damage threshold is normally considerably higher for load bearing or other structural portions of a house.

Above 12 hertz, the allowable vibration increases as the frequency increases, up to 40 hertz, above 40 hertz, a constant 2.0 inches per second level is recommended to protect the interior walls and ceilings of structures, regardless of construction material. A graphic representation of the USBM recommended criteria is shown In the velocity versus frequency curve on the following page, and the vibration analysis of the recordings are plotted on graphic representations at the end of this report.

It should be noted[2], however, that it is almost impossible in actual practice to visually determine if the recorded peak vibration on a typical seismogram is actually within the Bureau's 4-12 hertz range. This is because ground vibration is usually a complex mixture of many frequencies that cannot be accurately separated by visual analysis of a seismogram.

Proper implementation of the Bureau's limit can only be accomplished by a computerized technique that analyzes the seismographic data in terms of both peak particle velocity and frequency. Therefore, in order to best determine the potential effects of ground vibrations recorded in this study, a computerized response versus frequency technique known as RSVP was used in the preparation of this report.

RSVP TECHNIQUE

The Response Spectrum Velocity Profile (RSVP) technique used in this study was developed by Dr. Kenneth Medearis. It is a powerful vibration analysis tool which not only conforms to USSM recommendations, but also provides insight into the responses of various types of residences to a given vibration episode.

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[2] Siskind, David *et al*, *Structural Response and Damaie Produced by Ground Vibration From Blasting. U.S. Bureau of* Mines, RI, 1980.

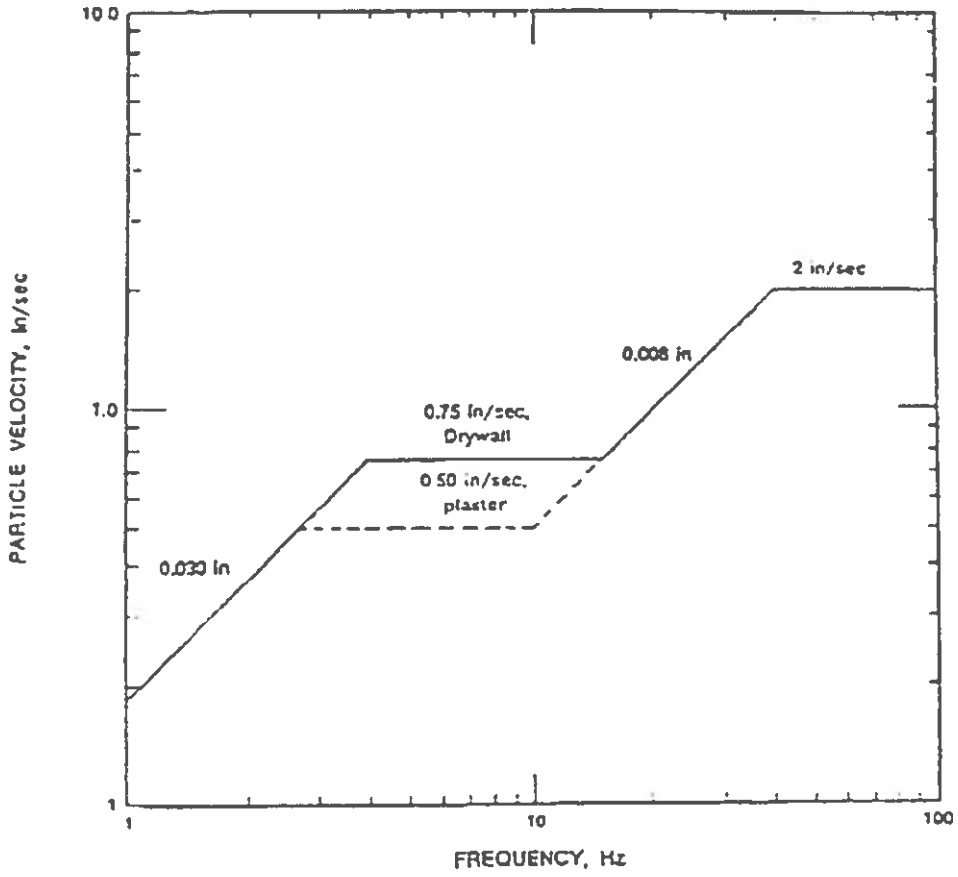
APPENDIX E: RECOMMENDED VIBRATION LIMITS (cont)

All buildings are characterized by a single natural fundamental frequency. This means that, as with a pendulum or a tuning fork, there is one dominant frequency at which a particular building will vibrate when excited. The fundamental natural frequency of a building depends primarily upon its height. Tall buildings are more flexible and vibrate at low frequencies. Low-rise structures, being stiffer, vibrate at higher frequencies.

When the frequency of a ground vibration wave matches the structure's natural frequency, the ground motion will be amplified within the structure. According to the USSM, the natural frequency of typical residential structures ranges between 4 and 12 hertz. Thus, it is within this range that the vibration limits recommended by the USBM are most stringent.

By applying the computerized RSVP Technique to the data obtained in this survey, both the ground particle velocity and response characteristics of residential structures are considered over a wide range of frequencies. The results are then related to the USSM velocity versus frequency curve discussed previously, and are plotted on the analysis sheets at the end of this report.

When particle velocities exceed the limits of the USBM Curve, non-damage probability calculations are performed, based on the research of Medearis. These probabilities are given under the graphs on the analysis sheet for 1, 1-1/2, and 2story houses. When no figures are given, probability of non-damage is essentially 100 percent.



DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

BID DOCUMENTS

METRORAIL 3rd RAIL ISOLATION DISCONNECT SWITCHES REPLACEMENT

PROJECT NO. RIP338

CONTRACT NO. RIP338-DTPW23-CT

TECHNICAL SPECIFICATIONS

SECTION 01 11 00

SUMMARY OF WORK

RPQ No.: IRP338-DTPW23-CT

Project No. IRP338

Third Rail Isolation Disconnect Switches Replacement at the Palmetto Yard (PYD) Maintenance Yard and the Metro Rail Mainline

BACKGROUND:

The Forty-six (46) existing Third Rail Isolation Disconnect Switches at the Palmetto Yard (PYD) and the Six (6) Third Rail Isolation Disconnect Switches located along the Main Line have exceeded their life expectancy and need to be replaced. The Fiberglass enclosures are deteriorated to the point that the bus bar supports are failing at most location, the operating mechanism and control boards for the operation and indications are no longer functional and no replacement parts are available. There are no Open/Closed or Power Status indications to the Yard Tower Traction Power Board or the Central Control Mimic Board because the switches were never wired into the Yard Tower or Central Control during the original installation. This project also includes the installation of Six (6) new Disconnect Switches at the entrance and exit points of the storage tracks at the Palmetto Yard, the six new switches will provide complete redundancy of the Third Rail Power System at the yard and allows us to safely isolate rail sections for maintenance activities without affecting safe train movement and storage in the yard.

At The Palmetto Yard specifically we have experienced several incidents that have been directly attributed to the lack of third rail status indications at the Yard Tower.
A Fiber Optic Ring Network must be constructed to bring the proper Disconnect Switch status. Controls and Power Indications to the Yard Tower.

Scope of Work:

Installation of the necessary conduits, inner ducts and fiber optic cables (single mode only), Fiber panels and related equipment needed to create a Fiber Optic Ring SCADA Network to connect all 52 disconnect switches to the Traction Power Nucleus at the Palmetto Yard Tower. A total of 58 Disconnect Switches are required, 52 for the Palmetto Yard (PYD) and on the Mainline, 2 for the Dadeland South Tail Track, 2 for Government Center Station and 2 for the Gap Tie 3/Palmetto Transition Area. Remove and replace the existing 46 switches and add 6 new switches at the ends of the 3 storage tracks at PYD. Remove/Replace existing 6 switches located on the Mainline. High Pot Test all Jumper Cables before reconnecting to the new Disconnect Switches, replaced bad cables as needed. Provide and install new Fiber Optic Patch Panels and PLCs as needed to connect the control and indication through SCADA to the Nucleus at Central Control for the new Disconnect Switches at South end of the Government Center Station. Install and connect the

necessary wiring for the power and switch position indications to the Central Control Nucleus between the Communications room at Dadeland South Station and the Tail Track Disconnect Switches. 2 spare inputs and 2 spare outputs shall be provided at each PLC/fiber equipment location for future use. Note that fiber optic ring will be installed inside Palmetto Yard only. Switch locations outside Palmetto Yard on Mainline will be connected via copper wires.

Technical Specifications Third Rail Disconnect Switches Replacement:

This Document describes the technical requirements for the equipment to be provided under this contract. The Table below shows the quantities for equipment to be provided under this contract.

DISCONNECT SWITCHES							
Qty	**Location**	**Rating**	**Motorized**	**Manual**			
14	**Palmetto Yard**	**1500 V 6000 A**	**4**	**10**			
16	**Palmetto Yard**	**1500 V 4000 A**		**16**			
22	**Palmetto Yard**	**1500 V 2000 A**		**22**			
2	**Government Center**	**1500 V 6000 A**	**2**				
2	**Tail Track**	**1500 V 6000 A**		**2**			
2	**Transition Area**	**1500 V 6000 A**	**2**				
FIBER RING & SCADA NETWORK							
Qty	**HDEP Conduit**	**Fiber (single mode only)**	**Inner Duct**	**Fiber Panels**	**PLC Equip**	**SCADA Equip**	**NEMA Enclosure**
8,000'	**4" conduit**						
8,500'		**72-EUF-T4101DA1**					
24,000'			**3x1" Orange**	**Corning**			
62				**WIC-024**			
31					**Simatic - 1200**		
2					**(or equal)**	**Master Simatic - 1500**	
31						**(or equal)**	**HANA Gen 2 HW2-N30-1V 30x24x11 120Vac MNT Plate Vented**
2				**AFL light link LAN system 2**			

				RU			

3.1 System Requirements:

The new Disconnect Switches shall be designed, manufactured, and factory tested meeting the following requirements:

1500VDC, 6000A ENCLOSED MOTOR OPERATED SWITCH

1. Enclosure Material shall be 1/4-inch minimum thick fiberglass reinforced polyester (FRP) laminate consisting of 30% Glass Fiber and 70% Resin. Resin System used shall meet UL 94VE-1 Min. flammability Rating.
2. Exterior Surfaces shall have 20 mil Thick ANSI 61 Light Grey Gel Coat.
3. Interior shall be Flat White finish.
4 Hardware shall be corrosion resistant Brass, Bronze, or Stainless Steel.
5 Enclosure shall be rated NEMA 4X.
6 All Metal Parts extending inside the enclosure shall be Insulated or Shielded.
7 The Switch Position Limit Switches shall have at a minimum 1 Extra N.O. Contact for SCADA Interface.
8 2-Fiber Optic Voltage Sensing Relays (VSR's)
9 2- Fiber Optic Voltage Sensors.
10 An Electrical Interlock shall be provided to prevent the Motor from operating the Switch by either Local or Remote Control with Voltage present on the Line and/or the Load side of the Switch.
11 A Manual Operating Handle shall be provided on the inside of the Front Door.
12 No Special Tools shall be required to operate the Switch.
13 A Disconnect Switch shall be provided to turn Control Power OFF Prior to operating Switch Manually.
14 Bus Bar for terminal connections Shall be 2 layers ¾" X 4" 110 Copper for 6000 A Rating.
15 Viewing Windows Shall be Clear Polycarbonate

1500VDC, 6000A, 4000A & 2000A ENCLOSED MANUAL OPERATED SWITCH

1. Enclosure Material shall be 1/4-inch minimum thick fiberglass reinforced polyester (FRP) laminate consisting of 30% Glass Fiber and 70% Resin. Resin System used shall meet UL 94VE-1 Min. flammability Rating.
2. Exterior Surfaces shall have 20 mil Thick ANSI 61 Light Grey Gel Coat.

3. Interior shall be Flat White finish.
4 Hardware shall be corrosion resistant Brass, Bronze, or Stainless Steel.
5 Enclosure shall be rated NEMA 4X.
6 All Metal Parts extending inside the enclosure shall be Insulated or Shielded.

7 The Switch Position Limit Switches shall have at a minimum 1 Extra N.O. Contact for SCADA Interface.
8 2-Fiber Optic Voltage Sensing Relays (VSR's)
9 2- Fiber Optic Voltage Sensors.
10 An Electrical Interlock shall be provided to prevent the Switch from being operated with Voltage present on the Line and/or the Load side of the Switch.
11 An Insulated Manual Operating Handle shall be provided on the outside by the Front Door.
12 No Special Tools shall be required to operate the Switch.
13 Bus Bar for terminal connections Shall be 2 layers ¾" X 4" 110 Copper for 6000 A, 4000 A and 2000 A Rating as required

3.2 CONTRACTOR RESPONSIBILY:

Provide and install the necessary conduits, inner ducts and fiber optic cables (single mode only), Fiber panels and equipment needed to create the Fiber Optic ring SCADA Network connecting all 52 disconnect switches to the Traction Power Board at the Yard Tower.
Acquire a total of 58 Disconnect Switches 52 for PYD and on the Mainline, 2 for the Dadeland South Tail Track, 2 for Government Center and 2 for the Transition Area.
Remove and replace the existing 46 switches and add 6 new switches at the ends of the 3 storage tracks at PYD.
Remove/Replace existing 6 switches located on the Mainline.
High Pot Test all Jumper Cables before reconnecting to the new Disconnect Switches, replaced bad cables as needed.
Provide and install new Control and indication wires from the new Disconnect Switches at Government Center to the communications room located on the fourth floor of the Government Center Building and to the communications room at Dadeland South Station for the Tail Track Disconnect Switches.

The Contractor shall perform the following tasks to accomplish the installation of the new Fiber Optic Ring and the replacement of the Third Rail Disconnect Switches at all locations:

3.2.1 The contractor shall furnish all components and subcomponents listed above and shall be responsible for all shipping to site and unloading at site.
Directional bore and/or trench as necessary to install a four-inch (4") conduit with three one-inch (1") inner ducts and a seventy-two (72) strands Fiber Optic cable to create a ring connecting the fifty-two (52) disconnect switches to the Train Control/Communications Room at the Palmetto Yard Maintenance Facility.

Provide and install thirty-one (31) NEMA enclosure by the disconnect switches as per design, provide, install, and terminate the fibers in the sixty-two (62) fiber patch panels as per design.

Provide, install, terminate and program thirty-one (31) PLC's Remote units inside the NEMA enclosures for SCADA communication.

Provide, Install and terminate fibers and 2 rack mount fiber panels at communication rack in train control room.

Provide, install, terminate, program the two (2) Master PLCs in the Communications Rack located in the Train Control/Communications, interface with the newly installed switches controls and indications with the B&C Nucleus equipment at the Yard Tower and Central Control.

The contractor shall provide all manuals and technical information of the new equipment installed.

The contractor shall provide full set of as-builts after completion.
The contractor shall provide a minimum of eight (8) hours of Operation and Maintenance training for all DTPW Operations and personnel associated with this project. Training shall be provided before the SCADA System is placed into service.

3.2.2 The contractor shall be responsible for the removal and disposal of the existing Disconnect Switches.

3.2.3 The contractor shall High Pot Test all cables coming into the Switch Enclosure prior to installing the new enclosures. The High Pot Test shall be performed following DTPW's High Pot Test Procedure. Cables found to be defective shall be replaced. DTPW will provide the cables needed, the cost for the labor of the cable replacement will be negotiated and paid from the contingency account.

3.2.4 The contractor shall install the new Disconnect Switches connect the existing feeder cables, remove the existing water from the conduits and seal the conduits to prevent water from entering the new enclosures.

3.2.5 The contractor shall terminate and connect all controls and indications wiring and or fiber between the new Disconnect Switches and the Remote PLCs located in the new NEMA Enclosures.

3.2.6 The contractor shall provide the services of a manufacturer's representative to oversee the installation, prepare the necessary Submittals and test procedures to place the new equipment in service, perform the Post Installation Checkout and Commissioning of the new Disconnect Switches and SCADA System.

3.2.7 The contractor shall install six (6) new Disconnect Switches at the north and south ends of the three (3) storage tracks as per design documents, the installation of the new switches will require the installation of six (6) new four inch (4") conduits per switch from the switch enclosure mounting pads to the two sections of third rails, the cables pot heads and jumpers required to complete the installation shall be the responsibility of the contractor.

3.2.8 The Contractor shall be fully responsible for connecting all control, indications, and power cables to complete the installation.

3.2.9 The Contractor shall be responsible to connect all dry contacts received from Yard Tower Facility at the Interface Terminal Cabinet.

3.2.10 The Contractor shall ensure that all hardwired and fiber optic interface is connected to the existing Nucleus Equipment at the Yard Tower.

3.2.11 The contractor shall be responsible for all control and indications wiring to the Central Control Facility from the new Disconnect Switches installed at the south end of the Government Center Station Platform. As well all indications wiring from the Dadeland South Train Control and Communication Room for the new Disconnect Switches installed at the Dadeland South Tail Track and the Palmetto Transition Area.

3.2.12 The contractor shall perform Post Installation Test for all the installed equipment under this contract prior to Commissioning and Integrated Testing.

3.2.13 The contractor shall submit all Test procedures for DTPW review and approval 10 days prior to scheduled test date.

All testing shall be properly documented and witnessed by DTPW personnel.

The contractor shall provide a project schedule which shall include all tasks required to complete the work under this contract.

The Contractor shall provide all labor and tools necessary to complete these tasks.

All waste created by electrical contractor will be removed by the contractor and disposed of in compliance with all Federal, State, and local requirements.

All work shall comply with National and Local Codes.

Electrical Installations shall meet the National Electrical Code and Florida Building Code.

Provide a warranty on all labor and materials that are provided. The warranty shall apply to the labor, work, electrical installation of material, fixtures, equipment, and other items supplied by the contractor for a period of one (1) year from the date of acceptance of the completed work.

3.2.14 Verification and Acceptance:

DTPW Traction Power Maintenance personnel shall perform the following test and verification procedures prior to acceptance of the contractor's work:

a. Test and verify the operation and functionality of all equipment affected by the work performed.

Full acceptance shall be required prior to the project being confirmed as having been completed.

3.3 DTPW RESPONSIBILITY:

3.3.1 DTPW forces shall provide suitable access to the work areas and suitable room for temporary material storage and staging of the work equipment.

3.3.2 Deleted

3.3.3 DTPW shall De-Energize the existing equipment by opening and racking out the corresponding feeder breaker in the Traction Power Substation (TPSS) and disconnect all of the third rail jumpers as required to isolate the disconnect switch beinh replaced The contractor shall apply their own Padlock and Red Tag to the corresponding feeder breaker and or Disconnect switch open to isolate the work area.

3.3.4 Deleted

3.3.5 DTPW shall provide wiring diagrams for nearest Terminal Block for remote control, and metering.

4.0 Required Testing

4.0.1 The Contractor shall provide Test Procedures for DTPW's Review 10 Days before the scheduled Test for DTPW's Review. The Tests shall be carried based upon the approved procedure. All testing requires 48 hours advance notification. All testing to be witnessed by DTPW.

4.0.2 The Contractor shall provide the services of a manufacturer's representative to perform the following tests:

a. Factory Acceptance Test (FAT)

b. Post Installation Testing.

c. Final Acceptance Test

d. SCADA Test (Operation/Alarms/Indications)

4.0.3 The Contractor shall provide to DTPW the Test Reports for the test listed above no later than 10 business days after the completion of each test.

5.0 SPARE PARTS

5.0.1 A recommended spare parts list shall be submitted for approval by DTPW with prices. The Contractor shall designate on the recommended list, the operation time upon which the recommended list is based. Spare parts from the recommended spare parts list shall be purchase using the funds from the Spare Parts Dedicated Allowance.

6.0 PERSONNEL TRAINING

6.0.1 This section covers the requirements for training of DTPW personnel in the operation and maintenance of equipment furnished under this contract.

6.0.2 Space for classroom lectures and practical training on equipment will be furnished at DTPW facilities.

6.0.3 Use of training equipment such as slide projectors, movie projectors, screens, easels, and similar equipment will be furnished by DTPW if available and in working order. Contractor shall provide whatever equipment is needed for training if not available from DTPW.

6.0.4 The Contractor may use spare parts furnished under the contract for use as training aids and for demonstration of and practical exercises for adjusting testing, disassembly, and assembly of equipment. However, the Contractor shall be responsible to ensure spare parts are repackaged and returned to storage in acceptable condition for installation in the system.

6.0.5 Practical training on installed substation equipment will be allowed if not an inconvenience to the installation Contractor, and operation of the installed system shall not be disturbed.

6.1 COURSE OUTLINES

6.1.1 A detailed outline of each course shall be furnished, thirty (30) days before first delivery of equipment to DTPW for approval. The course outline shall include the lists of course materials, training aids, necessary training equipment, names, and qualifications of proposed instructors for each course and time periods when required.

6.2 SCHEDULE

6.2.1 Schedule personnel training course after delivery of operation and maintenance manuals. All DTPW personnel shall be trained on the operation of the equipment before the first station goes online. The courses shall be scheduled to accommodate personnel from 3 different shifts. Complete the courses within a six-week period after the above date. The exact starting dates for courses will be determine by DTPW.

6.3 COURSES

6.3.1 Courses shall be provided on the subjects indicated below and for the minimum number of hours and number of students listed following the course title.

Course Subject	Minimum No. of Hours	Minimum No. of Students	Maximum No. of Students
Operation of Equipment	4	6	12
Maintenance of Equipment	4	6	12

6.4 OPERATION OF EQUIPMENT COURSE

6.4.1 Content of this course shall include, as a minimum, descriptions of procedures and in-service training or simulation for placing system into operation, making necessary adjustments while equipment is in operation, and shutting down the equipment. It shall also include troubleshooting procedures and thorough instruction in emergency procedures. This course shall be directed toward Technicians who are experienced in the operation of existing equipment but lack experience on the new electrical equipment used for the upgrade. The course shall prepare the trainee for operation of the new equipment.

6.5 MAINTENANCE OF EQUIPMENT COURSE

6.5.1 Content of this course shall include, as a minimum, review of basics of safety and electrical equipment maintenance: and classroom description and in-service training on performance of testing, maintaining, troubleshooting, adjusting, assembling, and disassembling of all items of equipment. This course shall be directed to technicians without prior experience in maintenance of the new equipment. The course shall prepare the trainee for maintenance of the new equipment.

6.6 TRAINING MATERIAL

6.6.1 Any printed material or audio-visual material prepared by the Contractor as teaching aids shall become the property of DTPW at the completion of the training program.

7.0 Quality Assurance

The contractor shall submit and maintain a quality assurance plan to include schedule of program installation and testing that will ensure compliance with DTPW's requirement of quality control. All test documentation to be turned over to DTPW after acceptance by DT

END OF SECTION

Section 01 11 00

Summary of Work

SECTION 01 14 00

SITE AND WORK RESTRICTIONS

1.01 DESCRIPTION:

A. This section includes specifications for the general requirements and procedures for access to the various areas within the site to perform the required construction operations to complete the facilities as depicted in the Contract documents. The Contractor is to coordinate through DTPW on access and coordination issues.

2.01 SUBMITTAL REQUIREMENTS:

A. The construction schedule for the project needs to take the restrictions described herein into account for the planning of the work. The schedule of work activities needs to take into account the site and work restrictions identified herein demonstrating the sequencing of the work so as not to impact the Contract duration due to the site and work restrictions presented herein.

B. The Contractor shall submit any required notice, request for access and any other procedural documents, as contained herein or referenced herein per the minimum lead times indicated in these procedures.

C. Contractor is to ensure that municipalities are properly informed of all work contemplated within their jurisdictions by preparing and submitting all necessary documents and permits to work within their right of way .

1. Definitions:

   a. *Engineer-of-Record (EOR)* – The engineering design firm and all designated representatives who were involved in the preparation of all the Contract Documents.

2. Authority:

   The safety of Bus patrons and property shall be a primary consideration during the prosecution of the work. Therefore, any direction given by the duly designated DTPW representative regarding train traffic or train safety shall be considered final and is to be followed immediately. If the Contractor has an objection to the request, the Contractor shall obey the request and subsequently seek relief under the applicable Contract Sections.

3. Delays in Vacating Premises:

   It is absolutely essential that work operations not be disrupted. All Contractor personnel (including suppliers, sub-contractors, vendors, etc.) shall cease work within

thirty (30) minutes after receipt of directions by the EOR and/or DTPW authorized representative.

4. Special Events:

   Certain special events require extended and/or more frequent service (football games, concerts, etc…) and may force work to revise the revenue service schedule and time constraints heretofore cited in this section. The Contractor shall expect and plan for these special events and reflect the impact of these special events in the project schedule and phasing plan.

5. Work Conditions and Access Requirements:

   Access to any given site must be accompanied by proper documentation permits and paid fees. This request shall also include written details, including but not limited to, placement of cranes, materials, form work, personnel, and equipment; the sequence and timing of the work, and any other factor which may be construed by the DTPW representative to affect transit safety or revenue service.

6. Special work Protection:

   Any work under and/or near the Bus stop , which could potentially cause damage or in any way endanger the safety of the Metro Bus patrons or the public, at the sole discretion of work, shall require protection such as barriers, nets, tarps, plywood, etc.… The Special work Protection must reflect the Contractors work activities and shall be designed by a Professional Engineer and submitted to work for approval. A minimum of six (6) weeks prior to performing any such work, the Contractor shall present this plan for the Special work Protection to work for approval.

7. Access to Controlled Areas: N/A

   Contractor access to areas requiring track allocation is prohibited unless prior approval is granted by the DTPW representative.

8. Foreign Objects on Existing Guideway:

   At no time will the Contractor be allowed to throw or discard any objects, construction materials, debris, scaffolds, etc… onto the Guideway. Appropriate measures will be employed by the Contractor to insure that the

9. End of Day Inspections and Other Inspections of Site work :

   The Contractor with the DTPW representative shall on a daily basis, conduct an inspection of the active site work after completion of work and immediately remove any foreign objects. No materials, attachments, anchorage systems, formwork or obstructions will be allowed to be left scattered or not cleaned. Contractor is

responsible to maintain a clean and organize construction area. Prior to any hurricanes or other major storms, the Contractor and DTPW shall inspect the Contractor's work site and the Contractor shall immediately secure any materials that in the sole opinion of work may pose a danger to Metro Bus and/or facilities.

10. Emergencies:

    Notwithstanding any of the above, in the event of an emergency, the Contractor maybe instructed to vacate the work area by either the EOR and/or the DTPW representative. Any such direction shall require immediate action by the Contractor. Prior to vacating the work area, the Contractor shall clear the work area of all materials, equipment, etc… at the discretion of either the EOR and/or the DTPW representative.

11. Work Restrictions:

The contractor must attend the weekly DTPW Track Allocation meeting and submit his schedule to work on the platform level, minimum one week prior to the work being performed. The contractor will only be allowed to work on the platform during non-revenue hours (1:00 AM to 3:30 AM). The contractor can request to work outside these hours at the DTPW Track Allocation meeting for approval. The contractor will be allowed to work outside the platform area during off-peak-hours (9:30 AM to 3:00 PM or 7:00 PM to 6:00 AM).

The DC Switchgear Upgrade will be performed in one Traction Power Substation at a time starting at the Gap Tie 1 Substation and working south. The substation being upgraded shall be completed, certify, and placed back in service before moving to the next substation.

All Fiber Optic installation in the cable trays on the Metrorail Rail Guideway shall be performed during non-revenue hours or on weekends if approved by DTPW at the Track Allocation weekly meeting committee.

All Fiber Optic splicing and terminations in the Communications Equipment Racks shall be performed during non-revenue hours

DTPW forces shall provide suitable access and room inside the substation being upgraded for temporary storage and staging of the works.

DTPW forces shall de-energized the existing equipment by disconnecting the feeder cables of all the substation breakers from the 3rd Rail Potheads and turn off all of the Control Power to the Switchgear so that the switchgear and feeder cables are entirely de-energized before turning the substation over to the contractor.

DTPW forces shall remove the disconnected equipment from the substation for reuse of parts and disposal.

DTPW shall provide wiring diagrams for nearest terminal block for remote control and metering.

DTPW forces shall reconnect all 3rd Rail feeder cables once work is completed at the substation.

The Contractor must be escorted by DTPW Personnel when working on DTPW property. It is the Contractors responsibility to request the DTPW Escort 48 hours in advance (not including weekends) to assure availability. Work in non-public areas of the stations will be performed from 6:00 a.m. to 2:00 p.m. (1st Shift), 2:00 p.m.
to 10:00 p.m. (2nd Shift), or 10:00 p.m. to 6:00 a.m. (3rd Shift). Work in the public areas of the stations shall not be performed during peak hours (normally 6am to 9am and 3pm to 6:30pm). Peak hours may change due to special circumstances. Work areas shall be segregated using appropriate barriers in order to comply with DTPW's working practices and to minimize DTPW's Patrons' inconvenience and maximize safety. If access to the Metrorail guideway is required for any part of the work, such work must be scheduled in advance through DTPW's Track Allocation meeting and performed as agreed upon at the meeting. Work on the Metrorail guideway is normally performed only between the hours of 11pm and 3am.

END OF SECTION

SITE AND WORK RESTRICTIONS

SECTION 01 21 00

ALLOWANCES

PART 1: GENERAL

1.01 DESCRIPTION:

This section specifies allowances to be used in the Contract.

2.01 ALLOWANCE ACCOUNT FOR UNFORESEEN CHANGES:

An Allowance Account has been established for the purpose of funding portions of the work which are unforeseeable at the time of execution of the Agreement, or for special work deemed desirable by the County to be incorporated into the Agreement.

3.01 PAYMENT:

A. Unforeseen changes will be paid from the Allowance Account for Unforeseen Changes.

B. Any unused portion of the allowance shall not be billed to work.

END OF SECTION

SECTION 01 26 13

REQUEST FOR INFORMATION (RFI)

1.01 DESCRIPTION:

A. This section covers Request for Information (RFI) from the Contractor. RFI in this section is defined as: the solicitation by the Contractor for clarifications, interpretations, verifications and/or corrections of the Contract Documents.

B. The Contractor shall comply with this section for all such requests for information. All costs incurred by the Contractor in preparing these requests shall be borne by the Contractor and are part of this Contract.

C. Any delays or impacts caused by the Contractor's failure to conform to the requirements of this section shall be solely the Contractor's responsibility and shall not be cause for any time extension and/or additional compensation.

1.02 REQUEST FOR INFORMATION REQUIREMENTS:

A. The Contractor is responsible for reviewing all Contract Documents related to a particular work product well in advance of the performance of such work in accordance with this contract. This review shall be planned to allow sufficient time to obtain resolution of any required RFI, as defined in this section.

B. All RFI's shall be submitted to the DTPW representative and the Engineer-of-Record (EOR) in the format within this section or in a pre-approved format equivalent to this section inclusive of the following information:

RFI's shall be signed by the Contractor's project manager or by a designated alternate and include the following:

1. Date Submitted

2. Contract Number and Title

3. Contractor Name, Address and Phone Numbers

4. Description of the request, including any supportive drawings, sketches and/or additional information deemed necessary for clarification.

5. List of schedule activities which may be impacted by the request and a brief explanation as to why there would be a schedule impact and specific date constraints.

6. Clear description of what response the Contractor is expecting and from who the response who come from.

2.01 RFI PROCESSING PROCEDURES:

A. Upon receipt of the RFI, the EOR shall promptly date stamp the request. The EOR is required to keep a log of all RFI's including receipt date and date returned to the Contractor.

B. The EOR shall review the request to determine if further information is required from the Contractor, once the RFI is resubmitted by the Contractor, the RFI shall be re-stamped. The EOR will coordinate a response and transmit the answer to the RFI to the Contractor and send a copy to the DTPW representative.

3.01 TIME ALLOWED FOR PROCESSING RFI's:

A. Although every attempt will be made to expeditiously resolve all RFIs, DTPW and the EOR shall have ten (10) working days in order to respond to the RFI, from the date the RFI is received by the EOR, including all necessary information needed to formulate a response. Failure by the Contractor to allow sufficient time for work to formulate a response to an RFI, as specified in this section, shall not constitute grounds for a delay claim from the Contractor.

4.01 MEASUREMENT:

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

5.01 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

MIAMI-DADE COUNTY

REQUEST FOR INFORMATION

DATE: _____

RFI No.: _____

CONTRACT No. _____

CONTRACT TITLE: _____

CONTRACTOR: _____

DESCRIPTION OF REQUEST: (ATTACH ADDITIONAL SHEETS AS REQUIRED)

DRAWING No. _____

SPEC. REFERENCE: _____

CPM ACTIVITIES OF POTENTIAL IMPACT AND TIME CONSTRAINTS:

SUBMITTED BY: _____ _____

*(CONTRACTOR / PROJECT MANAGER) DATE

REVIEWED BY: _____ _____

TITLE DATE

DATE RETURNED TO CONTRACTOR: _____

*CONTRACTOR'S SIGNATURE AFFIRMS THAT CONTRACTOR HAS REVIEWED THE CONTRACT DOCUMENTS AND THAT THE INFORMATION REQUESTED CANNOT BE OBTAINED FROM SUCH A REVIEW.

SECTION 01 26 13

REQUEST FOR INFORMATION (RFI)

1.01 DESCRIPTION:

A. This section covers Request for Information (RFI) from the Contractor. RFI in this section is defined as: the solicitation by the Contractor for clarifications, interpretations, verifications and/or corrections of the Contract Documents.

B. The Contractor shall comply with this section for all such requests for information. All costs incurred by the Contractor in preparing these requests shall be borne by the Contractor and are part of this Contract.

C. Any delays or impacts caused by the Contractor's failure to conform to the requirements of this section shall be solely the Contractor's responsibility and shall not be cause for any time extension and/or additional compensation.

1.02 REQUEST FOR INFORMATION REQUIREMENTS:

A. The Contractor is responsible for reviewing all Contract Documents related to a particular work product well in advance of the performance of such work in accordance with this contract. This review shall be planned to allow sufficient time to obtain resolution of any required RFI, as defined in this section.

B. All RFI's shall be submitted to the DTPW representative and the Engineer-of-Record (EOR) in the format within this section or in a pre-approved format equivalent to this section inclusive of the following information:

RFI's shall be signed by the Contractor's project manager or by a designated alternate and include the following:

1. Date Submitted

2. Contract Number and Title

3. Contractor Name, Address and Phone Numbers

4. Description of the request, including any supportive drawings, sketches and/or additional information deemed necessary for clarification.

5. List of schedule activities which may be impacted by the request and a brief explanation as to why there would be a schedule impact and specific date constraints.

6. Clear description of what response the Contractor is expecting and from who the response who come from.

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B. The EOR shall review the request to determine if further information is required from the Contractor, once the RFI is resubmitted by the Contractor, the RFI shall be re-stamped. The EOR will coordinate a response and transmit the answer to the RFI to the Contractor and send a copy to the DTPW representative.

3.01 TIME ALLOWED FOR PROCESSING RFI's:

A. Although every attempt will be made to expeditiously resolve all RFIs, DTPW and the EOR shall have ten (10) working days in order to respond to the RFI, from the date the RFI is received by the EOR, including all necessary information needed to formulate a response. Failure by the Contractor to allow sufficient time for work to formulate a response to an RFI, as specified in this section, shall not constitute grounds for a delay claim from the Contractor.

4.01 MEASUREMENT:

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

5.01 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

MIAMI-DADE COUNTY

REQUEST FOR INFORMATION

DATE: _____

RFI No.: _____

CONTRACT No. _____

CONTRACT TITLE: _____

CONTRACTOR: _____

DESCRIPTION OF REQUEST: (ATTACH ADDITIONAL SHEETS AS REQUIRED)

DRAWING No. _____

SPEC. REFERENCE: _____

CPM ACTIVITIES OF POTENTIAL IMPACT AND TIME CONSTRAINTS:

SUBMITTED BY: _____ _____

*(CONTRACTOR / PROJECT MANAGER) DATE

REVIEWED BY: _____ _____

TITLE DATE

DATE RETURNED TO CONTRACTOR: _____

*CONTRACTOR'S SIGNATURE AFFIRMS THAT CONTRACTOR HAS REVIEWED THE CONTRACT DOCUMENTS AND THAT THE INFORMATION REQUESTED CANNOT BE OBTAINED FROM SUCH A REVIEW.

SECTION 01 31 19

PROJECT MEETINGS

1.01 DESCRIPTION:

A. This Section includes specifications for project meetings. The Contractor, along with Contractor's superintendent, project manager, superintendents of major sub-contractors, and on-site safety representative, as a minimum, shall attend meetings scheduled by DTPW and EOR.

2.01 SPECIAL MEETINGS:

A. Special meetings between DTPW, EOR and the Contractor will be scheduled and conducted by DTPW throughout the course of construction as deemed necessary by DTPW and/or EOR.

3.01 PRECONSTRUCTION MEETING:

A. A pre-construction meeting will be scheduled and conducted by DTPW not more than five (5) working days after the effective date of the Notice to Proceed (NTP). Contractor's project manager, superintendent, safety representative, quality control supervisor, EEO officer, sub-contractor representatives shall attend the pre-construction meeting. DTPW will provide Contractor written notice of this meeting not less than five (5) working days prior to the date of the meeting.

B. DTPW will discuss the following at this meeting:

1. Introduce representatives of work, governmental agencies, public and private utilities.

2. Explain and discuss the responsibilities and authorities of DTPW, EOR and contractor.

3. Discuss Equal Employment Opportunity (EEO), Disadvantaged Business Enterprise (DBE), and affirmative action requirements along with the community relations functions. Work will be handling all of the community relations functions with coordination from the Contractor and EOR as needed.

4. Discuss Contractor’s construction control requirements.

5. Define and establish requirements for safety, first aid, emergency actions, security, and full-time safety representatives.

6. Explain and discuss selected laws, codes, traffic regulations, and permit requirements of public agencies and their regulations.

7. Discuss procedures for processing change notices, change orders, correspondence documents, RFI's, shop drawing submittals, product data, and samples.

8. Discuss monthly progress payment procedures.

9. Discuss final payment procedures.

10. Discuss proposed project schedule.

C. The Contractor shall discuss the following at this meeting:

1. Introduce Contractor's representatives, and briefly describe each person's responsibilities.

2. Distribute and discuss the list identifying Small Business and Disadvantaged Business Enterprises (SBE and DBE) sub-contractors including their areas of responsibility.

3. Discuss use of office, streets, right-of-way, haul routes, storage areas, staging areas, construction areas, and temporary easements.

4. Define housekeeping procedures.

5. Discuss construction means and methods.

6. Describe general worksite layout, erosion and sedimentation control plans, haul routes, noise abatement, air and water pollution control, temporary street closings, and street restoration.

7. Discuss coordination and notifications required for utility work and services.

8. Discuss deliveries and priorities of major equipment mobilization.

9. Discuss breakdown of schedule of values for lump sum items.

10. Discuss construction project schedule.

11. Discuss public safety measures.

4.01 CONSTRUCTION PROGRESS MEETINGS:

A. Construction progress meetings will be scheduled and conducted by DTPW and EOR and held each week during the period of performance of the Contract for the competent and timely execution of the Contract. Progress meetings shall include representatives of sub-contractors who are or will be performing work during the current and following month.

B. The Contractor shall distribute notices of these meetings prior to date to all sub-contractors.

C. The agenda for construction progress meetings will be prepared by the work and will generally include the following:

1. Introduce new attendees and areas of responsibility.

2. Review minutes of previous meetings, amend minutes if necessary, and accept minutes.

3. At the first meeting of each month, analyze work accomplished since previous meeting, offsite fabrication problems, product delivery problems, submitted schedule slippages, proposed changes, and circumstances that might affect progress of work.

4. At each meeting, display and discuss the status of the critical path activities. If they are behind schedule describe the methods intended to be used to bring these activities back on schedule. Discuss corrective measures to maintain progress.

5. Discuss work quality observations, problems, and employee work standards.

6. Discuss coordination of utility work.

7. Discuss work by outside parties.

8. Discuss changed conditions, time extensions, and other relevant subjects as they affect the progress of the work.

9. Discuss the status of Contract changes: new changes, status of negotiations and completed changes.

10. Discuss SBE and DBE issues.

11. Each of the Contractor’s inquiries, requests for information or requests for solutions of problems presented during such meetings shall be answered,

when possible, during the meeting; those not answered during the meeting will be answered by the appropriate party at least by the date of the next meeting. Answers provided orally at the meetings shall be recorded in the minutes.

12. All parties shall review the minutes of the meetings prepared by EOR and submit any requested corrections. Minutes will be prepared in action-item format with named responsible parties and dates for required completion indicated for each item.

5.01 MEASUREMENT:

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

6.01 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 01 32 16

PROJECT SCHEDULE

1.01 DESCRIPTION:

A. This section covers the preparation of a schedule in the Cost Loaded Construction in the Critical Path Method (CPM). The Contractor will be allowed to use his preferred scheduling system, if approved by DTPW. If the Contractor wishes to propose his own system, he shall so request prior to the required submittal time tables listed in this section.

B. Final Schedule:

1. A bar chart schedule shall be used by the Contractor to control the progress and time fixed for completion of this project. This system shall be implemented by the Contractor. Prior to approval of the final construction schedule, the Contractor shall provide work with letters from all his sub-contractors and suppliers indicating that they have reviewed the Contractor's schedule and concur with the sequence of events, activity durations and rates of production implied therein.

2. All work shall be done in accordance with the schedule and all costs incurred by the Contractor to correctly implement the schedule shall be borne by the Contractor and are a part of his Contract.

3. The schedule must be updated monthly and submitted with the Contractor's pay request. No payment will be made to the Contractor unless this monthly updated schedule and progress report is submitted with the Contractor's pay request. Even if no invoice is submitted in a particular month, the Contractor shall submit monthly schedule updates and progress reports to the satisfaction of work.

2.01 PREPARATION OF FINAL SCHEDULE:

A. Within five (5) working days after the date of Notice to Proceed (NTP), such as FP the Contractor shall develop and submit a comprehensive and detailed final schedule. Work performed prior to NTP shall not be allowed under this Contract.

B. When completed, the bar chart diagram shall represent the Contractor's own plan for the project as well as the sequence of each operation and all the involved parties. The schedule shall also identify the project's critical path. It shall be the responsibility of the Contractor to ensure that all of this work is described by the diagram and that the diagram does correctly represent the sequence in which he plans to do his work and the time in which he expects to do it.

C. As a minimum, the final schedule will cover the following areas:

1. Shop drawing preparation, review and approval
2. Procurement of major equipment or material
3. Permit acquisition activities
4. Material samples
5. Material delivery
6. All major work elements
7. Punch list activities
8. Rates of Production
9. Submittals
10. Work Elements by other &L, AT&T, etc…

D. The final schedule will be printed on a 11" x 17" sheet suitable for reproduction. The Contractor will submit three (3) copies of this schedule.

E. A written narrative on separate 8 1/2" x 11" sheets will be included with the Contractor's final schedule. This narrative will describe the Contractor's general approach for performing the work and any additional or unusual requirements not clearly represented in the schedule including, but not limited to, equipment to be used and the time equipment is to be on-site, anticipated delivery dates for material and/or equipment, crews and crew sizes, estimated quantities and rates of production. The narrative shall explain the basis for the Contractor's determination of durations for major work items and describe his approach for meeting the interim and final completion dates in his schedule. The narrative shall also address workdays per week, hours per shift, rain days, holidays or any other non-work periods that the Contractor is assuming in the planning of the work. Activities which may be expedited by the use of overtime or additional shifts shall be identified. Sequencing and other restraints such as manpower, material or equipment shall be identified and explained.

F. When completed, the final schedule shall be submitted to work for their approval. The Contractor shall incorporate work schedule review comments within ten (10) working days after receipt. DTPW shall be the final authority in deciding the acceptability of the schedule. Upon approval work, this shall become the Final Schedule for the Contract. No deviations from the final schedule will be allowed without the prior written approval of DTPW.

G. The Contractor shall identify all available float or slack time in his schedule in a format suitable to DTPW. Float or slack time is not for the exclusive use or benefit of either the Contractor or work. Float or slack time is considered project float as it is for the benefit of both parties. As such, it is not to be used exclusively by either party, but is to be used by the party that needs it first. No more than 15% to 25% of the activities in the Contractor's

schedule may be on or near the critical path ("Near the critical path" is defined as any activity having float of ten (10) days or less).

3.01 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 DTPW. 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.

4.01 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. 10% 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 DTPW based on the approved schedule of values under the contract.

D. No payment will be made to the Contractor for uncompleted activities.

5.01 MEASUREMENT AND PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form 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. **Work Days 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.

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.

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 01 33 00

SUBMITTALS
SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

1.01 DESCRIPTION:

A. This section includes specifications for the general requirements and procedures for preparing and submitting design and construction information and data for information and review. Other requirements for submittals are specified under applicable sections of the Contract Documents.

B. General requirements for submittals are detailed in this section. Schedule of Submittals: Within ten (10) days after the effective date of Notice to Proceed (NTP), the Contractor shall submit a completed submittal schedule and list of products for all items requiring the Engineer-of-Record's (EOR) review and approval, as follows:

1.02 QUALITY CONTROL:

A. Contractor shall utilize a work-approved quality assurance program to oversee the work of the contract and to ensure delivery of all final products in accordance with section 01 43 00.

B. Prepare shop drawings and record documents to a high standard of quality, such as set forth in DOD-STD-100, ANSIY14 series, or other relevant lower-tier specification defining equal drafting quality.

C. Reference standards: American National Standards Institute (ANSI) ANSI Y14 Series American Drafting Standards.

1.03 SUBMITTALS (CDRL):

A. Shop Drawings: Fabrication or layout drawings required by individual Technical Provisions - Systems sections for permanent incorporation in the Work.

B. Working Drawings: This refers to the Contractor's plan for temporary equipment or structures such as decking, temporary bulkheads, support of excavation, support of utilities, ground water control, and forming, and for such other work as may be required for construction but does not become an integral part of the permanent work. Submit working drawings and signed and sealed associated calculations as required by contract sections for temporary work that will not become a part of permanent structures included in this contract.

C. Samples: Samples of materials or equipment submitted to DTPW for review before incorporating in the work as required by individual contract sections.

D. Certification: Notarized certificates or certified test results submitted that demonstrate proof of compliance with Technical Provisions - Systems for products, materials, equipment, systems, and qualifications of personnel, manufacturers, fabricators, and installers.

E. Calculations: Where required by individual Technical Provisions - Systems sections, signed and stamped by a professional engineer.

F. Test Procedures and Reports: Provide test procedures for review by DTPW before commencement of testing. Provide test reports, in DTPW-reviewed format, for review by DTPW.

G. Documentation: Documents required to be submitted by the contract, including miscellaneous items such as delivery tickets, batch tickets, and bills of materials.

H. Product Data: Manufacturer's literature, catalog cuts, and material safety data sheets.

I. Operations and Maintenance Manuals: Operations and maintenance manuals for equipment and systems as required by the contract.

J. Systems Design Packages: Submitted to DTPW for review as required by the contract.

K. Software: Any software utilized in any processor-driven component.

1.04 SUBSTITUTIONS:

A. In addition to the requirements of this section, Substitution of a product must be done in accordance with Section 01 62 00.

B. Substitutions consist of preparing, submitting, amending, and updating lists of products or methods of construction which the Contractor proposes to furnish and install instead of those indicated.

C. Propose substitutions in accordance with provisions indicated, and include documentation on methods of construction, materials, products, and supplies that are proposed for substitution instead of items shown or methods indicated or implied in the contract documents. All substitutions must be approved by the Engineer.

1.05 CHANGES:

Changes proposed by the Contractor to items listed in DTPW-reviewed submittals will not be permitted unless those changes have been submitted to, and reviewed in writing by DTPW.

1.06 MASTER LIST OF SUBMITTALS:

Identify submittals required and determine the date on which each submittal is required in order to conform to the contract's submittal schedule.

1.07 SUBMITTAL FORMAT AND INSTRUCTIONS:

Drawings:

Submittals: Show the following information when applicable:

1. Names of Contractor, subcontractors, suppliers, manufacturers, and, when applicable, the seal and signature of a professional engineer
2. Identification of product by description, model number, style number, serial
3. number or lot number, and finish numbers
4. Subject identification by contract drawing or technical provisions reference
5. Relation to adjacent structures or materials
6. Field dimensions, clearly identified as such
7. Applicable standards, such as ASTM or federal specification numbers
8. Identification of deviations from contract documents
9. Contractor's sealed, signed and dated, certifying the following:
   - I. Review of submittals for compliance with contract requirements
   - II. Verification of field measurements
   - III. Verification of subcontractors' work for accuracy
   - IV. Compatibility of the work shown thereon with affected trades and other contracts
   - V. Action Block: Include a blank space, 5 inches wide by 2.5 inches high, in the lower right corner, just above the title block, in which DTPW may indicate action taken. Shop drawings without this space will be returned without review for compliance.
   - VI. Technical details of equipment to be installed shall be supplied at the same time that equipment general arrangements and layout drawings for the area are submitted. Include all space requirements for installation, maintenance and replacement, service connections required, environmental requirements, weights, foundation and fixing details, etc.
   - VII. Make submittals sufficiently in advance so review may be made by DTPW at least 3 calendar days before commencement of related work.
   - VIII. Allow 3 calendar days for review of each submittal cycle by DTPW.
   - IX. Ship submittals prepaid by overnight express delivery or hand-carry them to DTPW.

X. Accompany submittals with a Contractor transmittal form containing the following information:
   a. Contractor's name, address, and telephone number for home office or field office
   b. CDRL number and title
   c. Submittal number based on individual volume title, section number, and date
   d. Contract title and number
   e. Supplier's, manufacturer's, or subcontractor's name, address, and telephone number
   f. Subject identification, including contract drawing, volume title, section, and article reference
   g. Identification of deviations from contract documents, if any
   h. Copy of subcontractor's or supplier's transmittal to Contractor

XI. Provide sufficient data with subsequent submittals initiated by the Contractor for consideration of corrective procedures for review. Make subsequent submittals in the same manner as initial submittals.

XII. Incomplete or partial submittals may be returned to the Contractor without review.

XIII. Illegible facsimile copies of any portion of a submittal will not be accepted.

2.01 QUANTITIES:

A. One reproducible sepia and three prints of each shop drawing and working drawing (Reproducible sepia and prints that are of poor quality are not acceptable.)

B. Three copies of manufacturer's standard schematic drawings

C. Three copies of manufacturer's calculations, and four copies of manufacturer's standard data

D. Three copies of manufacturer's printed installation, erection, application, and placing instructions

E. Three samples of each item specified in the various Technical Provisions - Systems sections, unless otherwise specified

F. Three copies of inspection reports, test reports, and certificates of compliance

G. Three copies of engineer's calculations, with seal and signature of an engineer

H. Three copies of design packages

I. Three copies of Contractor's weekly report.

3.01 CONTRACTOR'S REVIEW:

Review all submittals, and stamp and sign them as reviewed and approved, before submission to DTPW. Failure to comply with this requirement will result in immediate return of the submittal without review.

4.01 DTPW'S REVIEW:

DTPW will provide timely reviews of the Contractor submittals identified in the CDRL and throughout the contract documents. The Contractor may continue with the work, pending receipt of DTPW's review comments, at its (the Contractor's) own risk.

A. Review Stamp

1. Review of submittals and the action taken, either NO EXCEPTIONS TAKEN or EXCEPTIONS TAKEN, may be indicated with a review stamp. DTPW's representative may affix the review stamp, mark the action block, and sign and date the stamp.

2. The review stamp action block marks have the following meanings:
   I. NO EXCEPTIONS TAKEN: Every illustration and description appears to conform to the respective requirements of the contract documents; that (a) design development may continue, or that (b) fabrication, assembly, manufacture, installation, application, and erection of the illustrated and described product may proceed, in the case of final submittals; and that the submittal need not be resubmitted.

   II. EXCEPTIONS TAKEN: The submittal is deficient to the degree as described by the notes on the actual submittal and/or as contained in the letter of exception and clarification attached to the returned submittal; that the Contractor shall not assume that the reviewer has completed a thorough review of the submittal; and that the submittal needs revision and it must be corrected to conform to the respective requirements of the contract documents. Re-submittal requirements shall be described in the letter of exception and clarification.

B. Review by Other Agencies

Various agencies designated by DTPW may have review stamps or other acceptance methods different from those of DTPW. The Contractor shall work with the designated agencies and obtain acceptance in the clearest and most straightforward manner possible. If a submittal requires review, acceptance, or approval from an agency other than DTPW, the Contractor shall gain such concurrence prior to submission to DTPW.

C. Review of submittals by DTPW or a designated agency shall not relieve the Contractor from responsibility for errors or omissions in the submittals, or from deviations from the contract documents, unless submittals containing such deviations were submitted to DTPW with the deviations specifically called to the attention of DTPW in the letter of transmittal, and reviewed by DTPW as a contract change order.

D. The Contractor shall notify DTPW in writing immediately of any review comments or suggested revisions by DTPW or other entity which the Contractor considers contrary to the requirements of the contract.

E. After review of submittals, the Contractor shall distribute prints or copies of accepted documents to the following:

1. Contractor's field office
2. DTPW representative's field office
3. Affected and concerned subcontractors, suppliers, and fabricators
4. Affected and concerned members of the Contractor's workforce

5.01 CONTRACTOR'S RESPONSIBILITIES:

A. Coordinate each submittal with requirements of the work. Place particular emphasis on ensuring that each submittal of one trade is compatible with other submittals of that trade, and with submittals of other trades.

B. Review by DTPW of submitted drawings and associated calculations does not relieve Contractor of responsibility for errors or omissions in the drawings and associated calculations, or from deviations from the contract documents, unless such deviations were specifically called to the attention of DTPW in the letter of transmittal submitted with the drawings. The Contractor is responsible for correctness, accuracy, and completeness of the drawings; for shop fits and field connections, dimensions, and quantities; and for results obtained by use of such drawings.

C. Contractor's liability to DTPW, in case of deviations in the submittals from requirements of the contract documents, is not relieved by DTPW review of submittals containing deviations, unless DTPW expressly approves deviations by issuing a change notice.

D. Do not start work for which submittals are required until submittals bearing the stamp of DTPW, and signatures indicating review, have been received.

E. Before making submittals, ensure products are available in quantities required by the contract.

F. Verify field measurements, catalog numbers, and similar data.

G. Re-submittals: Make any corrections required by DTPW and resubmit for review. The Contractor shall direct specific attention in writing on resubmitted shop drawings to revisions other than the corrections by DTPW on the previous submittal.

H. **Contract Deliverable List**

1. Prepare, and keep up to date, a contract deliverable list showing numbers and titles of each submittal, months and years in which submittals will be made, and current status of review by DTPW.
2. Indicate review priority for any items required on an early basis.
3. Send copies of the entire list to DTPW at monthly intervals.
4. Distribute copies of revised pages of the list whenever a drawing is revised and resubmitted.

6.01 SHOP DRAWINGS:

A. Prepare shop drawings on a sheet, maximum size of 22 inches by 36 inches, to a scale large enough to easily depict and annotate each of the various pertinent items. Provide blank space for the action stamp.

B. Submit final, corrected, reproducible sepia of each shop drawing, and show the work as actually installed, placed, erected, and applied.

7.01 BOOK OF PLANS:

The Contractor shall submit a complete Book of Plans upon acceptance of the system.

8.01 PRODUCT DATA:

A. Modify the manufacturer’s standard schematic drawings to delete information that is not applicable to the contract. Supplement standard information with additional information applicable to this contract.

B. Modify the manufacturer’s standard catalog cuts, brochures, diagrams, schedules, performance charts, illustrations, calculations, and other descriptive data to delete information that is not applicable to the contract. Failure to comply with this requirement will result in rejection of the submittal. Indicate dimensions, clearances, performance characteristics, capacities, wiring and piping diagrams, controls, and other information as required.

C. Modify the manufacturer’s printed installation, erection, application, and placing instructions to delete information that is not applicable to the contract.

D. Include appropriate information as required herein and by the contract.

E. Submit certificates of compliance to DTPW for those products for which no samples and test results are specified; certificates should be submitted not later than 3 days before products are installed. A copy of the certificate should accompany the product for which the certificate is prepared. Include on the certificate the following:

1. A statement that the product complies with respective requirements indicated
2. A certified copy of test results pertaining to the product
3. Submittal date, Contractor's name and address, contract title and number, product represented and its location in the contract, producer's name, product trade name and catalog number, place of product origin, test date, testing organization's name and address, quantity of the product furnished, and related contract drawing, volume title, and section numbers
4. A notarized signature of an officer or other authorized representative of the manufacturer or producer

F. When materials or equipment are required to conform to the standards of organizations such as the American National Standards Institute (ANSI), the American Society for Testing and Materials (ASTM), the National Electrical Manufacturers Association (NEMA), or Underwriters Laboratories (UL), submit proof of such conformance to DTPW for review. If an organization uses a label or listing to indicate compliance with a particular standard, said label or listing will be acceptable evidence, unless otherwise specified in individual sections. In lieu of a label or listing, Contractor may submit a certificate from an independent testing organization (one that has been reviewed by DTPW, and found competent to perform acceptable tests). The certificate shall state that item has been tested in accordance with the specified organization's standard.

9.01 SAMPLES:

A. Submit samples of sizes and quantities to clearly illustrate full color range and functional characteristics of products and materials, including attachment devices. Indicate country of origin.

B. Erect field samples and mock-ups at the work site, as specified in contract sections and as may be necessitated by the Contractor submitting value engineering proposals or substitutions; locations must be acceptable to DTPW.

C. Include appropriate information as required, and indicate the pertinent contract section. Submit product data to accompany samples.

D. Review of a sample shall only be for the characteristics or use named in such review, and shall not be construed to change or modify any contract requirements. Materials and equipment incorporated in work shall match reviewed samples.

E. Certain samples may be tested by DTPW as specified. Reviewed samples not destroyed in testing will be retained by DTPW. Samples not destroyed in testing and reviewed with exception taken will be returned to Contractor at Contractor's expense, if so requested at time of submission.

F. Failure of any material to pass specified tests will be sufficient cause for refusal to consider, under contract, any further samples of same brand and make of that material. DTPW reserves the right to take exception to any material or equipment that previously has proved unsatisfactory in service.

G. Samples of various materials or equipment delivered on site or in place may be taken by DTPW for testing. Samples failing to meet contract requirements will automatically void previous reviews of items tested.

H. When tests are required, only one test of each sample proposed for use will be made at DTPW's expense. Samples that do not meet contract requirements will be rejected. Retesting of additional samples will be made by DTPW at Contractor's expense.

I. DTPW reserves the right to require submission of samples or site mock-ups of any material, whether or not such submission is specifically mentioned in the contract.

10.01 WORKING DRAWINGS:

A. Identify working drawings by a submittal number based on volume title and section number, and provide a reference to pertinent contract drawing numbers. Use a working drawing sheet with a maximum size of 22 inches by 36 inches. B. Have working drawings prepared, stamped, and signed by an engineer of the involved discipline.

B. Verify field measurements and coordinate with pertinent contract drawings from other contracts, where applicable.

C. Do not begin work for which working drawings and associated calculations are required until drawings and calculations have been reviewed by DTPW; DTPW's corrections, if any, have been addressed; and submittals have been returned to the Contractor with the required review stamps and signatures.

D. Distribute copies of working drawings and calculations after DTPW review.

11.01 CALCULATIONS:

Have calculations required by Technical Provisions - Systems sections stamped and signed by a professional engineer of the involved discipline. When calculations accompany drawings in a submittal, the body of the calculations must contain cross references to the individual drawing to which the page of the calculations pertains.

12.01 DESIGN SUBMITTALS:

Submit designs for the work to DTPW for review. Submit in the following stages:

Conceptual Submittal:

A. Identify all systems, subsystems, equipment, or other elements that will later be the subject of preliminary and final submittal submissions, and which together constitute the whole design for Contractor's Work.

B. Identify the function of each system, subsystem, equipment, or other element within the overall design, and specify relationships and interfaces between such elements.

C. If at any time in the preparation of the preliminary and final designs, the Contractor wishes to modify conceptual submittal by dividing any system or subsystem into a number of smaller systems (or by reconfiguring interfaces or for any other reason), the Contractor shall resubmit conceptual design for re-review.

D. Preliminary Submittal:

A. Make a separate preliminary design submission for each element of the overall design, as identified in the conceptual design.

B. Submit in sufficient detail to evaluate progress and technical adequacy of the selected design approach.

C. Submission shall represent, at a minimum, a 50 percent completion level.

D. Clarify and confirm as necessary all technical aspects of all interfaces with other elements of Contractor's overall design, and of any interfaces with facilities.

E. Final Submittal:

A. Make a separate final design submission for each element of overall design, as identified in the conceptual design.

B. Submission shall represent not less than 95 percent completion.

C. Note that DTPW will not normally review a final design submission until at least a satisfactory preliminary design submission has been received for all interfacing elements, and will give only a conditional review until such time as the final design submission has been received for all interfacing elements.

13.01 SOFTWARE:

License and disclose to DTPW software utilized in any processor-driven component, according to the nature of the software selected:

A. Commercially Available Software: Pass on to DTPW the following:

All documentation, new and unused, received with the software from supplier.

A non-exclusive license in perpetuity to use software in all processor devices in which it is installed by Contractor.

B. High-Level Software and Operating Systems: For any software that is the property of the Contractor, provide the following support:

1. A non-exclusive license in perpetuity to utilize software in all processor devices in which it is installed by Contractor.
2. An undertaking, in effect for as long as the software is in operation, to provide DTPW with updated software if any defects or deficiencies in software become known to the Contractor from any source.
3. Full and detailed documentation of software. Place the documentation in escrow such that it will become property of DTPW if the software owner ceases trading as a commercial company.

C. Application Software and Databases: Provide the following support:

1. A non-exclusive license in perpetuity to use software in all processor devices in which it is installed by Contractor.
2. Full and detailed documentation, including operational descriptions, flow diagrams, and detailed program or data listings to allow DTPW to maintain and modify the software or ensuing databases without seeking additional information from the Contractor.

14.01 SUBSTITUTIONS:

A. In addition to the requirements of this section, Substitution of a product must be done in accordance with Section 01 62 00.

B. The list of materials, products, and supplies, and the list of methods of construction proposed for substitution of those indicated, will be considered only if those requests have been submitted. Review of substitute items or methods will be only for characteristics and the use named in the acceptance. This review will not be interpreted as a modification of the contract, nor will it establish precedence of products and methods for other portions of the project. Review of a substitution does not relieve the Contractor of responsibility for fulfilling requirements of the contract documents. DTPW will judge the quality and suitability of substitute items or methods, and its decisions are final. If use of substitute products or

methods involves redesign of other parts of the work, the Contractor shall perform the redesign and submit it for review by DTPW, bear the cost of redesign, and include the direct cost of evaluating substitutions by DTPW.

C. Include the following information with documentation for materials, products, and supplies:

3. Complete data substantiating the compliance of the proposed substitution with the requirements of the contract documents.
4. Identification of materials, products or supplies, including manufacturer's name, address, catalog name, and number.
5. Installation characteristics, installation drawings, and manufacturer's literature, including product description, performance and test data, and reference standards (if pertinent).
6. Name and address of projects on which the product was used under similar circumstances, and date of installation.
7. Itemized comparison of proposed substitution with the item specified. Include in a tabular form differences in materials, size, finish, estimated life, estimated maintenance, availability of spare parts and repair services, energy consumption, performance capacity, salvageability, and manufacturer's warranties.
8. Effect of the change on the construction schedule.
9. Accurate cost data for the proposed substitution in comparison with the product specified.
10. Equitable adjustment and credit which the Contractor proposes to offer DTPW.
11. When applicable or requested by DTPW, provide off-the-shelf samples of the specified item and the proposed substitution.

D. Certify the following when making a request for substitution:

1. The individual submitting the request has personally investigated the proposed item and determined it to be equivalent, or superior, to that indicated. Update the information as new or different data becomes known.
2. Furnish the same warranty for substitution as for the product specified.
3. Coordinate installation of the reviewed substitution into the work, and make those changes, subject to review by DTPW, required for the work to be complete in all respects.
4. Waive claims for additional costs related to substitution.
5. Provide complete cost data, including related costs, except the costs of the DTPW redesign or review of the Contractor's design.

E. Substitutions that are merely indicated or implied on shop drawings or product data submittals will not be considered unless a formal request for substitution has been submitted in conformance with this section.

F. Include the following information in documentation for construction methods:
   1. Detailed description of proposed methods.
   2. Working drawings illustrating the methods.
   3. Itemized comparison of proposed substitute methods with methods shown, and with product implied or specified. Include differences in estimated time for execution, labor, materials, and revisions to the construction process, and cost.

15.01 MEASUREMENT:

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

15.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 01 43 00

QUALITY ASSURANCE REQUIREMENTS

1.0: QUALITY ASSURANCE

The Contractor shall develop an effective Quality Assurance Plan **(QAP)** for the Traction Power Switchgear Replacement Project to assure adequate quality throughout all phases of the Contract Work and shall describe the methods used and means employed for the implementation of the plan. The Contractor's QAP shall, at minimum contain the fifteen (15) quality elements of the FTA Quality Management System (QMS) Guidelines (FTA-PA-27-5194-12.1) as revised. The QAP shall ensure compliance with the requirements of the contract documents within the Contractor's, subcontractor's and supplier's organizations.

The FTA QMS Guidelines web link is provided to the Contractor as a reference document to assist with the preparation and approval of the QAP which is located at the following link:

http://www.fl.dot.gov/FINAL_FTA_QMS_Guidelines_December_2012.pdf.

Refer to Chapter 2 on page 2-1 of the guidelines link for the details on the fifteen (15) quality elements that need to be included in the QAP as specified above. In addition to the link on the FTA QMS Guidelines, a QAP template shall be attached to the contract documents for further guidance in the development of the Contractors QAP.

2.0 : ORGANIZATION

2.1 Personnel performing Quality Assurance/Quality Control (QA/QC) functions shall have sufficient, well-defined responsibility, authority and the organizational freedom to identify and evaluate quality problems, and to initiate, recommend or provide solutions.

2.2 The Contractor's QAP shall be subject to MOT's verification at any time. Verification may include but not be limited to:

1. Surveillance of the operations.
2. Auditing of records and activities.
3. Inspection to measure quality of items and/or works to ensure compliance with requirements.
4. Review of Quality Records to ensure proper records keeping of activities affecting quality. These records shall be available for review by MDT at any time.

3.0: **APPLICABILITY**

The responsibility for providing QA/QC disciplines to verify that the work is performed in accordance with the Contract document rests with the Contractor. The Contractor's QAP shall be used to control quality throughout the duration of the project. Any inspections, audits or tests provided by MDT or designee shall not relieve the Contractor of the responsibility of providing work that strictly complies with the Contract requirements.

4.0 : REQUIREMENTS

The Contractor's QAP shall be in-line with the FTA QMS Guidelines (FTA-PA-27-5194-12.1) and shall also include:

4.1 An organizational chart indicating lines of authority and reporting relationship including QA/QC personnel.

4.2 Detailed Quality Procedures and Inspection Forms.

1. The QAP and associated quality procedures and inspection fonns should be submitted to MDT five (5) days after Notice to Proceed (NTP) for review and approval.

Note: All work undertaken by the Contractor before the approval of the Contractor's QAP by MDT QAD will be at the Contractor's risk and expense.

4.3 Records for all material tests, audits, and inspections performed, including data on conforming as well as nonconforming items shall be maintained by the Contractor at the job site current, up to date, and available for MDT inspection at any time throughout the contract work.

4.4 The Contractor's Daily Inspection Reports (DIR) is required by this Section and shall be available for review by MDT.

4.5 Test Records and Calibration Identification status of testing equipment required for the project shall be maintained by the Contractor and available for inspection by MDT at any time throughout the contract work.

S.O: NONCONFORMANCE AND REPAIR ACTION

5.1 The Contractor shall maintain an effective system for controlling nonconforming material, including procedures for its identification, segregation, and disposition.

5.2 All nonconforming material shall be positively identified to prevent unauthorized use, shipment, or intermingling with conforming material. Disposition for the use or repair of nonconforming material shall require the approval of MDT.

5.3 The Contractor shall be responsible for all costs associated with the removal of components and/or devices, the shipping charges to and from the Contractor's facilities and the costs associated with their reinstallation and/or repair.

END OF SECTION

PROJECT QUALITY ASSURANCE PLAN

PROJECT TITLE

PROJECT/CONTRACT NUMBER

COMPANY NAME

REVISION DATE

PROJECT QUALITY ASSURANCE PLAN

SIGNATURE SHEET

This Quality Assurance Plan dated *(input revision date identified on page* 1): _ _ _ _ _ _ _was prepared or revised in accordance with the project/contract requirements.

Prepared by (Quality Representative Signature): _ _ _ _ _ _ _ _ Date:___ _

Approved by (Project Manager Signature):_______________Date:___ _

PROJECT QUALITY ASSURANCE PLAN

REVISION LOG

Any changes to this document will be re-submitted for review and approval by Miami-Dade County (MDC).

REVISION DATE	AFFECTED PAGES	REASON FOR CHANGE
SAME DATE AS IDENTIFIED ON PAGE / :	*ALL PAGES*	*INITIAL ISSUE*

PROJECT QUALITY ASSURANCE PLAN

TABLE OF CONTENTS

PROJECT QUALITY ASSURANCE PLAN

1. MANAGEMENT RESPONSIBILITY

The successful implementation of this Quality Assurance Plan (QAP) for this project rests on the level of commitment by top management that ensures that the quality elements are understood, implemented, and maintained throughout all phases of the project.

Contractor input:

STATEMENT OF COMMITMENT to QUALITY:

(Input quality statement)

_____ (Approved by highest level of management) DATE:____ _

In this section, identify management's commitment to quality, and ensure that the commitment is understood, implemented, and maintained. Personnel assigned to this project shall be identified in an organizational chart format. Those personnel responsible for assuring quality must be independent of those having direct responsibility for the work being performed:

ORGANIZATIONAL CHART

(Insert the company's organizational chart)

PROJECT QUALITY ASSURANCE PLAN

Roles & Responsibilities: Include in this section assigned personnel duties and responsibilities within this project that are identified in the organizational chart.

Contractor input:

In this section, document the roles and responsibilities of key personnel (by functional position only) assigned to the project:

Example Positions:

Project Manager:

Quality Assurance Representative:

Inspection Personnel:

2. Documented Quality Management System (QMS)

The Quality Assurance Plan (QAP) applies to all quality activities performed under the contract. In order to ensure continued adherence to the standard practices, procedures and policies established for the project, periodic reviews, revisions, and redistribution of this QAP shall be performed.

Documentation records testifying to the satisfactory execution of the required activities for the project (i.e. construction, inspections, & testing) are readily available and delivered to authorized personnel as directed. An integral part of this project is the list of instructions, procedures, drawings, specifications, inspection test reports, and quality assurance reports to be prepared, submitted, or made available for review or approval, in accordance with contract requirements.

Contractor input:

In this section, document the method of insuring that all key documents are developed, reviewed, and updated. Also, any plan or procedure should include a statement of purpose, scope, and should contain any references to applicable codes, standards, or specifications to ensure compliance to contract requirements.

PROJECT QUALITY ASSURANCE PLAN

3. Design Control: (if applicable)

Note: If the design process does not apply, you may put "N/A" in this section.

The Contractor shall establish and maintain QA/QC procedures to control and verify the design in order to ensure that the design criteria, technical and relevant regulatory requirements are in compliance with Contract Documents and Ff A guidelines for this project. Design control includes ensuring that the design requirements are understood, planned, verified, executed and that changes are reviewed and approved throughout the design process and project completion as applicable. The Final Design establishes criteria for the inspection and testing on items that affect safety, reliability, service life, and ADA requirements.

Contractor input:

In this section, document the design process, including quality control reviews for assuring design Integrity is established throughout all phases of development, and what methods will be used to control the design within the key elements identified below:

Note: Key elements of the design process include, but not limited to:

- *Design Planning:*
- *Design Input:*
- *Design Output:*
- *Design Verification:*
- *Design Validation:*
- *Design Changes:*

4. Document Control

Procedures shall be established and maintained for the control of project documents and data. Quality procedures shall describe methods for review and approval of project documents by authorized personnel, distribution and storage of documents, correction and deletion of documents, and control of changes to these documents. These controls are required to be implemented in order to provide project participants and organizations with access to the latest version of each document.

Contractor Input:

In this section, identify which documents will be controlled and the process to ensure that they are maintained and current throughout the project:

Example of Documents:

- *Contractors Project Quality Assurance* ***Plan (QAP)***
- *Contractors inspection Procedures.*
- *Contract Documents.*
- *Drawings*

5. Purchasing (If applicable)

Note: If **the purchasing process does not apply, you may put *"NIA"*** in **this section**

Procedures shall be established and maintained to ensure that purchased services or products confonn to specified technical requirements. Purchasing requirements apply to all Contractors and Suppliers.

Receiving Inspection

The receiving inspection of all materials will be performed by the Contractor's QA/QC staff at their facility in accordance with approved Contractor's QAP. The Contractor's QAP shall provide methods to control and ensure that all materials received are properly inspected. Any nonconforming materials shall be identified.

Approved Supplier List

The Contractor shall develop and maintain an approved Supplier list available for review and approval.

Contractor input:

In this section, document the purchasing process and how all products are received, inspected and maintained:

6. Product Identification and Traceability (If applicable)

Note: If the product identification and traceability process does not apply, you may put **"N/A" in this** section.

The purpose of product identification and traceability is to ensure the control of materials, parts, components, equipment, and products, and the identification and traceability of these materials to prevent the use of incorrect or defective items. They also ensure that only correct and acceptable items are used or installed. These requirements apply to all materials, parts, components, equipment, and products, including partially fabricated or assembled components, produced for incorporation into the project.

Identification

All materials, supplies, and components that are intended for use in this Project shall be identified from the time of initial fabrication, or receipt, up to and including installation or end use. Items shall be identified by positive markings and/or certifications. They shall be segregated and/or stored with identification data to ensure control and proper identification as applicable.

Item identification methods include use of physical markings. If physical markings are either impractical or insufficient, other appropriate means of identification such as physical separation, container labels, barcodes or tags shall be employed.

Traceability

Item identification methods ensure that traceability is established and maintained in a manner that allows an item to be traced to applicable drawings, specifications, or other documents during all stages of production, delivery, and installation or end use.

Contractor input:

In this section, document how materials, components, equipment, and products will be identified:

7. Process Control

The Contractor shall identify and plan the installation and/or construction processes that directly affect quality and ensure these processes are performed under controlled conditions. Controlled conditions shall include the following:

- Qualifications requirements for personnel.
- Implementing documents defining the manner of design and/or construction process.
- Use of suitable products for design and/or construction equipment, and a suitable working environment.
- Compliance with reference standards/codes, quality plans, and/or documented procedures.
- Monitoring and control of suitable process parameters and product characteristics.

A major issue in process control is to ensure that work is performed in the proper sequence.

Contractor input:

In this section, document how the process will be controlled:

8. Inspection and Testing

Activities affecting quality shall be inspected and documented by experienced personnel who are independent of those performing the work. Inspections and tests shall be performed in accordance with approved documents to determine that contract activities meet the established requirements of the specifications.

Contractor input:

In this section, identify the types of inspections/testing to be performed and the procedures/forms to be used to perform tire Inspections and/or testing:

9 Inspection, Measuring, and Test Equipment

All equipment used in the inspection or testing process shall be identified, calibrated, and maintained under controlled conditions. Provisions shall be established for scheduled re-calibration. Such equipment shall meet the National Institute of Standards and Technology (NIST) standards of accuracy for the measurements and tests required.

Contractor input:

In this section, document which, inspection and test equipment will be identified, calibrated and maintained to ensure accuracy of the inspections and testing as required. Also, identify the calibration intervals or frequency for each, equipment that is subject to calibration:

IO Inspection and Test Status

A means should be provided for identifying the inspection and test status of the work during the installation process. The purpose of this is to ensure that only work that has passed the required inspections and tests is accepted.

The test and inspection status should be identified by means of markings, stamps, tags, labels, routing cards, inspection records, test software, physical location, or other suitable means.

Contractor input:

In this section, document the method to be used to identify the inspection and testing status on the work to be performed:

11 Nonconformance

Where practicable, nonconforming items should be segregated. When segregation is not possible, nonconforming items should be clearly identified as such. Those activities affected by the nonconforming work should be notified. Nonconforming work should be identified, documented, and evaluated to determine appropriate disposition.

Contractor input:

In this section, document the method to be used to identify, document, evaluate and address nonconforming products. It is highly recommended that a "log of nonconformances" is kept and that it includes the corrective actions to address the nonconformances:

12 Corrective Action

The corrective action plans should include the investigation of the root cause of any nonconforming work and the preventive action needed to prevent recurrence.

Contractor input:

In this section, document the method to be used to implement a corrective action plan to address all nonconformances. It's highly recommended that a log be kept to track all nonconformances and the proposed corrective action plans as necessary:

13 Quality Records

Procedures should be established and maintained for all quality records. These procedures should identify which records should be kept, responsibility for production and collection, and responsibility for indexing, filing, storage, maintenance, and disposition of all quality records.

Contractor input:

In this section, identify which quality records will be controlled and the process to ensure that they are maintained, stored and dispositions appropriately:

Example of Quality Records:

- *Inspection Reports*
- *Test Data*
- *Calibration Records*
- *Nonconformance Reports*
- *Corrective Action Reports*
- *Audit Reports*
- *Training Records*
- *Product Certification*

14 Quality Audits (if applicable)

Note: If **quality audits does not apply, you may put "N/A" in this section**

Quality audits are not the same as financial audits. A quality audit program should be established to ensure that the elements of the contractor's quality program are functioning as intended.

Quality audits should be performed by the Contractor's qualified quality personnel, and should be independent, scheduled, and performed to standards and/or checklists. A final report that identifies the audit results should be generated, distributed, and a log developed to track both the findings and corrective action plans.

Contractor input:

In this section, document the audit program that should include an audit scheduled, the activities to be audited and how the contractor will address the audit findings:

15 TRAINING

The contractor should establish and maintain procedures for identifying the training needs and provide for the training of all personnel performing the activities affecting quality.

Records of the training and evaluations should be maintained. A training matrix can be used as an effective tool for determining which personnel require what type of training.

Contractor input:

In this section, document the training program, personnel qualification and any certification needed as necessary:

APPENDICES

Contractor input

In This section, the Contractor may include any references, procedures, process, flow charts, forms and acronyms/definitions that apply to this project:

SECTION 01 45 00

CONTRACTOR CONSTRUCTION CONTROL REQUIREMENTS

1.01 DESCRIPTION:

A. This Section specifies the Contractor's requirements for defining and controlling in-process work. The Contractor is responsible for implementing and maintaining a program that will define how the work is to be performed and who is responsible to ensure work meets Contract Document requirements. This shall be detailed by Construction Work Plans (CWP) for each phase of the work to be performed.

B. Work may impose hold points in CWPs to verify compliance with Contract Documents during any phase of the work and the Contractor may not proceed with the work until a hold point has been released by DTPW.

C. The Contractor shall identify all safety-critical submittals associated with the Contract Specifications and Standard Specifications Section Article numbers referenced in the submittals.

2.01 GENERAL:

A. DTPW and EOR will have access to areas where work is performed under the Contract to conduct audits, surveillance, inspections, and tests to verify compliance with the Contract requirements. Access includes on-site and off-site work areas of the Contractor, sub-contractors, manufacturers, and suppliers.

3.01 SUBMITTALS:

A. The Contractor shall develop a list of Construction work Plans within forty-five (5) days after Notice to Proceed (NTP).

B. Test Plan within forty-five (5) days after NTP.

C. Test Reports shall be submitted within seven (7) days of receipt from laboratory

D. List of suppliers & fabricators shall be submitted within forty-five (5) days after NTP.

E. Responses to Nonconformance Reports

F. Names and qualifications of personnel performing special processes

4.01 CONSTRUCTION WORK PLANS:

A. Construction work Plans are detailed descriptions of a specific work activity. The EOR, in consultation with the Contractor, will determine which work activities require submission and approval of a CWP. The Contractor shall prepare and submit a list of CWPs to the EOR. The EOR may add CWPs to the list. Upon approval of the CWP list, the Contractor shall prepare and submit a CWP for each of these work activities. No work shall begin without work acceptance of a CWP. As a minimum, each CWP shall include:

1. Scope of work
2. List of persons responsible for supervision of the work
3. List of required submittals, drawings, and job hazard analysis
4. Planned start-work date, progress rate expected, and work hours
5. Sequence of events and construction methods for performing the work. Include work hold points and inspection requirements
6. Tests required by Contractor and/or work
7. Prerequisite activities and related construction safety issues
8. Off-site activities and locations
9. Procedures for controlling hazardous materials as applicable
10. Actions defined as “Special Events”, which may expose the general public to danger or inconvenience, and which may require a third party to be notified
11. Safety-critical installations, inspections, and tests

5.01 READINESS REVIEW:

A. Upon approval of a CWP and before beginning associated work activities, DTPW and the EOR will conduct a Readiness Review Meeting with Contractors, sub-contractors, and applicable third party representatives to discuss all elements contained in the CWP. The EOR will document the meeting with an agenda and minutes of the meeting including an attendance record.

6.01 TESTING:

A. Test Plan:

Submit a Test Plan defining the types and frequency of tests and which laboratory will perform each test.

B. Control of Inspection, Testing, and Monitoring Equipment:

C. Contractor and its Testing Laboratory shall calibrate and certify all testing equipment and monitoring devices. Calibration and certification requirements shall include the following:

1. Calibration to known national standards.

2. List the current status of calibration, and date re-calibration or certification is required.

3. List on a log that tracks all calibration and certifications. The tracking log shall identify the testing equipment or monitoring devices by name and serial number and shall show the date of calibration, date of next calibration, name of person or agency conducting the certification or calibration and shall contain a brief description of use. All testing equipment and monitoring devices shall be stored in a safe and secure location. They shall be maintained throughout the Contract and shall only be used for testing or monitoring work for which they are designed.

4. Re-issue is required if equipment is suspected of being out of calibration, broken, dismantled, or damaged.

5. Requirements apply to sub-contractors, Suppliers, and all others performing tests.

D. Test Reports: Test reports are considered Contract Record documents and shall be submitted to the Engineer. Test records shall contain as a minimum:

1. Contract or Project Identification Number
2. Identification of items tested
3. Quantity
4. Date Test was conducted
5. Name of Technician
6. Acceptance Criteria

7. Results
8. Location where sample was taken (i.e. Coordinates, stationing, and landmarks.)
9. Reference to Contract or Standard Specifications requirement or test procedure
10. Quantity of item tested Authorized signature.

E. Contractor performed tests are subject to verification by DTPW and EOR.

F. Testing conducted by DTPW or any other approved testing laboratory does not relieve the Contractor of the responsibility to meet the requirements of the Contract Documents.

7.01 INSPECTIONS:

A. The Engineer and his staff are responsible for performing Quality Control Inspection for work identified in the Contract Documents unless otherwise stated. Provide 48-hour notice to the Engineer for inspection coverage of work activities.

8.01 SUPER CONTROL:

A. Submit a list of all suppliers and fabricators that will be used to supply materials and items referenced in the Contract Documents. The list shall include:

1. Name of the supplier or fabricator
2. Address and telephone number of the supplier or fabricator
3. Description of material or fabricated item to be procured from the supplier or fabricator
4. Contract Specifications Section, Article number and/or drawing references of the material or item to be purchased

9.01 CONTROL OF MATERIALS:

A. Submit a CWP for Control of Materials. The CWP shall include provisions to ensure materials, equipment, parts, and components processed through the Contractor's receiving operations are identified, free from damage, traceable to acceptance criteria, and meet Contract requirements.

B. Handling, storage, and maintenance of materials/equipment shall be in accordance with manufacturer’s recommendations.

C. All materials, equipment, parts, and components are subject to receipt inspection by DTPW.

10.01 CONTROL OF SPECIAL PROCESSES:

A. Submit CWPs for Control of Special Processes (e.g., welding, soldering, and HDPE installation.)

B. Contractor or Sub-Contractor personnel performing special processes shall be qualified in accordance with applicable codes, standards, and manufacturers recommendations. Qualification records of personnel performing special processes shall be current and maintained in the worksite files.

C. Submit qualification records of personnel performing special processes to work before they start work on the project.

11.01 CONTROL OF NON-CONFORMING ITEMS:

A. The Contractor will document nonconforming items on a Non-Conformance Report (NCR). The Engineer may issue a Non-Conformance Report if the Contractor fails to issue the Non-Conformance Report in a timely manner.

B. The Contractor will be responsible for controlling Non-Conformance Reports through use of a sequential numbering system and updated by use of a Non-Conformance Log.

C. Upon receipt of a Non-Conformance Report, the Contractor shall be responsible for investigating and describing the root cause of the nonconformance and recommending a disposition by means of a Corrective Action Report (CAR). The Quality Assurance Requirements shall reflect this procedure. The following disposition codes shall be used for determining disposition:

1. “USE AS IS” - allows the use of an item that does not meet specified Contract requirements without the need for corrective action.

2. “REPAIR/REWORK” - item must be reworked or repaired to bring it into conformance with the requirements of the Contract.

3. “REJECT” - item is unsuitable for its intended use, is economically or physically incapable of being reworked or repaired, and must be replaced to bring it into conformance with the Contract Requirements.

4. Nonconforming items disposed as “USE AS IS” or “REPAIR/REWORK,” require review and approval of the Engineer.

12.01 DOCUMENT CONTROL:

A. Submit a CWP for Document Control detailing the control of receipt, status, maintenance, and transmittal of Project records and documents.

B. The Contractor shall establish a document control system to store and record the large quantity of correspondence, drawings, progress reports, technical reports, specifications, Contract Documents, Submittals, calculations, and administrative documents generated under the Contract. The Contractor shall establish correspondence routing, filing, control, and retrieval methods that are compatible with the system currently in use by DTPW or as approved otherwise by DTPW.

C. Technical document control, storage, and retrieval methods shall include the use of both hard copies and electronic records. Technical document control methods shall be capable of handling documents being developed (progress), finalized documents (for construction) and documents representing as-built conditions.

D. All correspondence of the Contractor to and from DTPW and its representatives (including the EOR) shall be serialized, and the Contractor shall maintain separate incoming and outgoing correspondence logs.

E. Within five (5) work days of issuance of the NTP, the Contractor and the EOR shall each designate, in writing, their respective authorized representatives to receive copies of all or specified correspondence. All correspondence shall include the Project Name, Contract Name, and Contract Number, along with the specific subject of the letter. All replies shall refer specifically to prior correspondence to which it relates.

F. Do not change or alter Contract records or documents without DTPW written approval.

G. Ensure current revisions of procedures, instructions, drawings, and other documents are provided at work locations.

H. Identify and maintain records and documents in an organized manner. Make records available to work upon request.

I. Protect records and documents from damage, deterioration, and loss. Keep records in fireproof cabinets at the Contractor's work site or maintain a duplicate set at another location.

13.01 RECORDS:

A. Records are defined as documentation required by the Contract. Record documents include, but are not limited to, correspondence, submittals, test reports, Contract and shop drawings, schedules, certificates of compliance, pay requests, change documents, requests for information, and schedules.

B. All records shall be maintained and retained in accordance with the Contractor's Document Control CWP.

C. All record documentation shall be made available and is subject to audit by DTPW or its designee.

14.01 AUDITS:

A. work may perform audits and surveillances on and off site during any phase of the work. Audits are multi-day functions, which include scheduled reviews of the Contractors work activities as required by the Contract, including formal notification, audit entrance/exit meetings, an audit plan, performance of the audit, and issuance of an audit report. Surveillance is unscheduled review of the Contractor's work activities and generally focuses on a specific activity. Surveillance does not include formal notification, entrance/exit meetings or written plan, but is documented in a surveillance report. The Contractor shall facilitate audits/surveillance by providing access to its facilities, personnel, and records.

15.01 MEASUREMENT:

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

15.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 01 56 00

TEMPORARY BARRIERS

1.01 DESCRIPTION:

A. This section specifies furnishing, installation maintenance, relocation and removal of temporary pedestrian barricades.

2.01 MATERIALS:

A. Temporary vehicular and pedestrian barricades will be installed, maintained and removed by the Contractor and all sub-contractors as necessary during the entire duration of the project construction. The type and location of the temporary barriers must be approved by DTPW and the EOR before installation.

B. Submit plan showing number and location of all vehicular and pedestrian barricades for review and approval by DTPW and the EOR.

3.01 MEASUREMENT:

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

4.01 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

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END OF SECTION

SECTION 01 60 00

PRODUCT MATERIAL AND EQUIPMENT REQUIREMENTS

1.01 DESCRIPTION:

A. This section includes specifications for general requirements for materials and equipment, including the packaging, handling, delivery, and storage thereof. Additional requirements are included in the general requirements and technical specifications.

2.01 QUALITY CONTROL:

A. Provide products, materials and equipment of the same generic kind from a single source. Where products or materials, by nature, are available only from sources that do not individually comprise sufficient quantity for the total project requirement, select products and materials from those individual sources that are most nearly equal and uniform in the indicated qualities.

3.01 PRODUCT SCHEDULE:

A. Prepare a schedule listing the principal products (by generic names) required for the work. For each product show the proprietary product names and manufacturer names proposed for incorporation in the work.

B. Submit the product listing schedule within five (5) calendar days of the NTP.

C. The list of products is not a substitute for required submittals, acceptance of products or a vehicle for submitting substitutions to products specified.

4.01 PROCEDURES FOR SELECTING PRODUCTS:

A. The specified requirements for individual products indicated in the Contract are multiple in nature and may include generic, descriptive, proprietary, performance, prescriptive, proscriptive, compliance with standards, compliance with codes, conformance with graphic details, and other similar forms of requirements.

1. Provide products conforming to all specified requirements unless otherwise directed. Other products will be considered only if requested as substitution.

2. Contractor's options: Where an option or choice is indicated, provide only one of the options. The choice of an option is the Contractor's. Where submittals are required, state which option has been chosen.

3. An option is not a consideration of whether a product or method shall be provided, but which of the several indicated products or methods shall be provided.

4. Non-compliance of a named product: If it is known that a named product or product source does not comply with requirements or is no longer available, advise the DTPW before proceeding.

5. Equivalent materials and equipment: Whenever a material or article is specified or described by using the name of a proprietary product or the name of a particular manufacturer or vendor, the specific item mentioned is understood as establishing type, function, dimension, appearance, and quality desired.

B. The Contractor's options for selecting products are limited by the specified requirements and governing regulations. Following are some of the various selection procedures for specified requirements:

1. Qualities or Performance Requirements:

   Provide products that comply with the specific qualities indicated, and which are recommended or certified in writing by manufacturer for the specific use indicated. General performance of a product is implied where product is specified for specific performances.

2. Prescriptive Requirements:

   Provide products produced in accordance with the prescriptive requirements, using the specified ingredients and components, and complying with the specified requirements for mixing, fabricating, curing, finishing, testing, and similar operations.

3. Standards, codes, and regulations:

   Provide product that complies with the specified standards, codes, and regulations and with the other requirements.

4. Or 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.

5. Product names:

Unless otherwise indicated, products identified by name mean a manufacturer's product as recorded in published literature, of latest issue preceding the date of Contract Documents. Submit request for substitution in order to use products of a later or earlier model.

6. Visual Selection:

Where product requirements include "... as selected from manufacturer's standard colors, patterns, textures..." or words of similar effect, the selection of manufacturing source and basic product, which complies with the requirements, is the Contractor's option, but the selection of color, pattern and texture is the Engineer of Record's responsibility.

C. Non-Conforming Products:

Use of a product not conforming to specified requirements may only be approved by means of a request for substitution as specified elsewhere.

D. Precedence of Specification by Qualities, Reference Standard, and Source:

If it occurs that a product cannot be supplied to meet all requirements, the following order of precedence will be followed:

1. Qualities:

For product specified by qualities or description, and also by reference standard or by source and name, the specified qualities or description shall take precedence.

2. Reference standards:

For product specified by reference to a published standard, and by source or name, the reference standard shall take precedence over the source.

5.01 PRODUCT REQUIREMENTS:

A. Where available, provide standard products of types that have been produced and used previously and successfully on other projects, and in similar applications.

6.01 NAME PLATES:

A. Except as otherwise indicated for required labels and operating data, attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of the products either in occupied spaces or on the exterior of the work.

B. Labels:

1. Locate required product labels and stamps on a concealed surface.

2. Attach labels where required for observation after installation, on inconspicuous accessible surfaces in occupied spaces.

C. Equipment Nameplates:

1. Provide a permanent nameplate on each item of service-connected or power-operated equipment. Indicate the manufacturer, product name, model number, serial number, capacity, speed, ratings, and similar essential operating data. Equipment nameplates shall be stainless steel.

2. Locate nameplate on an accessible surface, which, in occupied spaces, is not conspicuous.

7.01 MANUFACTURERS' INSTRUCTIONS:

A. When the Contract Documents require that installation of work comply with manufacturers' instructions, obtain and distribute copies of such instructions to parties involved in the installation and five (5) copies to the DTPW. Maintain one set at the site until installation is complete.

B. Handle, install, connect, clean, condition, and adjust products in strict compliance with the instructions and specified requirements. Should job conditions or specified requirements conflict with the manufacturers' instructions, notify the DTPW. Handle all equipment in strict accordance with the manufacturer’s written handling instructions.

C. Perform work in accordance with the manufacturer's instructions. Do not omit any steps unless specifically modified or exempted by the Contract Documents.

8.01 HANDLING OF MATERIALS:

A. Handle all materials and equipment to be incorporated in the work in a manner that will prevent misalignment of parts or the occurrence of damage of any kind.

B. Protect all materials and equipment at all times from all environmental conditions that might cause damage in a secure and dry storage facility.

C. Verify with the manufacturer all information regarding scheduling, delivery, and preparations necessary for installation.

D. Verify that equipment and installation supplied under other Contracts, but required for the work in this Contract, are compatible.

E. Contractor shall ensure that each item is marked in accordance with referenced codes and standards.

F. Ship each unit securely wrapped, crated or packaged, and labeled for safe handling in shipment and to avoid damage or distortion.

G. Supply all necessary supervision and coordination information to accommodate the installations of equipment.

H. Adhere to manufacturer's handling requirements when off-loading equipment and materials at the jobsite.

9.01 STORAGE OF MATERIALS AND EQUIPMENT:

A. All equipment and materials shall be stored in accordance with the manufacturer's recommendations, or as specified in the Contract Documents to preserve their quality and fitness for the work. Stored equipment and materials, although determined acceptable for the work upon delivery or during storage, must again be inspected by the Contractor before their incorporation into the work. Stored equipment and materials shall be located and arranged to facilitate inspection by DTPW.

B. Work-furnished materials or materials paid for before incorporation shall be stored in secure locations approved by DTPW in a manner that will preserve their full value. Such materials shall be prominently labeled as property of work and shall not be co-mingled with non-work materials. If necessary, storage shall be in controlled environment buildings.

10.01 MEASUREMENT:

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

10.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

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 NTP, submit five (5) copies of the list of selected products. Arrange the list in the order of each Section's appearance in the specification.

1. For products specified only by reference standards, any product satisfying those standards may be selected. Show name and address of manufacturer; trade name, model number or catalog designation of the product; manufacturer's reference standards and pertinent performance and test data.

2. For products specified by naming one product or by naming several products, this establishes a product standard. Any other product, which is equal in the opinion of DTPW and EOR may be furnished. A request must be submitted to the DTPW as required for substitutions, for acceptance of products not specifically named.

3. **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 DTPW and EOR for substitution of products and methods in place of those specified, but only if these requests are submitted within ten (10) days after effective date of NTP. No substitutions request will be considered after ten (10) days. Acceptance of substitute products and methods shall be only for the characteristics and use named in the acceptance, and shall be interpreted neither as a modification to the Specification and Drawing requirements nor to establish acceptance of products and methods for other portions of the Transit System. DTPW and the EOR shall judge the quality and suitability of the substitute product and method and his decision shall

be final. Where use of a substitute product and method involves redesign of other parts of the work, the cost and time required to affect that redesign will be considered in evaluating the suitability of the substitute product and method.

B. Submit five (5) copies of list of substitute products and methods, including the following information:

1. Complete data substantiating compliance of the proposed substitution with the requirements of the Specifications 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. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 01 71 13

MOBILIZATION

1.01 DESCRIPTION:

A. This section specifies the mobilization of the construction equipment at the worksites for material and supplies necessary for the prosecution of the work, but not to be incorporated in the work, for temporary storage of equipment and material at the site and for demobilization of the construction equipment. Mobilization should also include the costs of bonds and insurance required by the Contract Documents.

B. Construction equipment, material, supplies, and other items necessary for mobilization shall be available at the work site at the times they are to be built, used, installed or operated.

2.01 SUBMITTALS:

A. Submit within seven days after the effective date of NTP, a layout of the proposed construction plan site including fences, parking, and storage areas.

3.01 EQUIPMENT:

A. Construction equipment shall be of the capacity, type, quality, function and in the quantity necessary for the timely prosecution of the work.

4.01 MEASUREMENT:

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

5.01 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 01 73 29

CUTTING AND PATCHING

1.01 REQUIREMENTS INCLUDED:

A. Contractor is responsible for all cutting, fitting and patching, including attendant excavation and backfill required to complete the work to:

1. Make its several parts fit together properly.

2. Uncover portions for the work to provide for the installation of ill-timed work.

3. Remove and replace defective work.

4. Remove and replace work not conforming to requirements of Contract Documents.

5. Remove samples of installed work as specified for testing.

6. Remove routine penetrations of non-structural surfaces for installation of piping and electrical conduits.

2.01 SUBMITTALS:

A. Submit a written request to the DTPW and/or EOR well in advance of executing any cutting or alteration which affects:

1. Work of the DTPW or any separate Contractor.

2. Structural value or integrity of any element of the Project.

3. Integrity or effectiveness of weather-exposed or moisture resistant elements or systems.

4. Efficiency, operational life, maintenance or safety of operational elements.

5. Visual qualities of sight-exposed elements.

B. Include with each request:

1. Identification of the Project.

2. Description of affected work.

3. The necessity for cutting alteration or excavation.

4. Effect on work of DTPW or any separate Contractor, or on structural or weatherproof integrity of Project.

5. Description of proposed work:

    a. Scope of cutting, patching, alteration, or excavation.

    b. Trades who will execute the work.

    c. Products proposed to be used

    d. Extent of refinishing to be done.

6. Alternatives to cutting and patching.

7. Cost proposal, when applicable.

8. Written permission of any separate Contractor whose work will be affected.

C. Should conditions of work or the schedule indicate a change of products from original installation, submit request for substitution.

D. Submit written notice to DTPW and EOR designating the date the time the work will be uncovered.

3.01 INSPECTION:

A. Inspection existing conditions of Project, including elements subject to damage or movement during cutting or patching.

B. After uncovering work, inspect conditions affecting installation of Products, or performance of work.

C. Report unsatisfactory or questionable conditions to DTPW and EOR in writing; do not proceed with work until the Engineer has provided further instruction.

4.01 PREPARATION:

A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.

B. Provide devices and methods to protect other portions of Project from damage.

C. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching work, and maintain excavations far from water.

5.01 PERFORMANCE:

A. Executive cutting and demolition by methods which will prevent damage to other work, and which will provide proper surfaces to receive installation of repairs.

B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.

C. Employ original Installer or Fabricator to perform cutting and patching for:

1. Weather-exposed or moisture-resistant elements.
2. Sight-exposed finished surfaces.

D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.

E. Restore work which has been cut or removed, install new products to provide complete work in accord with requirements of Contract Documents.

F. Fit work airtight to pipes, sleeves, ducts, conduit and other penetration through surfaces.

G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:

1. For continuous surfaces, refinish to nearest intersection.
2. For an assembly, refinish entire unit.

6.01 MEASUREMENT:

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

6.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 01 74 00

CLEANING

1.01 DESCRIPTION:

A. This section specifies the maintenance of the work site in a clean, orderly hazard-free condition.

2.01 QUALITY ASSURANCE:

A. Conduct cleaning and disposal operations in accordance with local ordinances and anti-pollution laws. Rubbish, volatile wastes, and other construction wastes shall be neither burned nor buried on the work site, and shall not be disposed of into storm drains, sanitary drains, streams or other waterways.

B. Final cleaning shall be accomplished either men experienced in cleaning operations or by professional cleansers.

3.01 CLEANING MATERIALS:

A. Cleaning materials shall be as recommended by the manufacturer of the surface to be cleaned.

4.01 SAFETY REQUIREMENTS:

A. Maintain work site in accordance with local ordinances and anti-pollution laws applicable to work site cleanliness and in a neat, orderly and hazard-free condition until final acceptance of the work. Catwalks, accessible underground structures, work site sidewalks and walkways adjacent to the work site shall be kept free from hazards caused by construction activities.

B. No volatile substances are to be used on the job site.

C. Prevent accumulation of waste, which creates hazardous conditions.

D. Artificially ventilate spaces, which are not naturally ventilated when noxious substances are being used in those spaces.

5.01 INTERIM CLEANING:

A. Perform cleaning every workday for duration of the work. Structures, ground, and areas of the work site and public and private properties shall be maintained free from accumulations of waste materials and rubbish caused by construction

operations on the work site. Waste material will be removed from the work site daily.

B. Remove or secure loose material on open decks and on other exposed surfaces at end of each day's work or more often to maintain work site in hazard-free condition. Prevent dislodgment of materials due to wind and other forces.

C. Empty on-site waste containers whenever necessary so that trash overflow does not occur. Legally dispose of contents at either public or private dumping areas.

D. Control the handling of materials, debris and rubbish; do not drop or throw from heights.

E. Immediately remove spillages of construction-related materials from hauling routes.

F. Perform cleaning operations dust and other contaminants resulting from cleaning processes will not fall on structures or pedestrian traffic below.

6.01 FINAL CLEANING:

A. In preparation for substantial completion, conduct final inspection of exposed interior and exterior surfaces and of concealed spaces.

B. Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials from finished surfaces.

C. Maintain cleaning operations until project has been finally accepted.

D. All skylights shall be professionally cleaned on both interior and exterior.

7.01 DAMAGE TO EXISTING FINISHES:

A. Repair any concrete damaged.

B. Repaint to match existing areas of damaged paint due to Contractors operation.

8.01 MEASUREMENT:

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

8.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 01 78 00

CONTRACT CLOSE-OUT

1.01 SUBSTANTIAL COMPLETION:

A. Substantial Completion shall be determined in accordance with the Contract documents and this Section. Should a conflict arise between the General Conditions and this Section, the General Conditions shall take precedence.

2.01 FINAL CONSTRUCTION REVIEW:

A. When Contractor considers work is complete, he shall submit a written certification that work is acceptable and that:

1. Contract Documents have been reviewed.
2. Work has been reviewed for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents.
4. Equipment and systems have been tested in the presence of the EOR and are safe for operation.
5. Work is completed and ready for final construction review.

B. DTPW and the EOR will make a construction review to verify status of completion with reasonable promptness after receipt of such certification.

C. If, during construction operations or during inspections for substantial or final completion, DTPW and/or EOR should fail to reject defective work or materials, whether from lack of discovery of such defect or for any other reason, such initial failure to reject shall in no way prevent his later rejection when such defect is discovered, or obligate work to final acceptance, and the Contractor shall make no claim for losses suffered due to any necessary removals or repairs of such defects.

3.01 CONTRACTOR'S CLOSE-OUT SUBMITTALS:

A. Upon receipt of notice of acceptability from DTPW and EOR, the Contractor shall furnish evidence of compliance with requirements of governing authorities and Contract Documents to work, as follows:

1. As-built drawings and other project record documents.
2. Operating and maintenance data, instructions to work personnel.
3. Warranties and Bonds

4. Spare parts and maintenance materials (if applicable).
5. Evidence of payment to all sub-contractors, material men and equipment suppliers (i.e. releases of liens).
6. The Contractor shall pack, label, ship and store spare parts, equipment components, special tools and test equipment to the work Maintenance Facilities as designated by the DTPW representative.

4.01 MEASUREMENT:

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

5.01 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 01 78 36

WARRANTIES

PART 1: WARRANTY

1.01 DESCRIPTION OF WORK:

A. The warranties provided by the Contractor shall be for the longest period, starting on the date of final acceptance, of those specified as follows:

1. One (1) year from final acceptance on all the work as specified in the Contract.
2. Warranty period(s) as specified by the approved material or equipment manufacturers.
3. Longer warranty period(s) as specified in the technical specifications.

B. The Contractor shall provide certifications and other commitments, extended warranties and agreements for continuing services as specified elsewhere in the Contract Documents.

1.02 DISCLAIMERS AND LIMITATIONS:

A. Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers, and sub-contractors required to countersign special warranties with the Contractor.

1.03 DEFINITIONS:

A. Standard product warranties are reprinted written warranties published by the individual manufacturers for particular products and are specially endorsed by the manufacturer to Department of Transportation and Public Works (work).

1.04 WARRANTY REQUIREMENTS:

A. Related Damages and Losses:

When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.

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 Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the DTPW has benefited from use of the work through a portion of its anticipated useful service life.

D. DTPW Recourse:

Written warranties made to the owner 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 the work can enforce such other duties, obligations, rights or remedies.

E. Contractor shall provide a written guarantee, to the work, that proprietary parts and oil absorption material or their generic equal will be made available to the work at least for 10 years from the date of the system start-up.

F. Rejection of Warranties:

Work reserves the right to reject warranties and to limit selections to products with acceptable warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

G. The DTPW reserves the right to refuse to accept work for the project 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 are willing to do so.

H. All warranties including standard three (3) year warranty shall start at date of substantial completion of the Contract, or when work of an area is substantially completed, accepted, and taken over for use by DTPW. Ensure that all warranties comply with this stipulation prior to submission of same.

I. The DTPW will give prompt notice in writing to the Contractor of any defects noted during the warranty periods requesting him to promptly remedy such defects.

J. Prior to final acceptance, the Contractor shall formally assign to DTPW all extended warranties given by sub-contractors for their work on the project, and such sub-contractor shall be formally advised of the assignment.

K. Asset life expectancy: Contractor to provide the necessary documents securing the life expectancy at no less than 25 years

L. Asset maintenance: As per grant agreements asset are to be maintained by the municipality

1.05 SUBMITTALS:

A. Submit written warranties to DTPW prior to the date of the final acceptance inspection.

B. When a special warranty is required to be executed by the Contractor, or the Contractor and a sub-contractor, supplier, or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the DTPW for approval prior to final execution.

C. Submit a list of all warranty items within ten (10) days after notice to proceed.

D. Prior to final acceptance compile two (2) copies of each required warranty, and bond properly executed by the Contractor, or by sub-contractor, supplier or manufacturer.

E. Bind warranties and bonds in heavy duty, commercial quality, durable 3-ring vinyl covered loose leaf binders, thickness as necessary to accommodate contents, and sized to receive 8 1/2 inch by 11-inch paper.

F. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.

G. Identify each binder on the front and the spine with the typed or printed title, "WARRANTIES AND BONDS", the project title or name, and the name of the Contractor.

H. 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.

1.06 MEASUREMENT:

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

1.07 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

PART 2: ADDITIONAL THREE-YEAR WARRANTY (EXTENTED WARRANTY) OPTION

2.01 GENERAL:

This contract contains a Three-Year Warranty Option. If it is determined that there are sufficient funds to support the bid options, MDC will exercise its option and award the contract to the lowest responsive and responsible bidder.

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

1.01 DESCRIPTION:

A. This Section specifies the maintaining, marking, recording and submitting of project record documents.

DEFINITIONS:

1. Conformed Contract Documents:

   The conformed documents provided to the Contractor at the time the construction Contract was executed, prior to the start of construction.

2. Contractor Document Transmittal (CDT):

   Drawings, catalog cuts, samples or other documents submitted by the Contractor for County and consultant review and approval showing in detail how the Contractor proposes to carry out the work.

3. As-Builts:

   During construction, two set of conformed drawings and specifications, kept current by marking in red all "as-built" construction conditions and changes arising out of RFIs, clarifications, directed field changes and sketches. At the conclusion of construction activities, the information contained in these blue lines and specifications shall be incorporated into the Compact Disk (CD) containing the latest conformed drawings including revisions made by the EOR during construction. Prior to Contract completion, work will provide the Contractor with a CD containing the latest conformed drawings. (Changes to specifications are typically only effected through change orders. However, in some occasions clarifications may require a modification to the specifications). The revised CADD drawings which include the information incorporated from the drawings and specifications become As-Builts.

2.01 SUBMITTALS

A. Upon completion of the work, the Contractor shall submit the As-Builts to the EOR in time to be used for the final inspection and acceptance and for verification by DTPW and EOR. Availability of As-Builts shall be prerequisite to scheduling a final inspection of this Contract. Non-availability of As-Builts or inaccuracies therein may be grounds for cancellation and postponement of any scheduled final inspection by the either DTPW or EOR until such time as the discrepancy has been corrected. Upon completion of the work, the As-Builts shall become the property of work. The Contractor will transmit the As-Builts to DTPW with an attached Project Records "As-Built Drawings Index Form" uniquely identifying and describing each document.

B. Specifically, the following documents shall be submitted by the Contractor after construction is completed, but prior to submitting the request for final inspection:

1. The Contractor shall submit two (2) CDs labeled “As-Builts”, one in PDF format and the other in CAD format. The Contractor shall date and mark each drawing as “As-Built” using the revision block, and each drawing should be electronically signed by the Contractor certifying the accuracy and validity of the information contained therein. The Contractor shall also submit two (2) printouts from the CD containing the As-Builts reflecting all change notices, change orders, requests for information and field changes in red. The information regarding field conditions and changes is to be maintained in a set of record drawings and specifications during construction. Prior to Contract completion, DTPW will provide the Contractor with a CD containing the latest conformed drawings, including revisions made by the EOR. At the end of construction the “as-built” conditions are incorporated into the latest conformed drawings provided by DTPW. These final CADD drawings become As-Builts.

2. The Contractor’s engineer shall sign each record drawing, certifying the accuracy and validity of the as-built information contained therein.

3.01 QUALITY ASSURANCE:

A. Project record documents shall conform to a high standard of quality, similar to that set forth in the National CADD Standard ANSI and ISO, or other relevant lower tier specification defining drafting quality and electronic file formatting.

4.01 ACCESS TO AND RETENTION OF DOCUMENTS:

A. The Contractor shall provide DTPW and any of its authorized representatives, subject to entering into non-disclosure agreements, access to any work, books, documents, papers and records of the Contractor which pertain or relate to this Agreement or the work for the purposes of making audits, examinations, excerpts and/or transcriptions during the performance of the work and for a period of four (4) years after the date of the issuance of the acceptance crtificate, except in the event of litigation or settlement of claims regarding or arising from the performance of this contract or the work, in which case the Contractor shall maintain all such documents until all such litigation or settlement of claims have been fully completed and all appeals or exceptions exhausted.

5.01 MAINTENANCE OF DOCUMENTS:

A. The Contractor shall maintain at field office, one copy of each of the following:

1. Contract Documents
2. Conformed Contract Drawings and Conformed Specifications

3. Construction Safety Manual
4. Change Orders, Change Notices and other modifications to the Contract
5. Engineer Field Order or written instruction
6. Approved shop drawings, product data and samples
7. Field test reports/records
8. Updated record drawings marked in red to show field changes
9. Request for Information (RFI)
10. All directed Field Changes and sketches

B. Equal Employment and Affirmative Action Records.

6.01 RECORDING "AS-BUILT" DRAWINGS:

A. A flowchart explaining this process is included with this section.

1. Record information concurrently with construction progress on a conformed set of blue lines and specifications. During construction, this set of blue lines and specifications are known as "As-Built" drawings.

2. Do not conceal any work until the required information is recorded.

3. Drawings should be legibly mark in red to record actual construction depicting the as-constructed configurations resulting from field and/or design changes:

   a. Horizontal and vertical location of underground utilities and appurtenances, referenced by dimensions to permanent, visible and accessible features of the structure.

   b. Location of internal utilities, electrical conduits and appurtenances, referenced by dimensions to permanent, visible and accessible features of the structure.

   c. Field changes of dimension and detail.

   d. Details not on original conformed Contract Drawings.

   e. Changes made by Change Notice or by Change Order.

4. Legibly mark up each section of specifications to record:

   a. Manufacturer, trade name, catalogue number, and supplier of each product and item of equipment actually installed.

   b. Changes made by Change Notice or by Change Order.

5. Any changes due to RFI's, clarifications and field sketches shall be incorporated into the record drawings by affixing sketches and other 8 1/2" x 11" sheets to the record drawings.

This information will be incorporated into the CD containing the latest conformed drawings once construction is complete.

1. Do not use the record drawing set for construction progress purposes.

7.01 DOCUMENT MAINTENANCE:

A. Provide files and racks for storage of documents to maintain in clean, dry and legible condition.

B. Do not use record documents for construction purposes.

C. Make documents available for inspection by DTPW, EOR, Federal Government and State Government representatives.

8.01 MEASUREMENT:

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

9.01 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

VOLUME I

ELECTRICAL

DIVISION 26

SECTION 26 01 02

CABLE DISTRIBUTION SYSTEM

PART 1: GENERAL

1.01 DESCRIPTION:

The work specified in this section consists of design, furnishing, and installation of a cable distribution system as required.

1.02 DEFINITION

The cable distribution system shall provide for the logical interconnection and intra-connection of system components and facilitate the shared use of metallic cable plant.

1.03 DESCRIPTION OF COMPONENTS

A. Main Distribution Frame (MDF): Shall provide a common access and cross-connect point for twisted pair system interfaces. The MDF shall consist of a series of co- located, contiguous terminal blocks mounted on frames in a single area.
B. Cables: Connecting cables from various systems.
C. Cross-Connections: Jumpers (cross-connections) shall be installed between various blocks on the MDF and distributed terminal blocks as part of the installation procedure associated with each system.

PART 2: SUBMITTALS (CORL)

Refer to SECTION 01 33 00, Submittals for submittal procedures.

A. Preliminary Design:
   1. Block diagrams: Showing terminal blocks, frames, manufacturer's model numbers, and location of equipment.
   2. Certification: Manufacturer's certification that all cable and equipment meet specified requirements.
   3. Product data: Manufacturer's catalog cuts, material specifications, installation instructions, and other pertinent data for all furnished products.

B. Final Design Submittal:
   I. Elevation drawings of MDFs detailing cabling routing, bay number, terminal block number, and application.
   2. OEM practice publications for all apparatus supplied.
   3. Documentation detailing screens and operator interface to database software user application and system manager application programs.

C. Pre-Acceptance Requirements:
   1. Operations and maintenance manual that includes as-built drawings and written documentation of articles 1.4 A and B, accurately depicting the cable distribution system's in-service condition.
   2. In-service database software, complete with all connections of the cable distribution systems and the operations manuals.

D. Test Procedures and Reports: Submitted as required by contract.

PART 3: **PRODUCTS**

3.01 MDF -TRAIN CONTROL AND EQUIPMENT ROOMS

A. Main Distribution Frame (MDF):

   1. Construction: Double-sided (vertical and horizontal sides), floor mounted, equipped with end and guard rails, grounding buses and all mounting hardware.
   2. Verticals: Shall be assigned as follows as required:
      1. Vertical #1: Used for outside plant cable termination on protectors.
      2. Vertical #2: Used for termination of internal house distribution and tie-cables.
      3. Vertical #3: Reserved for analog terminations of fiber optic digital channel banks only. Provide additional verticals as required per Contractor's design.
      4. Horizontal shelves: Shelves B through E, inclusive; used only for PABX terminations.
   3. Height: 2.75 meters
   4. Level "A" vertical and horizontal block positions shall not be used.

B. Connectorized Terminal Blocks: Blocks connectorized on the equipment side may be used. The cross connect side shall be wire-wrap. All blocks shall be 8 26 terminals on the cross-connect side, unless otherwise approved. All unused block locations shall be equipped with an equal number of one-side connectorized and wire-wrap on both sides. All blocks, except protector connectors, shall be mounted on swivels.

C. MDF Identification: MDF verticals shall be numbered from left to right and lettered "A" through "L" from bottom to top; the letter "I" shall not be used. MDF horizontal shelves shall be lettered "A" through "L" from bottom to top; the letter "I" shall not be used. Horizontal side columns shall be numbered from right to left to coincide with the vertical side of the frame.

3.02 **TERMINAL BLOCKS:** All blocks shall be connectorized on the house/tie cable side and punch-down for solid and stranded wire on the drop side.

3.03 DATABASE SOFTWARE (APPLIES TO BOTH OPTICAL AND NON-OPTICAL CABLES)

A. Database and supporting database applications software shall:
1. Document all cable distribution systems' metallic and non-metallic cable plant.

2. Facilitate the sorting, tracing, printing, and manipulation of records for engineering and maintenance use.

B. Database: Database shall consist of a collection of records.
Record: Document each connection to terminal block documented with one record.

1 Fields: Field information shall agree with other documentation submitted under this contract.

2 Station: This two-character alpha field shall designate the particular station where the terminal block is located.

3 Room: This three-digit numeric field shall designate the room where the terminal block is located.

4 Terminal Block Bay: This two-digit numeric field shall specify the bay in which the terminal block is located. A blank entry shall indicate "not applicable."

5 Terminal Block Rack: This two-digit numeric field shall specify the rack in which the terminal block is located. A blank entry shall indicate "not applicable."

6 Terminal Block Number: This two-digit numeric field shall specify the vertical position of a MDF terminal block in the rack. For non-MDF terminal blocks, a number shall be assigned to identify a specific terminal block.

7 Pin Number(s): This six-digit numeric field shall designate the pin numbers on the terminal block of particular connections. This field shall be used to specify a maximum of two terminal block connections, using three digits per conductor. Entries with "O" in the second field indicate a one-conductor circuit.

8 Description: This 16-character alphanumeric field shall define the service and equipment functions of the connections.

9 Cable Number: A unique three-digit numeric field shall be assigned to each cable within a station.

10 Wire Numbers: This six-digit field shall designate the specific cable wires with the connections on the terminal block. This field shall be used to specify a maximum of two conductors using three digits per conductor.

11 Entries showing a "O" in the second field shall indicate a one conductor circuit.

12 Cable Binder: This two-character alpha field shall designate the cable binder. A null entry in this field means "not applicable." A null entry shall be permitted for connectorized cables.

13 Cable Color Code: This eight-character alpha field shall designate the color code of the wires in the binder group. A null entry in this field shall designate "not applicable." A null entry shall be permitted for connectorized cables.

14 Circuit Number: A six-digit number shall be assigned to each complete circuit within a given station. This number shall be used consistently in each record used to document the complete circuit.

C. Applications Programs: Provide two applications programs that operate on an MS Windows -compatible machine.
   1. User Application Program:
      I. Preclude the ability to create or modify database records.
      II. Provide the capability of displaying and printing reports. Reports shall consist of all records sorted by specific station, room, terminal block number, description, cable, wire number, and circuit number fields.
   2. System Manager Application Program:
      I. Provide for the entry of new records or the modification of existing records.
      II. Include a facility to provide a time-stamped backup of the database.

D. Operations Manuals:
   I. User Operations Manual: Describes the application of user software; it shall provide detailed step-by-step examples of typical software use.
   2. System Manager's Manual: Describes the use and application of the system manager's software, and provides examples of the features and functionality of the software.

PART 4: EXECUTION

4.01 MDF INSTALLATION -TRAIN CONTROL EQUIPMENT ROOM

A Install the equipment room frame in the space designated by design drawings. Frame and all shields shall be grounded.
B Install connectorized and non-connectorized blocks.
C Connect connectorized and non-connectorized cables to terminal blocks and install jumpers as individual systems are installed. Tie all shields together on MDF and ground.
D Prepare database records for the equipment room MDFs.

5.01 MEASUREMENT:

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

5.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 01 20

CONFIGURATION MANAGEMENT

PART l: GENERAL

1.01 DESCRIPTION:

This section specifies requirements for the Contractor's configuration management program, which includes planning, identification, definition, implementation, control, and accountability for the proposed systems.

1.02 CONFIGURATION MANAGEMENT PROGRAM

A. Maintain and make available to DTPW accurate and current configuration records throughout the period of performance of the contract, and for a three-year period after final contract payment.

B. Do not procure nor produce any hardware or software until such items have been approved by DTPW.

C. All items, beginning with the lowest level of repair or replacement, that are identified by the same part number shall have the same physical and functional characteristics, be equivalent in performance and durability, and be interchangeable without alteration to themselves or associated items, other than normal field adjustments. An item shall not be considered interchangeable if it requires modification for fit or performance. Old and new configuration items that require segregation shall be identified either by a new drawing number or with a dash number added to the original drawing.

D. Hardware Identification: Mark all hardware components to the lowest level of repair and replacement, with part number identification. The hardware identification marking shall coincide with officially released engineering data. Nameplates on major equipment items shall provide space for DTPW numbers to be added by the Contractor at the direction of DTPW. Serialization is required on each item of equipment delivered unless otherwise directed by DTPW. Assign an individual serial number in a numerical sequence established for the type or model series equipment being supplied. Do not use duplicate serial numbers within a type or model series.

E. Change Control: These specifications identify the procurement baseline for this proposed system. Changes to the procurement baseline-including any new work item or equipment desired by DTPW during DTPW input process, after the contract award-shall be controlled by the processing of Engineering Change Proposals (ECPs) in accordance with the procedures described herein. All ECPs shall be reviewed by the Contractor's organization responsible for configuration control for total impact evaluation prior to recommendation and submittal to DTPW for review and approval.

F. Classification of Changes

1. A proposed engineering change to any part, assembly, or equipment item for the supplier's product shall be designated as a Class I change when one or more of the following is affected:
   I. Form, fit, and functional interchangeability
   II. Reliability and maintainability
   III. Weight or balance (where it is a factor)
   IV. DTPW furnished equipment
   V. Safety
   VI. Electromagnetic interference characteristics
   VII. Delivered product (retrofit)
   VIII. Delivered training, operation, or maintenance manuals (where additional contract funds are required to revise manuals)
   IX. Sources of repairable items (source control drawings)
   X. Schedules or deliverables
   Xl. Initial provisioning
   XII. Performance of equipment
   XIII. Training
2. A proposed change to system software shall be designated as a Class I change when one or more of the following factors are affected:
   1. Function, performance (including reliability), maintainability, correctness, efficiency, flexibility, testability, usability, and outside tolerance
   2. Interface characteristics
   3. Cost
   4. Schedules
   5. DTPW furnished equipment
   6. Safety
   7. Skill levels, training or engineering design

3. Any engineering change not affecting form, fit, function, or interchangeability, nor falling within the preceding definition of a Class I change, shall be designated as a Class II change. Some examples of Class II changes are corrections and clarifications of documents and drawings, substituting alternative materials or hardware, and those changes that do not affect the preceding listed Class I factors.

G. Accountability: Maintain records such that the configuration of any item being delivered shall be definable in terms of its component part numbers. Account for differences between the as-built configuration and engineering released

documentation. Record status of change approvals and incorporation at each point in product development, test, production, or operational usage. Maintain a serialization and configuration record. Maintain the status of interface specifications, control documents, and plans. Maintain status of software once a baseline has been defined.

H. Engineering Change Proposal (ECP)

I . Process each Class I change as an ECP and submit to DTPW for approval prior to initiating any implementation action. Any action or cost necessary to correct problems in the product or documentation arising from Contractor's misclassification shall be borne by the Contractor. Contractor shall also classify and control changes originating from subcontractors. Submit six copies of the ECP to DTPW, accompanied by technical documentation and the cost information necessary to fully evaluate the change.

2. **Report** all Class I changes that affect safety immediately. Identify the change by ECP number if reported verbally, and confirm the change in writing to DTPW within 24 hours. Class II ECPs shall be submitted to DTPW for information.

I. Design/Submittal Reviews and Audits

I . Design reviews and audits shall be conducted jointly by DTPW and the Contractor. In all cases, approval by DTPW shall not constitute relief from contractual obligations. Submit all documentation, plans, and design data for the reviews and audits at least 5 working days prior to the date of the review. The individual subsystems' software design, programs, and hardware will not necessarily progress at the same rate. The likelihood of multiple PDRs and FDRs must be considered in planning for reviews and audit. Software reviews as applicable and audit shall be in accordance with ANSI/IEEE Standard 730 (latest revision).

2. Preliminary Submittal Review (PSR): Evaluate the design progress and technical adequacy of the selected design and hardware approach, and determine their compatibility with the performance requirements and interfaces of the contract and the schedule to complete all tasks. The review shall be held on a mutually agreeable date consistent with the Contractor's design schedule at DTPW's facility.

3. Final Submittal Review (FSR): Conduct the review(s) when detail design of an item is essentially complete, and the production drawings are ready for release. Determine that detail design of the system element under review will satisfy the design requirements established in the contract specifications, and establish the exact interface relationships between the item and other items of equipment and facilities. The reviews shall be held on mutually agreeable dates consistent with the Contractor's design schedule at DTPW's facility unless another location is approved by.

4. First Article Inspection (FAI)

I. Evaluate the assembled, in-place system by formal examination against the production drawings, specifications, and factory testing. Verify the system

meets all requirements, and that documentation is internally consistent. This will occur at the Contractor's facility prior to installation at DTPW facilities.

II. Prior to FAI, provide DTPW with factory test procedures and a list of all drawings to the lowest levels of repair and replacement, identified by revision or issue. The list shall be as complete as necessary to identify the baseline. Upon satisfactory completion of the audit, the data package shall be corrected within two weeks to incorporate any changes found during the audit.

III. Schedule FAIs for all subsystems as applicable prior to first shipment from the subsystem supplier's plant.

PART2: SUBMITTALS

Unless otherwise specified, all submittals shall be in accordance with APPENDIX B, SECTION 01 33 00 and article 2.3 herein:

A. Configuration Management Plan (CDRL)

B. Complete set of final (as-built) drawings, as specified in other sections specifying the various equipment, with all changes incorporated thereon (CDRL)

C. FAI audit results (CDRL)

0. Design review and audit documentation (CDRL)

E. Contract data requirements list (CDRL)

F. Shipping Plan (CDRL)

G. Staging Plan (CDRL)

2.01 CONFIGURATION MANAGEMENT PLAN (CDRL)

Prepare and submit to OTPW a Configuration Management Plan that covers hardware and software. Contractor's standard plan may be submitted for approval if it meets the stated criteria.

2.02 DRAWINGS AND DESIGN EVALUATION DATA

A. Subsystem Plans: Plans including all subsystems such as PLC, WAN/LAN, etc., are required in order to track drawings and design evaluation data for the entire system within the contract limits.

1. Subsystem plans: All subsystems plans shall include all subsystem components details. All equipment shall be shown using standard OTPW symbols and nomenclatures.

2. System cable plans: Showing all cable routings (local, power, express, and fiber) between communications locations, including subsystems covered under this contract. All cables shall be identified with numbers of conductors and size and nomenclature of the equipment to which the cable is connected.

B. The above plans shall be used to replace the current plans due to changes under this contract. Existing plans (if any) shall be available upon request from OTPW for Contractor's reference. Submit five half-size prints and two half-size reproducible of each plan at least 5 working days prior to the scheduled start of the review.

C. To support the design reviews for the project, provide five half-size prints and two half-size reproducible drawings of sufficient quality to make legible prints of those engineering drawings and documents that provide all essential data necessary to permit a meaningful evaluation and feasibility study of the proposed design. All engineering drawings and documents required to support design reviews shall be delivered to DTPW at least l *S* working days prior to the scheduled start of the review. All drawings shall be dimensioned in English units.

D. In addition to the other drawing requirements of these specifications, five full-size prints and two full-size reproducible drawings of sufficient quality to make legible prints of the following shall be submitted:

1. Installation drawings for all equipment provided under this contract.
2. Single line, control schematic, functional block diagrams, and wiring diagrams.
3. System block drawings for all equipment components showing the following:
   I. Overall dimensions, orientation, points of normal support, and method of mounting and removal
   II. Location of access doors and covers showing the relation to equipment inside the enclosure
   III. Required draw out space and space for opening of access doors

E. Manufacturing Drawings:

l . Throughout the design and manufacturing process, submit a continually updated list of manufacturing interconnect and assembly drawings and engineering change orders. Detail drawings shall be submitted at DTPW's request. Five full-size prints and two full-size reproducible versions of sufficient quality to make legible prints of manufacturing drawings shall be submitted to DTPW within *5* calendar days of their release or revision.

2. Prior to completion of the contract, Contractor shall submit to DTPW a complete set of the final (as-built) manufacturing drawings with all changes incorporated thereon. Two reproducible versions and eight copies of the above drawings shall be submitted.

F. Drawing Quality and Updating: Drawings shall be of a quality where every line, number, letter, and symbol is clearly legible. Reproducible drawings shall be capable of reproducing drawings to this level of quality. Contractor shall update each drawing, incorporating all outstanding approved changes, at least once every 30 days. In no event shall more than five approved changes be accumulated against a drawing without incorporation, irrespective of its scheduled update. Changes to drawings shall be incorporated sequentially. Copies of all updated drawings that were submitted to DTPW in earlier revision shall be resubmitted in the original quantity and format.

G. Calculations: Furnish calculations and other required data on standard 8.5 by I I-inch sheets, printed on one side only. Each sheet shall bear the following:
Contract name and number; title and number of pages; and data and revision status.

H. Drawing Approvals: If approved by DTPW, a reproducible copy of each drawing will be identified as having received such approval by being so stamped and dated. Drawings stamped "not approved" or "approved subject to . . . ," and with required corrections shown, will be returned to Contractor for correction and re-submittal. Re-submittals shall be handled in thesame manner as first submittals.

I. Electronic Drawing Files: Prior to completion of the contract, the Contractor shall submit electronic files for all the subsystem plans, installation drawings, manufacturing/shop drawings, and as-built drawings. All drawings shall conform to DTPW's drawings and CADD standards.

2.03 SHIPPING PLAN

Prepare and submit a Shipping Plan at least 3 days prior to the first shipment of equipment. The Shipping Plan shall include details on how Contractor plans to ship equipment from the factories to the site for installation.

2.04 STAGING PLAN

Prepare and submit a Staging Plan at least 3 days prior to the first shipment of equipment. The Staging Plan shall include details on how Contractor plans to ship equipment from the factories to the site forinstallation.

2.05 PROGRAM PLANS

Implement and maintain the plans during all phases of the contract.

2.06 CONTRACT DATA REQUIREMENTS LIST

Implement and maintain the list to plan, schedule and track status of all submittals required by the Contract.

2.07 REVIEW AND AUDITS

Conduct reviews and audits in accordance with specified requirements and procedures.

3.01 MEASUREMENT:

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

3.02 PAYMENT:

B. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 01 21

SYSTEM INTEGRATION

PART l: GENERAL

1.01 DESCRIPTION:

This section describes system integration services and work requirements necessary to successfully integrate all systems, subsystems, and devices contained within the scope of this contract into a fully unified, operational, tested, and certified system. A description of the various interfaces between all subsystems is also provided herein. They include but not limited to the following:

Phase	**PLC**	TCC Communications	Interface	ATO Cabinet Communications method
Phase I	Numa-Logic PC700B	Serial connection	RS-232	Hard wired
Phase 2	Westinghouse HPPC-1700	Serial connection	RS-232	Serial cable

1.02 SUBSYSTEM INTERFACES

A. The Contractor shall provide integration services for all the subsystems defined in this solicitation.

B. A brief description of the inter-subsystem interfaces as specified in this volume is provided below for reference.

I. Programmable Logic Controllers: The PLCs shall use Optical connectivity, or the Ethernet Protocol as defined in **APPENDIX A,** SECTION 5.3 between the distributed nodes. The PLC shall use the required protocols necessary to interface and communicate with existing systems, with which the PLCs shall be integrated,

2. LAN: This subsystem shall support all Ethernet Capable devices and subsystems at all Metro Mover locations.

3. VoIP Telephony Voice Appliances shall use the Ethernet protocol and the LAN for all 3. communications with a VoIP System to be installed by others as a part of the MIC-Earlington Heights expansion project.

4. The CCTV system shall use the Ethernet Network for communications with the existing CCTV Network.

C. In addition to these interfaces and subsystems, the Contractor shall provide integration services for other subsystems not mentioned in the contract documents, but required to interface to, or to be integrated with, the subsystems supplied under this contract to achieve successful system integration.

1.03 SYSTEM INTEGRATION:

The Contractor shall designate a person or group of people as the system integrator(s). This individual or group shall be the responsible party for ensuring successful system integration.

A. The system integrator shall attend and participate in all meetings, along with the Engineer.

B. Reserved

C. Locations and Facilities: The Contractor shall provide system integration work, services, and support for all locations, rooms, and facilities. Other locations and facilities not listed herein, but required to interface to or to be integrated with the system supplied under this contract to achieve a successful integration.

D. Required System Integration Services: The Contractor shall provide the following services:

E. Inter-subsystem interface control

F. Staging, Migration Planning, cut-over planning and support

G. Project management/coordination of subcontractors

H. Coordination of training

I. Test planning and execution

J. Test auditing

K. System and subsystem commissioning

L. Discrepancy resolution

M. Executive-level presentations

N. Internal arbitration

0. All other services not mentioned here, but necessary to achieve a successful integration.

1.04 INTER-SUBSYSTEM INTERFACE CONTROL:

A. The Contractor shall identify and manage all physical and logical interfacing among all the subsystems and subsystem devices provided under this contract to ensure that all communications, processes, and interactions among devices, subsystems, and that the system design provides optimum performance.

B. Any existing device, subsystem, or system that interfaces with any of the equipment provided under this contract shall be identified prior to performing any integration work.

C. Interfacing with old, fragile, or obsolete equipment shall require written approval from DTPW.

D. All device, subsystem, and system interfaces shall adhere to the approved interface requirements. Changes and deviations from the interface requirements shall require the interface matrix to be submitted for review and approval at least 3 days prior to implementation.

I.OS STAGING, MIGRATION PLANNING, CUTOVERS, AND SUPPORT

A. The Contractor shall provide staging and migration process for all devices, subsystems, and systems in a coordinated and phased manner so as to ensure a smooth transition from the existing devices, subsystems, and system to the new devices, subsystems, and system.

B. The migration process shall be executed in accordance with the conformed and approved Migration Plan.

C. The Migration Plan shall ensure continuity of revenue service for the Metro system. Under no circumstances shall the work of this project impede ability of DTPW to operate its regular revenue service. Work restrictions and availability of DTPW resources shall be considered in the Migration Plan.

D. The Contractor shall provide system integration services for all cutover stages throughout the life of this contract.

E. Planning for all cutovers shall be responsibility of the system integrator.

F. F. The Contractor (system integrator) shall be present at all cutovers, and shall provide support during the migrating period.

G. At any time, simultaneous work on the stations shall be limited to a maximum of two stations (including corresponding ancillary facilities). This is intended to constrain the use of DTPW personnel at any given time.

H. The cutover and Migration Plan shall be presented and finalized during the design phase. However, cutover plans for individual subsystems/stations shall be available at least JO days prior to the actual cutover.

I. The Contractor shall provide on-site technical support for the peak operational hours during migration and cutover for all systems. On-call support shall be provided on off-peak hours, 7 days a week, while all systems are being migrated. Such a support period shall at a minimum extend from the two weeks prior to the deployment of the CSCS hardware until the final acceptance test is completed, plus two weeks of on-call service post-acceptance.

J. Migration restrictions:
   1. No downtime to revenue operations shall be allowed.
   2. Temporary facilities and configurations shall be removed after they are no longer needed.
   3. Restricted downtime will be allowed for safety or critical equipment.
   4. Construction and installation of the new subsystems shall be done in parallel to avoid interfacing to old, fragile equipment. The submitted Migration Plan shall

comply with the requirements and restrictions listed herein and elsewhere in the contract specifications, and with any requirements produced by DTPW during the design phase.

K. Cutover requirements:
   1. Before a cutover can occur, the subsystem, station, or device shall be fully tested and approved in accordance with its system acceptance Test Plan.
   2. Subsystems/stations containing more than an individual subsystem (as defined in this section) shall require that every individual component subsystem be fully tested and approved before testing the (larger) composed subsystem/station.

   3. Cutover plans shall be provided at least 10 days in advance of the corresponding cutover.

   4. All plans submitted shall conform to the requirements listed herein, elsewhere in the specifications and those requirements generated by DTPW during the design phase.

1.06 COORDINATION OF TRAINING

A. The Contractor shall propose appropriate times for offering the training courses, as required.

B. DTPW will review and approve (as appropriate) the final Training Plan and schedule. After DTPW approval, any changes to the schedule shalt be negotiated with DTPW.

C. Requirements for training
   1. Training shall be provided at different hours of the day (as appropriate) so that all DTPW shifts will be able to participate.

   2. For every system configuration change, temporary or permanent, the Contractor shall provide training prior to implementation. For temporary changes the Contractor may use informal on-site training.

   3. Training courses and material shall cover the operational concept, maintenance, troubleshooting, and operations of all subsystems provided under this contract.

   4. All training examples, exercises, and examples shall be based on the actual DTPW Metrorail system. Generic examples and exercises shall not be allowed.

1.07 TESTING PLANNING AND EXECUTION

A. The Contractor is responsible for all Test Planning and procedures. Refer to section 01 45 23 for detailed Test Planning and execution requirements.

B. The Contractor designated system integrator shall plan and execute planning for the following tests:
   I. First Article Inspection Tests (FAITs) as may be required.

   2. Subsystem FATs

3. Integrated FAT.
4. Subsystem availability tests
5. System acceptance test
6. Integrated System Availability Test
7. Final acceptance test

1.08 TEST AUDITING

A. The Contractor shall provide a test auditor for all tests conducted by the system integrator to certify that all tests performed on all the devices, subsystems, and system are accurate, and that testing complied with the procedures.

8. DTPW will provide a representative to witness all tests. However, the witness signature shall not relieve the Contractor (test auditor) of its responsibilities and liability.

1.09 SYSTEM AND SUBSYSTEM COMISSIONING

1. The Contractor shall plan and coordinate all subsystem and the system commissioning.
2. Commissioning of any subsystem and the system shall be coordinated with DTPW, and shall adhere to the respective Test Plan presented by the Contractor and approved by DTPW.
3. Requirements for Commissioning
   I. No discrepancies in classification Priority 1 (as referenced in section, DISCREPANCY RESOLUTION, below) shall be left open.
   II. Availability test completed and approved.
4. All work under this contract requires all new subsystems to be constructed in parallel to the existing system components. Commissioning of devices or subsystems to work under the existing system shall only be implemented per DTPW request. For such occasions, the Contractor shall provide all training and manuals, perform a complete set of tests (including subsystem availability test as applicable), and resolve all discrepancies prior to commissioning.
5. All commissioned devices or subsystems become property and responsibility of DTPW upon commissioning. Warranty shall still be applicable.
6. The Contractor shall provide cutover services for commissioned devices or subsystem. Cutover plans shall be submitted prior to cutover, as normally specified.
7. System availability test: A test to confirm the overall system availability shall be performed after all cutovers have been performed.

1.10 DISCREPANCY RESOLUTION

The Contractor's system integrator shall keep track and pursue resolution of all discrepancies, including software bugs, in a timely manner, as required below:

I. Discrepancies/bugs shall be classified in three categories and assigned a priority for resolution. The priority shall be assigned by DTPW-designated test engineer to all discrepancies after testing any subsystem, station, device, or system. The list below relates the discrepancy categories to the appropriate resolution priority and time for resolution:

   I. Critical, Priority 1 - One natural month after initial testing will be allowed for resolution: These discrepancies may cause instability, improper operation, or may provide insufficient or confusing information that could cause an accident or damage to a device, subsystem, orsystem.

   II. Major, Priority 2 - Two natural months will be allowed for resolution: These discrepancies do not cause instability or incorrect operation; however, they may provide erroneous non-critical information or annoyance.

   III. Minor, Priority 3 - Three natural months allowed for resolution: These discrepancies are of a cosmetic nature, and do not interfere with operations.

2. Time for discrepancy resolution shall start counting from the date the discrepancy was noted in the discrepancy log.

3. Closing of discrepancies on the discrepancy log, regardless of whether the bug was generated internally by the Contractor or by DTPW, shall be witnessed by DTPW.

4. Discrepancy log reports shall be periodically submitted at least once monthly. However the Contractor shall submit discrepancy logs within two business days upon request at any time during construction.

5. Testing for problem resolution shall be conducted monthly, after the initial FAT for the first subsystem for which discrepancies are generated.

6. During construction, hardware/interface incompatibilities among devices,subsystems, and systems shall be tracked and resolved by the system integrator.

7. Unless otherwise specified, no device, subsystem, software build, or system can enter live operation with unresolved Priority I discrepancies.

8. Reserved.

1.11 EXECUTIVE PRESENTATIONS

A. The system integrator shall provide, at a minimum, one presentation to DTPW to report on integration issues and progress.

8. These presentations shall be detailed and technical enough as to provide a good understanding of the issues being discussed to a technically informed person (not an expert in the subject matter).

1.12 INTERNAL ARBITRATION

The system integrator shall resolve any and all technical disputes among subcontractors.

DEFINITIONS:

The list of definitions hereunder shall only apply within the context of this section. The purpose of this list is to define the work, systems, services, and goals requested from the Contractor under this section, as viewed from the point of view of the overall integrated system.

A. Device: Shall refer to the individual components of a subsystem. Physically a device may be composed of smaller components or modules.

B. Subsystem: Shall refer to a particular conglomerate of devices operating to achieve a particular functional goal provided or interfaced with under this contract. Some examples of subsystems are as follows:
   I. Central Control System (Sub) System: Specified elsewhere in these specifications.

   2. Fire Management (Sub) System: Specified elsewhere in this contract.

C. System: Shall refer to the integrated conglomeration of subsystems and devices provided or interfaced with under this contract, working in harmony and cooperating to achieve successful operation as specified by the contract documents. The system shall include every component, process, and hierarchy between the discrete field instrumentation devices throughout Metro and the Central Control MMI interface.

D. Successful Integration: Shall refer to achieving the overall system integrated functionality required by the contract documents and by any negotiations between the Contractor and DTPW.

E. System Integration: Shall refer to the work of harmonizing and fine-tuning (by coordinating, testing, etc.) the physical and logical interfaces among devices and subsystems, as specified in the contract documentation, to achieve a fully operational unified system as required by the contract documents.

F. Physical Interface: Shall refer to those interfaces where a direct interaction or connection is present.

G. Logical Interface: Shall refer to the communications of two or more devices on the highest communication layer **(e.g.,** application layer for the OSI model). In other words, it refers to the data exchange interface among data terminating equipment (as opposed to data communications equipment).

H. Commissioning: Bringing a device or subsystem into operations using the existing subsystems or the system. This definition excludes bridging the new Central Control System with the existing subsystems/systems.

1.13 QUALITY ASSURANCE

A. Testing of devices and subsystems, and calibration of testing equipment, shall be

performed per the requirements in this section, applicable codes and standards, and industry best practices (as specified elsewhere).

B. Installation of new equipment shall be done as required herein, following the manufacturer's instructions and recommendations, industry best practices, and applicable codes and standards as specified elsewhere.

PART 2: SUBMITIALS

2.01

A. All submittals listed under Part 2 of this section shall be done in accordance with SECTION OJ 33 00 and the requirements listed hereunder.

B. DTPW reserves the right to review and approve/disapprove all submittals required under this section.

2.02 GUIDANCE TO CONTRACTOR

Except where noted, equipment meeting the requirements of this specification may be considered for use. The specific models of equipment and accessories to be submitted under this specification must be approved by the Engineer, based on their degree of compliance with these requirements and their suitability for the needs of DTPW.

PART3: PRODUCTS

3.01 **SUBMITTALS: CONTRACT DATA REQUIREMENTS LISTS (CDRLs)**

A. The Contractor, at a minimum, shall submit each one of the documents listed below. These shall be submitted on the time frame specified for each submittal.

8. Design Phase Submittals

I . Migration Plan: This document shall describe in detail the strategies involved in migrating from the old subsystems and system to the new. It shall meet the contract requirements for both hardware and software, after analyzing the system survey findings and the information provided at DTPW input phase.

The Contractor, at a minimum, shall identify and describe the following items and processes necessary in the conversion process:

I. Technologies to be implemented

II. Phases for all work

III. Risks involved in every alternative proposed

IV. Tasks required to achieve successful migration and integration

V. Training for every phase, every group of users, and for every subsystem to be deployed

VI. Human resources involved in the Migration and Cutover plan

VII. Equipment needed to accomplish migration

VIII. Processes that will help attain a successful migration

IX. Real estate involved for storing, installing, testing, and operating while migrating

X. Temporary facilities and temporary fixes performed to both new and existing equipment during the migration process

XI. Temporary configuration implemented during the migration process

a. The preliminary Migration Plan shall be submitted at least *5* days prior to the final design review (FSR) and presentation.

b. The conformed Migration Plan shall be submitted for review at least 10 days after the FSR presentation.

2. Test Plan: It shall contain all tests based on the requirements specified elsewhere in the contract documents. The Test Plan shall be submitted *5* days after NTP.

3. Master Training Plan

I. The master Training Plan shall be based on the requirements described on the individual sections, DTPW input, and those approved during the design phase.

II. The Training Plan shall be submitted one week (five business days) after the Migration Plan has been reviewed and approved by DTPW.

4. Development and Factory Acceptance Phase Submittals

I. Master Interface Control Document (ICD): This CDRL shall clearly identify in both text and chart (matrix) format all the interfaces among devices, subsystems, and system, both old and new.

I. It shall clearly identify all logical interfaces for all devices and between subsystems.

II. All physical interfaces shall be identified and described.

III. All layers interfaces shall be defined and compared in relation with the OSI 7 layer model.

IV. Frames, packets, overhead, message format, expected inputs, expected outputs, and any relevant protocol information shall be included in the description of all interfaces.

V. All possible (data) messages needed for all interfaces shall also be provided in the ICD. The interface matrix shall be submitted for DTPW review no more than 5 days after the Design/submittal phase is completed.

2. Discrepancy Log and Reports for FAT

A. The log and reports are to be submitted monthly after the first FAT test with discrepancies.

B. Discrepancy Resolution Report: These reports shall contain the name of the person who identified the discrepancy, the date when the bug was noticed, a

description of the problem in plain (nontechnical) English, the name of the person who identified the cause of the problem, a plain English explanation of the rationale for the problem, and the name and the signature of the person stating that the discrepancy has been fixed.

C. The discrepancy log shall be submitted no later than five days after a test is conducted. The log shall contain all the signatures of the tester, the auditor, and DTPW-designated test engineer.

D. Deployment Phase Submittals
   1. Integrated System Availability Test Plan: It shall contain the test procedure to exercise the fully integrated system for a period of 60 natural days.
      I. The Test Plan shall identify all subsystems to be tested, with testing procedures and testing forms for each subsystem. It shall also provide a schedule for testing, identify the testers, and provide any other information relevant to the test.

      II. The detailed Test Plan shall be submitted at least 3 days prior to the actual testing.

   2. Commissioning Plan: The Commissioning Plan (if applicable) shall be submitted at least 3 days prior to commissioning. The Commissioning Plan shall provide the following information:
      I. A list of all tests to be performed on the device or subsystem to be commissioned (operating with the existing system)

      II. Detailed installation steps and diagrams

3. Discrepancy Log and Reports
   I. The log and reports are to be submitted monthly after FAT.

   II. Discrepancy Resolution Report: These reports shall contain the name of the person who identified the discrepancy, the date when the bug was noticed, a description of the problem in plain (nontechnical) English, the name of the person who identified the cause of the problem, a plain English explanation of the rationale for the problem, and the name and the signature of the person stating that the discrepancy has been fixed.

4. System overview diagrams and system conceptual diagrams
   I. These shall be provided at least *5* days prior any subsystem test.

   II. Final submission shall be done after the system availability test has been completed.

PART 4: EXECUTION

All system integration work shall be performed in accordance with the individual subsystem's section requirements and those requirements provided by DTPW during DTPW input and the design phase.

4.01 SYSTEM INTEGRATION

A. The integration process for the station subsystems shall flow from the bottom up. That is, simpler and single systems shall be fully tested and integrated prior to integrating a higher, larger, or more complex system.

8. The Contractor shall install the new system independently and in parallel with the existing system.

4.02 INTEGRATED SYSTEM AVAILABILITY TEST

A. The purpose of the test is to determine system stability and to identify any discrepancy that may arise from conflicts that could be created by having a fully integrated system. The duration of the test shall not be less than 6 consecutive natural days.

8. The test shall address all functional areas and shall execute more than one function at a time to identify any conflicts.

C. During this test, unlikely but possible scenarios shall be produced.

D. A Central System catastrophic system failure shall require restarting the test. If the cause for the failure cannot be identified, the Contractor may choose to restart testing right away. On the other hand, if the cause for failure is recreated, a critical discrepancy shall be generated, and no further testing shall be performed until fixed.

4.03 MEASUREMENT:

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

4.04 PAYMENT:

C. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART l: GENERAL

1.01 DESCRIPTION:

This section applies to electrical equipment coordination, sleeves and sleeve seals for raceways and cables, and common electrical installation requirements.

PART l: PRODUCTS

2.01 MATERIALS:

A. Sleeves for raceways and cables:

1. Steel pipe sleeves
2. Cast-iron pipe sleeves
3. Sleeves for rectangular openings

B. Sleeve seals: Modular sealing devices with sealing elements, plastic carbon-steel stainless-steel pressure plates, and carbon stainless-steel connecting bolts and nuts.

3.01 MEASUREMENT:

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

3.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 05 19

WIRE AND CABLE

PART l: GENERAL

1.01 DESCRIPTION:

This section addresses the furnishing and installation of non-Fiber Optic wire and cable for the Metro Mover Fiber Replacement Project. All requirements of this section apply to this work.

1.02 SUBMITTALS - Refer to Section 01 33 00. SUBMITIALS, for submittal procedures.

A. Contractor shall submit the following drawings:

I. Shop drawings and manufacturer's literature showing details of fabrication and technical data for each type of cable to be furnished

II. Working drawings showing specialized requirements for installation and termination

III. Cable plan showing the locations and functions of all cables to be installed

IV. Detailed installation wiring diagram and cabling diagram: Any special precautions associated with cabling shall be clearly identified. All the cable and wiring terminations shall be shown on drawings, and all terminal markings, cable connector markings, and cable lengths shall be clearly indicated. Submit test reports for all tests.

B. Contractor shall document manufacturer's qualifications and certifications.

PART 2: PRODUCTS

2.01 WIRE AND CABLE

A. General

1. Identify cables as to manufacturer, year of manufacture, insulation type, conductor size, and voltage rating in accordance with manufacturer's standard method, and subject to review by DTPW.
2. Use only flame-retardant and low-smoke-emission cables with insulating and jacketing materials capable of a 40-year average service life.
3. Use cables suitable for installation at minus 15 degrees C.
4. Use only cable with characteristics that meet or exceed the limits prescribed by the manufacturer of connected equipment.

5. When RJ-21 connectorized cables are used, they should be constructed of 25 twisted pairs, with an overall shield.

Main Distribution Frame (MDF) cross-connections:

I. Non-data (non-binary) signal cross-connects should have the following characteristics:
   a CAT6 Plenum rated cable
   b Construction: Twisted-pair construction
   c Conductors: Tinned, 24 AWG, solid copper

II. Data (binary) signal cross-connects:
   a CAT6 Plenum rated cable
   b Construction: Twisted-pair construction, with individual shields
   c Conductors: Tinned, 24 AWG, solid copper

B. Minimum voltage ratings for both AC and DC:
   1. External wiring for module, equipment, signal, and instrumentation circuitry: 300 volts
   2. Power circuitry: 600 volts

C. Conductors

Conductors should be sized to ensure operation of the equipment based on the anticipated equipment loads and operating parameters for the systems, in accordance with NFPA 70, chapter 3, article 310, and as specified herein. Use coated conductors of annealed copper wire in accordance with ASTM B 33; Class B and Class C stranded conductors conforming to ASTM B 8, Table 2; and Class G stranded conductors conforming to ASTM B 173, as follows:

I. Equipment module, signal, and instrumentation external wiring: No. 20 AWG minimum, Class B
2. Rack-to-rack and wiring: 20 AWG minimum, Class B
3. All other circuits: No. 14 AWG minimum, Class B

D. Cable Assembly

1. Use single-conductor and multiple-conductor cables with tight-fitting, free-stripping, very flame resistant and low smoke type modified ethylene tetrafluoroethylene (ETFE) material for insulation and jackets. Cables should be certified for continuous operation at 150 degrees C in dry locations.

2. Insulation thickness

I Multi-Conductor Cables: Minimum average of 0.01575 inches (0.4 mm) and absolute minimum of 0.01378 inches (0.35 mm). Test at 3,000 volts AC for *5* minutes.

n Single-Conductor Cables: Minimum average of0.009843 inches (0.25 mm) for No. 20 AWG. Minimum average of 0.01181 inches (0.3 mm) No. 14 AWG. Minimum average of 0.01575 inches (0.4 mm) and absolute minimum of 0.01378 inches (0.35 mm) for No. 12 AWG or larger. Each shall be tested at

3,000 volts AC for *5* minutes.

Ill Jacket thickness

a. For single-conductor cables, as specified for insulation

b. Overall thickness on multiple-conductor cables shall be per industry standards for similar use

c. Conductor Identification

i. Identify the conductors of twisted-pair cables in accordance with IPCEA S-19-81, paragraph 5.6.3.4, except where otherwise provided by referenced REA specifications.

ii. Except as otherwise specified, each insulated conductor in multiple conductor cables shall be identified with a specific number, or shall have a different color or tracer color combination.

iii. Power cable colors shall be coded as follows:

A0I. Conductor 208/120 Volts
A02. A Black
A03. B Red
A04. C Blue
A05. Neutral White
A06. Ground Green

2.02 MASTER CLOCK SYSTEM CABLES: NOT APPLICABLE

WIRE DISTRIBUTION SYSTEM:

The following criteria apply to distribution system cable.

A. Cable Construction: Twisted-pair construction, individual shield on each pair

8. Conductors: Tinned, 24 AWG minimum, solid copper

2.03 WIRE FOR CROSS-CONNECTIONS: Cable distribution system cable used for cross-connections at MDF locations shall use shielded cross-connections on data signals to destination at MDF.

2.04 WIRE DISTRIBUTION SYSTEM CABLES

A. Construction: Twisted-pair construction, individual shield on each pair

8. Conductors: Tinned, 24 AWG minimum, solid copper

PART 3: EXECUTION

3.01 INSTALLATION

A. Install wire and cable in accordance with manufacturer's recommendations and applicable codes and standards.

B. Do not exceed minimum bending radius as permitted by ICEA S-19081, and cable

manufacturer.

C. Install cables in the equipment rooms in overhead cable trays and in the Interior location within SPCC, beneath the raised computer floor.

D. Verify that the raceway conduit system is free of obstructions by pulling a suitable wire brush, swab, and mandrel through the raceway conduit to remove extraneous matter.

E. Ensure that the raceway conduit system is dry before installation of cable, and use lubricant approved by the cable manufacturer to facilitate pulling cable.

F. Determine maximum cable lengths and pulling tensions to avoid excessive pulling tensions or more bands than the manufacturer recommends.

G. Provide at least 20 percent spare conductors (but not less than four such conductors) in all multiple-conductor cables (other than individual twisted-pair cables). Provide sufficient wire length to reach the farthest terminal point within equipment where spare wiring is not to be terminated. Spare wiring shall be readily accessible.

H. Do not allow wires to cross one another when pulled into a conduit. Prevent kinking in conduit fittings or boxes. All cables and wires to be installed in a conduit shall be installed at the same time.

I. Do not pull into trays or troughs. Cables shall be laid, with a minimum amount of crossover, in the trays and troughs and secured at least every 3 feet; cables shall not be pulled tightly around bends. Conduits for cables entering or leaving trays shall be rigidly attached and supported at their ends by suitable brackets and conduit straps on the sides of the trays.

J. Wire and cable shall be permanently tagged as specified in APPENDIX B, SECTION 16120.

K. All exposed wires and cables entering or leaving equipment housings, junction boxes, etc., shall be protected from abrasion. Openings in equipment enclosures and junction boxes shall have split ring plastic grommets.

L. Seal all fire-rated openings.

M. Open wiring on individual equipment racks shall be neatly arranged, bundled, and tied approximately every 3 inches with nylon straps.

N. All wiring within cabinets and enclosures shall be neatly arranged, bundled, and tie-wrapped every 6 inches with nylon straps.

0. All communications wiring shall be separated from power cables.

P. The ANSI/TIA/EIA 606-A Standard for Telecommunications cabling system shall be used in all labeling methodologies. Classes of Administration l through 4 inclusive shall be used as applicable. All new wiring shall be labeled with a designation and labeling structure that is compliant with ANSI/TIA/EIA 606-A, and shall be submitted for approval by the Engineer. Labeling shall be on all origination and destination ends of all installed cables.

3.02 SPLICES AND TERMINATIONS

Wires and cables shall be continuous between equipment rooms and intended termination points at the equipment. Splices will not be permitted except as specifically authorized in writing by DTPW. All terminations shall be made in accordance with the cable manufacturer's recommendations. Termination hardware shall require DTPW's review.

3.03 TESTING

Test all cables for continuity, shorts, opens, crossed pairs, and grounded conductors. Each cable connector and MDF terminal shall be verified and recorded by connector pin number or terminal number and the wire color that is to be connected, per DTPW reviewed drawings. All testing shall conform to section O I 45 23 except where more stringent testing is specified in this section.

3.04 MEASUREMENT:

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

3.05 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 05 24

CONTROL SYSTEM - EQUIPMENT

PART 1: GENERAL

1.01 DESCRIPTION:

This section describes the required characteristics of the equipment to be supplied to meet the functional requirements in these Technical Provisions. Characteristics within this section shall comply with the requirements specified in the Quality Assurance - System Assurance section. Provide hardware that has sufficient capability and flexibility to meet the requirements of this section, as well as the present and future functional requirements specified.

1.02 GENERAL EQUIPMENT REQUIREMENTS

All hardware delivered as part of the control system shall include all engineering and field changes since the time it was manufactured. All engineering and field changes shall be implemented prior to the factory functional performance test. All equipment shall be new and of the finest production quality. Do not provide major equipment requiring a substantial amount of new design and development. No modified (physically altered) modules or printed circuit boards shall be supplied as part of the control system, as spare parts, or as replacement parts under warranty.

1.03 EQUIPMENT PERFORMANCE AND CAPACITY

All performance and capacity data (such as processor loading and main memory sizing) supplied for the control system shall be based on the following conditions:

A. The control system configuration as described in SECTIONS 01 11 00 and 01 43 00.

B. The total database size and total number of LNPs for the DTS system as applied to the line

C. The peak level of system activity

D. The amount of online/historical data as required by agency, federal and local regulations.

1.04 PEAK LOAD CONDITIONS

A. The peak load conditions listed herein shall delineate the loading parameters for sizing the equipment and are to be used in the factory and field tests. Simulation methodology to determine the effect of equipment not connected during the tests shall be submitted for DTPW's review. During the peak load test, the processor utilization may increase to a maximum of 40 percent, provided there are no pram stalls or abort results and no processor restarts or failovers occur due to the control system

performance and capacity problems.

B. During the peak load condition, a train service equal to the ultimate design capacity of the train control system shalt be operating.

1.05 SUBMITIALS (CORL)

A. System functional block diagrams showing the functions of each system element and the types of connections between elements

B. Detailed equipment specifications, descriptions, and drawings for the following items as applicable:

1. Optical Fiber
2. MAIN/Central Control PLC System Hardware and Software
3. Station PLC System Hardware and Software
4. Network equipment
5. Wireless Network equipment
6. Communications interface equipment
7. VoIP Telephony equipment
8. Digital Paging equipment
   I. Detailed interconnection diagrams shall be submitted showing individual connections to all items of equipment, including interface connections to other systems or equipment.
   II. Installation drawings shall be submitted as necessary for detailing equipment mounting, securing and grounding, cable diagrams, and connection diagrams.

PART 2: PRODUCTS

2.01 PROCESSORS

The main groups of processors for the control system shall be the Front-End Processors, Application and Database Servers and the workstation/overview diagram processors. The following articles apply to all groups of processors.

A. Processor Features

The following features shall be provided for each type of processor, as appropriate to the particular functions of each:

l. In addition to the security of supply provided by the UPS, power failure facilities providing the means for an orderly shutdown of the processor upon loss of input power, and automatic restoration of operation when power is restored.

2. Facilities to monitor and detect anomalous operation of processor and 1/0 instructions, and a watch-dog timer.

3. Detection and reporting to the processor of memory errors, 1/0 errors, attempts to access nonexistent main memory, and attempts to execute non-implemented or

illegal commands, the processor shall then cease indicating that it is available and, whenever possible, the error shall be reported as an alarm.

4. A real-time clock with at least 1.0 micro-second resolution and an interval timer with at least 8.0 micro-second resolution, this clock shall be maintained in synchronization with the master clock described in Section 26 05 25.

5. The LNPs shall be capable of having a reload initiated from any authorized management computer that is a client on the same network as the processors, whatever the state of the software in the processor.

B. Processor Loading

I . The control system shall have the ability to support all functions described in this Technical Provisions - Systems section, utilizing no more than 40 percent of the processing capability of the processor required for peak service conditions, and without utilizing any memory designated as spare while executing under the conditions listed in articles 1-3 and 1-4 above.

2. Demonstrate the control system's processing capability and spare capacity during factory and field acceptance tests. The performance monitoring function (Section 26 OS 25) shall be available to verify system performance during these tests.

C. Main Memory-Motherboard Memory

1. When the systems are delivered, main memory shall have sufficient capacity to satisfy the requirements of all system functions specified herein. Seventy-five percent of each delivered memory shall be spare capacity that is completely free, contiguous, and available for future use. Where memory is shared by two or more processors, this memory shall be required to conform to all the requirements of main memory, both separately and in combination with private memory.

2. Processor and any auxiliary memory shall be maximum that can be supported by the current hardware at the time of installation.

3. Parity-checking or error-correcting hardware shall be provided for all memory, including any cache memory provided. Memory errors shall be reported to the processor. Violations of write-protected areas shall likewise be prevented. Meaningful error codes shall be displayed where appropriate to complement diagnostic software and lead to isolation of faults at a board level.

2.02 DEVICE ACCESS

Except for the CPU 1/0 devices that shall be dedicated to each CPU, the control system shall be constructed so that any device or any group of devices communicating with the processors can be connected to and access, or be accessed by, either of the on-line or hot-standby processors without adversely affecting any other devices' access to, or access by, the other processor. All shared devices shall have redundant access. Failure of the redundant access logic shall not disable the control system. The failure of a single

processor shall not prevent the proper transfer of any shared device from the failed processor to the functioning processor and shall not prevent proper operation of the device when connected to the functioning processor.

2.03 PROCESSOR INTERCONNECTIONS

An interconnection shall be provided between the on-line and hot-standby processors to support the communication necessary for mutual monitoring of the states of the processors, performing message exchanges and performing database upgrades.

2.04 REMOVABLE MEDIA UNITS

Each central processor shall be provided with removable media, each with a minimum capacity to hold two versions of the entire system, including data, plus 25 percent residual capacity. A minimum of two versions are required to be held during system upgrades. Reloading the central processors shall be achievable from the drive. Until a specific version is deleted, it shall be possible to restore that version as the active version at any time, and reboot the processor. If the processor automatically reboots because of a handling failure, it shall reboot the most recent version activated.

2.05 LOCAL AREA NETWORK

1) Fiber shall be provided for the LAN network for all connectivity between the WAN equipment installed in the Train Control rooms and the Wireless Access point installed at the platform levels in the stations.

2) The LAN shall generate failure alarm messages or signals to allow alarm messages to be displayed via the SMTP protocol.

PART 3: EXECUTION

3.01 ENVIRONMENTAL REQUIREMENTS

A. The equipment shall function normally under the environmental requirements contained in DTPW's environmental design criteria unless otherwise modified by DTPW.

B. Temperature/Humidity/Heat Load

1. Under normal conditions, a controlled environment will exist in Train Control rooms and equipment rooms for computing, communication, and man/machine interface equipment.
2. Provide details of the individual and total heat load of the equipment at each location, and the maximum operating temperature for all equipment, no later than with the preliminary design submittal.

.

3.02 GENERAL NOTES

All control equipment shall conform with the following requirements:

A. Assembly Identification: Each assembly in the DTS and ancillary systems, to the level of printed circuit cards and EPROMs, shall be clearly marked with the manufacturer's part number, serial number, and the revision level of the assembly. Changes to assemblies shall be indicated by an unambiguous change to the marked revision level. All slots within printed circuit card cages shall be clearly labeled.

B. Interconnections

I . All cabling between component units of the systems shall be supplied and shown on system drawings. Plug-type connectors with captive fasteners shall be used for all interconnections. The connectors shall be polarized to prevent improper assembly. Terminations shall be entirely within the enclosures.

3. Wiring of components within enclosures shall be neatly arranged and fastened securely to the enclosure with flame-retardant fasteners. Metal clamps shall have insulating inserts between the clamps and the wiring. Wiring between all stationary and moveable components, such as wiring across door hinges or to components mounted on extension slides, shall allow for full movement of the component without binding or chafing of the wire.

04.04 CONTRACTOR'S FUTURE HARDWARE CHANGES

DTPW shall be informed of all future alterations or improvements to the hardware and the associated software supplied. DTPW shall be placed on the suppliers• mailing lists to receive announcements of the discovery, documentation. and solution of hardware and software problems, and other improvements that could be made to hardware that is provided with the systems. This service shall be initiated at the time of system acceptance and shall continue for as long as the equipment is being supported by the Contractor.

05.05 MEASUREMENT:

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

06.06 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1: GENERAL

1.01 SUMMARY

A. Methods and materials for grounding electrical systems and equipment

1.02 QUALITY ASSURANCE

A. Quality standard for grounding materials and equipment: UL 467

PART2: PRODUCTS

2.01

A. Insulated conductors: Copper wire and cable

8. Bare copper conductors:
   1. Solid conductors
   2. Stranded conductors
   3. Tinned conductors
   4. Stranded bonding conductors
   5. Copper tape braided bonding jumpers
   6. Tinned-copper braided bonding jumpers

C. Connectors: Bolted and exothermic-welded type

D. Grounding electrodes: Ground rods: Copper-clad, steel, sectional type

2.02 GROUNDING APPLICATIONS

- Conductors: Solid for No. 8 AWG and smaller; stranded for No. 6 AWG and larger
- Underground grounding conductors: Bare copper conductor, No. 2/0 AWO minimum
- Isolated grounding conductors
- Grounding bus
- Conductor terminations and connections: Bolted and welded

Insulated equipment grounding conductors with circuit conductors for the following:

1. Feeders and branch circuits
2. Lighting circuits

3. Receptacle circuits
4. Single-phase motor and appliance branch circuits
5. Three-phase motor and appliance branch circuits
6. Flexible raceway runs
7. Armored and metal-clad cable runs
8. Busway supply circuits
9. Computer- and rack-mounted electronic equipment circuits
10. Air-duct equipment circuits
11. Water heater, heat-tracing, and antifrost heating cables
12. Isolated grounding receptacle circuits
13. Isolated equipment enclosure circuits
14. Signal and communication equipment
15. Service and central equipment locations and wiring closets
16. Terminal cabinets

PART 3: EXECUTION

3.01 FIELD QUALITY CONTROL

A. Ground resistance testing: By Contractor (engaged testing agency)

3.02 MEASUREMENT:

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

3.03 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1: GENERAL

1.01 PERFORMANCE REQUIREMENTS
Rated strength: Minimum structural safety factor of five times the applied force

PART 2: PRODUCTS

A. Support, anchorage, and attachment components
   1. Steel slotted support systems with metallic coatings
   2. Nonmetallic slotted support systems
   3. Raceway and cable supports
   4. Steel conduit and cable hangers, clamps, and associated accessories
   5. Support for non-armored conductors and cables in vertical conduit risers
   6. Structural steel for fabricated supports and restraints
   7. Mounting, anchoring, and attachment components:
      I. Powder-actuated fasteners
      II. Mechanical-expansion anchors
      III. Concrete inserts
      IV. Clamps for attachment to steel structural elements
      V. All steel, springhead toggle bolts
      VI. Threaded hanger rods
B. Fabricated metal equipment support assemblies: Welded or bolted steel shapes
C. Concrete bases: 3,000-psi (20.7-MPa), 28-day compressive-strength concrete.

3.01 MEASUREMENT:

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

3.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 05 36

CABLE TRAYS FOR ELECTRICAL SYSTEMS

PART 1: GENERAL

1.01 QUALITY ASSURANCE

Quality standard: NEMA VE I

1.02 MATERIALS

I . Cable trays, fittings, and accessories: Aluminum hardware

2. Cable tray accessories
    1. Cable tray supports and connectors
3. Warning signs

PART 2: SOURCE QUALITY CONTROL

Tested according to NEMA FG I and NEMA VE I

3.01 MEASUREMENT:

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

3.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 13 00

DC SWITCHGEAR UPGRADE

PART 1: GENERAL

1.01 DESCRIPTION:

This section addresses the technical requirements for the equipment and installation to be provided under this contract. All requirements of this section apply to this work.

1.02 SUBMITTALS - Refer to Section 01 33 00. SUBMITTALS, for submittal procedures.

A. Contractor shall submit the following:
   I. Shop drawings and manufacturer's literature showing details of fabrication and technical **data** for each equipment furnished
   II. Working drawings showing specialized requirements for installation and termination.
   III. Construction plans showing the locations and functions of all equipment to be installed

B. Contractor shall document manufacturer's qualifications and certifications.

PART 2: PRODUCTS

2.01 SYSTEM REQUIREMENTS/OVERVIEW

A. General

This upgrade includes furnishing and installation of 750Vdc/6000A DC Switchgear Cubicles to replace existing DC breakers, protection, control and metering devices and functions, fully manufactured and factory tested meeting the following requirements.

2.01.1 Digital Multilevel Protection Relay (MPR)
Fully interchangeable with the equipment currently in service in the DTPW Orange Line (MIC) Substations. The proposed MPR shall be suitable to be installed in the existing DTPW upgraded Substations without any mechanical modifications of the existing switchgear. The MPR shall including the following protective Functions:

1.. Over current protection (Imax. Imax rev): (76)

The high-speed circuit breaker is tripped when the maximum permissible instantaneous value of current is reached. This function can be set separately for the forward and reverse supply directions.

2.. Current rise protection (di/dt standard functionality) and current step protection (DI): (51)

The high-speed circuit breaker is tripped in relation to the changes in current (detection of close and remote short-circuits). The tripping characteristic can be adjusted individually so that sudden changes in current during operation do not lead to tripping and that optimum adaptation to the status of the power supply system is enabled. Monitoring is carried out in two stages (alarm given and then tripping) with parameterizable values.

3.. Current-time protection (I DMT, I DMTrev): (76)

The high-speed circuit breaker is tripped when currents which are maintained over a long period of time and do not correspond to regular operating conditions are detected. This function can be set separately for the forward and reverse supply directions.

4.. Overvoltage protection (Vmax): (I59)

The high-speed circuit breaker is tripped if the maximum permissible operating voltage is exceeded.

5.. Under voltage protection (Vmin): (127)

The high-speed circuit breaker is tripped if the voltage falls below the minimum permissible operating.

6.. Sensing of Line Voltage fully interchangeable with Design provided for DTPW Orange Line (MIC) Project

7.. Sensing of Line Voltage (Track Alive Indication for Automatic Train Control, ATC) (127ATC)

8.. Sensing of Line Voltage (Cascading Function of Emergency Trip System, ETS) (l27ETS)

9.. Voltage Sensing /Load Measuring (82)

Voltage Sensing /Load Measuring (Line Test) will establish the feeder integrity and operate to allow or prevent breaker closure. The respective mode used to effect breaker closure shall be function of the feeder's voltage or lack of it as interpreted by the system.

Voltage Sensing Mode:
When a breaker closure is initiated, if the feeder is energized from its remote end and the voltage is above 450 volts the system shall interpret the voltage level as a non-faulted feeder and allow breaker closure (No line test).

When a breaker closure is initiated, if the feeder is energized from its remote end and the voltage is above 200 volts but bellow 450 volts the system shall interpret this voltage level as a NULL POINT or faulted feeder and prevent breaker closure. The closing system may continue to cycle for another closure attempt and most lockout after 3 minutes.

Load Measuring Mode (Line Test)
When a breaker closure is initiated, if feeder voltage is below 200 volts, a line test shall be initiated to establish the integrity of the feeder. If the feeder's load resistance produces a voltage above 200 volts as a result of the search current, the system shall interpret the voltage level as a non-faulted feeder and allow breaker closure.

2.01.11 Automatic Re-closure after Overcurrent trip or Transfer trip:

The breaker closing circuit shall initiate line test after an Overcurrent or transfer trip. If persistent fault is detected the breaker shall lockout after 6 unsuccessful closing attempts within 3 minutes. Closing cycles and time shall be adjustable.

After three successful closure and subsequent re-occurring trips breaker shall lockout. Closing cycles and time shall be adjustable.

2.01.12 Indication of the position of the circuit breaker via binary outputs

2.01.13 Monitoring of the breaker truck's position via binary inputs

2.01.14 Control of the circuit breaker via relay outputs and breaker-position monitoring via binary inputs

2.01.15 Transfer Trip function. Signal processing via binary input and output as well as processing via intelligent communication Interface.

2.01.16 Voltage Sensing Relays for 125VDC Transfer Trip System and set of Resistors fully compatible for the connection to existing Miami Dade Orange (MIC) Line Equipment.

2.01.17 All Components interchangeable with the equipment in service on the DTPW Orange Line (MIC) Equipment

2.01.18 Digital Loop Current Meter

2.01.19 Provide Provisions for future Transfer Trip via Fiber optic Cable compatible via a Programmable Logic Controller (PLC)

2.01.20 Set of ETS Relays (Relay Type shall be fully interchangeable (without wiring changes) with Relays in service in the DTPW's existing ETS System)
"A" Relay required per ETS Zone
"B" Relay required per Feeder Breaker
"C" Relay required per Feeder Breaker
"BX" Relay required per ETS Zone

2.01.1 Breaker Holding Current Resistor suitable for 125VDC

2.01.1 One High Z Ground Fault Relay per Substation including electromechanical 86 Lockout Relay

2.01.2 Umbilical Cord for connection of control functions to the removable breaker truck element.

2.01.3 Umbilical Cord or prefabricated control cables as required for connection to the nearest existing terminal block interface to remote control, protection and metering circuits.

2.01.2S The new switchgear cubicles shall be no less than 600mm wide

2.01.26 The new switchgear cubicles shall be designed to be installed and connected to the existing de track cables or cable landing pad without modification to the de track cables.

2.01.27 The new de switchgear track feeder bus shall be designed to align with the existing feeder cable landing pad bus and the existing feeder cable landing pad and compartment shall be left in place and be put back into service.

2.02 - S0VDC/600A DC SWITCHGEAR CUBICLES LV COMPARTMENT

2.02 7S0Vdc/6000A DC Switchgear Cubicles LV Compartment with factory pre-installed and prewired door panels including the following components

2.02. l Local Remote Selector Switch (69)

2.02.2 Open Close Selector Switch

2.02.3 Direct On Push Button+ Warning Sign

2.02.4 ETS Reset Pushbutton

2.02.S Transfer Trip Loop Current Meter

2.02.6 Green LED (Breaker opened)

2.02.7 Red LED (Breaker closed)

2.02.8 Blue LED (Remote)

2.02.9 Yellow LED (Group Alarm

2.02.10 White LED (Local)

2.02.11 Graphic user Interface for the Digital Multilevel Protection Relay {MPR) fully interchangeable with the equipment currently in service in the DTPW Orange Line. The user interface shall be located apart from the central unit and shall be mounted in the front of the switchgear. It shall have a graphic, monochrome display for visualization of the section feeder and the circuit breaker status and for display of the operating current and operating voltage. The function buttons fitted on the side shall be parameterizable to enable control functions to be carried out directly from the human machine interface. The human machine interface is connected to the central unit (MPR) by means of a permanently fitted cable.

2.03 - SOV DC/600A DC SWITCHGEAR CUBICLES **BREAKER** TRUCK

6 x 750Vdc/6000A DC Switchgear Cubicles Breaker Truck pre-installed and prewired meeting the following requirements and including the following components

2.03.1 High Speed DC Circuit Breaker 6000A continuous current, 200k.A peak short-circuit current

2.03.2 Electrically held (trips upon loss of Control Power)

2.03.3 Set of AuxContacts suitable for operation with MPR

2.03.4 Umbilical Cord Connector for connection of control and protection functions Breaker Operation Counter

2.03.5 The proposed High Speed Circuit Breaker Type shall have been in service together with the multilevel protective Relay in another 750VDC Traction Power system for a minimum of *5* years.

2.03.6 The Equipment shall be designed for a lifecycle of 30 years.

2.03.7 The Upgrade includes Track Feeder Breakers and Rectifier Cathode Breakers.

2.03.8 The Track Feeder Breakers shall be equipped with a direct acting over current trip device.

2.03.9 The Cathode Breakers shall be equipped with a unipolar trip device tripping only in reverse direction.

2.03.10 Finger Contacts to connect the main current path to the DC Switchgear cubicle bus

2.04 · 750V DC/600A DC SWITCHGEAR TRANSITION COMPARTMENT TO THE EXISTING CABLE LANDING COMPARTMENT (IF REQUIERED) INCLUDING THE FOLLOWING COMPONENTS.

2.04.1 Adapter Bus bar to align new cable landing pad to existing de track feeder cables.

2.05 ANUNCIATOR PANEL PER TPS/GTS

I x Annunciator Panel per TPS/GTS

2.05.1 The Annunciator Panel shall be equipped with a PLC compatible with the Multilevel Protective Relay and shall utilize Profibus or Profinet in order to communicate with the DC Multiplevel Protective Relay.

2.05.2 The PLC shall be furthermore equipped with sufficient Digital Inputs and Outputs in order to interface with DTPW's existing RTU for connecting to the Central Control Facility.

2.05.3 The Annunciator shall be based on a minimum 12" diagonal touch screen and provide a sufficient amount of alarm windows to display all alarms inside the TPS.

2.05.4 The Annunciator as well as the PLC shall be compatible to communicate to the PLC Equipment inside the neighboring TPS/GBS via optical Bus Terminals and shall be able to send and receive transfer trip signals between two associated Breakers.

PART 3: EXECUTION

3.01 INSTALLATION

3.01.1 The contractor shall furnish all components and subcomponents listed above shall be responsible for all shipping to site and unloading onsite.

3.01.2 The contractor shall be responsible for removing the existing DC switchgear and tum the removed gear over to DTPW for re.use or disposal.

3.01.3 The contractor shall install the new DC switchgear and coMect to the existing de track feeder cables.

3.01.4 The contractor shall provide the services of a manufacturer's representative to prepare a test procedure to put the new equipment in service and perform the Post Installation Checkout.

3.01.5 The contractor shall remove all existing control, protection and remote metering wiring up to the nearest interface terminal block and connect new wiring for control, protection and remote metering.

3.01.6 The contractor shall clean the **area** where the new Upgraded Breaker Cubicle/LV Compartment shall be placed and verify the integrity of the insulated flooring.

3.01.7 The Contractor shall provide the services of a manufacturer's representative on site to oversee all aspects of the installation of the equipment.

3.01.8 The Contractor shall be fully responsible to connect the PLC based Annunciator via fiber optic cable to the new DC Switchgear.

3.01.9 The Contractor shall be responsible to connect all dry contacts received from Central Control Facility to the new PLC based Annunciator.

3.01.l0 The Contractor shall ensure that the hardwired interface is reconnected to existing Equipment inside the TPS or GTS.

3.01.11 Includes but shall not be limited to all Wiring to the Central Control Facility. As well all wiring to and from existing equipment inside the TPS/GTS.

3.02 REQUIRED TESTING

3.02.1 The Contractor shall provide Test Procedures for DTPW's Review 60 Days before the scheduled Test for DTPW's Review. The Tests shall be carried based upon the approved procedure.

3.02.2 The Contractor shall provide the services of a manufacturer's representative to perform the following field tests:

3.02.3 Short Circuit Test

3.02.4 Transfer Trip Test

3.02.5 Train Startup Test

3.02.6 Factory Acceptance Test (FAT) Testing

3.02.7 Post Installation Testing.

3.02.8 The Contractor shall provide to DTPW the Test Reports for the test listed above no later than IO business days after the completion of each test.

All testing shall conform to section 0I 45 23 except where more stringent testing is specified in this section.

4.01 MEASUREMENT:

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

4.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 27 16

INDOOR CABINETS, RACKS, FRAMES AND CLOSURES

PART 1: GENERAL

1.01 DESCRIPTION:

Provide all labor, materials, tools and equipment required for the complete installation of work called for in the Contract Documents.

1.02 SCOPE OF WORK

A. This document describes the products and execution requirements relating to furnishing and installing Telecommunications Cabling. Communication Equipment Room Fittings of cabinets, racks, frames and enclosures which are covered under this document.

B. This section includes minimum requirements for the following:
   1. Cabinets
   2. Racks and Rack Cable Management
   3. Frames
   4. Enclosures

A. All cables and related terminations, support and grounding hardware shall be furnished, installed, wired, tested, labeled, and documented by the Contractor as detailed in this document.

1.03: SECTION INCLUDES

A. Equipment cabinets

B. Cable entrance cabinets

C. Cabinet identification

1.04: REFERENCES (The most recent revisions shall be used in this project)

A. American National Standards Institute (ANSI): 1 .ANSI/EIA-310

B. American Railway Engineering and Maintenance-of-Way Association (AREMA) I. Signal Manual, Part 1.5.10

C. TIA/EIA structured cabling system TIA/EIA-568-B Commercial Building Telecommunications Cabling Standard

1. TIA/EIA-569-A Commercial Building Standard for Telecom Pathways and Spaces
2. TIA/EIA-606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
3. TIA/EIA-607 Commercial Building Grounding/Bonding Requirements
4. EIA-310-D Rack systems
5. NFPA-70 National Electric Code (NEC)-2008
6. 1SO/IEC 1180I Generic Cabling for Customer Premises

PART2: SUBMITTALS

A. General: Refer to SECTION 013300 - Submittal Procedures for submittal requirements and procedures.

B. Submit the following:
   1. Product data for equipment cabinets.
   2. Shop drawings.
   3. Cabinet mounting details.
   4. Cabinet paint types and colors.

PART3: PRODUCTS

3.01 **MANUFACTURING REQUIREMENTS**

A. Equipment Cabinets. Equipment in communication rooms and train control rooms shall be housed in free standing cabinets conforming to the following requirements:
   1. General. Cabinet frame shall be constructed of I4-gauge cold rolled steel. Cabinet construction shall be as shown in the Contract Drawings.
   2. Cabinet structures shall have uniform dimensions. Equipment cabinets shall not exceed 48 inches in width and 24 inches in depth. A cabinet complex shall not exceed 72 inches in width.
   3. Enclosures: Cabinet enclosures shall be furnished complete. The front and rear of the cabinets shall be enclosed with captive full-length doors opening at least 120 degrees, closed with hand-operated key-locked catches, and with louvered openings, if required. Doors shall be removable without unscrewing.
      I. Cabinets shall be designed for side-by-side mounting with provisions for running interconnection wiring within a complex in closed wire way between cabinets.
      II. All non-used front spaces of cabinets shall be covered with blank panels.
      III. Self-ventilation of cabinet enclosures shall be used. If fans or filters are required shop drawings shall be submitted for approval before procurement.

4. Cabinet Hardware: Cabinets and appurtenances shall be designed and constructed to comply with ANSI/EIA-310. The frame element shall be designed to accept universally adjustable panel-mounting hardware. The panel-mounting angles shall be constructed of 12-gauge cold rolled steel with standard EIA hole spacing and structured to comply with ANSI/EIA-310.
5. Cable Entry: Cable entry shall be through the top of the cabinet. Cable entry shall have provisions for protecting the cable. All cables shall be routed so as to protect them from damage during and after installation.
6. Terminal Block Mounting Board: Mounting boards for terminal blocks and other items as required shall be made from flame retardant non-metallic, non-wood, insulating sheet material approved by DTPW.
7. Supports: Chassis supports, or guides shall be provided as required for auxiliary support of heavy equipment.
8. Height: Overall cabinet height shall be uniform and shall not exceed 7 feet-2 inches, including mounting sill.

8. Cable Entrance Cabinets. Cable entrance cabinets shall be equipped with front full-length removable doors with key-locked catches opening at least 120 degrees. The rear of the cabinet shall be accessible by a bolted removable panel or full-length removable door. The structure shall not exceed 60 inches in width or 24 inches in depth. Cable entrance cabinets shall meet the requirements specified for equipment cabinets, with the exception of cabinet dimensions and door construction. Cable entrance cabinets shall be installed as indicated on the Contract Drawings.

C. Painting: Cabinets shall be painted in accordance with the following requirements:
   1. Communications equipment cabinets and racks shall be painted Dark Blue/Black with color number 5B/1N as selected from the Munsel Color Chart. Exterior rack surfaces shall have a textured finish.
   2. Quality: Painting shall conform to the requirements specified in AREMA Signal Manual, Part 1.5. l0, or equivalent. Paint types and colors shall be submitted for approval.

D. Cabinet Identification: Each equipment cabinet/enclosure shall be provided with I.D. Nameplates. Free standing cabinets/enclosures shall be provided with two nameplates, one for the front and one for the rear. Wall mounted cabinets/enclosures shall be provided with one nameplate on the front. Nameplates shall be of 1/16-inch-thick lamicoid, with beveled edges, black background and white letters. Mounting hardware shall be stainless steel.
   1. Nameplate sizes:
      I. Nameplates 1-9/16 inches high by 18 or 12 inches wide shall have lettering in block letters l /2 inch high.
      II. Nameplates 3/4-inch-high by 12 inches wide shall have lettering in block letters 3/16 inch high

2. Nameplate text sha11 consist of two lines, unless otherwise approved by DTPW. The first line shall denote the cabinet/enclosure number, and the second line shall denote the name of the cabinet/enclosure.
3. Cabinet numbering format shall be submitted to DTPW for approval.
4. Communications cabinet name and number shall correspond with the designations indicated on the Contract Drawings.

PART 4: EXECUTION

4.01 INSTALLATION

A. Cabinet Mounting: Cabinets shall be mounted in accordance the following requirements. Each sill structure shall be leveled to a maximum deviation not exceeding 1/8 inch over its total length and width.
   1. The equipment cabinets shall be mounted rigidly such that a I00-pound horizontal force applied to either side 6 feet from the floor shall cause less than 1/8-inch deflection of any part of the equipment cabinet. Cabinets shall be mounted plumb and level using captive shims as required.
   2. In addition to the cabinet deflection, a 1/16-inch deflection shall be allowed by the mounting channels after being rigidly mounted to the floor. Equipment cabinets shall be attached together but isolated one from the other and from the floor with insulating material. The equipment cabinet mounting details shall be submitted for approval.
   3. Cabinet fronts in adjacent rows shall face each other.

B. Cabinet Grounding: Cabinet-grounding requirements including sill insulation and isolation between cabinets shall be as shown on the Contract Drawings.

C. Racks: The Cable Management System shall be used to provide a neat and efficient means for routing and protecting fiber and copper cables and patch cords on telecommunication racks and enclosures. The system shall be a complete cable management system comprised of vertical cable managers, horizontal cable manager, and cable management accessories used throughout the cabling system. The system shall protect network investment by maintaining system performance, controlling cable bend radius and providing cable strain relief.

D. Each rack shall be UL listed for a load-carrying capacity of 1000 lbs. (454 kg.).

E. Provide patch management ring runs in each rack. Provide (1) 2U high horizontal patch management between each panel of each rack.

F. Provide side-mounted vertical cable management with covers on both sides of each rack. The cable management shall be with cover plates and bracket kits as needed to attach to adjacent racks.

G. Provide strain relief and cable management at the rear of each rack to ensure uniform routing of all feeder and distribution cables.

H. Each rack to have a minimum of eight power sockets mounted on a strip at the rear of the rack. The power outlets on the connector strip shall be NEMA 5-20R compatible. The plug shall be NEMA 5-20P compatible.

4.2 MEASUREMENT:

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

4.3 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1: PRODUCTS

1.01

A. Receptacles: Duplex, 125 V, 20 A
   I . Straight blade

   2. GFCI: Non-feed through

B. Pendant cord-connector devices with external cable grip

C. Cord and plug sets

D. Snap switches: 120/277 V, 20 A
   •I Key-operated switches

E. Occupancy sensors
   l. Wall-switch sensors: Adaptive-technology type with adjustable time delay

   2. Long-range wall-switch sensors: Dual-technology type with adjustable time delay

   3. Wide-range wall-switch sensors: Passive-infrared type with adjustable time delay

F. Communications outlets
   1. Telephone outlet: Single RJ-45
   2. Combination TV and telephone outlet: Single RJ-45 and coaxial cable coMectors

G. Wall plates
   l. Material for finished spaces: Thermoplastic
   2. Material for unfinished spaces: Thermoplastic
   3. Material for damp and wet locations: Thermoplastic

H. Floor service fittings: Modular, dual service, with power receptacle and voice and data communication outlet
   1. Type: Flush

   2. Service plate: Round, brass

   3. Voice and data communication outlet: Blank cover with bushed cable opening or two modular, keyed, RJ-45

I. Poke-through **assemblies:** Below-floor junction box with multi-channeled, through-floor raceway/firestop and detachable floor service outlet assembly
   1. Service outlet assembly: Flush type

   2. Size: 4 inches

J. Multi-outlet assemblies: Metal raceways

K. Finishes
   I. Connected to normal power system: As selected by DTPW
   2. Connected to emergency power system: Red
   3. TVSS devices: Blue
   4. Isolated-ground receptacles: Orange

PART 2: EXECUTION

2.01 MEASUREMENT:

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

2.02 PAYMENT:

A. Work under this section will be paid for as part of the lump sum bid item unit prices in the bid form under this contract.

END OF SECTION