

# Memorandum



**Date:** November 25, 2020

**To:** Gary T. Hartfield, Division Director  
Small Business Development Division  
Internal Services Department

**From:** Leticia Smith, Chief *LS*  
Contract Services Division  
Department of Transportation and Public Works

**Subject:** Project No.: IRP299  
Project Name: Traction Power Switchgear Replacement Project Phase III Update  
FCSC: 8.23  
Description: Upcoming Solicitation for Construction Services under the  
Miscellaneous Construction Contract 7360 Plan  
Contract Number: RPQ 412034

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The Department of Transportation and Public Works (DTPW) respectfully requests that the Division of Small Business Development (SBD) evaluate Project No. IRP299, Request for Price Quotation No. 412034 – Traction Power Switchgear Replacement Project Phase III Update for determination of Small Business Enterprise measures and a Community Workforce Program goal, as applicable. Below are details about the project for reference purposes. The attached cost estimate indicates a project construction cost of \$4,964,085.75 (inclusive of all allowance accounts). The contract duration is 730 calendar days, and the funding source is People’s Transportation Plan Bond Program Funds.

**Scope of Services** – The project involves the upgrade of the existing Department of Transportation and Public Works’ (DTPW) Traction Power Substations Direct Circuit (DC) Switchgear and Supervisory Control and Data Acquisition (SCADA) System at six locations: Allapattah (ALP), Santa Clara (SCL), Culmer (CUL), Gap Tie 2 (GT2), Overtown (OVT), and Brickell (BKL) Traction Power Substations. The DC Switchgear at those locations has exceeded its life expectancy of thirty years and the failure rate and associated maintenance cost has increased. Additionally, spare parts are no longer available.

**Minimum Qualifications** - This project requires specialized equipment and license requirements to include a State of Florida Electrical Contractor. The project is considered a closed and interconnected system, which requires that the work be completed by the same Contractor. The Contractor must be able to pull a Master Permit.

In addition, the Contractor is required to have a minimum of three years of experience with AC and DC Traction Power Systems in a Transit environment including Power Cables and Fiber Optic installation, termination and testing, equipment installation, testing and commissioning for revenue service; have previously worked on Traction Power SCADA systems; configured Siemens PLC CPUs and Siemens Input/output modules; verified PROFIBUS communications between PLC and Sitras Pro DC Protective Relays; programmed Siemens Scalance Network Switches; programmed Siemens ladder logic, software blocks and hardware tables; and worked with a Test Plan to verify all commands and indications at Central Control.

Should you have any questions or require additional information, please feel free to contact my office via email at [Leticia.Smith@miamidade.gov](mailto:Leticia.Smith@miamidade.gov) or phone at (786) 469-5291.

Attachment

**DEPARTMENT INPUT**  
**CONSTRUCTION CONTRACT/PROJECT MEASURE ANALYSIS AND RECOMMENDATION**

Check applicable Ordinance(s):  90-143 Responsible Wage and Benefits       03-237 (formerly 03-1) Community Workforce Program

**PROJECT INFORMATION**      See attachment

**Contract/Project/\*Work Order No.:** RPQ No. 412034

\*Reference corresponding project number when submitting a work order

**Contract/Project Title:** Traction Power Switchgear Replacement Project Phase III Update

**Description/Scope of Work:** See attached.

**Estimated Cost:** \$4,964,085.75 (Inclusive of Allowance Accounts)      **Funding Source:** People's Transportation Plan Bond Program Funds

**Location of Project** (street address or beginning and ending points) i.e. 12345 NE 23<sup>rd</sup> Ct or Starts at 135 St. ends at 145 St.  
Various locations

**PROJECT ANALYSIS FOR GOAL RECOMMENDATION (CWP)**      See attachment

Engineer/Department or Agency's estimated required workforce for Project  Work Order :

Trade/Skills Required	Est. # of workforce required per trade	Est. # of total days to complete job

Comments: \_\_\_\_\_

**PROJECT ANALYSIS FOR GOAL RECOMMENDATION (CSBE)**      See attachment

Sub-Trade	Est. Cost	% of Item to Base Bid	Availability

**RECOMMENDATION**

**Set-Aside:** Level 1  Level 2  Level 3  Trade Set-Aside  Sub-Contractor Goal  Workforce Goal  No Measure

**Basis for Recommendation:** \_\_\_\_\_

**Date submitted to DBD:** November 25, 2020

**Contact Person:** Leticia Smith

**Telephone No.:** 786-469-5291

## **SECTION 01 11 00**

### **SUMMARY OF WORK**

#### **BACKGROUND:**

Miami-Dade Department of Transportation and Public Works (DTPW) is continuing the upgrade of its existing Traction Power Substations Direct Circuit (DC) Switchgear and Supervisory Control and Data Acquisition (SCADA) System at the next 6 locations, Allapattah (ALP), Santa Clara (SCL), Culmer (CUL), Gap Tie 2 (GT2), Overtown (OVT), and Brickell (BKL) Traction Power Substations. The DC Switchgear at those locations have exceeded its life expectancy (30 Years) and the failure rate and associated maintenance cost has increased exponentially, and spare parts are no longer available.

The Life Expectancy for the new Equipment shall be 30 years.

There is no change to the operating cost. The operation of the new equipment should be the same as that of the equipment being replaced.

**Traction Power DC Switchgear and the Supervisory Control and Data Acquisition (SCADA) System Upgrade PHASE III.**

The contract for this phase (Phase III) of the project also includes requirements for the reconfiguration and modifications to the existing Supervisory Control And Data Acquisition (SCADA) System. All hardware and software necessary to convert to fiber as well as programming services is to be supplied by the Contractor. The latest PLC software is to be installed on the PLCs installed under this contract.

**Technical Specifications 750Vdc/6000A DC Switchgear Upgrade Phase III**

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.

<b>TPSS</b>	<b>Cathode Breakers</b>	<b>Feeder Breakers</b>	<b>Annunciator</b>	<b>SCITC Panel AC Breakers Control Relays</b>	<b>Fiber Optics Patch Panels</b>
ALP	2	4	1	1	2
SCL	2	4	1	1	2
CUL	2	4	1	1	2
GT2	0	4	1	0	2
OVT	2	4	1	1	2
BKL	2	4	1	1	2

**3.1 System Requirements/Overview:**

**This upgrade includes 750Vdc/6000A DC Switchgear Cubicles to replace existing cubicles containing DC breakers, protection, control, and metering devices and functions. The new equipment shall be fully manufactured, and factory tested meeting the following requirements and including the following components:**

**3.1.2 Digital Multilevel Protection Relay (MPR)**

Maximum interchangeability with equipment installed during the previous Traction Power Switchgear Upgrades is desired. The proposed MPR shall be suitable to be installed in the existing DTPW Orange Line (MIC) Substations without any wiring or mechanical modifications of the existing switchgear. The MPR shall including the following protective Functions:

**3.1.3 Over current protection ( $I_{max}$ ,  $I_{max rev}$ ): (176)**

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.

**3.1.4** Current rise protection (di/dt standard functionality) and current step protection ( $\Delta I$ ): (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.

**3.1.4** Current-time protection ( $I_{DMT}$ ,  $I_{DMT_{rev}}$ ): (176)  
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.

**3.1.5** Overvoltage protection ( $V_{max}$ ): (159)  
The high-speed circuit breaker is tripped if the maximum permissible operating voltage is exceeded.

**3.1.6** Under voltage protection ( $V_{min}$ ): (127)  
The high-speed circuit breaker is tripped if the voltage falls below the minimum permissible operating.

**3.1.7** The design and components for the sensing of line voltage shall provide maximum interchangeability with the circuits and components employed on previous phases of the DC Switchgear Project.

**3.1.8** Sensing of Line Voltage (Track Alive Indication for Automatic Train Control, ATC) (127ATC)

**3.1.9** Sensing of Line Voltage (Cascading Function of Emergency Trip System, ETS) (127ETS)

**3.1.10** Voltage Sensing /Load Measuring (182)

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 455 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 below 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 must 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.

**3.1.11 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.

**3.1.12 Indication of the position of the circuit breaker via binary outputs**

**3.1.13 monitoring of the breaker truck's position via binary inputs**

**3.1.14 Control of the circuit breaker via relay outputs and breaker-position monitoring via binary inputs**

**3.1.15 Transfer Trip function. Signal processing via binary input and output as well as processing via intelligent communication Interface. All Equipment must be properly integrated with the existing Substations which will require Transfer Trip over FO Cables in the Green Line TPSS.**

**3.1.16 All Components chosen shall provide maximum interchangeability with the equipment in service on the DTPW Green Line installed during Phases I & II of the DC Switchgear Project.**

**3.1.17 Deleted**

**3.1.18 Provide Provisions for future Transfer Trip via Fiber optic Cable compatible via a Programmable Logic Controller (PLC)**

**3.1.19 Set of ETS Relays (Relay Type shall be fully interchangeable (without wiring changes) with Relays in service in the Switchgear installed during the previous Traction Power Switchgear Upgrade.**

- “A” Relay required per ETS Zone
- “B” Relay required per Feeder Breaker
- “C” Relay required per ETS Zone
- “BX” Relay required per Feeder Breaker

**3.1.20 Deleted**

**3.1.21** Breaker Holding Current Circuit suitable for 125VDC shall not employ voltage dropping resistors.

**3.1.22** One High Resistance Ground Fault Relay (164) per Substation including electromechanical 186 Lockout Relay

**3.1.23** Umbilical Cord for connection of control functions to the removable breaker truck element.

**3.1.24** Umbilical Cord or prefabricated control cables as required for connection to the nearest existing terminal block interface to remote control, protection and metering circuits.

**3.1.25** The new switchgear cubicles should be 600mm wide. Contractor is responsible for any necessary modifications if proposed switchgear cubicles are not 600mm wide.

**3.1.26** The new switchgear cubicles shall be designed to be installed and connected to the existing dc track cables or cable landing pad without modification to the dc track cables.

**3.1.27** The new dc 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.

**3.2** 750Vdc/6000A DC Switchgear Cubicles LV Compartment with factory pre-installed and prewired door panels including the following components

**3.2.1** Local Remote Selector Switch (69)

**3.2.2** Open Close Selector Switch

**3.2.3** Direct On Push Button + Warning Sign

**3.2.4** Red ETS Reset Pushbutton

**3.2.5** Green LED (Breaker opened)

**3.2.6** Red LED (Breaker closed)

- 3.2.7** Blue LED (Remote)
- 3.2.8** Yellow LED (Group Alarm)
- 3.2.9** White LED (Local)
- 3.2.10** Graphic user Interface for the Digital Multilevel Protection Relay (MPR) fully interchangeable with the equipment currently in service in the DTPW previously upgraded Traction Power Substations. 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.
- 3.3.0** Six (6) pre-installed and prewired 750Vdc/6000A DC Switchgear Cubicles and Breaker Trucks shall be provided per station (four (4) for Gap Tie #2). The breakers and cubicles shall meet the following requirements and include the following components.
  - 3.3.1** High Speed DC Circuit Breaker 6000A continuous current, 200kA peak short-circuit current
  - 3.3.2** Electrically held (trips upon loss of Control Power)
  - 3.3.3** Set of Aux Contacts suitable for operation with MPR
  - 3.3.4** Umbilical Cord Connector for connection of control and protection functions  
Breaker Operation Counter
  - 3.3.5** The proposed High-Speed Circuit Breaker and the multilevel protective relay combination shall have been in service in another 750VDC Traction Power system for a minimum of 5 years. Contractor shall provide the name of the transit system(s) for verification by DTPW.
  - 3.3.6** The Equipment shall be designed for a lifecycle of at least 30 years.
  - 3.3.7** The Upgrade includes Track Feeder Breakers and Rectifier Cathode Breakers.
  - 3.3.8** The Track Feeder Breakers shall be equipped with a direct acting over current trip device.
  - 3.3.9** The Cathode Breakers shall be equipped with a unipolar trip device tripping only in reverse direction.
  - 3.3.10** Finger Contacts to connect the main current path to the DC switchgear cubicle bus.



### **3.4 750Vdc/6000A DC Switchgear Cubicles Breaker Compartment**

**3.4.1** The Breaker Compartment shall be fitted with an automatic shutter system made from Lexan (clear) for easy inspection of the Main Bus bar and the Shunt at any time without de-energizing the Substation.

**3.4.2** The Compartment shall be fitted with a manual mechanical racking system with the following positions: Service – Test – Disconnected. The DC Circuit Breaker shall be easily maneuverable across the substation floor. The use of a hoisting crane for the removal of DC Circuit Breakers is not permitted.

**3.4.3** Deleted

**3.4.4** The use of a screw type racking mechanism may be permitted.

### **3.5 750Vdc/6000A DC Switchgear Transition Compartment to the existing Cable Landing Compartment (if required) including the following Components**

**3.5.1** Adapter Bus bar to align new cable landing pad to existing dc track feeder cables

### **3.6 One (1) Annunciator/SCITC Panel per substation**

**3.6.1** 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.

**3.6.2** The PLC shall also be equipped with sufficient Digital Inputs and Outputs in order to interface with DTPW's existing RTU for connecting to the Central Control Facility.

**3.6.3** 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. The ability to control the AC and DC breakers (open and close commands) shall also be provided. This feature is to be implemented at all TPSSs with Siemens DC Switchgear.

**3.6.4** The Annunciator as well as the PLC shall be compatible to communicate to the PLC Equipment inside the neighboring TPSS via optical Bus Terminals and shall be able to send and receive transfer trip signals between two associated Breakers.

**3.6.5** The Mercury Relays for the AC Breakers Control in the existing SCITC Panel must be replaced with a new AC Breaker Control Relay Panel and PLC equipped with enough Digital Inputs and Outputs in order to interface with DTPW's existing RTU for connecting to the Central Control Facility.

- 3.6.6** The contractor shall furnished and install Fiber Optic Cable in innerduct between the Traction Power Substations (TPSS) and the Train Control & Communications Rooms (TC&C) for SCADA and Transfer Trip at all locations to communicate the PLC Equipment inside the neighboring TPSS and DTPW's existing RTU for connecting to the Central Control Facility via optical Buss terminals. To include the recommended below or approved equal:

Fiber Optic Cable PN: 012EUF-T4101DA1  
1" HDPE Orange outside plant innerduct  
Fiber Optic Patch Panels  
Fiber Optic Cable Terminations  
Fiber Optic Cable Assemblies  
Fiber Optic Cable Connectors Type SC  
Fiber Optic Splice Pigtails  
Siemens Ethernet Card  
Ethernet Jumpers  
Siemens Fiber Optic Converters  
Siemens Programing Services

### **3.7 DC Breaker Test Station**

- 3.7.1** The DC Breaker Test Station shall be designed to test both the Cathode and Feeder Breakers.

#### **Scope of Installation Works / Services**

### **3.8 CONTRACTOR:**

- 3.8.1** The contractor shall furnish all components and subcomponents listed above and shall be responsible for all shipping to site and unloading at site.
- 3.8.2** The contractor shall be responsible for removing the existing DC switchgear and turn the removed gear over to DTPW for re-use or disposal.
- 3.8.3** The contractor shall install the new DC switchgear and connect to the existing dc track feeder cables.
- 3.8.4** 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.
- 3.8.5** 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.

- 3.8.6** 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. Contractor shall repair flooring as necessary to pass tests.
- 3.8.7** The Contractor shall provide the services of a manufacturer's representative on site to oversee all aspects of the installation of the equipment.
- 3.8.8** The Contractor shall be fully responsible to connect the PLC based Annunciator via fiber optic cable to the new DC Switchgear.
- 3.7.9** The Contractor shall be responsible to connect all dry contacts received from Central Control Facility to the new PLC based Annunciator.
- 3.8.10** The Contractor shall ensure that the hardwired interface is reconnected to existing Equipment inside the TPSS.
- 3.8.11** 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 TPSS.
- 3.8.12** Deleted
- 3.8.13** The Contractor shall coordinate with DTPW's service contractor, B&C Transit Inc., to make the modifications to the Power Control Center Console and Display Panel (mimic board) located in the Central Control Facility. All the functions and capabilities at CCF including displays, alarms, and visual indication of status changes, faults or other abnormal conditions associated with the traction power substations upgrade.
- 3.9 DTPW Responsibility:**
- 3.9.1** DTPW forces shall provide suitable access to the TPSS and suitable room inside the substations for temporary storage and staging of the works.
- 3.9.2** DTPW shall remove the disconnected equipment from the substation for reuse of parts and/or disposal.
- 3.9.3** DTPW shall de-energize the existing equipment by disconnecting the feeder cables of all breakers from the 3rd Rail Potheads so that DC Switchgear and feeder cables are entirely de-energized.
- 3.9.4** DTPW shall reconnect 3rd Rail Sections to Feeders.
- 3.9.5** DTPW shall provide wiring diagrams for nearest Terminal Block for remote control, protection and metering.

## **4.0 Required Testing**

**4.0.1** 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. All testing requires 4 weeks 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 field tests:

**4.0.1** Short Circuit Test – Only required if a high-speed circuit breaker/MPR combination is proposed that has not been employed at any DTPW station. If this test is performed, the contact resistances will be measured before and after the test on each breaker that is involved in the test. Regardless of whether the contact resistances are within manufacture's tolerance, the main current carrying and arcing contacts on any breaker involved in the test will be replaced if any visible damage exists on the contacts. Any other parts of the breaker damaged by the test will also be replaced. All replacement contacts and parts will be supplied and installed by the Contractor.

**4.0.3** Emergency Trip System Test. (ETS)

**4.0.4** Transfer Trip Test

**4.0.5** Train Startup Test

**4.0.6** Factory Acceptance Test (FAT)

**4.0.7** Post Installation Testing.

**4.0.8** SCADA Testing

**4.0.9** 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 period 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.

**5.0.2** The Contractor shall provide the following spare parts to be included in the base contract bid:

One (1) Complete Cathode Breaker assembly  
Two (2) Complete Feeder Breakers assemblies  
Four (4) Digital Multilevel Protection Relays (MPR) with all associated components including the buffer amplifiers.  
One (1) Annunciator Panel screen.

## **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	24	6	12
Maintenance of Equipment	24	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 the legacy Traction Power Substation 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 traction power 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 DTPW.

**END OF SECTION**

SUMMARY OF WORK

01 11 00

PROJECT NO. IRP299

RPQ NO. 412034