SECTION 5
SPECIFICATIONS

SECTION 011100 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 LOCATION OF THE PROJECT

A. The project is located at the Intersection of Keel Ridge Road (SR3011) / East State Street (US62), City of Hermitage, Mercer County, Pennsylvania.

1.2 PROJECT DESCRIPTION

The project consists of performing upgrades to the existing traffic signal & equipment including new signal heads, mast arms, controller box, wiring, preemption and radar detection.

SPECIFICATIONS

A. In general, these Specifications describe the work to be performed by the various trades, other than work specifically excluded. It shall be the responsibility of the Contractor and Subcontractors to perform all work incidental to their trade, whether or not specific mention is made of each item, unless such incidentals are included under another Item.

B. It is advised that the Contractor and all Subcontractors familiarize themselves with the contents of the complete Specifications, particularly for the trades preceding, following, related or adjacent to their work.

1.3 DRAWING SCHEDULE

A. The work to be done under this Contract is shown on the following Drawings:

Title	Sheet No.
Title Page	1 of 5
Index Map	2 of 5
Traffic Signal Plan	3 of 5
Traffic Signal Plan	4 of 5
Traffic Signal Plan	5 of 5

END OF SECTION 011100

SECTION 013323 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.1 GENERAL

A. The Contractor shall submit detailed drawings, acceptable catalog data, specifications and material certifications for all equipment and materials specified or required for the proper completion of the work.

B. The intent of these items is to demonstrate compliance with the design concept of the work and to provide the detailed information necessary for the fabrication, assembly and installation of the work specified. It is not intended that every detail of all parts of manufactured equipment be submitted, however sufficient detail will be required to ascertain compliance with the specifications and establish the quality of the equipment proposed.

Shop Drawings shall be sufficiently clear and complete to enable the Engineer/Architect and Owner to determine that items proposed to be furnished conform to the specifications and that items delivered to the site are actually those that have been reviewed.

C. It is emphasized that the Engineer/Architect's review of Contractor's submitted data is for general conformance to the contract drawings and specifications but subject to the detailed requirements of drawings and specifications. Although the Engineer/Architect may review submitted data in detail, such review is an effort to discover errors and omissions in Contractor's drawings. The Engineer/Architect's review shall in no way relieve the Contractor of his obligation to properly coordinate the work and to Engineer/Architect the details of the work in such manner that the purposes and intent of the contract will be achieved. Such review by the Engineer/Architect shall not be construed as placing on him or on the Owner any responsibility for the accuracy and for proper fit, functioning or performance of any phase of the work included in the contract.

D. Shop Drawings shall be submitted in proper sequence and with due regard to the time required for checking, transmittal and review so as to cause no delay in the work. The Contractor's failure to transmit appropriate submittals to the Engineer/Architect sufficiently in advance of the work shall not be grounds for time extension.

E. The Contractor shall submit Shop Drawings for all fabricated work and for all manufactured items required to be furnished in the Contract in accordance with the General Provisions and as specified herein. Shop Drawings shall be submitted in sufficient time to allow at least twenty-one (21) calendar days after receipt of the Shop Drawings from the Contractor for checking and processing by the Engineer/Architect.

F. It is the responsibility of each Prime Contractor to furnish to all other Prime Contractors and especially the General Construction Contractor reviewed Shop Drawings for guidance in interfacing the various trades; i.e., sleeves, inserts, anchor bolts, terminations, and space requirements.

G. No work shall be performed requiring Shop Drawings until same have been reviewed by Engineer/Architect.

H. Accepted and reviewed Shop Drawings shall not be construed as approval of changes from Contract plan and specification requirements.

I. The Engineer/Architect will review the first and second Shop Drawing item submittals at no cost to the Contractor. Review of the third submittal and any subsequent submittal will be at the Contractor's expense. Payment will be deducted from the Contract amount at a rate of 2.8 times direct labor cost plus expenses.

1.2 SUBMITTAL PROCEDURE

A. All required submissions shall be made to the Engineer/Architect by the Prime Contractor(s) only. Any data prepared by subcontractors and suppliers and all correspondence originating with subcontractors, suppliers, etc., shall be submitted through the Contractor.

B. Contractor shall review and approve all Shop Drawings prior to submission. Contractor's approval shall constitute a representation to Owner and Engineer/Architect that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or assumes full responsibility for doing so, and that Contractor has reviewed or coordinated each Shop Drawing or sample with the requirements of the work and the Contract Documents.

C. Submittal Preparation: Mark each submittal with a permanent label or page for identification. Provide the following information on the label for proper processing and recording of action taken:

1. Location
2. Project Name
3. Contract
4. Name and Address of Engineer/Architect
5. Name and Address of Contractor
6. Name and Address of Subcontractor
7. Name and Address of Supplier
8. Name of Manufacturer
9. Number and Title of appropriate Specification Section
10. Drawing Number and Detail References, as appropriate.
11. Submittal Sequence or Log Reference Number.

    a. Provide a space on the label for the Contractor's review and approval markings and a space for the Engineer/Architect's "Action Stamp".

D. Each Shop Drawing, sample and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor:

Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

_____ _____

Signature Date

_____

Company

E. Shop Drawings shall be submitted in not less than six (6) copies to the Engineer/Architect at the address specified at the Preconstruction Conference. Single mylar or sepia reproducible copies of simple Shop Drawings may be submitted with prior approval of the Engineer/Architect.

F. At the time of each submission, Contractor shall in writing identify any deviations that the Shop Drawings or samples may have from the requirements of the Contract Documents.

G. Drawings shall be clean, legible and shall show necessary working dimensions, arrangement, material finish, erection data, and like information needed to define what is to be furnished and to establish its suitability for the intended use. Specifications may be required for equipment or materials to establish any characteristics of performance where such are pertinent. Suitable catalog data sheets showing all options and marked with complete model numbers may, in certain instances, be sufficient to define the articles which it is proposed to furnish.

H. For product which require submittal of samples, furnish samples so as not to delay fabrication, allowing the Engineer reasonable time for the consideration of the samples submitted. Properly label samples, indicating the material or product represented, its place of origin, the names of the vendor and Contractor and the name of the project for which it is intended. Ship samples prepaid. Accompany samples with pertinent data required to judge the quality and acceptability of the sample, such as certified test records and, where required for proper evaluation, certified chemical analyses.

1.3 REVIEW PROCEDURE

A. Engineer/Architect will review with reasonable promptness all properly submitted Shop Drawings. Such review shall be only for conformance with the design concept of the Project and for compliance with the information given in the plans and specifications and shall not extend to means, methods, sequences, techniques or procedures of construction or to safety precautions or programs incident thereto.

B. The review of a separate item as such will not constitute the review of the assembly in which the item functions. The Contractor shall submit entire systems as a package.

C. All Shop Drawings submitted for review shall be stamped with the Engineer/Architect's action and associated comments.

D. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Engineer/Architect will review each submittal, mark to indicate action taken, and return accordingly. Compliance with specified characteristics is the Contractor's responsibility.

Action Stamp: The Engineer/Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. If Shop Drawings are found to be in general compliance, such review will be indicated by marking the first statement.
2. If only minor notes in reasonable number are needed, the Engineer/Architect will make same on all copies and mark the second statement. Shop Drawings so marked need not be resubmitted.
3. If the submitted Shop Drawings are incomplete or inadequate, the Engineer/Architect will mark the third statement, request such additional information as required, and explain the reasons for revision. The Contractor shall be responsible for revisions, and/or providing needed information, without undue delay, until such Shop Drawings are acceptable. Shop Drawings marked with No. 3 shall be completed resubmitted.
4. If the submitted Shop Drawings are not in compliance with the Contract Documents, the Engineer/Architect will mark the fourth statement. The Contractor will be responsible to submit a new offering conforming to specific products specified herein and/or as directed per review citations.

E. No submittal requiring a Change Order for either value or substitution or both, will be returned until the Change Order is approved or otherwise directed by the Owner.

APPLICATION FOR USE OF SUBSTITUTE ITEM

TO: _____

PROJECT: _____

SPECIFIED ITEM:

_____ _____ _____

Page Paragraph Description

A. The undersigned requests consideration of the following as a substitute item in accordance with Article 6.05 of the General Conditions.

_____

B. Change in Contract Price (indicate + or -) $ _____

C. Attached data includes product description, specifications, drawings, photographs, references, past problems and remedies, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified. For consideration of the attached data as SHOP DRAWINGS, submittal shall be in accordance with requirements of Section 013323.

D. Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments are correct:

1. The proposed substitute does not affect dimensions shown on Drawings.

2. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.

3. The proposed substitution will have no adverse affect on other contractors, the construction schedule, or specified warranty requirements. (If proposed substitution affects construction schedule, indicate below using + or -)

_____ CONSECUTIVE CALENDAR DAYS

4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item, and agrees to reimburse the OWNER for the charges of the ENGINEER for evaluating this proposed substitute item.

E. Signature: _____

Firm: _____

Address: _____

_____

Telephone: _____ Date: _____

Attachments: _____

_____

_____

_____

For use by ENGINEER:

_____Accepted as evidenced by affixed SHOP DRAWING REVIEW stamp.
_____Accepted as evidenced by included CHANGE ORDER.
_____Not accepted as submitted. See Remarks.
_____Acceptance requires completion of submittal as required for SHOP DRAWINGS.
_____Not accepted. Do not resubmit.

By: _____ Date: _____

Remarks: _____

_____

_____

_____

_____

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_____

_____

_____

_____

APPLICATION FOR USE OF "OR-EQUAL" ITEM

TO: _____

PROJECT: _____

SPECIFIED ITEM:

_____ _____ _____

Page Paragraph Description

A. The undersigned requests consideration of the following as an "or-equal" item in accordance with Article 6.05 of the General Conditions.

_____

B. Change in Contract Price (indicate + or -) $ _____

C. Attached data includes product description, specifications, drawings, photographs, references, past problems and remedies, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified. For consideration of the attached data as SHOP DRAWINGS, submittal shall be in accordance with requirements of Section 013323.

D. Signature:

_____

Firm:

_____

Address:

_____

_____

Telephone: _____ Date: _____

Attachments: _____

_____

_____

_____

For use by ENGINEER:

_____Accepted as evidenced by affixed SHOP DRAWING REVIEW stamp.
_____Accepted as evidenced by included CHANGE ORDER.
_____Not accepted as submitted. See Remarks.
_____Acceptance requires completion of submittal as required for SHOP DRAWINGS.
_____Not accepted. Do not resubmit.

By: _____ Date: _____

Remarks: _____

END OF SECTION 013323

SECTION 014323 – QUALIFICATIONS OF TRADESMEN

PART 1 - GENERAL

1.1 CHARACTER OF WORKMEN AND EQUIPMENT

A. The Contractor shall employ competent and efficient workmen for every kind of work. Any person employed on the work who shall refuse or neglect to obey directions of the Engineer or his representative, or who shall be deemed incompetent or disorderly, or who shall commit trespass upon public or private property in the vicinity of the work, shall be dismissed when the Engineer so orders, and shall not be re-employed unless express permission be given by the Engineer. The methods, equipment and appliances used on the work and the labor employed shall be such as will produce a satisfactory quality of work, and shall be adequate to complete the contract within the specified time limit.

B. In hiring of employees for the performance of work under this Contract, or any Subcontract hereunder, no Contractor or Subcontractor, nor any person acting on behalf of such Contractor or Subcontractor, shall, by reason of race, sex, creed or color, discriminate against any citizen of the State of Ohio in the work to which the employment relates. No Contractor, Subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, creed, sex or color.

END OF SECTION 014323

SECTION 017800 - FINAL COMPLIANCE AND SUBMITTALS

PART 1 - GENERAL

1.1 The following forms and related sign-offs shall be documented in accordance with provisions of the contract. These forms shall be completed by the Contractor and approved by the Owner before final retainer is approved for release. Forms for Items A to E will be attached to the Contractor's executed copy of the contract.

A. Certificate of Substantial Completion (To be submitted at time of Substantial Completion).

B. Contractor's Certification of Completion.

C. Contractor's Affidavit of Prevailing Wage.

D. Consent of Surety Company for Final Payment.

E. Affidavit of Final Acceptance Date and Correction Period.

F. Before the OWNER will approve and accept the work and release the retainer, the CONTRACTOR will furnish the OWNER a written report indicating the resolution of any and all property damage claims filed with the CONTRACTOR by any party during the construction period. The information to be supplied shall include, but not be limited to, name of claimant, date filed with CONTRATOR, name of insurance company and/or adjuster handling claim, how claim was resolved and if claim was not resolved for the full amount, a statement indicating the reason for such action.

G. DBE Subcontractor Participation Forms SR-EPA.7-8 (Applicable for WPCLF & WSRLA funded projects only).

H. CDBG Subcontractor List 017800 (Applicable for CDBG funded projects only).

END OF SECTION 017800

SECTION 017839 - PROJECT RECORDS, DRAWINGS

PART 1 - GENERAL

1.1 RECORD DRAWINGS

A. The Contractor shall furnish an authentic set of marked-up drawings showing the installation insofar as the installation shall have differed from the Engineer's drawings. The drawings shall be delivered to the Engineer for making revisions to the original drawings immediately after final acceptance by the Owner.

B. The Contractor shall furnish dimensioned drawings indicating locations of all underground mechanical and electrical facilities.

1.2 SERVICE CONNECTION RECORDS

A. The Contractor shall record the location of all service and property connections, new or existing, made to utilities constructed under this contract. Such records shall be turned over to the Owner upon completion of the work. The cost of making such records shall be included in the various unit or lump sum prices stipulated for the various items of the work.

B. The location of each sewer connection as measured along the sewer from the nearest downstream manhole and its description with respect to the sewer shall be recorded. The record shall include the depth of new stubs for future connections and the depth of existing connections as measured from the surface grade. Also, the use of any vertical riser pipe shall be noted.

C. The location of each water connection as measured along the water line from the nearest fire hydrant.

END OF SECTION 017839

SECTION 900

- ITEM 0901-0001 – MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION

  Perform all work during the hours of 7:00 am to 7:00 pm. It is not permitted to work on Saturday, Sunday or any legal holiday without the Borough's written consent given after written notice to the Engineer.

  No portion of the sidewalks shall be closed during a winter shutdown.

  Install long term signing and establish maintenance and protection of traffic in accordance with the Traffic Control Plan, Publication 213 and the MUTCD.

  Utilize PATA 001, 002, 003, 010, 011 or 11f of Publication 213 (Work Zone Traffic Control Guidelines) as minimum project traffic control for short-term work when approved by the Engineer.

  Maintain access to all businesses and residences at all times. Install drum mounted "ENTER HERE" signs at business drives when directed by the Engineer. Provide temporary access drives of a width adequate to accommodate commercial or two-way traffic where applicable.

  Maintain pedestrian access in accordance with Publication 213 (Work Zone Traffic Control Guidelines) PATA 130 and in accordance with ADA standards.

  Pedestrian temporary walkways inclusive of pedestrian access to walkways, buildings and parking must be utilized and maintained during all times that the finished permanent sidewalk surface is not in place or as directed by the City.

  Provide hand held two way radios during all flagging operations. Additional flaggers may be necessary to safely move traffic through intersections.

  All signs to be in new or like new condition.

  Where on street parking exists, notify local municipal officials two weeks in advance to coordinate parking restrictions.

  Re-establish normal traffic patterns during holidays and special events.

  Notify the City, Emergency Services, Local Police Agencies and Local Bus Lines a minimum of two weeks prior to the start of construction. Verify the actual start of work one day in advance.

- ITEM 9952-1020 – ECONOLITE TS-2; TYPE 1 CONTROLLER ASSEMBLEY, TYPE 1 MOUNTING, WITH GPS

DESCRIPTION - This work is the furnishing and installation of a shelf-mounted 2-12 phase traffic signal controller configured to provide the operation as shown on the drawings. This work also includes furnishing and installation of a complete Global Positioning System (GPS) antenna and receiver system to provide accurate date and time-of-day to the intersection controller, and automatically adjust for daylight savings time.

MATERIAL - Sections 952.2, 1104.01, 1104.03, 1104.04, and the following:

Furnish a one-piece GPS antenna and receiver with an environmental temperature range of -30 degrees C to +80 degrees C and monitors a minimum of 8 channels. The accuracy of the system shall maintain the intersection controller date and time-of-day within 50 microseconds of UTC/GMT, and automatically adjust for daylight savings time.

Provide MOV power line surge protector that has minimum surge protection of 50KA with status indicator showing device failure.

Provide cabinet riser with minimum height of 15".

CONSTRUCTION - Section 952.3, 1104.01 and as follows:

Furnish cabinet layout diagrams and catalog cuts for review and approval prior to constructing controller assembly.

Provide a controller assembly wired to provide the operation shown on the drawings.

Provide the following controller assembly facilities:

- TS-2, Type 1 cabinet and controller.
- TS-1 backboard.
- Florescent light with in-door switch.
- Relay isolation of pedestrian circuits.
- MUTCD flash operation.
- 16-Channel MMU with LCD displays and RS-232 interface.
- Manual control pushbutton cord in police panel for manual control operation.
- Stop time switch with 2 positions marked "stop time" and "run" on test panel.
- Detector test panel (vehicular, pedestrian, preempt).

Terminate all spare signal conductors on an isolated terminal strip. Do not ground.

Install the GPS antenna on the top of the traffic signal controller cabinet as per the manufacturer's recommendations. Do not compromise the weatherproof capabilities of the cabinet.

Provide space between the top of door opening and top of cabinet for fan only. No portion of any other equipment is to occupy this area.

A representative of the controller supplier shall be available during activation of the signal for confirmation of signal phasing, signal programming, and potential troubleshooting of traffic signal controller.

Conduct a conflict monitor or malfunction management unit test when the controller assembly becomes operational and during initial turn-on.

Change timings or other controller settings as directed or programming controls during the 30-day intersection test period.

MEASUREMENT AND PAYMENT – Each and as specified in Sections 952.4, 1104.01, and 1104.03. Also includes mounting hardware, cables, power supply, receiver, and all incidental items for the fully functional GPS unit.

- ITEM 9956-0771 – RADAR DETECTION SYSTEM, WAVETRONIX ADVANCE

DESCRIPTION – – This item of work shall consist of furnishing and installing an Advance/Dilemma Zone Detection System capable of intersection advance detection control utilizing above ground Digital Wave Radar detection techniques. The system shall be non-intrusive and shall detect vehicles from 80 feet up to 500 feet from the sensor. The system shall detect vehicle presence, speed and shall identify vehicles within the dilemma zone and shall provide up to 8 detection zones simultaneously for intersection control. One sensor shall be provided per approach, covering multiple lanes where advance detection is required. The detection system shall include the following list of features and capabilities:

The system shall provide accurate presence-detection of moving vehicles or cluster of vehicles.

The sensor shall be mounted in a forward-fire position, looking at either approaching or departing traffic and shall only detect vehicles in one direction of travel.

It shall maintain accurate performance in all weather conditions and shall be tested to meet NEMA TS-2 environmental standards.

The system shall determine which vehicles are within the predetermined dilemma zone and place a call to the controller. Gaps within the dilemma zone shall then be identified such that the corresponding phase call will be dropped and the phase safely terminated.

The system shall include a simple setup routine that will automatically configure and calibrate the sensor for proper operation during installation.

The sensor shall also be capable of being programmed and updated from a laptop computer or other portable programming device such as a Pocket PC. Software shall be provided. The graphical user interface shall operate on a Windows platform.

The sensor shall be mounted directly to a pole or mast arm as recommended by the manufacturer. Cable shall be provided as required and recommended by the manufacturer.

Surge protection devices as recommended by the manufacturer shall be included both at the pole where the sensor is located to protect the sensor and in the traffic cabinet to protect the cabinet electronics.

Power shall be provided from the traffic cabinet. The sensor shall consume less than 10 Watts and operate from a DC input between 12VDC and 28VDC. Complete and automatic recovery from a power failure shall be within 15 seconds after resumption of normal power.

All required inputs cards shall be included in the traffic cabinet that are compatible with 170, 2070, NEMA TS-1 and NEMA TS-2 detector racks. The cards shall provide true presence detector calls or contact closure to the traffic controller.

The manufacturer's representative shall provide a six (6) hour training course on the setup, operation and maintenance of the system.

CONSTRUCTION – Locate and mount detector in accordance with manufacturer specifications. Program detector operation per plan.

MEASUREMENT AND PAYMENT – Each. Complete and in place including all required cabinet hardware, mounting brackets, cables, and detection set up equipment with necessary software license and connections tested and accepted.

- ITEM 9956-0772 – RADAR DETECTION SYSTEM, WAVETRONIX STOPBAR

DESCRIPTION - This item of work will consist of furnishing and installing a Stop Bar Detection System utilizing above ground Digital Wave Radar detection techniques.

MATERIAL - The system will be non-intrusive and will detect from 6' up to 140' for a 90° field of view from the sensor. The system will provide real-time presence data for up to 10 lanes and will provide up to eight detection zones simultaneously for intersection control. One sensor will be provided per approach as indicated on the plans, covering multiple lanes where stop bar detection is required. The detection system will include the following list of features and capabilities.

The system will provide accurate presence-detection of moving vehicles. The sensor will be mounted in a forward-fire or side-fire position, looking at either approaching or departing traffic

and will only detect vehicles in one direction of travel. It will maintain accurate performance in all weather conditions and will be tested to meet NEMA TS2 environmental standards.

The system will include simple setup routine that can provide for automatic or manual configuration of lanes, stop bars and detection zones. The sensor will also be capable of being programmed and updated from a laptop computer or other portable programming device such as a personal digital assistant (PDA). Software will be provided. The graphical user interface will operate on a Windows platform.

The sensor will be mounted directly to a pole or mast arm as recommended by the manufacturer. Cable will be provided as required and recommended by the manufacturer.

Surge protection devices as recommended by the manufacturer will be included both at the pole where the sensor is located to protect the sensor and in the traffic cabinet to protect the cabinet electronics.

Power will be provided from the traffic cabinet. The sensor will consume less than 10 watts and operate from a DC input between 9 VDC and 28 VDC. Complete and automatic recovery from a power failure will be within 15 seconds after resumption of normal power.

All required inputs cards will be included in the traffic cabinet that are compatible with 170, 2070, NEMA TS1 and NEMA TS2 detector racks. The cards will provide true presence detector calls or contact closure to the traffic controller.

The manufacturer's representative will be on site during installation and testing and will provide a 6 hour training course on the setup, operation, and maintenance of the system.

Provide training to municipality and/or representative during activation for set up and maintenance of radar system.

Provide all equipment and software necessary to set up and view detection zones.

CONSTRUCTION - Locate and mount detector in accordance with manufacturer's specifications.

MEASUREMENT AND PAYMENT – Each. Complete and in place including all required cabinet hardware, mounting brackets, cables, and detection set up equipment with necessary software license and connections tested and accepted.