



# Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

September 3, 2008

SUBJECT: Various Routes  
Section 2008-002 TS  
Various Counties  
Contract No. 60E15  
Item No. 56, September 19, 2008 Letting  
Addendum A

## NOTICE TO PROSPECTIVE BIDDERS:

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

1. Revised pages 27, 30, 67, 70, 96, 104, 105, 134, 141, 148, 150, 162, 229, 235, 267, 320, 323 & 326 of the Special Provisions.

Prime contractors must utilize the enclosed material when preparing their bid and must include any Schedule of Prices changes in their bidding proposal.

Bidders using computer-generated bids are cautioned to reflect any and all Schedule of Prices changes, if involved, into their computer programs.

Very truly yours,

Eric E. Harm  
Interim Bureau Chief  
Bureau of Design and Environment

A handwritten signature in black ink, appearing to read "Ted B. Walschleger" with a small "P.E." to the right.

By: Ted B. Walschleger, P. E.  
Engineer of Project Management

cc: Diane O'Keefe, Region 1, District 1; Mike Renner; Estimates

TBW:MS:jc

## SCHEDULE OF PRICES

Item	Item Description	# of Bid Locations	Units per Location	ELU**
[L-1	Lighting System - On-Expressway	245	3.00	735.00
[L-2	Lighting System - Off-Expressway	180	1.50	270.00
[L-3	Lighting System - Other Luminaires	91	0.25	22.75
P-1	Pump Stations > or = 4 Pumps	27	6.00	162.00
P-2	Pump Stations < 4 Pumps	21	4.00	84.00
S-1	Surveillance System - Ramp Controls	118	1.00	118.00
[S-2	Surveillance System - Cabinets	644	0.25	161.00
S-3	Surveillance System - Expressway DMS	40	2.00	80.00
S-4	Surveillance System - Arterial DMS	15	1.00	15.00
T-1	Traffic Signal System - Signals	2445	1.00	2445.00
T-2	Traffic Signal System - Flashing Beacons	275	0.25	68.75
X-1	Extra Systems	89	0.50	44.50

[ **Total Equivalent Location Units (ELUs)** **4206.00**

**Bid Price per ELU per month**

\$

**Monthly Cost of Routine Maintenance (Bid Price per ELU X Total ELU)**

\$

**Routine Maintenance/Yr (Monthly Cost X 12)**

\$

**\*\*Equivalent Location Units (ELUs) = # of Bid Locations X Units per Location**

<b>GF02</b>	Fiber Optic Lateral Installation SM	Ea	8	\$	\$
<b>GF03</b>	Fiber Optic Cable, Hybrid 12 MM & 12 SM	Ft	5,000	\$	\$
<b>GF04</b>	Fiber Optic Termination Panel, 12F or 24F	Ea	5	\$	\$
<b>GF05</b>	Fiber Optic Patch Panel, 96 SM	Ea	5	\$	\$
<b>GF06</b>	Fiber Optic Splice Enclosure	Ea	5	\$	\$
<b>GF07</b>	Fiber Optic Innerduct, up to 1 1/2"	Ft	5,000	\$	\$
<b>GF08</b>	Fiber Optic Cable, Install Only	Ft	5,000	\$	\$
<b>GFC1</b>	Foundation, Concrete, Type 1	Ft	20	\$	\$
<b>GFR1</b>	Foundation Removal	Ea	5	\$	\$
<b>GGR1</b>	Ground Rod	Ea	40	\$	\$
<b>GH01</b>	Handhole	Ea	8	\$	\$
<b>GH02</b>	Handhole, Fiber Optic	Ea	4	\$	\$
<b>GH03</b>	Handhole, Heavy-Duty	Ea	4	\$	\$
<b>GH04</b>	Handhole, Heavy-Duty, Double	Ea	4	\$	\$
<b>GH05</b>	Handhole, Heavy-Duty, Special	Ea	4	\$	\$
<b>GH06</b>	Handhole, Remove	Ea	10	\$	\$

		Make Timely Repairs, or Fix Outages
\$200.00	\$300.00	Failure to Provide Documentation
\$200.00	\$300.00	Failure to Provide Timely Repair/Replacement of Parts
\$200.00	\$300.00	Failure to Provide Proper Service
\$200.00	\$300.00	Failure to Provide Reports/Communication
\$200.00	\$300.00	Failure to Follow Specified Procedures
\$200.00	\$300.00	Failure to Provide Proper Staffing
\$2000.00*		Blocking Lane or Ramp to Traffic
\$5000.00*		Blocking Two Lanes to Traffic
\$200.00	\$300.00	Improper Use of Materials or Methods
\$500.00	\$1000.00	Failure to Replace State Stock
\$500.00	\$3000.00	Failure to Return State Stock at End of Contract

\*per each and every 15 minute interval or portion thereof that a lane is blocked outside the allowable time limitations

**4.5 Contractor Facility Requirements**

**4.5.1 General Requirements**

At the time of bidding the Contractor shall have an established business presence in the District to assure the timeliness of the assumption of the contract work on the first day of the Contract.

The Contractor shall have and maintain adequate facilities at all times for the timely completion of work under this contract. These facilities shall include an EMC Office and 24-hour Dispatch Center and other permanent facilities, which may be strategically located, geographically, to support the Contractor's work force. The size and type of facility may vary depending on the location, type, and quantity of electrical equipment to be serviced within that area.

All Contractor's facilities shall be complete and ready for operation no later than December 23, 2008, ready for a demonstration inspection by the Engineer, except that dial-up phone numbers which are transferred from the outgoing contractor need not be established by the Contractor until a mutually acceptable date is arranged with the Engineer.

**4.5.2 EMC Office**

The Contractor shall establish, for the duration of this Contract, a contractor's office in-District, (in the six county area covered by this Contract) for management of all contractor work under this Contract. This EMC office may be a satellite office remote from the Contractor's headquarters or it may be a singular and clearly-defined section within the Contractor's in-District headquarters. In order to facilitate communication and shared interest in contract matters, the contract management and technical/administrative functions as defined herein and represented in the Contractor's organization chart shall not be dispersed throughout various areas of the Contractor's operations but shall be established here

**supervisory field inspection personnel and communications center personnel shall be provided new units with features equal or better than Nextel i880. To maximize productivity for emergency response patrolmen, supervisory personnel, and specific personnel as requested by the Department, unlimited direct talk and voice, a 2.0 megapixel camera, email and photo transmittal capability, and monthly 100 text use shall be provided in units equal or better than Nextel i880.**

Cigarette lighter charger/adapters, AC recharging units in the form of cords, largest Lithium-Ion battery available, separate carry case or protector (unless flip-top model), belt carry attachment, and twenty-five (25) hands-free receivers equal or better than Motorola H710, meeting all requirements of state laws and designed for the approved model, shall be provided for Department units. As these units are used for field work, it may be necessary for the Contractor to replace up to five inspector units or receivers, and furnish additional new parts, holsters, chargers, adapters or batteries to all units, as necessary, during each contract year. The Contractor shall furnish field email access for data/photo transfers for each unit, all necessary cables, original CD with PC compatible software for the programming of numbers, name changes, and other programmable functions, and device necessary for the copying of SIMS cards.

Each communication unit shall be new, and models and accessory equipment shall be approved by the Engineer prior to purchase or lease by the Contractor. The Contractor shall submit catalog cuts of the proposed system, units, and programming software, at the Pre-Construction Meeting.

The list of proposed call numbers shall be furnished to the Engineer for approval and assignment by December 1, 2008. The system shall be purchased or leased, and units delivered, ready for programming, with applicable software and cables, by December 15, 2008.

The Contractor is responsible under routine maintenance for the monthly billing and other provider assistance as necessary for data transfers and proper operation of the communication units.

#### **4.6.2 Voice and Data Communication Lines**

The Contractor shall have the following telephone and data communications lines installed and fully operable by January 1, 2009:

- One (1) high speed T-1 data line between IDOT and the Dispatch Center for the Lighting and Pump Station SCADA and EMCMS connections
- One (1) dedicated “hot-line” (PLNC) between the Dispatch Center and the ComCenter
- A minimum of eight (8) incoming voice lines to the Dispatch Center available to police agencies, etc. (The Contractor shall not utilize an automated voice-answering or voice mail option for the Dispatch Center.)
- Minimum of one (1) high speed data line from the nearest EMCMS node to the EMC Contract Office for the EMCMS terminals.
- One (1) telephone lines (DID or POTS) at the Dispatch Center for dial-up access to the Pump Station’s AEGIS equipment
- One (1) telephone line (DID or POTS) at the Dispatch Center for dial-up access to the Lighting SCADA
- Three (3) telephone lines (DID or POTS) at the Dispatch Center for dial-up access to the Pump Station SCADA
- One (1) telephone line (DID or POTS) at the Dispatch Center for dial-up access from the PS SCADA field processor to the PS SCADA

permitted on weekdays (Monday through Friday) from 5:00 a.m. to 9:00 a.m. and from 3:00 p.m. to 7:00 p.m. Lane closures hours, if needed, will be determined by the expressway Traffic Operations Engineer, and will be made a part of the Traffic Control Plan.

The approval for emergency closures or emergency moving operations during the normal workday, shall be requested from the Expressway Traffic Operations Engineer (847-705-4151). After office hours request for approval shall be made to the ComCenter, (847-705-4612) as soon as the need is determined, prior to the Contractor's arrival on the expressway.

All daily lane closures shall be removed during adverse weather conditions such as rain, snow, and/or fog and as determined by the Engineer.

Additional lane closure hour restrictions may have to be imposed to facilitate the flow of traffic to and from major sporting events and/or other events.

Private vehicles shall not be parked in the work zone. Contractor's equipment and/or vehicles shall not be parked on the shoulders or in the median during non-working hours. The parking of equipment and/or vehicles on State right-of-way will only be permitted at the locations approved by the Engineer.

#### 4.14.3 Payment for Traffic Control

Traffic Control and protection will not be paid separately but shall be considered as incidental to the contract and the cost for all work shall be included as part of the unit bid prices for the routine maintenance pay items. These contract unit prices for routine maintenance shall be payment in full for all labor, materials, transportation, handling and incidentals necessary to furnish, install, maintain, replace, relocate and remove all traffic control devices indicated in these specifications.

Where non-routine work requires the use of pay items which specifically allow additional payment for non-routine traffic control and protection, payment will be made in accordance with the applicable unit bid prices of the non-routine traffic control pay items included in the Contract. Otherwise, the traffic control plan costs shall be incidental to the non-routine items.

#### 4.14.4 Traffic Control Deficiencies and Liquidated Damages

Upon notification from the Engineer or Department Expressway/Traffic Operations personnel, the Contractor shall dispatch qualified personnel immediately to make needed corrections of deficiencies that constitute an immediate safety hazard and/or the blocking of traffic lanes or ramps. **If the Contractor fails to correct the deficiency within the specified time, a daily monetary deduction will be imposed, in accordance with Article 105.03 (b) of the Standard Specifications.**

Should the Contractor fail to completely open and keep open all the traffic lanes to traffic or fails to restore the required traffic control and protection, in accordance with the limitations specified under the Special Provisions for "Keeping the Expressway Open to Traffic", the Engineer will impose daily monetary liquidated damages for each 15 minute interval (or a portion thereof) that the deficiency exists. This time period will begin with the time of notification to the Contractor and end with the Resident Engineer's acceptance of the corrections. (Refer to liquidated damages in Article 4.0)

#### 4.15 Vehicles

##### 4.15.1 General Requirements

The Contractor shall provide at all times sufficient vehicles and construction equipment to perform the routine and non-routine work and specialized operations required and described herein. The Contractor is expected to be familiar with the extent of systems to be maintained under this contract and the equipment necessary to provide the specified work response. Failure to have adequate equipment to perform the work shall not be sufficient grounds for the delay of routine or other authorized work. The equipment shall be owned or under long-term lease to the Contractor, and available at all times for the Contractor's use.

The Contractor's vehicles, including but not limited to the minimum special equipment listed herein, shall be in good working condition and physical appearance (no rust) to be suitable for providing timely

Accuracy: +/- 1.25 % of full scale deflection on 2.8” arc length

Lo-Ω resistance Resistance: 0 to 5,000 Ohms@ 3 V +/- 0.2 V  
 Voltage: 0 to 600 Volts  
 Accuracy: +/- 3 % of reading

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Power Source: Hand Crank/Line/Battery  
 Make: Megger or approved equal

Two (2) AMPROBES, which meet the following requirements:

Current AC

Range:	1 A - 600 A, AC	1 A - 1,000 A, DC
Lowest:	0.5 A	0.5 A
Accuracy:	2 % + 0.5 A	2 % + 0.5 A
Useable Frequency:	DC – 10 KHz	
Output Levels:	1 mV/A	
Power Source:	Rechargeable Battery	
Make:	Fluke 80-i1010 or approved equal	

Three (3) CLAMP-ON GROUND RESISTANCE METER, which meet the following requirements:

Range	0.1Ω to 1.00Ω	1.0Ω to 50Ω	50Ω to 100Ω	100Ω to 200Ω	200Ω to 400Ω	400Ω to 600Ω	600Ω to 1200Ω
Resolution	0.01Ω	0.1Ω	0.5Ω	1Ω	5Ω	10Ω	50Ω
Accuracy	±(2%+2)	±(1.5%+1)	±(2%+1)	±(3%+1)	±(6%+2)	±(10%+1)	±(25%+1)
Current Measurement Ranges	Auto-Ranging 1mA to 30.00 Arms						
Range	300 mA, 3 A, 30A						
Resolution	1 mA, 0.001 A, 0.01 A						
Accuracy	± (2.5% + 2)						
Power Source:	Battery						
Make:	AEMC 3700 Clamp-On Ground Resistance Meter or approved latest equal model						

| One (1) Set Fiber Optic Light Source and Detector for testing both SM and MM fiber optic cables, Noyes Model SMLP 5-5 or equal

| Deleted

## Article 5.0 -- Routine Maintenance Work and Payment

### 5.1 Control of Work

Except as notified in writing by the Engineer, the Contractor is automatically authorized and required to perform routine maintenance work, which includes response, scheduled and preventative actions on all state maintained electrical Systems in a manner prescribed in this Contract.

Unless certain work is specifically described herein to be non-routine work, all work required by the Contract shall be incidental to the requirements of routine maintenance. Specific items of routine maintenance work are described under the description of work for each respective system. General requirements in support of routine maintenance are included in, but not limited to, this article.

The Engineer appointed for this Contract will be responsible for the control of the work in conformance with Section 105 of the Standard Specifications for Road and Bridge Construction, and contract Special Provisions.

The Contractor shall continuously watch for System elements that are malfunctioning or in need of replacement. Malfunctioning equipment shall be repaired or replaced as part of routine maintenance. The Contractor shall, however, submit a Contractor Advisory, per Article 5.13.4, for items which are a safety risk or due to age have become prone to imminent failure, and receive non-routine payment for the material portion of the repair.

The Contractor shall document to the Engineer that the various items of equipment at all locations perform properly, that maintenance operations for the respective installations and systems prescribed by this contract are not to be interrupted, that maintenance completion dates as specified or agreed are met, and that repair work as performed on system equipment meets all applicable codes and IDOT requirements.

The Contractor is responsible to perform maintenance under this Contract which prevents operational problems, minimizes trouble calls, safeguards electrical safety, promotes operational safety and which prolongs the operations life of installed systems. Some of these maintenance activities will be initiated by the Engineer, some will be jointly developed between the Contractor and the Engineer, and some are expected to be routine maintenance obligations of the Contractor.

The Engineer may make frequent investigations of Contractor work and periodic inspections of the respective systems and installations to determine if all maintenance operations are being performed satisfactorily and in the manner specified in the Contract.

Refer to systems articles herein to review required maintenance programs which may be paid either through the monthly routine work payment or may be individually authorized through the non-routine bid items.

an EMCMS ticket for repair. The EMC dispatcher shall notify the IDOT ComCenter and Advanced System Maintenance Contractor (ASMC) of the problem.

**Tower Knockdown and Reset:**

Within ten (10) calendar days from notification of a tower knockdown, the Contractor shall install temporary lighting (under routine maintenance) to restore lighting service and shall provide catalog material cuts for the tower replacement to the Engineer for approval. Following the approval of the catalog cuts, and receipt of a non-routine authorization, the Contractor shall order the material and complete the reinstallation of the light tower within a three (3) month period. The Contractor shall be paid for permanent restoration/repairs to light towers damaged by motorists through applicable non-routine pay items.

**Block Retaining Wall and Pad:**

If a light tower block retaining wall and adjacent concrete pad are found to be damaged, they shall be promptly repaired.

**Site Maintenance:**

The Contractor shall clear all vegetation within the 10 ft area surrounding a light tower.

**Rust:**

The Contractor shall inspect rust on outside of the shaft and at all slip joints during the wash/relamp and tower inspection programs. The location and magnitude of the rust spots shall be described in detail on the inspection report. Contractor shall note if immediate corrective action is necessary by submitting a Contractor Advisory Report. Any rust spots, found within 20 feet from ground, shall be cleaned and touched up at the time of the wash/relamp or tower inspection program through routine maintenance. If the Engineer determines the need to paint the whole tower, the Contractor shall be paid through Non-Routine maintenance pay items.

**Analysis Report:**

The Contractor shall subcontract to conduct an analysis and inspection for rust at tower slip joints on twenty (20) light towers per year (selection as approved by the Engineer). The Contractor shall use a program equal to Utilivations Mast Check ([www.utilivations.com](http://www.utilivations.com)) which records a complete 360 degree digital video record of the entire tower exterior (pole surface, slip joints, and foundation) while performing data collection. (This program is similar to other Department of Transportation (DOT) agencies programs which use CCTV to test for safety.) A summary report shall be provided to the Engineer with photo analysis. The repair of any defects as found shall be paid through non-routine maintenance, using pay items when applicable.

The Contractor shall also inspect the following on the twenty (20) towers:

- **Corrosion Depth at Base of Tower:**  
Measure and record the thickness of the tower material at eight (8) points around the base using an ultrasonic meter. The eight points will consist of one point six (6) inches above the base and another at eighteen (18) inches above the base. There will be four (4) sets of these points spaced at approximately 90 degrees around the tower base.
- **Base Weld Cracks:**  
The vertical tower column is connected to the base with a fillet weld. Clean and prepare the surface for a dye penetrant test by mechanically removing the paint and other coatings followed by a chemical cleaning on each tower to detect the presence and extent of weld cracks.
- **Anchor Bolts:**  
Use an ultrasonic testing system to analyze each anchor bolt searching for cracks within the first 6-8 inches.

If it is determined that the tower, foundation and/or anchor bolts needs to be replaced due to corrosion or damaged then the defective component shall be replaced using non-routine pay items.

**The six (6) locations to be modified in the first year of contract are:**

**L0825 - I 90 @ Cumberland Ave., PC:E, L0890 - I 90 @ Van Buren St., PC:Z, L0945 - I 90/94 @ 27<sup>th</sup> St., PC:X, L0950 - I 90/94 @ Normal Ave., PC:Y, L0955 - I 90/94 @ Wallace St., PC:Z, L0960 - I 90/94 @ 21<sup>st</sup> St., PC:A.**

**If the contract is renewed for a second year, the six (6) locations to be modified are:**

**L0965 - I 90/94 @ 17<sup>th</sup> St., PC:B, L0970 - I 90/94 @ Maxwell St., PC:C., L0975 - I 90/94 @ Polk St., PC:D, L0150 - I 55 @ Central Ave., PC:X, L0177- I 55 @ IL 171 PC:Z, L0435 - I 57 @ IN. Harbor Belt RR, PC:H.**

If one of these control cabinets is replaced for any cause whatsoever, then it is the Engineers option to designate an alternate location to keep the same number of locations per contract year.

The Contractor is responsible for scheduling the work and for coordinating with the Engineer whenever Engineer-witness functions are required. The Contractor shall also advise the Engineer when each location is complete and shall provide a written certification to that effect. The Engineer reserves the right to require a final inspection of the changeover at any or all of the locations certified as complete. Should deficiencies be found upon inspection, a corrective work list will be prepared. The Contractor shall provide a progress report in the monthly routine maintenance submittal book.

The Contractor shall be responsible for all traffic control and temporary provisions required for the work, all at no additional cost to the contract. All materials and work shall be in conformance with the requirements of applicable contract specifications and Article 250 of the National Electrical Code.

The Contractor shall be responsible for coordination with the Electric Utility as necessary and shall be responsible for any modifications arising from the work. Although it is anticipated that all service shall be restored on the same day and if for any reasons it is not completed on the same day, then the Contractor shall provide generator power or make temporary service connections as necessary to assure continuity of operations as modifications are made at no additional cost to the contract.

The work will generally include:

- **New conduit and cable from the service disconnect to the controller cabinet up to 100', additional length, if needed, shall be paid under non-routine pay items.**
- **Restoration of ground with seed or sod**
- **New grounding of the service except the existing grounding is adequate witnessed by the Engineer**
- **Removing of the old cabinet and transferring into State Stock.**
- **Replacing with new SCADA type cabinet with the same radio code**
- **Co-ordinate the RTU terminal and FIU configuration GUI modification**
- **Testing and documentation**

**The foundation, if modified or replaced, shall be paid using non-routine pay items.**

#### **Replace Electric Service Conductors**

The work shall include the removal of the existing service conductors and shall include the furnishing and installing a new service conductors, based on the manner of the existing service

#### **Provide New System Ground of Electric Service**

The work shall include the installation of a new system ground, using one or more ground rod grounding electrodes, or other means approved by the Engineer. The system ground shall have a resistance to earth not to exceed 10 ohms. The system ground resistance shall be verified by a contractor test, using the fall-of potential method and witnessed and approved by the Engineer, with a record of the test entered by the Contractor and signed by the Contractor and the Engineer. Ground resistance readings shall be submitted on progress reports. Should more than one electrode be required to establish a low enough resistance, additional electrodes shall be connected to the grid, with re-testing. All ground electrode connections shall

OSHA safety regulations must be followed at all pump stations. Any Contractor personnel entering a pump station shall be properly trained and equipped for confined space entry.

The Pump Station Manager shall be notified of any reports of possible hazardous materials in the pump station wet pits, and he shall be responsible to immediately contract the services of an approved full service materials waste contractor to remove the hazardous material and dispose of properly off of state property. (Refer to Article 4.0)

~~The Contractor's responsibility is to provide the immediate hazmat response by an approved company and insure compliance in accordance with Article 4.0. The Department is responsible for payment to the approved hazmat company for their services.~~

#### 8.4.2 Station Procedures and Response Documentation

EMC personnel shall not manually operate the pumps with insufficient wet pit water elevation, for general maintenance operations, including pump inspection, wet pit cleaning, and all other wet pit work. Contractor shall use his own pump equipment to de-water the wet pit.

Two log books are maintained in each pumping station to document entry/inspection. The Contractor shall maintain the log books so that one book contains the current year information and the second log book contains information recorded in the previous years. In January of each year, the Contractor shall transfer the sheets from the current year log book to the previous year log book and place blank sheets in the current year log book. The Contractor shall furnish a new log book for newly rehabbed pump stations. The log book shall not be altered or removed from the station.

There are specific procedures, which are required of all personnel when entering or leaving any pump station. It is necessary to:

- Notify the EMC Dispatch Center of arrival (10-7)
- Complete log book chart I, with the date, time, persons name and reason for entry
- Upon completion of inspection, record the observations in the required charts in the log book.
- Notify the EMC Dispatch Center to issue a Ticket for any deficiencies, observed during the inspection. (Refer to Article 5.0 for Ticket requirements and procedures.) Record the ticket number and the deficiency in the logbook.
- Acknowledge any alarms before departure
- Check all pumps that are not tagged "Out of Service" and set in the auto position (H-O-A switch) immediately before departing the pump station
- Secure all station doors and hatches
- Notify the EMC Dispatch Center of departure (10-8)

#### 8.4.3 PS Alarm Response

Upon receipt of an AEGIS and/or SCADA Pump Station alarm, the EMC Dispatch Center shall:

1. Create a ticket.
2. For all alarms, except entry alarms, dispatch a patrolman to the station, to check the alarm. Arrival shall be within one hour of the receipt of the alarm. For entry alarms (Zone 1), notify the IDOT ComCenter and the respective police department for the station, for a police escort for the patrolman. He shall not enter the premises without having the pump station investigated by the police. (Refer to Article 5.0 for information on procedures for incidents of intrusion, vandalism or theft).

Upon arrival at the station, the patrolman shall:

1. Notify the EMC Dispatch Center of the arrival information, including a notation of all alarms flashing on the annunciator and SCADA panel.
2. Record all information on the incident in the log book
3. Perform all necessary repairs required to restore the pump station to its normal operating condition, if possible. (If follow-up repairs are needed in an emergency situation, notify the PS Manager immediately.)

The Contractor shall submit a detailed temporary pumping operating plan, to the Engineer for approval, at the Pre-Construction meeting, for all maintenance activities which will directly affect normal inflow and outflow pumping operations. The Temporary Operating Plan submittal shall include a list of suppliers that, on an immediate on-call basis, can provide the Contractor with temporary pumps, or generators, to maintain the outflow capacity.

A back-up generator(s) shall be immediately mobilized to each pump station when the Contractor is notified of a high water level or alarm, or water on the pavement due to a power failure. Upon approval of the Engineer, the Contractor may utilize the two 200KW generators which are normally kept in state stock. These generators may not be considered in the Contractor's temporary pumping operations plan.

## **8.5 Service Companies**

### **8.5.1 Submittals of Service Company Names**

The Contractor shall submit the following, for Engineer approval, at the Pre-Construction meeting:

- Names, addresses qualifications of at least six potential vertical/submersible services repair companies within the tri-state area of Illinois/Indiana/Wisconsin.
- Name(s) of lab facilities that are certified and equipped to test oil and other lubricant fluids.

### **8.5.2 Service Company Work**

When the Contractor is unable to complete repairs to pump station equipment, the Contractor shall provide an IDOT approved Service Company to supplement his forces in order to meet contract requirements.

The Contractor shall provide all labor, equipment, and general services necessary to schedule and assist a specialty service company in conducting various comprehensive testing and inspections, including routine and non-routine work.

The Contractor shall coordinate the work with the service companies and provide qualified personnel to:

- Allow free and clear access to and from the pump station and all equipment
- Open and close all enclosures to provide access to the electrical equipment being inspected, replaced and/or repaired.
- Notify the power utility company to schedule all power outages required for the project.
- Perform all switching, de-energizing and re-energizing of electrical equipment
- Perform lock out tag out procedures
- Provide safe working conditions in accordance with OSHA requirements
- Assist in data collection when requested by the Engineer

## **8.6 Scheduled Daily Maintenance**

### **8.6.1 Daily SCADA Maintenance**

**The Contractor shall be responsible for proper operation and maintenance of all SCADA System equipment described herein. (Refer also to PS SCADA equipment/ComCenter monitoring in Article 11.0, Extra Systems.)**

On a daily basis, the SCADA Specialist shall review the daily operations of the SCADA System. The SCADA System, including the Master, Slave and RTU equipment shall have its periodic maintenance activities/programs completed by the SCADA Specialist. This work would include, but is not limited to system back-ups, central algorithms, Windows OS debugging, Tescode and/or RSView Programming, Liquitronic 5 Firmware, modem configuration, database and archive array configuration and collating.

**8.10.15 Tube Type Pump Maintenance – Year 2009 Only**  
**PS #5, 22 and 23**

The maintenance program shall be completed by September 2009

The Contractor personnel and/or service company shall:

- Remove the pumps, inspect and replace, if necessary, the upper mechanical seals. The condition of the mechanical seal is satisfactory if no fluid leakage (contaminant) or only light seepage out of the inner hole in the casing.
- Dismantle the pump partially, if fluid has leaked, which is evidence that the bearing has also been affected. Check the mechanical seals and replace if necessary.
- Replace the roller bearing grease, if water has penetrated into the bearing.
- Drain all the leakage fluid and the liquid seal, and refill with a sealing fluid as recommended by the manufacturer.

**8.10.16 Yeoman Pump Maintenance - Year 2010 Only**  
**PS # 21, 27, 29, 30, 42**

In June 2010, at stations with Yeoman Pumps, the Contractor shall:

- Drain, flush and refill the seal chamber with new oil.
- Inspect oil for water intrusion in the motor seal chamber.
- Inspect the cable for any signs of abrasion or damage.
- Inspect the impeller and casing wear ring.
- Notify the Engineer in advance of this scheduled work.
- Create tickets for any problems found during the inspection.

**8.10.17 Yearly Generator Maintenance**

**PS # 9, 11, 15, 18, 19, 25, 28, 34, 36, 39, 41, 42, 47, Two in State Stock**

The Contractor shall perform inspection and maintenance required for the standby generators in October of each year as follows:

- Change oil and oil filters
- Drain, flush, and replace coolant
- **Replace cooling system hoses in 2010**
- **Replace thermostats in 2010**
- **Replace fan belts in 2010**
- Check and adjust valves as necessary
- Conduct operational inspection to insure proper valve rotation
- Check fan hub
- Check pulley
- Check water pump
- Change the day tank breather
- Clean or replace the crankcase breather
- Change fuel filter
- Drain sediment from the fuel tank
- Clean accumulation of grease, oil and dirt on set
- Lubricate generator bearing
- Check vibration isolators for proper adjustment and conditions
- Check circuit breaker and transfer switch, and test equipment by simulating a power outage

**Installation.** The Contractor shall notify the electric utility marketing representative a minimum of 15 working days prior to the anticipated date of hook-up. This 15 day advance notification will begin only after the electric utility marketing representative has received service charge payments from the Contractor. The Contractor shall ascertain the work being provided by the electric utility and shall provide all additional material and work required to complete the electric service work in complete compliance with the requirements of the utility. No additional compensation will be allowed for work required for the electric service, even though not explicitly shown on the Drawings or specified herein. Service cable shall be paid for via separate pay item elsewhere herein.

**Basis of Payment.** This work will be paid for at the contract unit price each for:

GE12 ELECTRIC SERVICE, PEDESTAL OR POLE MOUNTED, COMPLETE

GE13 ELECTRIC SERVICE, RELOCATE

which shall be payment in full for furnishing and installing the service installation complete. Any charges by the utility company to provide electrical services to the service installation will be paid for in accordance with the Standard Specifications for Road and Bridge Construction.

### **GF01 Fiber Optic Trunk/Distribution/Lateral Cable Single Mode Up To 96 SM**

**Description:** This item shall consist of furnishing, installing, and testing a loose tube, single-mode, fiber-optic cable of the type, size, and number of fibers specified, at the locations shown on the plans and shall be in counts of 12, as specified by the Engineer.

**Materials:** The single-mode, fiber optic cable shall incorporate a loose, buffer-tube design. The cable shall be qualified to the requirements of RUS 7 CFR1755.900 (PE-90) for a single sheathed, non-armored cable, and shall be new, unused and of current design and manufacture.

The cables shall use dispersion unshifted fibers. The optical and physical characteristics of the un-cabled fibers shall include:

Core Diameter	8.3 μm (nominal)
Numerical Aperture	0.14
Zero Dispersion Wavelength	1300-1322 nm
Zero Dispersion Slope	0.092 ps/(nm <sup>2</sup> *km)(maximum)
Cladding Diameter	125.0 ± 0.7 μm
Core-Clad Concentricity	0.05 μm maximum
Cladding Non-Circularity	1% maximum
Coating Diameter	245 ± 10 μm
Coating-Cladding Concentricity	12 μm maximum
Mode Field Diameter	9.2 μm ± 0.4 μm at 1310 nm
Mode Field Diameter	10.4 μm ± 0.5 μm at 1550 nm
Dispersion	18.0 ps/(nm*km) maximum at 1550 nm

The number of fibers in each cable shall be as specified on the plans.

For cables with more than 12 fibers, the core construction shall consist of individual buffer tubes, each containing 12 fibers. These buffer tubes shall be stranded around a dielectric central strength member using a reverse oscillation process. For cables containing 12 fibers or less, the core shall use a unitube construction with either 6 or 12 fibers in a single tube.

The individual fibers and buffer tubes shall be identifiable by means of a color-coding scheme as specified in TIA/EIA-598.

The maximum attenuation of any cabled fiber shall not exceed 0.4 dB/km at 1310 nm and shall not exceed 0.3 dB/km at 1550 nm.

Where identified on the plans, or as directed by the Engineer, additional lengths of fiber shall be stored, as maintenance coils. The aggregate lengths of the maintenance coils and the slack fiber will be used to repair and maintain the fiber optic cable.

Fiber optic cable shall be tagged inside hand holes with yellow tape containing the text “CAUTION – FIBER OPTIC CABLE.” In addition, permanent tags, as approved by the engineer, shall be attached to all cable in a hand hole or other break-out environment. These tags shall be stainless steel, nominally 0.75” by 1.72”, and permanently embossed. These tags shall be attached with stainless steel straps, and shall identify the cable number, the number of fibers, and the specific fiber count. Tags and straps shall be Panduit or approved equal.

**Method of Measurement:** The fiber optic cable of the number of fibers specified will be measured for payment as the number of feet (meters) of cable, including lengths stored as splicing slack and maintenance coils, actually furnished installed and tested.

**Basis of Payment:** FIBER OPTIC CABLE of the number of fibers specified shall be paid for at the contract unit price per foot, which cost shall include the cost of furnishing all labor, material, documentation, tools and equipment to install and test the fiber optic cable.

Fiber optic termination panels, splice closures, connectors, splice vaults and hand holes will be supplied and paid for under other contract items.

### **GF02 Fiber Optic Lateral Installation SM**

**Description:** Work under this item shall consist of furnishing and installing a fiber optic termination panel, 12 SM fiber optic cable, splice closure, pigtails and patch cords, testing, and documentation to connect a surveillance cabinet or pump station to the trunk or distribution cable.

#### **Materials, Construction Requirements, and Installation:**

- Fiber optic cable refer to GF01 requirements
- Fiber optic termination panel refer to GF04 requirements
- Splice Closure, refer to GF01 requirements
- Pigtails, patch cords, testing and documentation, refer to GF01 requirements

**Method of Measurement:** The fiber optic lateral installation single mode shall be measured for payment at the contract unit price each which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

**Basis of Payment:** This work will be paid for at the contract unit price each for Fiber Optic Lateral Installation SM, which price shall include furnishing and installing the 12 SM fiber optic cable, splice closure, pigtails and patch cords, testing, and documentation to connect a surveillance cabinet or pump station to the trunk or distribution cable, as directed by the Engineer.

### **GF03 Fiber Optic Cable, Hybrid 12 MM And 12 SM**

**Description:** This work shall conform with Section 871 of the Standard Specification for Road and Bridge Construction and District Traffic Signal Specifications as directed by the Signal Engineer.

**Method of Measurement:** The Fiber Optic Cable, Hybrid 12 MM and 12 SM, shall be measured for payment at the contract unit price each which cost shall include the cost of furnishing all labor, materials, documentation, tools and equipment to install, test, and make the location operational.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for Fiber Optic Hybrid 62.5/125 multimode (MM) 12 fiber and single mode 12 fiber, which price shall include furnishing and installing the fiber optic cable, necessary slack, cable termination and testing, distribution, enclosures, breakout kits, connectors,

The foundation shall have a depth and size as shown on the contract drawing. The top of the foundation shall extend twelve inches from the surrounding finished grade and the edges shall be beveled. A poured, 4-inch thick concrete pad, 4 feet wide X 4 feet shall be provided in front of the cabinet with an expansion joint. Exact concrete pad dimensions and location shall be confirmed with the Engineer, prior to installation. The ground field shall be a 10 feet triangle as shown on the drawing. Each ground rod shall be within a ground well as detailed on the drawing. No ground well shall be placed in the concrete pad in front of the controller. The cabinet shall be caulked at the base. All the conduit entrances into the cabinet shall be sealed with a pliable waterproof material.

**Method of Measurement.** Lighting Controller, console type, foundation shall be counted each, furnished and installed.

**Basis of Payment.** This item shall be paid at the contract unit price each, for furnishing and installing FOUNDATION, LIGHTING CONTROLLER, which shall be payment in full for the work as specified herein.

### **LF05 Foundation, Modification for Concrete or Metal**

**Description.** This item shall consist of furnishing the necessary labor, equipment, and materials to modify and adjust an existing foundation, concrete or metal, to an elevation as specified herein and as indicated by the Engineer, and the re-installation of the existing light pole or cabinet upon the modified foundation.

**General.** This work shall include removing an existing light pole or cabinet, opening the unit duct, exposing the cable, and pulling the cable out of the foundation in order to adjust foundation, concrete or metal, to an acceptable elevation. The existing unit duct shall be opened in a manner as to minimize bends and not damage the existing electric feeder cable into the adjusted foundation. This work shall meet the requirements of Section 844 of the Standard Specifications for Road and Bridge Construction, current version.

The existing raceway wiring slots are 180 degrees apart, thus in the process of lowering the existing metal foundation, rotation should be in multiples of 180 degrees to assure existing raceway cables can be reused. The foundation shall be lowered with its axis plumb so that the light pole may be reinstalled without the use of shims, grout or other leveling devices.

The foundation shall be adjusted vertically and the base plate shall be level. Extreme care shall be used to achieve the proper final elevation of the top of the foundation with respect to the existing grade. The base plate shall be level and not more than 1" above the highest point of adjacent existing grade.

This work shall include installing a unit duct sleeve, which is the next larger diameter unit duct with respect to the existing unit duct diameter, together with the installation of unit duct compression coupling in line splice on both ends to create a water tight seal. The cable shall be reinstalled and respliced as specified. The hollow foundation shall be filled with densely packed sand. The breakaway couplings or breakaway device and/or hardware, shall not be used to align and reset the pole.

All work shall be performed in a safe manner, include necessary area restoration and shall meet the requirements of Articles 836.03(d) and 1070.01 of the Standard Specifications for Road and Bridge Construction, current version.

**Method of Measurement.** Foundation, modification of concrete or metal, shall be counted, each, modified.

**Basis of Payment.** This item will be paid at the contract unit price per each for FOUNDATION, MODIFICATION FOR CONCRETE OR METAL, which shall be payment in full for the work as described herein.

### **LGF1 Ground Field**

When directed by the Engineer in writing, the Contractor shall furnish where indicated and applicable, all materials, equipment and labor, to perform work as specified and otherwise in accordance with specification. All materials and work not expressly specified but necessary for the proper completion in a neat, workmanlike manner shall be considered incidental and shall be included under this pay item.

The District has in place a Supervisory, Control And Data Acquisition (SCADA) system to remotely monitor, alarm and control its un-manned storm water pumping stations. These stations are to be considered critical systems that must remain operational at all times.

The SCADA system central equipment is in place, operational and several stations, as noted elsewhere herein, have been equipped with the required remote terminal units (RTU's) and interfacing transducer sets. The system has become part of the District's standard for storm water pumping stations, but not all stations have been equipped. Maintenance under this contract includes the prosecution of work to include additional stations in the system's coverage.

For compatibility with the District's existing system equipment, the Pump Station SCADA equipment shall be a RSView/ControlLogix system, as programmed and configured for IDOT District One, as manufactured by Rockwell Automation. Information on the system and local service is available from:

Meade Electric Company Inc.  
9550 W. 55<sup>th</sup> Street Suite A  
McCook, IL 60525  
Phone: (708) 588-2515  
Fax: (708) 588-2501

Englewood Electrical Supply  
41 N. Lively Boulevard  
Elk Grove Village, IL. 60007  
Phone: (847) 640-2500  
Fax: (847) 640-2525

Contact: Scott Myers

Contact: Jeffrey P. Barrett

**All equipment listed below shall be furnished and installed by the Contractor, including but not limited to the mounting of the SCADA equipment, the furnishing and installing of software and hardware and all interconnecting wiring between the SCADA equipment and these devices.**

#### **Materials.**

##### SCADA Equipment PLC

The Contractor shall furnish a Supervisory, Control And Data Acquisition (SCADA) PLC complete with programmable logic controller (PLC), ControlLogix processor A/B model 1756 L61 with 2 Mbytes memory, interface hardware, MMI, communication modems and programming as specified herein and indicated by the Engineer

All furnished equipment shall be UL listed and shall be appropriately labeled as such.

Equipment catalog information shall be submitted to the Engineer for approval (as specified elsewhere herein).

All panel wiring diagrams and programming shall be submitted and approved by the Engineer before the equipment is furnished.

All equipment shall be installed in the SCADA enclosure unless directed otherwise by the Engineer.

The PLC and Versaview 200R shall be mounted inside of the SCADA panel. Install 15" flat panel display in existing cut out. The MMI hardware shall be pre-programmed with the IDOT Universal RSView screen file and shall be configuration and developed for the pump station/location it is installed. The MMI shall come pre-wired for power and integration to the PLC, as per IDOT standard configuration. The enclosure door shall be reinforced to provide rigidity when a MMI key is pressed (no deflection shall be experienced when PLC keys are pressed). The controlLogix chassis

Ethernet hub NetWare part # DS10, Hirschman Spider 8TX shall be furnished and installed at pump stations with fibre optic connections.

#### Miscellaneous equipment

The contractor shall furnish and install in addition to the above equipment wire, wire-way, nameplates, fuses, circuit breaker 20 Amp 120/240V one (1) pole 10,000 AIC Cutler hammer QC1020, as required to make a complete and operational system.

All components shall be labeled with a rigid, two-color laminated, plastic nameplate indicating the enclosed contents. The lettering shall be engraved, at least one-half inch high, and highly contrast with its back-ground. The labels shall be permanently affixed to the cabinetry with stainless steel screws or rivets. All wiring shall be uniquely color coded with its color shown on the associated system documentation. A permanent tag affixed within three (3) inches of every termination shall indicate the function and placement of all connectors. All terminals shall be labeled and identified on the associated system documentation. The interior cabinet door housing the PLC shall have the procedures laminated and posted for replacing any processor equipment and replacing it with a rotating spare; downloading the PLC programs from the other system processors, interrogating the PLC to obtain specific levels of information in registers, and set points. The initial set points for alarms and controls shall be posted. Other abbreviated maintenance and user procedures shall be created, laminated, and posted in appropriate areas, as determined by the Engineer. Samples of all materials and the attachment procedures shall be submitted for approval/revision to the Engineer before Installation.

#### Documentation

SCADA System Operations and Maintenance Manual shall be modified to show the replaced equipment with new. A SCADA system operations and maintenance manual will be provided. This manual shall have complete documentation of all equipment and software installed for an individual pumping station under these specifications. It shall serve as maintenance, trouble shooting and operations guide for the Electrical Maintenance Contractor who is responsible for maintaining the Departments pumping stations. . The manual shall include but not be limited to the following items:

#### Table of Contents

- SCADA system Description
- PLC operation, maintenance and programming Manual
- Set point table listing all programmable set point values
- PLC input/output designation table
- Telemetry, control and alarm message specifications
- List of materials supplied
- All supplied equipment catalog cuts
- Copies of all station labeling
- Full size wiring diagrams (as described herein)
- Cumulative storage curves and calculations
- back-up control operations and elevations
- PLC field replacement procedures

**Four (4) copies of these manuals shall be furnished.**

#### Diagrams

All circuit, system, wiring, block and interfacing diagrams shall be modified to show all new equipment and devices. The complete set of diagrams provided shall completely illustrate all wiring and equipment installed under these specifications including: termination points, equipment labeling, mounting and Installation dimensions and wiring. Seven four (4) copies of each of these diagrams shall be provided prior to the beginning of the final acceptance testing. Each diagram shall be stamped record drawing and shall reflect all final wiring and Installations. A minimum of the following diagrams shall be provided:

- PLC I/O wiring diagram (drawing)
- Pumping station network diagram that will show communication interface
- Telemetry panel diagram (control panel Drawing)
- A complete block diagrams of all telemetry and control equipment installed

**Central and Engineering Processor Programs.** The SCADA system consists of three (3) central processors (IDOT Schaumburg, IDOT electrical maintenance office and EMC) and two (2) engineering processors.

Each processor in the system shall be configured, by the Contractor, to communicate, monitor, archive all I/O points, control and alarm each additional PLC installed in a pumping station over a communication media.

Software revisions or modifications required to integrate additional PLC's into the existing processor shall be provided by the Contractor. Processor functionality and integrity shall be maintained with each added PLC.

All mounting apparatuses necessary to rigidly mount the SCADA panel. Conduits, wiring and fittings as required for a complete operational system is included in this pay item.

All equipment furnished and installed under this item shall be appropriately identified with nameplates as specified under Basic Materials and Methods, elsewhere herein.

**Removal and Installation.** The Engineer shall designate the Pumping Station to facilitate the removal and installation of SCADA PLC. No splicing.

The Contractor shall maintain the operation of the pumping station. All operations shall be subject to approval of the engineer.

The Contractor shall protect adjacent material, equipment and areas during process of removal and replacement of SCADA panel operations from all dirt, dust, debris or damage of any kind.

The SCADA equipment shall be rigidly mounted with an Engineer-approved mounting means. The Flex I/O shall be installed on a Custom Bracket design as approved by the engineer.

All software shall be configured, installed and interfaced with existing SCADA system at the pumping station and at both central and satellite location to provide a complete and operational system

All equipment furnished, installed or mounted for this pay item shall conform to the NEC and applicable specifications for Basic Materials and Methods, elsewhere herein.

The Contractor shall submit catalog cuts, design drawings and product data for the Engineers approval prior to installation including all software as specified elsewhere herein. Three complete sets of record drawings, catalog cuts and O&M manuals shall be provided upon completion for Engineers approval.

All equipment needed and recommended by the manufacturer to ensure system warranty shall be furnished, including miscellaneous mounting apparatuses.

#### Startup / Training (on-site)

A minimum of eight hours of on site support shall be included for each pump station for start-up and training.

**Method of Measurement.** Each furnished and installed SCADA EQUIPMENT and removal of existing SCADA PLC with associated devices as specified above and approved by the Engineer shall be counted as a unit for payment

**Basis of Payment.** This work shall be paid at the Contract unit prices each for PS01 PUMP, SCADA EQUIPMENT, FURNISH AND INSTALL Which shall be payment in full for the work as described herein.