29

June 17, 2022 Letting

Notice to Bidders, Specifications and Proposal

Illinois Department of Transportation

Contract No. 66L48
GRUNDY County
Section (32,47)4RA-4
Route FAI 80
District 3 Construction Funds

Prepared by	
	S
Checked by	

(Printed by authority of the State of Illinois)

Illinois Department of Transportation

NOTICE TO BIDDERS

1. **TIME AND PLACE OF OPENING BIDS.** Electronic bids are to be submitted to the electronic bidding system (iCX-Integrated Contractors Exchange). All bids must be submitted to the iCX system prior to 12:00 p.m. June 17, 2022 prevailing time at which time the bids will be publicly opened from the iCX SecureVault.

2. **DESCRIPTION OF WORK**. The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

   Contract No. 66L48
   GRUNDY County
   Section (32,47)4RA-4
   Route FAI 80
   District 3 Construction Funds

   Rest area and renovations, I-80 Three Rivers Rest Stop.

3. **INSTRUCTIONS TO BIDDERS**. (a) This Notice, the invitation for bids, proposal and letter of award shall, together with all other documents in accordance with Article 101.09 of the Standard Specifications for Road and Bridge Construction, become part of the contract. Bidders are cautioned to read and examine carefully all documents, to make all required inspections, and to inquire or seek explanation of the same prior to submission of a bid.

   (b) State law, and, if the work is to be paid wholly or in part with Federal-aid funds, Federal law requires the bidder to make various certifications as a part of the proposal and contract. By execution and submission of the proposal, the bidder makes the certification contained therein. A false or fraudulent certification shall, in addition to all other remedies provided by law, be a breach of contract and may result in termination of the contract.

4. **AWARD CRITERIA AND REJECTION OF BIDS**. This contract will be awarded to the lowest responsive and responsible bidder considering conformity with the terms and conditions established by the Department in the rules, Invitation for Bids and contract documents. The issuance of plans and proposal forms for bidding based upon a prequalification rating shall not be the sole determinant of responsibility. The Department reserves the right to determine responsibility at the time of award, to reject any or all proposals, to readvertise the proposed improvement, and to waive technicalities.

By Order of the
Illinois Department of Transportation

Omer Osman,
Secretary

FAI Route 80 (I-80)
Section (32,47)4RA-4
Grundy County
Contract No. 66L48

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2022

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS and frequently used RECURRING SPECIAL PROVISIONS.

No ERRATA this year.

SUPPLEMENTAL SPECIFICATIONS

Std. Spec. Sec. Page No.

No Supplemental Specifications this year.

RECURRING SPECIAL PROVISIONS

The following RECURRING SPECIAL PROVISIONS indicated by an "X" are applicable to this contract and are included by reference:

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STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the “Standard Specifications for Road and Bridge Construction, Adopted January 1, 2022”, the latest edition of the “Manual on Uniform Traffic Control Devices for Streets and Highways”, and the “Manual of Test Procedures for Materials” in effect on the date of invitation for bids, and the “Supplemental Specifications and Recurring Special Provisions” indicated on the Check Sheet included herein, which apply to and govern the construction of FAI Route 80 (I-80), Section (32,47)4RA-4, Grundy County, Contract No. 66L48 and in case of conflict with any part, or parts, of said Specifications, the said Special Provisions shall take precedence and shall govern.

LOCATION OF PROJECT

The project is located on Interstate 80 at the eastbound and westbound Three Rivers Rest Areas located approximately 5.0 miles and 6.3 miles northeast of IL 47, and along Shady Oak Road from the eastbound rest area to Minooka Road.

DESCRIPTION OF PROJECT

The project consists of construction of sanitary sewer force mains to replace the existing lagoon wastewater treatment systems. It also consists of replacing or lining of existing sanitary sewer gravity pipes at the rest area sites; construction of two sanitary sewer lift stations; replacement of existing rest area backup power supplies; and decommissioning of the existing wastewater treatment systems.

RESTORATION OF WORK AREA

Except for work shown on the Lagoon Decommissioning Plan, the Contractor shall restore the work area as specified in Article 104.06 of the Standard Specifications. All damage to mowed lawns shall be replaced with an approved sod, and all damage to unmowed fields shall be seeded and mulched using Method 2 Procedure 1 of the Standard Specifications. Disturbed areas with slopes steeper than 1:3 an erosion control blanket according to Article 251 of the Standard Specifications. Access control fences removed for construction operations shall be re-erected in the same locations. If fencing material is damaged during removal operations, it shall be replaced with new material. Aggregate shoulders disturbed by construction operations shall be reshaped with virgin aggregate shoulder material and compacted. All restoration work shall be to the satisfaction of the engineer. Restoration of the work area will not be paid for separately but shall be included in the cost of the associated pay items.

STATUS OF UTILITIES TO BE ADJUSTED:
(Effective January 1, 2007; Revised January 24, 2011)

Name & Address of Utility	Type	Location	Estimated Date Relocation Complete
AT&T 1000 Commerce Dr. Oak Brook, IL 60523 #MK4104-1	Communication	AT&T has facilities near the project limits but most of their facilities are not within the interstate ROW. They do have an 11 pair buried cable which crosses I-80 near station 1538+90 (from Shady Oaks Road which looks to be feeding the westbound rest area). They may also have buried facilities at the EB rest area.	The proposed sewer will cross underneath the 11 pair cable at the WB rest area. See the AT&T drawing for additional information. The proposed sewer will be deep enough that no conflicts are anticipated.
AT&T Transmission	Fiber	AT&T Transmission does not have any facilities within the project limits.	No conflicts.
ComEd, An Exelon Company Two Lincoln Centre, 8th Floor Oakbrook Terrace, IL 60181	Electric Please call 1-800-892-0123 to request "facility protection" but be aware that charges may be involved.	ComEd has electric throughout the project limits. Most of it appears to run along the south frontage road and then follows Minooka Road to the south. They also have 12kV OH near 9+45; light poles at the rest areas; cross under I-80 near 1539+85; and a possible crossing near 1556+20.	At station 203+87 the proposed 6" sanitary sewer will cross approximately 7.5' underneath the underground electric at the WB rest area. The proposed sewer will be deep enough that no conflicts are anticipated.
Comcast Cable 688 Industrial Drive Elmhurst, IL 60126	Cable	Comcast never responded but may have facilities within the project limits.	No conflicts are anticipated.

Name & Address of Utility	Type	Location	Estimated Date Relocation Complete
Northern Border Pipeline	36" high pressure natural gas pipeline.	The pipeline crosses I-80 on an angle just east of Minooka Road and then follows Minooka Road to the south.	No conflicts are anticipated. Northern Border has General Crossing Guidelines which need to be followed when working near their pipeline.
Nicor 1844 Ferry Road Naperville, IL 60563 #SC19820	4" and 6" Gas	Nicor has a 4" gas main which runs from the eastbound rest area along the south side of the Shady Oaks frontage road to Minooka Road where it turns into a 6" main (this main crosses I-80).	No conflicts are anticipated.
Mediacom 3900 26th Avenue Moline, IL 61265		Mediacom never responded but may have facilities within the project limits.	No conflicts are anticipated.
Village of Minooka		The Village appears to have water main at each rest area. There is an abandoned water main crossing I-80 near 1539+82. The proposed sewer ties into a sanitary sewer line near the east project limits.	No conflicts are anticipated.

The above represents the best information of the Department and is only included for the convenience of the bidder. The applicable provisions of Section 102 and Articles 105.07, 107.20, 107.37, 107.38, 107.39, 107.40, and 108.02 of the Standard Specifications for Road and Bridge Construction shall apply.

The estimated utility relocation dates should be part of the progress schedule submitted by the Contractor.

** Above utility relocation information as of November 17, 2021. No utility relocations are anticipated for this project.

PLUGGING EXISTING SANITARY SEWERS

This work shall consist of plugging existing sanitary sewers which are to be abandoned in accordance with Article 550.05 of the Standard Specifications.

Method of Measurement. This work will be measured for payment in units of each, at the locations specified.

592.07 Basis of Payment. This work will be paid for at the contract unit price per each for PLUGGING EXISITNG SANITARY SEWERS at the location specified.

SANITARY SEWER CONNECTION

This work includes connecting the sanitary sewer force main to the existing Village of Minooka force main according to plan details and includes all appurtenances shown on the plan detail.

Basis of Payment. The work will be paid for at the contract unit price per each for SANITARY SEWER CONNECTION at the location designated on the plans.

AIR RELEASE VALVE MANHOLE

This work includes constructing air release valve manholes according to plan details.

Excavation and backfilling shall be in accordance with Article 602.12 of the Standard Specifications.

The structure shall be cleaned of any accumulation of silt, debris, or foreign matter of any kind, and shall be free from such accumulations at the time of final inspection.

Basis of Payment. The work will be paid for at the contract unit price per each for AIR RELEASE VALVE MANHOLE at the location designated on the plans and includes the manhole structure and all accessories shown in the plan detail.

CURED-IN-PLACE PIPE LINER

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Cleaning and flushing existing sanitary sewers.
2. Taking video of existing sewers.
3. Inserting liner into existing sewers with manhole end seals.
4. Reestablishing service connections.
5. Final video record of completed work.

1.2 SUBMITTALS

A. Product Data:
   1. Liner material, curing chemicals, and lubricants.
   2. Submit a complete description of proposed installation procedures.

B. Shop Drawings: Liner dimensions for each pipe size to be relined.

C. Samples: Submit samples of liner material in both uncured and cured state.

D. Digital Video Discs (DVDs):
   1. Show condition of existing pipe and pipe joints and location of existing service connections after cleaning and prior to lining.
   2. Show cured liner and reestablished service connections after lining Work is complete.

E. Manufacturer's Certificate: Products meet or exceed specified requirements.

F. Design Submittals: Submit shop drawings with design calculations and assumptions for liner thickness.

G. Test and Evaluation Reports: Submit reports certifying that liner material meets ASTM testing standards listed in this Section.

H. Manufacturer Instructions:
   1. Liner placement and curing procedures for piping.
   2. Sealing of liner material at manholes and reestablishing service connections.
   3. Receiving, handling, and storage of materials.

I. Source Quality-Control Submittals: Indicate results of factory tests and inspections.

J. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

K. Qualifications Statements:
   1. Qualifications for manufacturer, installer, licensed professional, pipeline assessor, and inspector.
   2. Manufacturer's approval of installer.

L. Proposed plan for bypassing sewage during installation.

1.3 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of each service connection. Submit copies of project DVDs to Engineer.

1.4 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 5 years' experience.

B. Installer: Company specializing in performing Work of this Section with minimum 5 years' experience and licensed or certified by manufacturer.

C. Camera Operator: NASCCO PACP certified operators utilizing PACP standard format of video and reports.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store liner material according to manufacturer instructions.

B. Protect liner material from moisture and other potential damage.

1.6 EXISTING CONDITIONS

A. Field Measurements:
1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

1.7 WARRANTY

A. Furnish liner manufacturer’s warranty to be free from defects in raw materials for one year from the date of installation. During manufacturer’s warranty period, repair defects affecting integrity or strength of pipe at manufacturer’s expense in a manner mutually agreed by owner and manufacturer.

B. Furnish Contractor’s warranty for liner installation for a period of one year from the date of installation. During Contractor’s warranty period, repair defects affecting integrity or strength of pipe at Contractor’s expense in manner mutually agreed by Owner and Contractor.

PART 2 PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

A. Design lining material to have sufficient structural strength to support dead loads, soil loads, paving and full traffic loads (H-20), and groundwater load imposed (assuming fully deteriorated host pipe). Assume modulus of soil reaction = 1000 psi and ovality = 5%. The Owner has dug in various spots in the project area over the years and reports they have not encountered any significant groundwater.

B. Liner shall be minimum 6.0 mm thickness.

C. Design liner material to provide jointless, continuous, and structurally sound construction able to withstand imposed static, dynamic, and hydrostatic loads on a long-term basis.

D. Identify design provisions for shrinkage control to prevent future misalignment of service reconnections.

2.2 Cured-In-Place Pipe (CIPP) Liner

A. Description:
1. Fabric Tube:
a. One or more layers of absorbent, flexible, needled felt, or an equivalent non-woven or woven material.
b. Comply with ASTM D5813, F1216, F1743, and F2019.
c. Capable of absorbing and carrying resins and compatible with the resin used.
d. Capable of withstanding installation pressures and curing temperatures.
e. Tube shall be fabricated to a size that will fit the internal circumference of the existing sewer main. An allowance shall be made for stretching due to insertion of liner and deterioration of existing pipe walls.
2. Resin: Corrosion-resistant polyester or vinyl ester resin and catalyst system that, when properly cured within tube composite, provides the physical and chemical resistance strengths specified.
3. The liner shall be fabricated from materials that, when cured, shall be chemically resistant to withstand exposure to normal sewage effluent.
4. Resin shall not be affected by ultraviolet light and shall form no excessive bubbling or wrinkling during lining. Resins shall be tinted for visibility and provide indication of adequate liner wet-out.
5. The CIPP system shall conform to and comply with the minimum criteria listed below:

Characteristic	Test Method	Polyester Resins
Flexural Strength	ASTM D 790	4,500 psi
Initial Flexural Modulus (Unfilled Resins)	ASTM D 790 ASTM D 2990	250,000 psi
Long Term Flexural Modulus (Unfilled Resins)	ASTM D 2990	125,000 psi
Initial Flexural Modulus (Filled Resins)	ASTM D790 ASTM D2990	400,000 psi
Long Term Flexural Modulus (Filled Resins)	ASTM D2990	200,000 psi

B. End Seals:
1. Use LMK Insignia watertight end seals (or approved equal).

2.3 SOURCE QUALITY CONTROL

A. Inspection: Inspect each lot of liner for defects. Verify that liner is homogeneous throughout, uniform in color, and free of cracks, holes, foreign materials, blisters, or deleterious faults.

B. Marking:
1. Mark liner with coded number identifying manufacturer, SDR, size, material, date, and shift when liner was extruded.

C. Certificate of Compliance:
   1. Submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify location of piping to be lined.

3.2 PREPARATION

A. Cleaning: Clean existing sewer pipes of debris, sedimentation, and mineral deposits with high-velocity cleaner, bucket and scraper, root saws, rolling or balling units, or other appropriate means.

B. The Owner will provide a water source free of charge and extricated debris may be passed on to Owner's WWTP.

C. Initial Video Inspection and Repair:
   1. Conduct closed-circuit video inspection to assure that the pipe is in a condition that it can be lined.
   2. Determine condition of existing piping, degree of offset of joints, crushed walls, and obstructions.
   3. Clear obstructions, service piping protrusions, and other materials from bottom of existing pipe to ensure inserted pipe liner directly contacts existing pipe wall.
   4. Determine locations of service laterals and decide with Engineer which will be grouted, and which will be T-lined. It is assumed most services will be pressure grouted. However, the Engineer must approve T-lining before it is undertaken.

D. Bypassing Sewage:
   1. Set up bypassing pump system to isolate each section of piping for lining.
   2. Maintain bypass pumping until lining is totally formed and service connections reestablished.

E. Coordination:
   1. Coordinate work with users connected to the system.
   2. Notify residents and business owners at least forty-eight hours in advance of expected disruption of sanitary sewer service.
   3. Limit disruption of sanitary sewer service to eight hours maximum.
   4. Do not disrupt customer service between the hours of 5:00 PM and 8:00 AM.

3.3 INSTALLATION

A. Excavate for point repairs only on emergency basis and as permitted by the Owner or Engineer.

B. Perform lining and reestablish service connections without need for excavation while minimizing disruptions to adjacent occupied buildings. Installation of the liner shall utilize existing manholes.

C. Resin Impregnation:
1. Designate a location where uncured resin in original containers and unimpregnated liner will be vacuum impregnated prior to installation. Installer shall allow Owner's representative to inspect materials and "wet out" procedure.
2. Quantities of resin used shall be to manufacturer's standards to provide the lining thickness required.
3. Liner tube shall be impregnated with resin not more than 7 days before proposed time of installation and stored out of direct sunlight at temperatures less than 40 degrees F.
4. Transport resin impregnated liner to site immediately prior to inversion in suitable light-proof container with temperature maintained below 40 degrees F.
5. Prior to installation, and as recommended by manufacturer, place remote temperature gages or sensors inside host pipe to monitor temperature during cure cycle.

D. Liner Insertion:
1. Position resin impregnated liner tube in pipeline through existing manholes. Care should be exercised not to damage tube during installation.
2. Invert liner by application of a hydrostatic head, compressed air, or other means recommended by the manufacturer to fully extend the liner to the next manhole.
3. Ensure that the pressure in the liner exceeds both the pressure due to the groundwater and any pressure due to sewage in laterals.

E. Curing:
1. After insertion is complete cure installed liner in accordance with manufacturer's recommendations.
2. Provide a suitable heat source and distribution system to circulate hot water, air, and/or steam through the pipe as recommended by the manufacturer. The equipment shall be capable of delivering hot water, air, and/or steam to uniformly raise the temperature above that required to cure the resin. This temperature shall be determined by the manufacturer based on the resin system used.
3. The heat source piping shall be fitted with suitable continuous monitoring thermocouples to gauge the temperature of the incoming and outgoing curing medium. The temperature of the curing medium shall meet the requirements of the resin manufacturer as measured at the inflow and outflow locations.
4. The initial cure shall be deemed complete when inspection of the exposed portions of liner appear to be hard and sound. A cure time no shorter than that recommended by the manufacturer shall be used.
5. The contractor shall cool the hardened liner to a temperature below 100 degrees F prior to relieving the pressure on the section.
6. Care shall be taken in the release of pressure from the cured pipe so that a vacuum will not be created which could damage the pipe and newly installed lining.

F. Sealing at Manholes:
1. Install LMK Insignia (or approved equal) watertight seals to host pipe at beginning and end of installed liner.

G. Service Connections:
1. Reestablish existing sewer service connections through use of closed-circuit television camera and remote-controlled cutting device.
2. Match invert of reestablished service with previously existing invert. Maintain minimum of 95 percent to maximum of 100 percent of original service connection opening.
3. Reestablish sewer service connection with uniform cuts free of burrs and sharp edges.
4. After reestablishing service connection, flush piping clean.
5. Sanitary services shall not be out of service for more than 8 hours during the lining process.

3.4 FIELD QUALITY CONTROL

A. If liner fails to re-form, remove failed liner and install new liner.

B. Conduct closed-circuit video inspection of completed lining Work.

C. No infiltration of groundwater is permitted.

D. Acceptance:
1. No visual defects, including foreign inclusions, dry spots, pinholes, cracks, or delamination.
2. Confirm that service connections are complete and unobstructed.
3. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.

Method of Measurement. Cured-in-place pipe liner will be measured for payment in place in feet (meters) along the centerline of the pipe from center to center of manhole.

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for CURED-IN-PLACE PIPE LINER, of the diameter specified. The price includes pipe cleaning and flushing, TV inspection and videography, bypass pumping, liner installation, reestablishment of service connections, cleanup, and debris removal, and final video of completed work, along with anything else necessary for a complete and final project.

SANITARY FORCE MAIN

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Excavation for approach trenches and pits.
2. Horizontal directional drilling.
3. Pipe.

1.2 DESIGN REQUIREMENTS

A. Design Criteria:
1. Drilling Steering System: Remote with continuous electronic monitoring of boring depth and location.
2. Directional Change Capability: 90 degrees with 35-foot radius curve.
3. Ratio of Reaming Diameter to Pipe Outside Diameter: 1.5 maximum.

1.3 SUBMITTALS

A. Shop Drawings:
1. Submit technical data for equipment, method of installation, and proposed sequence of construction.
2. Include information pertaining to pits, dewatering, method of spoils removal, equipment size and capacity, equipment capabilities including installing pipe on radius, type of drill bit, drilling fluid, method of monitoring line and grade and detection of surface movement, name plate data for drilling equipment and mobile spoils removal unit.

B. Product Data:
1. Identify source of water used for drilling.
2. Submit copy of approvals and permits for use of water source.

C. Installer Qualifications: Submit history of previous work completed of equivalent nature and scope. Include qualification and experience of key personnel.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of pipe and invert elevations.

B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

C. Record actual depth of pipe at 25-foot intervals.

D. Record actual horizontal location of installed pipe.

E. Show depth and location of abandoned bores.

F. Record depth and location of drill bits and drill stems not removed from bore.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with the following:
1. NUCA HDD Installation Guidelines.
2. ASTM F1962.

B. Perform Work in accordance with these Specifications, the Roadway Specifications, and the Water and Sewer Specifications.

1.6 QUALIFICATIONS

A. Installer: Company specializing in performing work of this section with minimum 10 years documented experience.
   1. Work Experience: Include projects of similar scope and conditions.
   2. Furnish list of references upon request.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Provide temporary end caps and closures on piping and fittings until pipe is installed.

B. Protect pipe from entry of foreign materials and water by temporary covers, completing sections of work, and isolating parts of completed system.

C. Accept products on site in manufacturer's original containers or configuration. Inspect for damage.

D. Use shipping braces between layers of stacked pipe. Stack piping lengths no more than 3 layers high.

E. Store field joint materials indoors in dry area in original shipping containers. Maintain storage temperature of 60 to 85 degrees F.

F. Support pipes with nylon slings during handling.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Conduct operations so as not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

1.9 COORDINATION

A. Coordinate work with utilities within construction area.

PART 2 PRODUCTS

2.1 PIPE

A. 3" SDR-17, 250 psi, restrained joint PVC pressure pipe, ASTM D1784/ASTM D2241.

B. 4" SDR-17, 250 psi, restrained joint PVC pressure pipe, ASTM D1784/ASTM D2241.

C. All restrained joints shall be compromised of precision-machined grooves on the pipe and in the coupling, which also allows a spline to be inserted, resulting in a fully circumferential restrained joint which locks the pipe coupling together. O-

rings shall be rated for permanent use. Lubricants shall be as recommended by the pipe manufacturer.

D. All pipe shall provide a min. tensile strength @ yield of 3600 psi.

2.2 DRILLING FLUID

A. Drilling Fluid: Liquid bentonite clay slurry; totally inert with no environmental risk.

2.3 WATER SOURCE

A. Water: Potable, obtained from utility source.

2.4 UNDERGROUND PIPE MARKERS

A. Trace Wire: Electronic detection materials for non-conductive piping products.
   1. Tracer wire for pipe shall be eight (8) gauge tin coated solid copper, covered with a minimum of 45 mil of green HDPE. Wire shall be specifically designed for directional drilling applications with a nominal tensile strength of min. 38,5000 psi and a nominal break strength of min. 38.95 lbs., 30% elongation max.
   2. Tracer wire connectors shall be clear, UV-resistant polycarbonate, filled with silicone-based water blocking compound, with pull out resistance of 60 lbs. (to lose continuity), complying with UL486-2003.
   3. Connectors shall be provided in ground locating stations as much as possible. In-ground splices should be avoided unless absolutely necessary.
   4. Underground pipe locate stations shall be in accordance with plan details, installed at no more than every 1,000 feet.

2.5 ACCESSORIES

A. Granular Backfill for Trench Approaches and Pits to Finish Grade: Trench backfill meeting the requirements of Section 208 of the Standard Specifications.

B. Soil Backfill for Trench Approaches and Pits to Finish Grade: Subsoil with no rocks over 4 inches in diameter, frozen earth or foreign matter.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify connection to existing piping system size, location, and invert elevations are in accordance with Drawings.

3.2 PREPARATION

A. Call J.U.L.I.E. not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Locate, identify, and protect utilities indicated to remain from damage.

C. Identify required lines, levels, contours, and datum locations.

D. Protect plant life, lawns, and other features remaining as portion of final landscaping.

E. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 DEWATERING

A. Intercept and divert surface drainage, precipitation, and groundwater away from excavation through use of dikes, curb walls, ditches, pipes, sumps or other means.

B. Develop and maintain substantially dry subgrade during drilling and pipe installation.

C. Comply with Storm Water Pollution Prevention Plan for dewatering to any watercourse, prevention of stream degradation, and erosion and sediment control.

D. Dewatering shall be incidental to the Contract.

3.4 EXISTING WORK

A. As much as is reasonable, maintain access to existing roadways, facilities, and other remaining active installations requiring access. Modify installation as necessary to maintain access.

3.5 EXCAVATION

A. Excavate approach trenches and pits in accordance with shop drawings and as site conditions require. Minimize number of access pits.

B. Provide sump areas to contain drilling fluids.

C. Install excavation supports as required.

D. Restore areas after completion of drilling and carrier pipe installation.

3.6 DRILLING

A. Drill pilot bore with vertical and horizontal alignment as indicated on Drawings.

B. Guide drill remotely from ground surface to maintain alignment by monitoring signals transmitted from drill bit.
   1. Monitor depth, pitch, and position.
   2. Adjust drill head orientation to maintain correct alignment.

C. Inject drilling fluid into bore to stabilize hole, remove cuttings, and lubricate drill bit and pipe.

D. Continuously monitor drilling fluid pumping rate, pressure, viscosity, and density while drilling pilot bore, back reaming, and installing pipe to ensure adequate removal of soil cuttings and stabilization of bore.
   1. Provide relief holes when required to relieve excess pressure.
   2. Minimize heaving during pullback.

E. Calibrate and verify electronic monitor accuracy during first 50 feet of bore in presence of Engineer before proceeding with other drilling. Excavate minimum of four test pits spaced along first 50 feet bore to verify required accuracy. When required accuracy is not met, adjust equipment or provide new equipment capable of meeting required accuracy.

F. After completing pilot bore, remove drill bit.

3.7 DRILLING OBSTRUCTIONS

A. When obstructions are encountered during drilling, notify Engineer immediately. Do not proceed around obstruction without Engineer's approval.

B. For conditions requiring more than 3 feet deviation in horizontal alignment, notify Engineer immediately. Do not proceed without Engineer’s approval.

C. Maintain adjusted bore alignment within easement or right-of-way.

3.8 PIPE INSTALLATION

A. After completing pilot bore, remove drill bit. Install reamer and pipe pulling head.
   1. Select reamer with minimum bore diameter required for pipe installation.

B. Where included, attach pipe to pipe pulling head for casing pipe. Pull reamer and pipe to entry pit along pilot bore.

C. Inject drilling fluid through reamer to stabilize bore and lubricate pipe.

D. Install piping with horizontal and vertical alignment as shown on Drawings.

E. Protect and support pipe being pulled into bore so pipe moves freely and is not damaged during installation.

F. Install carrier pipe with casing spacers and end-seals. Casing spacers shall be provided at manufacturer’s recommended spacing.

G. Do not exceed pipe manufacturer’s recommended pullback forces.

H. Install trace wire continuous with each bore. Splice trace wire only at intermediate bore pits. Tape or insulate trace wire to prevent corrosion and maintain integrity of pipe detection.
   1. Terminate trace wire for each pipe run at structures along pipe system.
   2. Provide extra length of trace wire at each structure, so trace wire can be pulled 3 feet out top of structure for connection to detection equipment.
   3. Test trace wire for continuity for each bore before acceptance.

I. Provide sufficient length of pipe to extend past termination point to allow connection to other pipe sections.

J. Allow minimum of 24 hours for stabilization after installing pipe before making connections to pipe.

K. Mark location and depth of bore with spray paint on paved surfaces, and wooden stakes on non-paved surfaces at 25-foot intervals.

3.9 SEWER CROSSING

A. Maintain 18” vertical and 10’ horizontal clearance from all existing or proposed water mains and services.

3.10 SLURRY REMOVAL AND DISPOSAL

A. Contain excess drilling fluids at entry and exit points until recycled or removed from site. Provide recovery system to remove drilling spoils from access pits.

B. Remove, transport and legally dispose of drilling spoils.
1. Do not discharge drilling spoils in sanitary sewers, storm sewers, or other drainage systems.
2. When drilling in suspected contaminated soil, test drilling fluid for contamination before disposal.

C. When drilling fluid leaks to surface, immediately contain leak and barricade area from vehicular and pedestrian travel before resuming drilling operations.

D. Complete cleanup of drilling fluid at end of each work day.

3.11 BACKFILL

A. Install backfill in boring pits as specified in Section 208 of the Standard Specifications.

3.12 ERECTION TOLERANCES

A. Section 01 4000 - Quality Requirements: Tolerances.

B. Maximum Variation From Horizontal Position: 12 inches.

C. Maximum Variation From Vertical Elevation: 1 inch.

D. Minimum Horizontal and Vertical Clearance From Other Utilities: 12 inches.

E. When pipe installation deviates beyond specified tolerances, abandon bore, remove installed pipe, re-bore, and reinstall pipe in correct alignment.

F. Fill abandoned bores greater than 3 inches in diameter with grout or flowable fill material.

3.13 FIELD QUALITY CONTROL

A. Upon completion of pipe installation, test pipe in accordance with the Water and Sewer Specifications.

B. Compaction Testing: As specified in Section 208 of the Standard Specifications.

C. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

3.14 MANUFACTURER'S FIELD SERVICES

A. Certify that equipment for drilling has been properly set-up and is ready for drilling.

3.15 CLEANING

A. Upon completion of drilling and pipe installation, remove drilling spoils, debris, and unacceptable material from approach trenches and pits. Clean up excess slurry from ground.

B. Restore approach trenches and pits to original condition.

C. Remove temporary facilities for drilling operations in accordance with Section 01 5000 - Temporary Facilities and Controls.

Method of Measurement. Sanitary force main will be measured for payment in place in feet (meters) along the centerline of the pipe from center to center of manhole.

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for SANITARY FORCE MAIN, of the diameter specified. The price includes excavation, drilling, pipe, accessories, tests, underground pipe locate stations and backfill.

SANITARY SEWER REMOVAL

This work shall consist of removing existing gravity sanitary sewers. Removal shall be in accordance with Article 551.03 of the Standard Specifications.

Method of Measurement. This work will be measured for payment according to Article 550.09.

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for SANITARY SEWER REMOVAL, of the diameter specified.

SANITARY MANHOLE AND PIPE CONNECTION

This work shall consist of connecting existing sanitary sewer force main to a new sanitary sewer manhole. It shall also include all the manhole, all appurtenances shown on the plan detail, the modified polymer manhole lining system, and temporary bypass piping of the sanitary sewer force main during construction of the manhole.

Modified Polymer Manhole Lining System. The manhole lining system shall be as specified below:

PART I – GENERAL

1.01 DESCRIPTION:

The work described within details a complete program for wastewater structure lining and rehabilitation. This specification details the methods, procedures, materials and equipment required to produce “A Total Lining System for Wastewater Structures”. The completed system will provide a corrosion resistant liner that restores the surface profile and eliminates water infiltration and exfiltration.

1.02 REFERENCES:

A. ASTM D7234 - Adhesion
B. ASTM D412 - Tensile Strength (PSI)
C. ASTM D412 - Elongation (%)
D. ASTM D624 - Tear Strength (PLI)
E. ASTM D2240 - Hardness
F. ASTM D522 - Flexibility (1/8” mandrel)
G. ASTM D4060 - Taber Abrasion (mg loss)

1.03 SUBMITTALS

All materials and procedures required to establish compliance with the specifications shall be submitted upon request to the owner/engineer for review/approval. Submittals shall include at least the following:

1. Technical Data Sheet on each product used.
2. Safety Data Sheet (SDS) for each product used.
3. Manufacturer’s Certification of Applicator.
4. Certified Applicator Minimum Qualifications (Section 1.04 D).
5. Descriptive literature, bulletins and or catalogs of materials.
6. Work procedures including flow diversion plan, method of repair, etc.
7. Material and method for repair of leaks or cracks in the structure.
8. Applicator and Manufacturer warranty forms (Section 4.01)

1.04 QUALITY ASSURANCE

A. The manufacturer of the total lining system for wastewater structures shall be a company that specializes in the design and manufacture of corrosion protection materials / systems for wastewater structures.

B. The applicator (company performing the installation) shall be completely trained in leak repair, surface preparation and application of the lining system.

C. The materials/products shall be suitable for installation in a wastewater environment without any deterioration of the liner.

D. The applicator shall be trained and provide a letter of certification from the manufacturer for the handling, mixing, application, and inspection of the liner system as described herein.

E. To ensure total unit responsibility, all materials and installation thereof shall be furnished and coordinated by manufacturer/certified applicator.

PART II - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. The materials to be utilized in the lining of wastewater structures shall be designed and manufactured to withstand the severe effects a wastewater environment. The manufacturer of the corrosion protection products shall have at least 10 years of experience in the production of the lining products utilized, and the products shall have satisfactory installation record.

B. Equipment for installation of lining materials shall be of high quality and as recommended by the manufacturer.

C. The lining system to be utilized for wastewater structures shall be a multi-layer stress skin panel' liner system as described below:

1. Liner.

Installation	Liner
Moisture barrier	Modified Polymer (Silicone modified polyurea) Surfacer
Polyurethane/Polymeric blend foam	
Final corrosion barrier	Modified polymer (Silicone modified Polyurea)

2. The Modified polymer (silicone modified polyurea) shall be sprayable, solvent free, two-component polymeric, moisture/chemical barrier specifically developed for the corrosive wastewater environment.

3. The Polyurethane Rigid Structure Foam, shall be low viscosity two-component, containing flame retardants.

4. Total thickness of multi-layer liner system shall be a minimum of 500 mils.

D. Manufacturer:

1. SPECTRASHIELD, manufactured by CCI Spectrum, Inc.
2. Engineer Pre-Approved Equal

PART III - EXECUTION

3.01 INITIAL INSPECTION

A. Applicator shall take appropriate action to comply with all local, state, and

federal regulations including those set forth by OSHA, EPA, the Owner and any other applicable authorities.

B. Prior to conducting any work, an initial inspection of the structure shall be performed to determine need for protection against hazardous gases or oxygen depleted atmosphere and the need for flow control or flow diversion.

C. If required, submit a plan for flow control or bypass to the owner/engineer for approval prior to conducting the work.

D. New Portland cement structures shall have endured a minimum of 28 days since manufacture prior to commencing installation of the liner system.

3.02 SURFACE PREPARATION

A. The surface preparation program will include checking the atmosphere for hydrogen sulfide, methane, low oxygen, or other gases, approved flow control equipment, and surface preparation equipment.

B. Surface preparation for standard manhole structures shall be in accordance with the manufacturer's recommendations and may include high pressure water cleaning and shall provide a surface compatible for installation of the liner system.

C. Surface preparation and methods for other structures shall be in accordance with the manufacturer's recommendations, and may include high pressure water cleaning, hydro blasting, abrasive blasting, grinding, or detergent water cleaning, and shall be suited to provide a surface compatible for installation of the liner system.

D. The surface preparation method shall produce a cleaned, abraded and sound surface with no evidence of laitance, loose concrete, loose brick, loose mortar, contaminants, or debris, and shall display a surface profile suitable for application of the liner system in accordance with the manufacturer's recommendations.

E. After completion of surface preparation, perform the seven-point check list, inspecting for:

1. Leaks
2. Cracks
3. Holes
4. Exposed Rebar
5. Ring and Cover condition
6. Invert Condition
7. Inlet and Outlet Pipe Condition

F. After the defects in the structure are identified, repair all leaks and severe cracks with methods approved by the manufacturer.

G. Upon completion of leak and crack repair, the surface shall be primed in accordance with the manufacturer's recommendations.

3.03 MATERIAL INSTALLATION

A. Application procedures shall conform to recommendations of the manufacturer, including materials handling, mixing, environmental controls during application, safety, and spray equipment.

B. Spray equipment shall be specifically designed to accurately ratio and apply the liner system.

C. Application of multi-component liner system shall be in strict accordance with manufacturer's recommendation. Final installation minimum total thickness shall be 500 mils. A permanent identification and date of work performed shall be affixed to the structure in a readily visible location.

D. If requested a final written report may be provided to the owner/engineer detailing the location, date of work and description of the work.

3.04 FINAL INSPECTION

A. Final liner system shall be completely free of pinholes or voids. Liner thickness shall be the minimum value as described herein.

B. Visual inspection may be made by the Owner/Engineer. Any deficiencies in the finished liner system shall be marked and repaired according to the procedures set forth by the manufacturer.

4.01 WARRANTY

Applicator and Manufacturer must warrant the liner system installation against failure for a period of 10 years from the installation date. Applicator shall correct failures any time prior to 10 years after the installation date. Failure will be deemed to have occurred if the protective liner fails to: (a) prevent the internal corrosion of the structure or (b) prevent groundwater infiltration. Failure does not include damage resulting from mechanical force or the presence of chemical substances not customarily present or used in Wastewater Structures, defects in the workmanship or devises of others upon which the Wastewater Structure functions or act of God. The liner must be installed in accordance with Manufacturer's instructions by Applicators certified by Manufacturer. Executed 10-year Applicator and Manufacturer warranties are to be provided upon completion of work.

Basis of Payment. This work will be paid for at the contract lump sum price for SANITARY MANHOLE AND PIPE CONNECTION. This price shall be payment in full for all labor, material and any other work necessary to bypass pipe around manhole construction, construct the manhole, install the manhole lining, and connect the sanitary sewer force main to the new manhole.

PAVEMENT PATCHING (SPECIAL)

This work shall consist of the removal of the existing pavement, the necessary excavation, and the replacement of the existing pavement with Hot-Mix Asphalt at the locations designated in the plans in accordance with applicable portions of Section 442 of the Standard Specifications.

The thickness of the replacement pavement shall be equal to the existing pavement thickness.

Method of Measurement. Pavement removal and replacement will be measured for payment in place, and the area computed in square yards (square meters).

Basis of Payment. This work will be paid for at the contract unit price per square yard (square meter) for PAVEMENT PATCHING (SPECIAL).

MANHOLES, SANITARY

This work shall consist of constructing sanitary manholes according to plan details and applicable portions of Section 602 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per each for MANHOLES, SANITARY, of the type or type and diameter specified, and with the type of frame and grate or frame and lid specified.

SANITARY MANHOLES TO BE REMOVED

This work shall consist of removing sanitary manholes. Work shall be in accordance with Section 602 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per each for SANITARY MANHOLES TO BE REMOVED.

SANITARY MANHOLE, SPECIAL

This work shall consist of constructing a sanitary manhole with frame and lid over an existing gravity sanitary sewer and construction of an interior sanitary force main drop according to plan details and applicable portions of Section 602 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per each for SANITARY MANHOLE, SPECIAL.

TRAFFIC CONTROL AND PROTECTION, (SPECIAL)

This work shall include furnishing, installing, maintaining, replacing, relocating, and removing all traffic control devices used for the purpose of regulating, warning, or directing traffic within the rest areas, within I-80 right of way and along Shady Oaks Road and Minooka Road. Traffic control and protection shall be provided according to the applicable Highway Standards as included in the list of highway standards in the plans, the Standard Specifications, these special provisions, or as directed by the Engineer. Except for noted as below nighttime lane closures will not be allowed.

Special Requirements:
The Contractor shall complete the proposed work on Minooka Road near International Parkway including excavation, installation of the manhole and connections, plugging the existing sanitary sewer, and backfill to the top surface on a single weekend. Minooka Road lane closures for this work will be allowed between 7PM on Friday and 5:00 AM Monday. The Contractor will be allowed a weekday daytime lane closure to construct the permanent pavement patches.

This work will be paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (SPECIAL). This price shall be payment in full for all labor, materials, transportation, handling, and any other work necessary to furnish, install, maintain, replace, relocate, and remove all traffic control devices required in the plans and specifications.

SANITARY SEWER

This work shall consist of constructing gravity sanitary sewers.

Materials.

1. Sanitary Sewer Pipe and Fittings 4” to 16”:
    a. Plastic Pipe: ASTM D3034, Type PSM, Poly Vinyl Chloride (PVC) material; SDR 26; bell and spigot rubber ring sealed gasket joint.
        1) Fittings: PVC; SDR 26. Insertion type tees are not allowed on smaller pipe unless approved by the Engineer in writing prior to installation.
        2) Gasket: ASTM F477.
        3) Bell Joint: ASTM D3212.

CONSTRUCTION REQUIREMENTS

Construction of sanitary sewers and testing shall be according to plan details and the “Standard Specifications for Water and Sewer Main Construction in Illinois”. The applicable requirements of Article 550.07 of the IDOT Standard Specifications shall govern the backfilling, except that backfilling shall not be done in freezing weather nor made with frozen material.

Gravity sewers specified in the plans to be horizontally directionally drilled shall be installed in accordance with Section 3 of the special provisions titled “SANITARY FORCE MAIN” contained herein as applicable.

Method of Measurement. This work will be measured for payment in place in feet (meters).

Trench backfill for gravity sanitary sewers installed in trenches will be measured for payment according to Article 208.03.

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for SANITARY SEWER, of the diameter specified.

Trench Backfill for gravity sanitary sewers installed in trenches will be paid for according to Article 208.04.

STEEL CASINGS

This work shall consist of installing steel casings at locations indicated by plans.

Materials. Materials shall be as shown in the plans.

CONSTRUCTION REQUIREMENTS

Construction of steel casings shall be according to plan details and shall be horizontally directionally drilled (H.D.D.) following the requirements in Section 3.6 of the special provision for sanitary force main.

Method of Measurement. This work will be measured for payment in place in feet (meters).

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for STEEL CASINGS, of the diameter specified and includes all spacers and accessories.

DECOMISSIONING OF SEWAGE TREATMENT LAGOON

This work includes removing and satisfactory disposal of existing lagoon control structures, effluent structures, buildings, rock filters, and other sewage treatment appurtenances according to plan details and in accordance with plan details and Illinois Environmental Protection Agency requirements.

Method of Measurement. Decommissioning of sewage treatment lagoons will be measured for payment in units of each at the location designated on the plans

Basis of Payment. The work will be paid for at the contract unit price per each for DECOMISSIONING OF SEWAGE TREATMENT LAGOON at the location designated on the plans.

LAGOON SLUDGE PUMPING AND DISPOSAL

This work shall consist of the pumping, transportation, and proper disposal of sanitary treatment lagoon sludge. Work shall be in accordance with plan details and Illinois Environmental Protection Agency requirements.

Method of Measurement. Lagoon sludge pumping, and disposal will be measured for payment in units of each at the location designated on the plans.

Basis of Payment. The work will be paid for at the contract unit price per each for LAGOON SLUDGE PUMPING AND DISPOSAL at the location designated on the plans.

SANITARY SEWER LIFT STATION

This work includes work necessary to construct sanitary sewer lift stations according to plan details. It includes furnishing all components, constructing, commissioning, and testing. It also includes furnishing and installation of fencing, aggregate surface course, pumps, lift station components, equipment wiring, testing, yard light, manholes, valve vaults and all appurtenances shown on the plan details for lift stations.

PART I GENERAL

2.1 SUMMARY

A. Section Includes: Submersible grinder pumps and associated hardware and controls, and wet well aeration system.

2.2 SUBMITTALS

A. Product Data: Information concerning materials of construction, fabrication, and protective coatings.

B. Shop Drawings:
1. The contractor shall submit an electronic copy of all drawings to the engineer for approval. Of these, an electronic copy of approval will be returned to the contractor with appropriate action taken. The shop drawings shall include, but not necessarily be limited to:
   a. Drawings showing dimensions of all equipment. Control details and electrical schematic diagrams. Performance data including, when applicable, pump curves, and motor data.
   b. All other information necessary to enable the engineer to determine whether the proposed equipment meets the requirements.

C. Manufacturer's Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

E. Manufacturer Reports: Indicate that equipment has been installed according to manufacturer's instructions.

F. Qualifications Statement:
1. Submit qualifications for manufacturer.

2.3 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations and final orientation of equipment and accessories.

2.4 QUALITY ASSURANCE

A. The pumping units shall conform to all applicable requirements of NEMA, IEEE, NEC, SWPA and Hydraulic Institute. For said requirements, the revision and/or version in effect on the date of public bid opening shall apply.

B. The pumps shall be manufactured by a company regularly engaged in the manufacture and assembly of submersible units for a minimum of five (5) years.

C. The manufacturer shall assume full responsibility for the compatibility of the supplied components with the application.

D. The motor and pump shall be manufactured by one company providing sole source responsibility for the warranty of the total unit, both pump, motor, and all supplied hardware, cabling, and other components.

2.5 WARRANTY

A. The manufacturer shall warrant his product to be free from defects in workmanship for a period of one (1) year from date of completion. Warranties and guarantees by the suppliers of various components in lieu of a single source responsibility by the contractor shall not be accepted. The contractor shall be solely responsible for the warranty.

PART 2 PRODUCTS

2.1 SUBMERSIBLE GRINDER PUMPS

A. Manufacturers and Models:

Eastbound Lift Station
1. Hydromatic Model HPGBX1500 60 Hz
2. Engineer Pre-Approved Equal

Westbound Lift Station
3. Hydromatic Model HPGBX1000 60 Hz
4. Engineer Pre-Approved Equal

B. Scope:

Eastbound Lift Station

1. Furnish and install 2 submersible pumps, each capable of meeting both duty conditions listed.
2. Maximum Rated Duty Condition: Each pump shall be capable of delivering 82 GPM at approximately 178’ TDH with a minimum shut off head of 216.8’ TDH.
3. Minimum Rated Duty Condition: Each pump shall be capable of delivering 115 GPM at approximately 150’ TDH with a minimum shut off head of 216.8’ TDH.

Westbound Lift Station

4. Furnish and install 2 submersible pumps, each capable of meeting both duty conditions listed.
5. Maximum Rated Duty Condition: Each pump shall be capable of delivering 61 GPM at approximately 140’ TDH with a minimum shut off head of 165.9’ TDH.
6. Minimum Rated Duty Condition: Each pump shall be capable of delivering 122 GPM at approximately 84’ TDH with a minimum shut off head of 165.9’ TDH.

C. OPERATING CONDITIONS

1. The required units shall be grinder-type submersible pumps.
2. The pump shall have a continuously rising head capacity curve from run-out flow through shutoff.
3. The pump shall be designed to operate continuously for extended periods at any point in the allowable operating range of the curve without cavitation, overheating or excessive vibration. The motor nameplate horsepower rating shall not be greater than specified herein.
4. Performance Data:

Eastbound Lift Station

a. Pump Item Number: Hydromatic Model HPGBX1500 60 Hz
b. Number of Units Required: 2
c. Rated Maximum Duty Point Condition
    1) Capacity (Flow): 82 gpm
    2) Total Dynamic Head (TDH): 178 feet
d. Rated Minimum Duty Point Condition
    1) Capacity (Flow): 115 gpm
    2) Total Dynamic Head (TDH): 150 feet
e. Minimum Motor HP Required: 15 HP
f. Maximum Pump Operating Speed: 3450 RPM
g. Electrical Characteristics Required
    1) Voltage: 230V
    2) Phase: 3 PH
    3) Frequency: 60 Hz
h. Minimum Shutoff Head: 217 Feet
i. Pumped Liquid: Water
j. Pump Discharge Size: 2 ½”

Westbound Lift Station

k. Pump Item Number: Hydromatic Model HPGBX1000 60 Hz
l. Number of Units Required: 2

m. Rated Maximum Duty Point Condition
   1) Capacity (Flow): 61 gpm
   2) Total Dynamic Head (TDH): 140 feet
n. Rated Minimum Duty Point Condition
   1) Capacity (Flow): 122 gpm
   2) Total Dynamic Head (TDH): 84 feet
o. Minimum Motor HP Required: 15 HP
p. Maximum Pump Operating Speed: 3450 RPM
q. Electrical Characteristics Required
   1) Voltage: 230V
   2) Phase: 3 PH
   3) Frequency: 60 Hz
r. Minimum Shutoff Head: 166 Feet
s. Pumped Liquid: Water
t. Pump Discharge Size: 2 ½”

D. PUMP DESIGN

1. Each pump shall have a flanged guide claw attached to the pump discharge flange by an ANSI flange connection. A replaceable Nitrile Butadiene Rubber (NBR) profile seal shall be provided as an integral part of the guide claw to form a leak-proof seal with the base discharge elbow.
2. The guide claw shall direct the pump down by two vertical guide rails to the discharge connection in a simple linear movement without tilting the pump side wards. There shall be no need for any personnel to enter the wet well in order to remove the pumps. No portion of the pump shall be supported directly on the bottom of the wet well in order to remove the pumps. No portion of the pump shall be supported directly on the bottom of the wet well, guide rails or lifting chain. A cast iron or fabricated steel base plate with integral guide rail holders shall be provided. The base plate shall be designed with an integral 90 degree elbow.

E. PUMP CONSTRUCTION

1. The pump, motor housings, and seal housing to be of high quality cast iron, ASTM A-48, Class 30.
2. Recessed impeller to be bronze. All fasteners to be of 300 Series stainless steel.
3. All exposed nuts or bolts shall be 316 stainless steel. All metal surfaces coming into contact with the pumped media, other than stainless steel, shall be protected by a factory applied Impact-resistance powder coating finish on the exterior of the pump.
4. Critical mating surfaces where watertight sealing is required shall be machined and fitted with NBR O-rings. Joint sealing will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit. Rectangular cross-sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal.
5. Pump shaft shall be Stainless Steel. Pump and motor shall be shipped from the factory as a finished product. Pumps that are assembled outside of the manufacturer’s facility are not allowed.
6. Pump housing and motor housing shall be fastened together by a 316 stainless steel clamp in lieu of bolts for easy serviceability.

F. CUTTERS

1. The two-stage grinder assembly shall consist of a primary cutter to macerate the solids and a secondary cutter that grinds the macerated solids to fine particles for pumping by the centrifugal impeller.
2. The cutters shall be made of 440C stainless steel hardened to Rockwell 60C and ground to close tolerance.
3. The cutter and stationary ring must be capable of being turned over to provide new cutting edges for double life.
4. The complete grinder assembly must be removable from pump without disturbing pump, seals, or motor.
5. Shredders or single blade cutters are not considered comparable to the grinder assembly.

G. CABLE AND CABLE ENTRY SEAL

1. The power cable into the cord cap assembly shall first be made with a compression fitting.
2. Each individual lead shall be stripped sown to bare wire, at staggered intervals, and each strand shall be individually separated.
3. This area of the cord cap shall then be fitted with an epoxy compound potting which will prevent water contamination to gain entry even in the event of wicking or capillary attraction.
4. There shall be an additional epoxy compound potting area separating the motor housing from the cord cap assembly for added protection.
5. The power cable shall be sized in accordance with NEC and ICEA standards and shall be of sufficient length to reach the junction box without need of splices. The outer jacket of the cable shall be oil resistant chloroprene rubber.
6. The pump shall be equipped with a leak-proof stainless steel cable plug where the unscreened conductors of the cable are cast into the plug by means of a two-component sealant to prevent moisture from entering the motor via the cable core.
7. The pump cable end (plug) shall incorporate in its design the ability to quick disconnect the power cable from the pump without the need to enter the pump. This cable plug shall allow the same plug be utilized for 230/460 volt or 208V applications without the need to enter the pump.

H. PUMP MOTOR

1. Pump motor shall be of the sealed submersible explosion-proof type with standard insulation for operation in high-dielectric oil to give better heat dissipation and longer bearing life.
2. Motor stator shall be held in place with removable end ring so that it can be removed for repair without heating outer shell or using a press.
3. Motor housing shall be filled with high-dielectric oil and no pressure balancing devices shall be used.
4. Motor shaft and housing to be sealed with tow mechanical shaft seals with an oil chamber between seals. Seals to have a carbon and ceramic seal faces.
5. Integral motor and pump shaft to be of 416 stainless steel supported by an upper ball radial and thrust bearing and a lower bronze sleeve bearing.
6. Each pump motor will be provided with heat sensing units which shall trip the starter if the motor overheats.

7. Seal chamber shall be fitted with an electrode probe to detect water in the seal chamber.

I. COOLING SYSTEM

1. Pump shall be of submersible design cooled by ambient fluids with no additional cooling system required.

J. BEARINGS

1. The pump shaft shall rotate on two bearings. Motor bearings shall be grease lubricated for the life of the bearing. The upper motor bearing and lower bearings shall compensate for axial thrust and radial forces and shall consist of a roller bearing and angular contact ball bearing.

K. MECHANICAL SEALS

1. Mechanical seal shall be a cartridge style encased with a 316 stainless steel housing
2. Primary seal faces shall be silicon carbide / silicon carbide and secondary seal faces shall be carbon / ceramic.

L. PUMP SHAFT

1. Pump shaft must be a short overhung and dynamically balanced to eliminate shaft deflection. Pump shaft shall be stainless steel.

M. LIFTING BAIL

1. Lifting bail shall be cast 316 stainless steel bolted to the top of the pump. Bail shall be constructed so that the pump is in proper position to connect to the elbow.

N. AUTO COUPLING SYSTEM

1. Pumps shall be equipped with a complete auto coupling system to include factory upper guide rail brackets, base elbow, guide claw. Fabricated non factory components will not be accepted.
2. Upper guide rail bracket shall be 304 stainless steel.
3. Base elbow shall have a smooth interior to allow for specific solids passage. Base elbow shall be gray cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blowholes or other irregularities. Base elbows shall have a factory applied spray coating.
4. Minimum guide rail diameter shall be 2” SCH40S. Guide rails to be 304 stainless steel.

O. PUMP PROTECTION

1. Each pump shall incorporate three thermal switches, one per stator phase wind and be connected in series, to monitor the temperature of the motor. Should the thermal switches open, the motor shall be stopped and an alarm indication shall be activated.
2. Pumps shall have one normally closed moisture switches. The moisture switches shall be incorporated into the pump to sense moisture in the bottom of the stator housing. The switch shall be wired in series so that if a switch opens the motor is de-energized and the pump is stopped.

P. FACTORY TESTING

1. All factory testing shall be conducted. All testing is to be performed at the pump manufacturer's facility.
2. A performance curve shall be completed after the test and included in the final data package.
3. Field/functional testing will be performed to insure proper mechanical operation at the jobsite. All testing to be used for evaluation shall be performed at the pump manufacturer's facility.

2.2 METAL-TO-METAL RAIL SYSTEM

A. SCOPE

1. Each pump shall include a guide rail "quick-removal" system including a 3" discharge elbow, 3" sealing flange with rail guide, upper guide bracket, stainless steel lifting chain, and 2" schedule 40, stainless steel guide rails, with stainless steel hardware and fasteners.

B. DISCHARGE BASE ELBOW

1. The discharge base elbow shall have mounted directly on the sump floor and sized according to the plans.
2. It shall be cast iron and have either a standard NPT thread or flanged connection. The design shall be such that the pump to discharge connection is made without the need for any nuts, bolts, or gaskets.
3. The base elbow shall also anchor two (2) 2" stainless steel guide rails.

C. SEALING FLANGE

1. The sealing flange/rail guide bracket shall be mounted on each pump discharge.
2. It shall have a machined mating flange which matches the base elbow discharge connection.
3. Sealing of this discharge connection shall be accomplished by simple linear downward motion of the pump culmination with the entire weight of the pumping unit supported entirely by the base elbow.

D. UPPER GUIDE BRACKET

1. The upper guide bracket shall align and support the two guide rails at the top of the sump.
2. It shall bolt directly to the hatch frame and incorporate an expandable rubber grommet.

E. LIFTING CHAIN

1. Each pump shall be provided with a 300 series, stainless steel lifting chain, and be of sufficient length to extend from the pump to the top of the wet well.
2. The access frame shall provide a hook to attach the chain when not in use. The lifting chain shall be sized according to the pump weight..

2.3 CONTROL EQUIPMENT

A. CONTROL PANEL CONSTRUCTION

1. Each duplex pump control panel shall have a NEMA-1 enclosure with inside sub panel to protect electrical equipment.

2. The enclosure shall be constructed of 16 gauge galvanized steel and finished with ANSI 61 gray polyester powder coat inside and out and shall be mounted inside a Nema 3R pad mounted stainless steel enclosure.
3. A lock hasp shall be provided on outside door of the traffic box. A circuit breaker shall be provided for protection on each pump.
4. Each pump shall also come equipped with magnetic starter, including 3-leg overload protection.
5. All of the pilot-devices, lights, switches, operator interface and indicators shall be installed on the face of the door, to accommodate the operating personnel, as listed:
   a. A door-interlocked main power disconnect-switch;
   b. A color touch-screen operator interface panel.
   c. A 3-position control-mode selector switch.
   d. A Hand-Off-Automatic selector switch for each pump.
   e. A Pump-Running indicator-light for each pump.
   f. A Seal-Failure indicator-light for each pump.
   g. A Motor-Over-Temperature indicator-light for each pump.
   h. An Elapsed-Time-Meter for each pump.
6. A terminal strip shall be provided for connecting pump and control wires.
7. The panel shall include a GFI convenience outlet.
8. The PLC shall include a DC power supply with battery back-up. The enclosure shall be protected from condensation through the use of a pre-wired thermostatically-controlled 30-watt anti-condensation heater.
9. The control components shall be mounted on a 12 gauge painted steel subpanel. Individual electrical components shall be mounted in accordance with the manufacturer's recommendations.
10. Wiring within the enclosure shall be run through plastic wiring duct or tied and bundled to prevent strain and abrasion.
11. All customer connections shall be wired to individually numbered terminals and wires shall be numbered at both ends for ease of trouble shooting.
12. The control panel manufacturer shall be listed with UL508 (type l) listing category for the manufacture of control equipment.
13. The control panel shall contain UL listed components wherever practical.
14. The entire control panel assembly shall be approved by UL and labeled to that effect.

B. INTEGRATED LEVEL-MANAGEMENT PUMP CONTROL SYSTEM

1. Furnish a Metropolitan LMS-Jr microprocessor-based electronic Level-Management control system within the control panel. The level-management system shall be furnished as a complete factory assembled unit requiring only field installation of required electrical and sensor connections. The level-management system shall sequence the pumps automatically, in response to changing wet well levels. The control system shall be a complete automatic control package consisting of pump sequencing logic, operator interface terminal, and discreet operator controls. The system shall operate completely unattended, and shall provide notification of alarm conditions. The entire assembly shall be completely pre-wired and function-tested at the factory prior to shipment.
2. The LMS-Jr shall receive an analog signal proportional to the level in the wet-well and sequence the pumps as required in order to maintain the

desired level set-point. The level management system shall provide totally automated sequencing of the pumps.
The analog input shall be provided for wet well level reference, via (1) submersible level-transducer, provided with cords which shall be 50-foot long--longer cords are available, if required by jobsite conditions. All cords must extend the entire distance from the transducers to the control panel terminals, without junction box or splices. The input signals shall be 0-5 vdc scalable or 4-20 mA.

3. The level management system shall alternate the lead pump after each cycle. The LMS-Jr shall alternate each available pump, by the operator's preference. Pumps which are faulted or out of service shall automatically be omitted from the alternation scheme. The operator shall also be capable of manually selecting the lead pump.
4. The wet well level shall be displayed on the controller's color touch-screen operator interface terminal. Each pump and alarm set point shall also be displayed accordingly.
5. Pump-on and pump-off set points shall be independently adjustable providing true differential level control. All set points shall be adjusted via the operator-interface color touch-screen.

C. PROGRAMMABLE LOGIC CONTROLLER (PLC)

1. The programmable logic controller (PLC) shall include integral processor, power supply, input and output circuits and communications ports. This specification requires the use of a non-proprietary, commercially available PLC and touch screen operator interface device.
2. Universal, proprietary controllers and/or displays with separate function buttons, indicators and complex multi-level function trees will not be considered equal or acceptable.
3. A built in real time clock shall provide reference for time based control applications.
4. The unit shall include a memory module for backup and portability of user program. Processor on board memory shall be non-volatile.
5. The processor shall function as specified over an ambient temperature range of -4°F to +140°F with a relative humidity up to 95%, non-condensing.
6. The PLC shall be UL listed for industrial control equipment.
7. To facilitate inter-connectivity the PLC shall include two communications channels, an isolated RS-232/485 communication port and an Ethernet/IP port.
8. The controller shall also be capable of providing a flow estimation algorithm that can be used to provide estimated flow values, and totalize for up to 5 days.
9. This data may be stored in the on-board SCADA option if desired.

D. OPERATOR INTERFACE PANEL

1. The operator interface panel shall show system status and shall provide the operator with convenient soft screen touch keys for the entry of pass codes, set points, and commands.
2. Screen menu keys shall produce instructional screens that will guide the operator in set point entry and alarm diagnosis.
3. Multi-level password protection shall be available to prevent unauthorized set point changes.

4. All information displayed on the screen shall be in plain English and simple graphic representations of the system components.
5. An alarm log shall be provided at the operator interface.
6. This screen shall allow the user to view a summary of a minimum of 20 alarm occurrences.
7. The screen shall show the time and date at the onset of the alarm.
8. The operator interface shall consist of a 640 x 480 pixel, color transmissive, TFT active matrix LCD with backlight. The screen size shall be a minimum of 7".
9. The touch panel shall be sealed from dirt & moisture and shall not exhibit parallax within the viewing angle.
10. Statistical Display Screen:
    a. Pump Status (Off/Running/Alarm) (Each Pump)
    b. Pump Running Hours (Each Pump)
    c. Wet-Well Level
    d. Alarm Conditions
    e. Transducer Failure
11. Set-Point Screens:
    a. Level Set-Points
    b. Alarm Set-Points

E. PRIMARY LEVEL CONTROL VIA SUBMSERSIBLE LEVEL TRANSDUCER

1. The transducer shall incorporate intrinsically safe barriers to maintain safe operation for a Class 1, Division 1 location.
2. The transducer shall serve as the primary level-sensor and a float back up system shall serve as a fail-safe secondary unit.
3. The transducer housing shall be 316 stainless-steel fitted with a stainless-steel cable support bracket.
4. Liquid level shall be sensed by the deflection of a stainless-steel diaphragm having a displacement of less than 5 cu.mm from 0 to full scale.
5. The atmospheric pressure side of the diaphragm shall be bonded to a silicon strain sensor coupled to an integral bridge circuit.
6. Atmospheric venting shall be through the signal cable, directly to atmosphere.
7. Transmitters requiring separate, sealed, expansion breathing systems shall not be accepted.
8. Electrical connection shall be 2 wire, 4-20 mA, and shall be reverse polarity and surge protected. Accuracy shall be 0.6 percent of full scale.
9. Full scale range shall be 0 to 14 feet.
10. Temperature compensated range shall be -20°F to 122°F., maximum operating temperature shall be -40°F to 176°F.
11. The level-transducers shall be field-adjustable from above the wet-well, via the use of a chain & anchor system, consisting of a stainless-steel chain, stabilized by a cast-iron anchor, as shown on the drawings.

F. BACKUP LEVEL CONTROL VIA FLOAT SWITCHES

1. The mechanical floats shall incorporate intrinsically safe barriers to maintain safe operation for a Class 1, Division 1 location.
2. Sealed float type mechanical switches shall be supplied for back-up in case of transducer failure.

3. The mechanical tube switches shall be sealed in a solid polyurethane float for corrosion and shock resistance.
4. The support wire shall have heavy neoprene jacket and a weight shall be attached to the cord above the float to hold switch in place in sump.
5. The weight shall be above the float to prevent sharp bends in the cord when the float operates under water.
6. The float switches shall hang in the sump supported only by the cord that is held to the wiring channel.
7. Four (4) float switches shall be used to control level. One for pump turn on lead pump, one for turn on lag pump, one for high water alarm, and one for pump turn off. Float switches shall be Model No. 2900.

G. HIGH WATER ALARM
1. A high water alarm light shall be supplied for mounting on the control box.
2. Alarm light shall glow bright and flash under alarm conditions.
3. Alarm light shall have reset button.
4. Contacts shall be supplied for separate remote alarm system, dialer, and/or SCADA.

H. OPERATION OF SYSTEM
1. On sump level rise, the switches shall energize and start lead pump.
2. With lead pump operating, sump level will be lowered until the off level is reached, thereby de-energizing the lead pump.
3. Alternating relay shall index on stopping of pump so that lag pump will start on next operation.
4. If the level continues to rise when the lead pump is operating, the lag pump will start and run both pumps together.
5. If the level continues to rise when the lead & lag pump is operating and the high level is reached, the high level alarm shall be activated.
6. If one pump should fail for any reason, the lag pump shall operate in the override mode.

2.4 WET WELL AERATION SYSTEM

A. SYSTEM DESCRIPTION
1. The WWA-1000 aeration system shall be housed within a Nema 4x 304ss enclosure suitable for outdoor applications. The enclosure shall include all motor protection components, timing circuitry, control circuitry, selector switches, and internally mounted air compressor. Incoming service shall be protected by means of a service disconnect external to the panel by others. The incoming service shall be 1/60/120 VAC, 20A minimum. Aeration systems are required at both the Eastbound and Westbound Lift Stations.

B. MANUFACTURERS
1. These specifications describe a standard aeration system as manufactured by Precision Systems, Calumet City, Illinois, represented by Gasvoda and Associates (Ryan Gasvoda – 708-701-1274. The aeration system shall be Precision Systems Model WWA-1000-2688-X1 in a Nema 4x enclosure with 100W heater.

C. CONTROL SYSTEM

1. The controls shall be designed to interface with the pump control panel. It shall be the pump panel supplier's responsibility to provide isolated motor starter auxiliary contact outputs for use by the aeration system. The auxiliary contacts shall be normally closed and wired in series to terminals within the WWA-1000 enclosure for use by the aeration control logic.
2. The aeration control timer shall have an independently adjustable on and off cycle with a range of .05 seconds to 30 hours. The timer shall monitor time sewage pump "off" time and aerator "on" time. The aeration cycle shall reset upon each lift station pump start and upon aeration cycle completion.
3. A filtered static louver shall be provided in the enclosure for ventilation requirements.
4. A 100 watt flexible convection heater shall be provided in the enclosure for temperature maintenance. Thermostat shall be integral to heater with a fixed temperature range of 40-55 deg. F.

D. COMPRESSOR

1. The aeration compressor shall be a 1/3 HP unit with an output capacity of 3.15 cfm @ 0 PSI. The operating voltage shall be 1/60/120 VAC. The compressor shall be of the oil less design with a series of sliding, flat vanes rotating in a cylindrical housing. Rotor shall be eccentrically-mounted rotor to allow individual vanes to slide in and out of their slots by centrifugal and pressure-loading forces. No valves shall be part of the assembly to allow for continuous air movement without pulsation. Am inlet air filter shall be provided.

E. DIFFUSER SYTEM

1. The diffuser(s) and piping assembly inside of the wet well shall be completely constructed of stainless steel, unless specified otherwise, to prevent corrosion in the sewage wet well. The diffusers and piping shall be suspended above the floor of the wet well at the elevation shown on the plans. The air diffuser(s) will be of a coarse air type with deflector shield and dual range diffuser outlet ports. Each aerating assembly shall have (1) 3/4" male NPT discharge. A stainless steel pipe bracket shall be supplied for the 3/4" aeration pipe. The diffuser(s) and pipe mount bracket(s) are provided; their installation is the responsibility of the installing Contractor. The supply and installation of all other piping, fittings, and bracketing, external to the control panel, required to place the unit into operation, are also the responsibility of the installing Contractor.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify layout and orientation of pumps, accessories, and piping connections.

3.2 SHIPPING, DELIVERY, STORAGE, AND HANDLING

A. Submersible grinder pumps shall ship fully assembled.

B. The skidded pump and related equipment shall be unloaded, stored and installed in strict accordance with the manufacturer's Installation and Operating Instructions. The Contractor shall review in detail and implement items relating to mounting, lubrication, power requirements and pump rotation as contained in the manufacturer's Installation and Operating Instructions to ensure proper warranty. If storage is planned to be longer than three (3) months or in a harsh environment, the manufacturer's long term storage instructions must be followed.

3.3 INSTALLATION

A. Install pumps and accessories where indicated on Drawings and according to manufacturer's instructions.

B. Provide and connect piping, accessories, and power and control conduit and wiring to make system operational, ready for startup.

C. Flush piping with clean water.

3.4 START-UP FIELD SERVICE

A. The pump manufacturer's representative shall include in bid at minimum one (1) days' start-up field service for the purpose of supervising pump start-up and instruction of proper pump operation and maintenance.

3.5 SERVICE PROVIDED BY FACTORY REPRESENTATIVE TIME ON SITE

A. Supervise field run test – ½ day

B. Instruct owner in proper start up procedures as well as operations of the pump – ½ day

Method of Measurement. Sanitary sewer lift stations will be measured for payment in units of each at the location designated on the plans.

Basis of Payment. The work will be paid for at the contract unit price per each for SANITARY SEWER LIFT STATION at the location designated on the plans and includes all labor, equipment, fittings, and materials necessary to construct

EMERGENCY GENERATOR WITH AUTOMATIC TRANSFER SWITCH

This work shall consist of the removal and satisfactory disposal of the existing cabinet, enclosed electrical equipment, wiring that is not to be reused, and all other miscellaneous items associated with the existing emergency generator. It also includes furnishing, installing, and commissioning a new emergency generator with automatic transfer switch including all wiring, service installation and other appurtenances as shown in the plan details and as described herein.

Materials and installation shall be according to following specifications and the details, location, and orientation shown on the plans.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes packaged engine-generator sets suitable for use in applications with the features as specified and indicated where the engine generators will be used as the Standby power source for the system.

1.3 DEFINITIONS

A. Emergency Standby Power (ESP): Per ISO 8528: The maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generating set is capable of delivering in the event of a utility power outage or under test conditions for up to 200 hours of operation per year with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. The permissible average power output (Ppp) over 24 hours of operation shall not exceed 70 percent of the ESP unless otherwise agreed by the RIC engine manufacturer.

B. Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of packaged engine generator indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. In addition, include the following:

1. Thermal damage curve for generator.

2. Time-current characteristic curves for generator protective device.

3. Sound test data, based on a free field requirement.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, and location and size of each field connection.

1. Dimensioned outline plan and elevation drawings of engine-generator set and other components specified.

2. Wiring Diagrams: Control interconnection, Customer connections.

C. Certifications:

1. Submit statement of compliance which states the proposed product(s) is certified to the emissions standards required by the location for EPA, stationary emergency application.

1.5 INFORMATIONAL SUBMITTALS

A. Source quality-control test reports.

1. Certified summary of prototype-unit test report. See requirements in Part 2 "Source Quality Control" Article Part A. Include statement indicating torsional compatibility of components.

2. Certified Test Report: Provide certified test report documenting factory test per the requirements of this specification, as well as certified factory test of generator set sensors per NFPA110 level 1.

3. List of factory tests to be performed on units to be shipped for this Project.

4. Report of exhaust emissions and compliance statement certifying compliance with applicable regulations.

B. Warranty:

1. Submit manufacturer’s warranty statement to be provided for this Project.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Manufacturer Qualifications: A qualified manufacturer. Maintain, within 50 of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

C. Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.

D. Comply with NFPA 37 (Standard For the Installation and Use of Stationary Combustion Engines and Gas Turbines).

E. Comply with NFPA 70 (National Electrical Code. Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702).

F. Comply with NFPA 110 (Emergency and Standby Power Systems) requirements for Level 1 emergency power supply system.

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

1. Ambient Temperature: (-20.0 deg F) to 38.0 deg C (100.0 deg F).

2. Relative Humidity: 0 to 95 percent.

3. Altitude: Sea level to 500.0 feet (152.0 m).

1.8 WARRANTY

A. Base Warranty: Manufacturer shall provide base warranty coverage on the material and workmanship of the generator set for a minimum of twenty-four (24) months for Standby product and twelve (12) months for Prime/Continuous product from registered commissioning and start-up.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: The basis for this specification is Cummins Power Generation equipment, approved equals may be considered if equipment performance is shown to meet the requirements herein.

2.2 ENGINE-GENERATOR SET

A. Factory-assembled and -tested, engine-generator set.

B. Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments.

1. Rigging Information: Indicate location of each lifting attachment, generator-set center of gravity, and total package weight in submittal drawings.

C. Capacities and Characteristics:

1. Power Output Ratings: Electrical output power rating for Standby operation of not less than 80.0kW, at 80 percent lagging power factor, 277/480, Series Wye, Three phase, 4 -wire, 60 hertz.

2. Alternator shall be capable of accepting maximum 306.0 kVA in a single step and be capable of recovering to a minimum of 90% of rated no load voltage. Following the application of the specified kVA load at near zero power factor applied to the generator set.

3. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component. The engine-generator nameplate shall include information of the power output rating of the equipment.

D. Generator-Set Performance:

1. Steady-State Voltage Operational Bandwidth: 1.0 percent of rated output voltage from no load to full load.

2. Transient Voltage Performance: Not more than 15 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within 4 seconds. On application of a 100% load step the generator set shall recover to stable voltage within 10 seconds.

3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.

4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.

5. Transient Frequency Performance: Not more than 8 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within 2 seconds. On application of a 100% load step the generator set shall recover to stable frequency within 10 seconds.

6. Output Waveform: At full load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for any single harmonic. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50.

7. Sustained Short-Circuit Current: (For engine-generator sets using a PMG-excited alternator) For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 300 percent of rated full-load current for not less than 8 seconds without damage to generator system components. For a 1-phase, bolted short circuit at system output terminals, system shall regulate both voltage and current to prevent over-voltage conditions on the non-faulted phases.

8. Start Time: Comply with NFPA 110, Level 1, Type 10, system requirements.

9. Ambient Condition Performance: Engine generator shall be designed to allow operation at full rated load in an ambient temperature under site conditions, based on highest ambient condition. Ambient temperature shall be as measured at the air inlet to the engine generator for enclosed units, and at the control of the engine generator for machines installed in equipment rooms.

2.3 ENGINE

A. Fuel: Natural Gas

B. Rated Engine Speed: 1800RPM.

C. Lubrication System: The following items are mounted on engine or skid:

1. Lube oil pump: shall be positive displacement, mechanical, full pressure pump.

2. Filter and Strainer: Provided by the engine manufacturer of record to provide adequate filtration for the prime mover to be used.

3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

D. Engine Fuel System: The engine fuel system shall be installed in strict compliance to the engine manufacturer's instructions

E. Governor: Adjustable isochronous, with speed sensing. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate as appropriate to the state of the engine generator. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed, accelerating to rated speed, and operating in various isochronous states.

F. Cooling System: Closed loop, liquid cooled

1. The generator set manufacturer shall provide prototype test data for the specific hardware proposed demonstrating that the machine will operate at rated standby load in an outdoor ambient condition of 40 deg C.

2. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.

3. Size of Radiator overflow tank: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.

4. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.

5. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.

6. Duct Flange: Generator sets installed indoors shall be provided with a flexible radiator duct adapter flange.

G. Muffler/Silencer: Selected with performance as required to meet sound requirements of the application, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure

requirements. For generator sets with outdoor enclosures the silencer shall be inside the enclosure.

H. Air-Intake Filter: Engine-mounted air cleaner with replaceable dry-filter element and restriction indicator.

I. Starting System: 12 or 24V, as recommended by the engine manufacturer; electric, with negative ground.

1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in Part 1 "Project Conditions" Article.

2. Cranking Cycle: As required by NFPA 110 for level 1 systems.

3. Battery Cable: Size as recommended by engine manufacturer for cable length as required. Include required interconnecting conductors and connection accessories.

4. Battery Compartment: Factory fabricated of metal with acid-resistant finish.

5. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation. The battery charging alternator shall have sufficient capacity to recharge the batteries with all parasitic loads connected within 4 hours after a normal engine starting sequence.

6. Battery Chargers: Unit shall comply with UL 1236, provide fully regulated, constant voltage, current limited, battery charger for each battery bank. It will include the following features:

a. Operation: Equalizing-charging rate based on generator set manufacturer’s recommendations shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.

b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 20 deg C to plus 40 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.

c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.

d. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.

e. Provide LED indication of general charger condition, including charging, faults, and modes. Provide a LCD display to indicate charge rate and battery voltage. Charger shall provide relay contacts for fault conditions as required by NFPA110.

f. Enclosure and Mounting: NEMA, Type 1, wall-mounted cabinet.

2.4 CONTROL AND MONITORING

A. Engine generator control shall be microprocessor based and provide automatic starting, monitoring, protection and control functions for the unit.

B. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of generator set. When mode-selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. (Switches with different configurations but equal functions are acceptable.) When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of the local (generator set-mounted) and/or remote emergency-stop switch also shuts down generator set.

C. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts generator set. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of the local (generator set-mounted) and/or remote emergency-stop switch also shuts down generator set.

D. Configuration: Operating and safety indications, protective devices, system controls, engine gages and associated equipment shall be grouped in a common control and monitoring panel. Mounting method shall isolate the control panel from generator-set vibration. AC output power circuit breakers and other output power equipment shall not be mounted in the control enclosure.

E. Indicating and Protective Devices and Controls: As required by NFPA 110 for Level 1 system, and the following:

1. AC voltmeter (3-phase, line to line and line to neutral values).

2. AC ammeter (3-phases).

3. AC frequency meter.

4. AC kVA output (total and for each phase). Display shall indicate power flow direction.

5. Ammeter-voltmeter displays shall simultaneously display conditions for all three phases.

6. Emergency Stop Switch: Switch shall be a red “mushroom head” pushbutton device complete with lock-out/tag-out provisions. Depressing switch shall cause the generator set to immediately stop the generator set and prevent it from operating.

7. Fault Reset Switch: Supply a dedicated control switch to reset/clear fault conditions.

8. DC voltmeter (alternator battery charging).

9. Engine-coolant temperature gage.

10. Engine lubricating-oil pressure gage.

11. Running-time meter.

12. Generator-voltage and frequency digital raise/lower switches. Rheostats for these functions are not acceptable. The control shall adjustment of these parameters in a range of plus or minus 5% of the voltage and frequency operating set point (not nominal voltage and frequency values.)

13. AC Protective Equipment: The control system shall include over/under voltage, over current, short circuit, loss of voltage reference, and over excitation shut down protection. There shall be an overload warning, and overcurrent warning alarm.

14. Status LED indicating lamps to indicate remote start signal present at the control, existing alarm condition, not in auto, and generator set running.

15. A graphical display panel with appropriate navigation devices shall be provided to view all information noted above, as well as all engine status and alarm/shutdown conditions (including those from an integrated engine emission control system). The display shall also include integrated provisions for adjustment of the gain and stability settings for the governing and voltage regulation systems.

16. Panel lighting system to allow viewing and operation of the control when the generator room or enclosure is not lighted.

17. DC control Power Monitoring: The control system shall continuously monitor DC power supply to the control, and annunciate low or high voltage conditions. It shall also provide an alarm indicating imminent failure of the battery bank based on degraded voltage recover on loading (engine cranking).

2.5 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1.

B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

C. Electrical Insulation: Class H

D. Temperature Rise: 125 / Class H environment.

E. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, over speed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

F. Permanent Magnet Generator (PMG) shall provide excitation power for optimum motor starting and short circuit performance.

G. Enclosure: Drip-proof.

H. Voltage Regulator: SCR type, Separate from exciter, providing performance as specified. The voltage regulation system shall be microprocessor-controlled, full wave rectified, and provide a pulse-width modulated signal to the exciter. No exceptions or deviations to these requirements will be permitted.

I. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

J. Subtransient Reactance: 15 percent maximum, based on the rating of the engine generator set.

2.6 OUTDOOR GENERATOR-SET ENCLOSURE

A. Description: Weather Aluminum housing. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Instruments, control, and battery system shall be mounted within enclosure.

B. Construction:

1. Hinged Doors: With padlocking provisions. Restraint/Hold back hardware to prevent door to keep door open at 180 degrees during maintenance. Rain lips over all doors.

2. Exhaust System:

a. Muffler Location: Within enclosure.

3. Hardware: All hardware and hinges shall be stainless steel.

4. Mounting Base: Suitable for mounting on sub-base fuel tank or housekeeping pad.

5. A weather protective enclosure shall be provided which allows the generator set to operate at full rated load with a static pressure drop equal to or less than 0.5 inches of water.

C. Engine Cooling Airflow through Enclosure: Housing shall provide ample airflow for engine generator operation at rated load in an ambient temperature of 40 deg C.

D. Sound Performance: Reduce the sound level of the engine generator while operating at full rated load to a maximum of 20 dBA measured at any location 7 m from the engine generator in a free field environment.

E. Site Provisions:

1. Lifting: Complete assembly of engine generator, enclosure shall be designed to be lifted into place as a single unit, using spreader bars.

2.7 VIBRATION ISOLATION DEVICES

A. Vibration Isolation: Generators installed on grade shall be provided with elastomeric isolator pads integral to the generator, unless the engine manufacturer requires use of spring isolation.

2.8 FINISHES

A. Indoor and Outdoor Enclosures and Components: Powder-coated and baked over corrosion-resistant pretreatment and compatible primer. Manufacturer’s standard color or as directed on the drawings.

2.9 SOURCE QUALITY CONTROL

A. Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

1. Tests: Comply with NFPA 110, Level 1 Energy Converters. In addition, the equipment engine, skid, cooling system, and alternator shall have been subjected to actual prototype tests to validate the capability of the design under the abnormal conditions noted in NFPA110. Calculations and testing on similar equipment which are allowed under NFPA110 are not sufficient to meet this requirement.

B. Project-Specific Equipment Tests: Before shipment, factory test engine-generator set manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:

1. Test engine generator set manufactured for this Project to demonstrate compatibility and functionality.

2. Full load run.

3. Maximum power.

4. Voltage regulation.

5. Steady-state governing.

6. Single-step load pickup.

7. Simulated safety shutdowns.

8. Provide 14 days' advance notice of tests and opportunity for observation of tests by Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with packaged engine-generator manufacturers' written installation, application, and alignment instructions and with NFPA 110.

B. Equipment shall be installed by the contractor in accordance with final submittals and contract documents. Installation shall comply with applicable state and local codes as required by the authority having jurisdiction. Install equipment in accordance with manufacturer's instructions and instructions included in the listing or labeling of UL listed products.

C. Installation of equipment shall include furnishing and installing all interconnecting wiring between all major equipment provided for the on-site power system. The contractor shall also perform interconnecting wiring between equipment sections (when required), under the supervision of the equipment supplier.

D. Equipment shall be installed on concrete housekeeping pads. Equipment shall be permanently fastened to the pad in accordance with manufacturer’s instructions and seismic requirements of the site.

E. Equipment shall be initially started and operated by representatives of the manufacturer. All protective settings shall be adjusted as instructed by the consulting engineer.

F. All equipment shall be physically inspected for damage. Scratches and other installation damage shall be repaired prior to final system testing. Equipment shall be thoroughly cleaned to remove all dirt and construction debris prior to initial operation and final testing of the system.

G. On completion of the installation by the electrical contractor, the generator set supplier shall conduct a site evaluation to verify that the equipment is installed per manufacturer’s recommended practice.

3.2 ON-SITE ACCEPTANCE TEST

A. The complete installation shall be tested to verify compliance with the performance requirements of this specification following completion of all site work. Testing shall be conducted by representatives of the manufacturer, with required fuel supplied by Contractor. The Engineer shall be notified in advance and shall have the option to

witness the tests. The generator set manufacturer shall provide a site test specification covering the entire system. Tests shall include:

B. Prior to start of active testing, all field connections for wiring, power conductors, and bus bar connections shall be checked for proper tightening torque.

C. Installation acceptance tests to be conducted on site shall include a "cold start" test, a two hour full load (resistive) test, and a one-step rated load pickup test in accordance with NFPA 110. Provide a resistive load bank and make temporary connections for full load test, if necessary.

D. Perform a power failure test on the entire installed system. This test shall be conducted by opening the power supply from the utility service, and observing proper operation of the system for at least 2 hours. Coordinate timing and obtain approval for start of test with site personnel.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

3.4 SERVICE AND SUPPORT

A. The generator set supplier shall maintain service parts inventory for the entire power system at a central location which is accessible to the service location 24 hours per day, 365 days per year. The inventory shall have a commercial value of $3 million or more. The manufacturer of the generator set shall maintain a central parts inventory to support the supplier, covering all the major components of the power system, including engines, alternators, control systems, paralleling electronics, and power transfer equipment.

B. The generator set shall be serviced by a local service organization that is trained and factory certified in generator set service. The supplier shall maintain an inventory of critical power system replacement parts in the local service location. Service vehicles shall be stocked with critical replacement parts. The service organization shall be on call 24 hours per day, 365 days per year. The service organization shall be physically located within 50 of the site.

C. The manufacturer shall maintain model and serial number records of each generator set provided for at least 20 years.

Method of Measurement. Emergency generators with automatic transfer switches will be measured for payment in units of each at the location designated on the plans

Basis of Payment. The work will be paid for at the contract unit price per each for EMERGENCY GENERATOR WITH AUTOMATIC TRANSFER SWITCH at the location designated on the plans.

BLENDED FINELY DIVIDED MINERALS (BDE)

Effective: April 1, 2021

Revise the second paragraph of Article 1010.01 of the Standard Specifications to read:

"Different sources or types of finely divided minerals shall not be mixed or used alternately in the same item of construction, except as a blended finely divided mineral product according to Article 1010.06."

Add the following article to Section 1010 of the Standard Specifications:

"**1010.06 Blended Finely Divided Minerals.** Blended finely divided minerals shall be the product resulting from the blending or intergrinding of two or three finely divided minerals. Blended finely divided minerals shall be according to ASTM C 1697, except as follows.

(a) Blending shall be accomplished by mechanically or pneumatically intermixing the constituent finely divided minerals into a uniform mixture that is then discharged into a silo for storage or tanker for transportation.

(b) The blended finely divided mineral product will be classified according to its predominant constituent or the manufacturer's designation and shall meet the chemical requirements of its classification. The other finely divided mineral constituent(s) will not be required to conform to their individual standards."

COMPENSABLE DELAY COSTS (BDE)

Effective: June 2, 2017 Revised: April 1, 2019

Revise Article 107.40(b) of the Standard Specifications to read:

"(b) Compensation. Compensation will not be allowed for delays, inconveniences, or damages sustained by the Contractor from conflicts with facilities not meeting the above definition; or if a conflict with a utility in an unanticipated location does not cause a shutdown of the work or a documentable reduction in the rate of progress exceeding the limits set herein. The provisions of Article 104.03 notwithstanding, compensation for delays caused by a utility in an unanticipated location will be paid according to the provisions of this Article governing minor and major delays or reduced rate of production which are defined as follows.

(1) Minor Delay. A minor delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two hours, but not to exceed two weeks.

(2) Major Delay. A major delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two weeks.

(3) Reduced Rate of Production Delay. A reduced rate of production delay occurs when the rate of production on the work in conflict with the utility in an unanticipated location decreases by more than 25 percent and lasts longer than seven calendar days."

Revise Article 107.40(c) of the Standard Specifications to read:

"(c) Payment. Payment for Minor, Major, and Reduced Rate of Production Delays will be made as follows.

(1) Minor Delay. Labor idled which cannot be used on other work will be paid for according to Article 109.04(b)(1) and (2) for the time between start of the delay and the minimum remaining hours in the work shift required by the prevailing practice in the area.

Equipment idled which cannot be used on other work, and which is authorized to standby on the project site by the Engineer, will be paid for according to Article 109.04(b)(4).

(2) Major Delay. Labor will be the same as for a minor delay.

Equipment will be the same as for a minor delay, except Contractor-owned equipment will be limited to two weeks plus the cost of move-out to either the Contractor's yard or another job and the cost to re-mobilize, whichever is less. Rental equipment may be paid for longer than two weeks provided the Contractor presents adequate support to the Department (including lease agreement) to show retaining equipment on the job is the most economical course to follow and in the public interest.

(3) Reduced Rate of Production Delay. The Contractor will be compensated for the reduced productivity for labor and equipment time in excess of the 25 percent threshold for that portion of the delay in excess of seven calendar days. Determination of compensation will be in accordance with Article 104.02, except labor and material additives will not be permitted.

Payment for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be determined according to Article 109.13."

Revise Article 108.04(b) of the Standard Specifications to read:

"(b) No working day will be charged under the following conditions.

(1) When adverse weather prevents work on the controlling item.

(2) When job conditions due to recent weather prevent work on the controlling item.

(3) When conduct or lack of conduct by the Department or its consultants, representatives, officers, agents, or employees; delay by the Department in making the site available; or delay in furnishing any items required to be furnished to the Contractor by the Department prevents work on the controlling item.

(4) When delays caused by utility or railroad adjustments prevent work on the controlling item.

(5) When strikes, lock-outs, extraordinary delays in transportation, or inability to procure critical materials prevent work on the controlling item, as long as these delays are not due to any fault of the Contractor.

(6) When any condition over which the Contractor has no control prevents work on the controlling item."

Revise Article 109.09(f) of the Standard Specifications to read:

"(f) Basis of Payment. After resolution of a claim in favor of the Contractor, any adjustment in time required for the work will be made according to Section 108. Any adjustment in the costs to be paid will be made for direct labor, direct materials, direct equipment, direct jobsite overhead, direct offsite overhead, and other direct costs allowed by the resolution. Adjustments in costs will not be made for interest charges, loss of anticipated profit, undocumented loss of efficiency, home office overhead and unabsorbed overhead other than as allowed by Article 109.13, lost opportunity, preparation of claim expenses and other consequential indirect costs regardless of method of calculation.

The above Basis of Payment is an essential element of the contract and the claim cost recovery of the Contractor shall be so limited."

Add the following to Section 109 of the Standard Specifications.

"**109.13 Payment for Contract Delay.** Compensation for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be allowed when such costs result from a delay meeting the criteria in the following table.

Contract Type	Cause of Delay	Length of Delay
Working Days	Article 108.04(b)(3) or Article 108.04(b)(4)	No working days have been charged for two consecutive weeks.
Completion Date	Article 108.08(b)(1) or Article 108.08(b)(7)	The Contractor has been granted a minimum two week extension of contract time, according to Article 108.08.

Payment for each of the various costs will be according to the following.

(a) Escalated Material and/or Labor Costs. When the delay causes work, which would have otherwise been completed, to be done after material and/or labor costs have increased, such increases will be paid. Payment for escalated material costs will be limited to the increased costs substantiated by documentation furnished by the Contractor. Payment for escalated labor costs will be limited to those items in Article 109.04(b)(1) and (2), except the 35 percent and 10 percent additives will not be permitted.

(b) Extended Project Overhead. For the duration of the delay, payment for extended project overhead will be paid as follows.

(1) Direct Jobsite and Offsite Overhead. Payment for documented direct jobsite overhead and documented direct offsite overhead, including onsite supervisory and administrative personnel, will be allowed according to the following table.

Original Contract Amount	Supervisory and Administrative Personnel
Up to $5,000,000	One Project Superintendent
Over $ 5,000,000 - up to $25,000,000	One Project Manager, One Project Superintendent or Engineer, and One Clerk
Over $25,000,000 - up to $50,000,000	One Project Manager, One Project Superintendent, One Engineer, and One Clerk
Over $50,000,000	One Project Manager, Two Project Superintendents, One Engineer, and One Clerk

(2) Home Office and Unabsorbed Overhead. Payment for home office and unabsorbed overhead will be calculated as 8 percent of the total delay cost.

(c) Extended Traffic Control. Traffic control required for an extended period of time due to the delay will be paid for according to Article 109.04.

When an extended traffic control adjustment is paid under this provision, an adjusted unit price as provided for in Article 701.20(a) for increase or decrease in the value of work by more than ten percent will not be paid.

Upon payment for a contract delay under this provision, the Contractor shall assign subrogation rights to the Department for the Department's efforts of recovery from any other party for monies paid by the Department as a result of any claim under this provision. The Contractor shall fully cooperate with the Department in its efforts to recover from another party any money paid to the Contractor for delay damages under this provision."

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)

Effective: September 1, 2000 Revised: March 2, 2019

FEDERAL OBLIGATION. The Department of Transportation, as a recipient of federal financial assistance, is required to take all necessary and reasonable steps to ensure nondiscrimination in the award and administration of contracts. Consequently, the federal regulatory provisions of 49 CFR Part 26 apply to this contract concerning the utilization of disadvantaged business enterprises. For the purposes of this Special Provision, a disadvantaged business enterprise

(DBE) means a business certified by the Department in accordance with the requirements of 49 CFR Part 26 and listed in the Illinois Unified Certification Program (IL UCP) DBE Directory.

STATE OBLIGATION. This Special Provision will also be used by the Department to satisfy the requirements of the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575. When this Special Provision is used to satisfy state law requirements on 100 percent state-funded contracts, the federal government has no involvement in such contracts (not a federal-aid contract) and no responsibility to oversee the implementation of this Special Provision by the Department on those contracts. DBE participation on 100 percent state-funded contracts will not be credited toward fulfilling the Department's annual overall DBE goal required by the US Department of Transportation to comply with the federal DBE program requirements.

CONTRACTOR ASSURANCE. The Contractor makes the following assurance and agrees to include the assurance in each subcontract the Contractor signs with a subcontractor.

> The Contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of contracts funded in whole or in part with federal or state funds. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:
>
> (a) Withholding progress payments;
>
> (b) Assessing sanctions;
>
> (c) Liquidated damages; and/or
>
> (d) Disqualifying the Contractor from future bidding as non-responsible.

OVERALL GOAL SET FOR THE DEPARTMENT. As a requirement of compliance with 49 CFR Part 26, the Department has set an overall goal for DBE participation in its federally assisted contracts. That goal applies to all federal-aid funds the Department will expend in its federally assisted contracts for the subject reporting fiscal year. The Department is required to make a good faith effort to achieve the overall goal. The dollar amount paid to all approved DBE companies performing work called for in this contract is eligible to be credited toward fulfillment of the Department's overall goal.

CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR. This contract includes a specific DBE utilization goal established by the Department. The goal has been included because the Department has determined the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies. The determination is based on an assessment of the type of work, the location of the work, and the availability of DBE companies to do a part of the work. The assessment indicates, in the absence of unlawful discrimination and in an arena of fair and open competition, DBE companies can be expected to perform **0.00%** of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

(a) The bidder documents enough DBE participation has been obtained to meet the goal or,

(b) The bidder documents a good faith effort has been made to meet the goal, even though the effort did not succeed in obtaining enough DBE participation to meet the goal.

DBE LOCATOR REFERENCES. Bidders shall consult the IL UCP DBE Directory as a reference source for DBE-certified companies. In addition, the Department maintains a letting and item specific DBE locator information system whereby DBE companies can register their interest in providing quotes on particular bid items advertised for letting. Information concerning DBE companies willing to quote work for particular contracts may be obtained by contacting the Department's Bureau of Small Business Enterprises at telephone number (217) 785-4611, or by visiting the Department's website at:
http://www.idot.illinois.gov/doing-business/certifications/disadvantaged-business-enterprise-certification/il-ucp-directory/index.

BIDDING PROCEDURES. Compliance with this Special Provision is a material bidding requirement and failure of the bidder to comply will render the bid not responsive.

The bidder shall submit a DBE Utilization Plan (form SBE 2026), and a DBE Participation Statement (form SBE 2025) for each DBE company proposed for the performance of work to achieve the contract goal, with the bid. If the Utilization Plan indicates the contract goal will not be met, documentation of good faith efforts shall also be submitted. The documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor is selected over a DBE for work on the contract. The required forms and documentation must be submitted as a single .pdf file using the "Integrated Contractor Exchange (iCX)" application within the Department's "EBids System".

The Department will not accept a Utilization Plan if it does not meet the bidding procedures set forth herein and the bid will be declared not responsive. In the event the bid is declared not responsive, the Department may elect to cause the forfeiture of the penal sum of the bidder's proposal guaranty and may deny authorization to bid the project if re-advertised for bids.

GOOD FAITH EFFORT PROCEDURES. The contract will not be awarded until the Utilization Plan is approved. All information submitted by the bidder must be complete, accurate and adequately document enough DBE participation has been obtained or document the good faith efforts of the bidder, in the event enough DBE participation has not been obtained, before the Department will commit to the performance of the contract by the bidder. The Utilization Plan will be approved by the Department if the Utilization Plan documents sufficient commercially useful DBE work to meet the contract goal or the bidder submits sufficient documentation of a good faith effort to meet the contract goal pursuant to 49 CFR Part 26, Appendix A. This means the bidder must show that all necessary and reasonable steps were taken to achieve the contract goal. Necessary and reasonable steps are those which, by their scope, intensity and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not successful. The Department will consider the quality, quantity, and intensity of the kinds of efforts the bidder has made. Mere *pro forma* efforts, in other words efforts done as a matter of form, are not good faith efforts; rather, the bidder is expected to have taken genuine efforts that would be reasonably expected of a bidder actively and aggressively trying to obtain DBE participation sufficient to meet the contract goal.

(a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive. Other

factors or efforts brought to the attention of the Department may be relevant in appropriate cases and will be considered by the Department.

(1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.

(2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items with its own forces.

(3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.

b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable. In accordance with the above Bidding Procedures, the documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.

(5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

(6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.

(7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.

(8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.

(b) If the Department determines the bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided it is otherwise eligible for award. If the Department determines the bidder has failed to meet the requirements of this Special Provision or that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification will also include a statement of reasons for the adverse determination. If the Utilization Plan is not approved because it is deficient as a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no more than a five calendar day period to cure the deficiency.

(c) The bidder may request administrative reconsideration of an adverse determination by emailing the Department at "DOT.DBE.UP@illinois.gov" within the five calendar days after the receipt of the notification of the determination. The determination shall become final if a request is not made on or before the fifth calendar day. A request may provide additional written documentation or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be reviewed by the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

CALCULATING DBE PARTICIPATION. The Utilization Plan values represent work anticipated to be performed and paid for upon satisfactory completion. The Department is only able to count toward the achievement of the overall goal and the contract goal the value of payments made for the work actually performed by DBE companies. In addition, a DBE must perform a commercially useful function on the contract to be counted. A commercially useful function is generally performed when the DBE is responsible for the work and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. The Department and Contractor are governed by the provisions of 49 CFR Part 26.55(c) on questions of commercially useful functions as it affects the work. Specific counting guidelines are provided in 49 CFR Part 26.55, the provisions of which govern over the summary contained herein.

(a) DBE as the Contractor: 100 percent goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE does not count toward the DBE goals.

(b) DBE as a joint venture Contractor: 100 percent goal credit for that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work performed by the DBE's own forces.

(c) DBE as a subcontractor: 100 percent goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subcontractor from the Contractor or its affiliates. Work that a DBE subcontractor in turn subcontracts to a non-DBE does not count toward the DBE goal.

(d) DBE as a trucker: 100 percent goal credit for trucking participation provided the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible. At least one truck owned, operated, licensed, and insured by the DBE must be used on the contract. Credit will be given for the following:

(1) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.

(2) The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission is receives as a result of the lease arrangement.

(e) DBE as a material supplier:

(1) 60 percent goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.

(2) 100 percent goal credit for the cost of materials of supplies obtained from a DBE manufacturer.

(3) 100 percent credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a DBE regular dealer or DBE manufacturer.

CONTRACT COMPLIANCE. Compliance with this Special Provision is an essential part of the contract. The Department is prohibited by federal regulations from crediting the participation of a DBE included in the Utilization Plan toward either the contract goal or the Department's overall goal until the amount to be applied toward the goals has been paid to the DBE. The following administrative procedures and remedies govern the compliance by the Contractor with the contractual obligations established by the Utilization Plan. After approval of the Utilization Plan and award of the contract, the Utilization Plan and individual DBE Participation Statements become part of the contract. If the Contractor did not succeed in obtaining enough DBE participation to achieve the advertised contract goal, and the Utilization Plan was approved and contract awarded based upon a determination of good faith, the total dollar value of DBE work calculated in the approved Utilization Plan as a percentage of the awarded contract value shall become the amended contract goal. All work indicated for performance by an approved DBE

shall be performed, managed, and supervised by the DBE executing the DBE Participation Commitment Statement.

(a) NO AMENDMENT. No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be emailed to the Department at DOT.DBE.UP@illinois.gov.

(b) CHANGES TO WORK. Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request for Approval of Subcontractor, Department form BC 260A or AER 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, a new Request for Approval of Subcontractor will not be required. However, the Contractor must document efforts to assure the existing DBE subcontractor is capable of performing the additional work and has agreed in writing to the change.

(c) SUBCONTRACT. The Contractor must provide copies of DBE subcontracts to the Department upon request. Subcontractors shall ensure that all lower tier subcontracts or agreements with DBEs to supply labor or materials be performed in accordance with this Special Provision.

(d) ALTERNATIVE WORK METHODS. In addition to the above requirements for reductions in the condition of award, additional requirements apply to the two cases of Contractor-initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition of award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:

(1) The replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item of work) in a modification of the condition of award; or

(2) The DBE is aware its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or

(3) The DBE is not capable of performing the replacement work or has declined to perform the work at a reasonable competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.

(e) TERMINATION AND REPLACEMENT PROCEDURES. The Contractor shall not terminate or replace a DBE listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in this Special Provision. The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the Contractor obtains the Department's written consent as provided in subsection (a) of this part. Unless Department consent is provided

for termination of a DBE subcontractor, the Contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the DBE in the Utilization Plan.

As stated above, the Contractor shall not terminate or replace a DBE subcontractor listed in the approved Utilization Plan without prior written consent. This includes, but is not limited to, instances in which the Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm. Written consent will be granted only if the Bureau of Small Business Enterprises agrees, for reasons stated in its concurrence document, that the Contractor has good cause to terminate or replace the DBE firm. Before transmitting to the Bureau of Small Business Enterprises any request to terminate and/or substitute a DBE subcontractor, the Contractor shall give notice in writing to the DBE subcontractor, with a copy to the Bureau, of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor shall give the DBE five days to respond to the Contractor's notice. The DBE so notified shall advise the Bureau and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Bureau should not approve the Contractor's action. If required in a particular case as a matter of public necessity, the Bureau may provide a response period shorter than five days.

For purposes of this paragraph, good cause includes the following circumstances:

(1) The listed DBE subcontractor fails or refuses to execute a written contract;

(2) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the Contractor;

(3) The listed DBE subcontractor fails or refuses to meet the Contractor's reasonable, nondiscriminatory bond requirements;

(4) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;

(5) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1200 or applicable state law.

(6) The Contractor has determined the listed DBE subcontractor is not a responsible contractor;

(7) The listed DBE subcontractor voluntarily withdraws from the projects and provides written notice to the Contractor of its withdrawal;

(8) The listed DBE is ineligible to receive DBE credit for the type of work required;

(9) A DBE owner dies or becomes disabled with the result that the listed DBE subcontractor is unable to complete its work on the contract;

(10) Other documented good cause that compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the Contractor can self-perform the work for which the DBE contractor was engaged or so that the Contractor can substitute another DBE or non-DBE contractor after contract award.

When a DBE is terminated or fails to complete its work on the Contract for any reason, the Contractor shall make a good faith effort to find another DBE to substitute for the original DBE to perform at least the same amount of work under the contract as the terminated DBE to the extent needed to meet the established Contract goal. The good faith efforts shall be documented by the Contractor. If the Department requests documentation under this provision, the Contractor shall submit the documentation within seven days, which may be extended for an additional seven days if necessary at the request of the Contractor. The Department will provide a written determination to the Contractor stating whether or not good faith efforts have been demonstrated.

(f) FINAL PAYMENT. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than 30 calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Resident Engineer. If full and final payment has not been made to the DBE, the DBE Payment Agreement shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the DBE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages. The Contractor may request an administrative reconsideration of any amount deducted as damages pursuant to subsection (h) of this part.

(g) ENFORCEMENT. The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.

(h) RECONSIDERATION. Notwithstanding any other provision of the contract, including but not limited to Article 109.09 of the Standard Specifications, the Contractor may request administrative reconsideration of a decision to deduct the amount of the goal not achieved as liquidated damages. A request to reconsider shall be delivered to the Contract Compliance Section and shall be handled and considered in the same manner as set forth in paragraph (c) of “Good Faith Effort Procedures” of this Special Provision, except a final decision that a good faith effort was not made during contract performance to achieve the goal agreed to in the Utilization Plan shall be the final administrative decision of the Department. The result of the reconsideration process is not administratively appealable to the U.S. Department of Transportation.

FUEL COST ADJUSTMENT (BDE)
Effective: April 1, 2009 Revised: August 1, 2017

Description. Fuel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in fuel prices when optioned by the Contractor. The bidder shall indicate with their bid whether or not this special provision will be part of the contract. Failure to indicate "Yes" for any category of work will make that category of work exempt from fuel cost adjustment.

General. The fuel cost adjustment shall apply to contract pay items as grouped by category. The adjustment shall only apply to those categories of work checked "Yes", and only when the cumulative plan quantities for a category exceed the required threshold. Adjustments to work items in a category, either up or down, and extra work paid for by agreed unit price will be subject to fuel cost adjustment only when the category representing the added work was subject to the fuel cost adjustment. Extra work paid for at a lump sum price or by force account will not be subject to fuel cost adjustment. Category descriptions and thresholds for application and the fuel usage factors which are applicable to each are as follows:

(a) Categories of Work.

(1) Category A: Earthwork. Contract pay items performed under Sections 202, 204, and 206 including any modified standard or nonstandard items where the character of the work to be performed is considered earthwork. The cumulative total of all applicable item plan quantities shall exceed 25,000 cu yd (20,000 cu m). Included in the fuel usage factor is a weighted average 0.10 gal/cu yd (0.50 liters/cu m) factor for trucking.

(2) Category B: Subbases and Aggregate Base Courses. Contract pay items constructed under Sections 311, 312 and 351 including any modified standard or nonstandard items where the character of the work to be performed is considered construction of a subbase or aggregate, stabilized or modified base course. The cumulative total of all applicable item plan quantities shall exceed 5000 tons (4500 metric tons). Included in the fuel usage factor is a 0.60 gal/ton (2.50 liters/metric ton) factor for trucking.

(3) Category C: Hot-Mix Asphalt (HMA) Bases, Pavements and Shoulders. Contract pay items constructed under Sections 355, 406, 407 and 482 including any modified standard or nonstandard items where the character of the work to be performed is considered HMA bases, pavements and shoulders. The cumulative total of all applicable item plan quantities shall exceed 5000 tons (4500 metric tons). Included in the fuel usage factor is 0.60 gal/ton (2.50 liters/metric ton) factor for trucking.

(4) Category D: Portland Cement Concrete (PCC) Bases, Pavements and Shoulders. Contract pay items constructed under Sections 353, 420, 421 and 483 including any modified standard or nonstandard items where the character of the work to be performed is considered PCC base, pavement or shoulder. The cumulative total of all applicable item plan quantities shall exceed 7500 sq yd (6000 sq m). Included in the fuel usage factor is 1.20 gal/cu yd (5.94 liters/cu m) factor for trucking.

(5) Category E: Structures. Structure items having a cumulative bid price that exceeds $250,000 for pay items constructed under Sections 502, 503, 504, 505, 512, 516 and 540 including any modified standard or nonstandard items where the character of the

work to be performed is considered structure work when similar to that performed under these sections and not included in categories A through D.

(b) Fuel Usage Factors.

English Units

Category	Factor	Units
A - Earthwork	0.34	gal / cu yd
B – Subbase and Aggregate Base courses	0.62	gal / ton
C – HMA Bases, Pavements and Shoulders	1.05	gal / ton
D – PCC Bases, Pavements and Shoulders	2.53	gal / cu yd
E – Structures	8.00	gal / $1000

Metric Units

Category	Factor	Units
A - Earthwork	1.68	liters / cu m
B – Subbase and Aggregate Base courses	2.58	liters / metric ton
C – HMA Bases, Pavements and Shoulders	4.37	liters / metric ton
D – PCC Bases, Pavements and Shoulders	12.52	liters / cu m
E – Structures	30.28	liters / $1000

(c) Quantity Conversion Factors.

Category	Conversion	Factor
B	sq yd to ton	0.057 ton / sq yd / in depth
	sq m to metric ton	0.00243 metric ton / sq m / mm depth
C	sq yd to ton	0.056 ton / sq yd / in depth
	sq m to metric ton	0.00239 m ton / sq m / mm depth
D	sq yd to cu yd	0.028 cu yd / sq yd / in depth
	sq m to cu m	0.001 cu m / sq m / mm depth

Method of Adjustment. Fuel cost adjustments will be computed as follows.

$CA = (FPI_P - FPI_L) \times FUF \times Q$

Where: CA = Cost Adjustment, $
FPI_P = Fuel Price Index, as published by the Department for the month the work is performed, $/gal ($/liter)
FPI_L = Fuel Price Index, as published by the Department for the month prior to the letting for work paid for at the contract price; or for the month the agreed unit price letter is submitted by the Contractor for extra work paid for by agreed unit price, $/gal ($/liter)
FUF = Fuel Usage Factor in the pay item(s) being adjusted
Q = Authorized construction Quantity, tons (metric tons) or cu yd (cu m)

The entire FUF indicated in paragraph (b) will be used regardless of use of trucking to perform the work.

Basis of Payment. Fuel cost adjustments may be positive or negative but will only be made when there is a difference between the FPI_L and FPI_P in excess of five percent, as calculated by:

Percent Difference = $\{(FPI_L - FPI_P) \div FPI_L\} \times 100$

Fuel cost adjustments will be calculated for each calendar month in which applicable work is performed; and will be paid or deducted when all other contract requirements for the items of work are satisfied. The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

ILLINOIS WORKS APPRENTICESHIP INITIATIVE – STATE FUNDED CONTRACTS (BDE)

Effective: June 2, 2021
Revised: September 2, 2021

Illinois Works Jobs Program Act (30 ILCS 559/20-1 et seq.). For contracts having an awarded contract value of $500,000 or more, the Contractor shall comply with the Illinois Works Apprenticeship Initiative (30 ILCS 559/20-20 to 20-25) and all applicable administrative rules. The goal of the Illinois Apprenticeship Works Initiative is that apprentices will perform either 10% of the total labor hours actually worked in each prevailing wage classification or 10% of the estimated labor hours in each prevailing wage classification, whichever is less. The Contractor may seek from the Department of Commerce and Economic Opportunity (DCEO) a waiver or reduction of this goal in certain circumstances pursuant to 30 ILCS 559/20-20(b). The Contractor shall ensure compliance during the term of the contract and will be required to report on and certify its compliance. An apprentice use plan, apprentice hours, and a compliance certification shall be submitted to the Engineer on forms provided by the Department and/or DCEO.

PORTLAND CEMENT CONCRETE – HAUL TIME (BDE)

Effective: July 1, 2020

Revise Article 1020.11(a)(7) of the Standard Specifications to read:

"(7) Haul Time. Haul time shall begin when the delivery ticket is stamped. The delivery ticket shall be stamped no later than five minutes after the addition of the mixing water to the cement, or after the addition of the cement to the aggregate when the combined aggregates contain free moisture in excess of two percent by weight (mass). If more than one batch is required for charging a truck using a stationary mixer, the time of haul shall start with mixing of the first batch. Haul time shall end when the truck is emptied for incorporation of the concrete into the work. The maximum haul time shall be as follows.

Concrete Temperature at Point of Discharge, °F (°C)	Maximum Haul Time 1/ (minutes)	
	Truck Mixer or Truck Agitator	Nonagitator Truck
50 - 64 (10 - 17.5)	90	45
> 64 (> 17.5) - without retarder	60	30
> 64 (> 17.5) - with retarder	90	45

1/ To encourage start-up testing for mix adjustments at the plant, the first two trucks will be allowed an additional 15 minutes haul time whenever such testing is performed.

For a mixture which is not mixed on the jobsite, a delivery ticket shall be required for each load. The following information shall be recorded on each delivery ticket: (1) ticket number; (2) name of producer and plant location; (3) contract number; (4) name of Contractor; (5) stamped date and time batched; (6) truck number; (7) quantity batched; (8) amount of admixture(s) in the batch; (9) amount of water in the batch; and (10) Department mix design number.

For concrete mixed in jobsite stationary mixers, the above delivery ticket may be waived, but a method of verifying the haul time shall be established to the satisfaction of the Engineer."

SUBCONTRACTOR AND DBE PAYMENT REPORTING (BDE)
Effective: April 2, 2018

Add the following to Section 109 of the Standard Specifications.

"**109.14 Subcontractor and Disadvantaged Business Enterprise Payment Reporting.** The Contractor shall report all payments made to the following parties:

(a) first tier subcontractors;

(b) lower tier subcontractors affecting disadvantaged business enterprise (DBE) goal credit;

(c) material suppliers or trucking firms that are part of the Contractor's submitted DBE utilization plan.

The report shall be made through the Department's on-line subcontractor payment reporting system within 21 days of making the payment."

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: November 2, 2017
Revised: April 1, 2019

Replace the second paragraph of Article 109.12 of the Standard Specifications with the following:

"This mobilization payment shall be made at least seven days prior to the subcontractor starting work. The amount paid shall be at the following percentage of the amount of the subcontract reported on form BC 260A submitted for the approval of the subcontractor's work.

Value of Subcontract Reported on Form BC 260A	Mobilization Percentage
Less than $10,000	25%
$10,000 to less than $20,000	20%
$20,000 to less than $40,000	18%
$40,000 to less than $60,000	16%
$60,000 to less than $80,000	14%
$80,000 to less than $100,000	12%
$100,000 to less than $250,000	10%
$250,000 to less than $500,000	9%
$500,000 to $750,000	8%
Over $750,000	7%"

SUBMISSION OF PAYROLL RECORDS (BDE)

Effective: April 1, 2021

Revise Item 3 of Section IV of Check Sheet #5 of the Recurring Special Provisions to read:

"3. Submission of Payroll Records. The Contractor and each subcontractor shall, no later than the 15th day of each calendar month, file a certified payroll for the immediately preceding month to the Illinois Department of Labor (IDOL) through the Illinois Prevailing Wage Portal in compliance with the State Prevailing Wage Act (820 ILCS 130). The portal can be found on the IDOL website at https://www2.illinois.gov/idol/Laws-Rules/CONMED/Pages/Prevailing-Wage-Portal.aspx. Payrolls shall be submitted in the format prescribed by the IDOL."

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012 Revised: November 1, 2021

The Contractor shall submit a weekly report of Disadvantaged Business Enterprise (DBE) trucks hired by the Contractor or subcontractors (i.e. not owned by the Contractor or subcontractors) that are used for DBE goal credit.

The report shall be submitted to the Engineer on Department form "SBE 723" within ten business days following the reporting period. The reporting period shall be Sunday through Saturday for each week reportable trucking activities occur.

Any costs associated with providing weekly DBE trucking reports shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

WORK ZONE TRAFFIC CONTROL DEVICES (BDE)

Effective: March 2, 2020

Add the following to Article 701.03 of the Standard Specifications:

"(q) Temporary Sign Supports .....1106.02"

Revise the third paragraph of Article 701.14 of the Standard Specifications to read:

"For temporary sign supports, the Contractor shall provide a FHWA eligibility letter for each device used on the contract. The letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device. The signs shall be supported within 20 degrees of vertical. Weights used to stabilize signs shall be attached to the sign support per the manufacturer's specifications."

Revise the first paragraph of Article 701.15 of the Standard Specifications to read:

"**701.15 Traffic Control Devices.** For devices that must meet crashworthiness standards, the Contractor shall provide a manufacturer's self-certification or a FHWA eligibility letter for each Category 1 device and a FHWA eligibility letter for each Category 2 and Category 3 device used on the contract. The self-certification or letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device."

Revise the first six paragraphs of Article 1106.02 of the Standard Specifications to read:

"**1106.02 Devices.** Work zone traffic control devices and combinations of devices shall meet crashworthiness standards for their respective categories. The categories are as follows.

Category 1 includes small, lightweight, channelizing and delineating devices that have been in common use for many years and are known to be crashworthy by crash testing of similar devices or years of demonstrable safe performance. These include cones, tubular markers, plastic drums, and delineators, with no attachments (e.g. lights). Category 1 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 1 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2024.

Category 2 includes devices that are not expected to produce significant vehicular velocity change but may otherwise be hazardous. These include vertical panels with lights, barricades, temporary sign supports, and Category 1 devices with attachments (e.g. drums with lights). Category 2 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 2 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2024.

Category 3 includes devices that are expected to cause significant velocity changes or other potentially harmful reactions to impacting vehicles. These include crash cushions (impact attenuators), truck mounted attenuators, and other devices not meeting the definitions of Category 1 or 2. Category 3 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 3 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2029. Category 3 devices shall be crash tested for Test Level 3 or the test level specified.

Category 4 includes portable or trailer-mounted devices such as arrow boards, changeable message signs, temporary traffic signals, and area lighting supports. It is preferable for Category 4 devices manufactured after December 31, 2019 to be MASH-16 compliant; however, there are currently no crash tested devices in this category, so it remains exempt from the NCHRP 350 or MASH compliance requirement.

For each type of device, when no more than one MASH-16 compliant is available, an NCHRP 350 or MASH-2009 compliant device may be used, even if manufactured after December 31, 2019."

Revise Articles 1106.02(g), 1106.02(k), and 1106.02(l) to read:

"(g) Truck Mounted/Trailer Mounted Attenuators. The attenuator shall be approved for use at Test Level 3. Test Level 2 may be used for normal posted speeds less than or equal to 45 mph.

(k) Temporary Water Filled Barrier. The water filled barrier shall be a lightweight plastic shell designed to accept water ballast and be on the Department's qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings.

(l) Movable Traffic Barrier. The movable traffic barrier shall be on the Department's qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings. The barrier shall be capable of being moved on and off the roadway on a daily basis."

WORKING DAYS (BDE)
Effective: January 1, 2002

The Contractor shall complete the work within **80** working days.

REVISIONS TO THE ILLINOIS PREVAILING WAGE RATES

The Prevailing rates of wages are included in the Contract proposals which are subject to Check Sheet #5 of the Supplemental Specifications and Recurring Special Provisions. The rates have been ascertained and certified by the Illinois Department of Labor for the locality in which the work is to be performed and for each craft or type of work or mechanic needed to execute the work of the Contract. As required by Prevailing Wage Act (820 ILCS 130/0.01, et seq.) and Check Sheet #5 of the Contract, not less than the rates of wages ascertained by the Illinois Department of Labor and as revised during the performance of a Contract shall be paid to all laborers, workers and mechanics performing work under the Contract. Post the scale of wages in a prominent and easily accessible place at the site of work.

If the Illinois Department of Labor revises the prevailing rates of wages to be paid as listed in the specification of rates, the contractor shall post the revised rates of wages and shall pay not less than the revised rates of wages. Current wage rate information shall be obtained by visiting the Illinois Department of Labor web site at http://www.state.il.us/agency/idol/ or by calling 312-793-2814. It is the responsibility of the contractor to review the rates applicable to the work of the contract at regular intervals in order to insure the timely payment of current rates. Provision of this information to the contractor by means of the Illinois Department of Labor web site satisfies the notification of revisions by the Department to the contractor pursuant to the Act, and the contractor agrees that no additional notice is required. The contractor shall notify each of its subcontractors of the revised rates of wages.