# 156

**Letting January 21, 2022**

# Notice to Bidders, Specifications and Proposal

Illinois Department of Transportation

**Contract No. 93762**
**SANGAMON County**
**Section 20-00491-00-BR (Springfield)**
**Routes FAP 67 & FAP 67A (Madison St & Jefferson St)**
**Project 8UQF-680 ()**
**District 6 Construction Funds**

| | |
|---|---|
| Prepared by | F |
| 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. January 21, 2022 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. 93762**
   **SANGAMON County**
   **Section 20-00491-00-BR (Springfield)**
   **Project 8UQF-680 ()**
   **Routes FAP 67 & FAP 67A (Madison St & Jefferson St)**
   **District 6 Construction Funds**

**Construction of four structures to carry the Norfolk Southern and Union Pacific Railroad over Madison Street and Jefferson Street in Springfield. Project extends from 9th St. to 11th St., along Madison, Jefferson, Washington, Monroe, and Capitol Avenue.**

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 re-advertise the proposed improvement, and to waive technicalities.

By Order of the
Illinois Department of Transportation

Omer Osman,
Acting Secretary

**CONTRACT 93762**

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2022

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS, frequently used RECURRING SPECIAL PROVISIONS, and LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS.

No ERRATA this year.

SUPPLEMENTAL SPECIFICATIONS

## RECURRING SPECIAL PROVISIONS

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

LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS

Table of Contents

F.A.P. Route 67 (Madison Street)
F.A.P. Route 67A (Jefferson Street)
Section No. 20-00491-00-BR
City of Springfield, Sangamon County
Contract No. 93762

# SPECIAL PROVISION
# TABLE OF CONTENTS

**Page**

## BDE SPECIAL PROVISIONS

The following special provisions indicated by an "X" are applicable to this contract. An * indicates a new or revised special provision for the letting.

| | File Name | Pg. | | Special Provision Title | Effective | Revised |
|---|---|---|---|---|---|---|
| * | 80099 | | | Accessible Pedestrian Signals (APS) | April 1, 2003 | Jan. 1, 2022 |
| | 80274 | 242 | X | Aggregate Subgrade Improvement | April 1, 2012 | April 1, 2016 |
| | 80192 | | | Automated Flagger Assistance Device | Jan. 1, 2008 | |
| | 80173 | | | Bituminous Materials Cost Adjustments | Nov. 2, 2006 | Aug. 1, 2017 |
| * | 80246 | | | Bituminous Surface Treatment with Fog Seal | Jan. 1, 2020 | Jan. 1, 2022 |
| | 80436 | 245 | X | Blended Finely Divided Minerals | April 1, 2021 | |
| | 80241 | | | Bridge Demolition Debris | July 1, 2009 | |
| | 5026I | | | Building Removal-Case I (Non-Friable and Friable Asbestos) | Sept. 1, 1990 | April 1, 2010 |
| | 5048I | 246 | X | Building Removal-Case II (Non-Friable Asbestos) | Sept. 1, 1990 | April 1, 2010 |
| | 5049I | | | Building Removal-Case III (Friable Asbestos) | Sept. 1, 1990 | April 1, 2010 |
| | 5053I | | | Building Removal-Case IV (No Asbestos) | Sept. 1, 1990 | April 1, 2010 |
| | 80384 | 262 | X | Compensable Delay Costs | June 2, 2017 | April 1, 2019 |
| | 80198 | | | Completion Date (via calendar days) | April 1, 2008 | |
| | 80199 | | | Completion Date (via calendar days) Plus Working Days | April 1, 2008 | |
| | 80293 | | | Concrete Box Culverts with Skews > 30 Degrees and Design Fills ≤ 5 Feet | April 1, 2012 | July 1, 2016 |
| | 80311 | | | Concrete End Sections for Pipe Culverts | Jan. 1, 2013 | April 1, 2016 |
| | 80261 | | | Construction Air Quality – Diesel Retrofit | June 1, 2010 | Nov. 1, 2014 |
| | 80434 | | | Corrugated Plastic Pipe (Culvert and Storm Sewer) | Jan. 1, 2021 | |
| | 80029 | 266 | X | Disadvantaged Business Enterprise Participation | Sept. 1, 2000 | Mar. 2, 2019 |
| | 80229 | 276 | X | Fuel Cost Adjustment | April 1, 2009 | Aug. 1, 2017 |
| * | 80433 | | | Green Preformed Thermoplastic Pavement Markings | Jan. 1, 2021 | Jan. 1, 2022 |
| * | 80422 | | | High Tension Cable Median Barrier | Jan. 1, 2020 | Jan. 1, 2022 |
| * | 80442 | | | Hot-Mix Asphalt – Start of Production | Jan. 1, 2022 | |
| * | 80438 | | | Illinois Works Apprenticeship Initiative – State Funded Contracts | June 2, 2021 | Sept. 2, 2021 |
| * | 80411 | 279 | X | Luminaires, LED | April 1, 2019 | Jan. 1, 2022 |
| * | 80045 | | | Material Transfer Device | June 15, 1999 | Jan. 1, 2022 |
| | 80418 | 288 | X | Mechanically Stabilized Earth Retaining Walls | Nov. 1, 2019 | Nov. 1, 2020 |
| * | 80441 | | | Performance Graded Asphalt Binder | Jan. 1, 2022 | |
| | 80430 | 289 | X | Portland Cement Concrete – Haul Time | July 1, 2020 | |
| * | 3426I | 290 | X | Railroad Protective Liability Insurance | Dec. 1, 1986 | Jan. 1, 2022 |
| | 80395 | | | Sloped Metal End Section for Pipe Culverts | Jan. 1, 2018 | |
| * | 80340 | | | Speed Display Trailer | April 2, 2014 | Jan. 1, 2022 |
| * | 80127 | 291 | X | Steel Cost Adjustment | April 2, 2014 | Jan. 1, 2022 |
| | 80397 | 294 | X | Subcontractor and DBE Payment Reporting | April 2, 2018 | |
| | 80391 | 295 | X | Subcontractor Mobilization Payments | Nov. 2, 2017 | April 1, 2019 |
| | 80437 | | | Submission of Payroll Records | April 1, 2021 | |
| * | 80435 | 296 | X | Surface Testing of Pavements – IRI | Jan. 1, 2021 | Jan. 1, 2022 |
| | 80410 | | | Traffic Spotters | Jan. 1, 2019 | |
| * | 20338 | 302 | X | Training Special Provisions | Oct. 15, 1975 | Sept. 2, 2021 |
| | 80318 | | | Traversable Pipe Grate for Concrete End Sections | Jan. 1, 2013 | Jan. 1, 2018 |
| * | 80429 | | | Ultra-Thin Bonded Wearing Course | April 1, 2020 | Jan. 1, 2022 |
| | 80439 | 305 | X | Vehicle and Equipment Warning Lights | Nov. 1, 2021 | |
| | 80440 | | | Waterproofing Membrane System | Nov. 1, 2021 | |
| | 80302 | 306 | X | Weekly DBE Trucking Reports | June 2, 2012 | Nov. 1, 2021 |
| | 80427 | 307 | X | Work Zone Traffic Control Devices | Mar. 2, 2020 | |
| | 80071 | 309 | X | Working Days | Jan. 1, 2002 | |

The following special provisions are in the 2021 Supplemental Specifications and Recurring Special Provisions.

| File Name | Special Provision Title | New Location(s) | Effective | Revised |
|---|---|---|---|---|
| 80425 | Cape Seal | Sections 405, 1003 | Jan. 1, 2020 | Jan. 1, 2021 |
| 80387 | Contrast Preformed Pavement Marking | Articles 780.08, 1095.03 | Nov. 1, 2017 | |
| 80402 | Disposal Fees | Article 109.04(b) | Nov. 1, 2018 | |
| 80378 | Dowel Bar Inserter | Articles 420.03, 420.05, 1103.20 | Jan. 1, 2017 | Jan. 1, 2018 |
| 80421 | Electric Service Installation | Articles 804.04, 804.05 | Jan. 1. 2020 | |
| 80415 | Emulsified Asphalts | Article 1032.06 | Aug. 1, 2019 | |
| 80423 | Engineer's Field Office and Laboratory | Section 670 | Jan. 1, 2020 | |
| 80417 | Geotechnical Fabric for Pipe Underdrains and French Drains | Articles 1080.01(a), 1080.05 | Nov. 1, 2019 | |
| 80420 | Geotextile Retaining Walls | Article 1080.06(d) | Nov. 1, 2019 | |
| 80304 | Grooving for Recessed Pavement Markings | Articles 780.05, 780.14, 780.15 | Nov. 1, 2012 | Nov. 1, 2020 |
| 80416 | Hot-Mix Asphalt – Binder and Surface Course | Sections 406, 1003, 1004, 1030, 1101 | July 2, 2019 | Nov. 1, 2019 |
| 80398 | Hot-Mix Asphalt – Longitudinal Joint Sealant | Sections 406, 1032 | Aug. 1, 2018 | Nov. 1, 2019 |
| 80406 | Hot-Mix Asphalt – Mixture Design Verification and Production (Modified for I-FIT) | Sections 406, 1030 | Jan. 1, 2019 | Jan. 2, 2021 |
| 80347 | Hot-Mix Asphalt – Pay for Performance Using Percent Within Limits – Jobsite Sampling | Sections 406, 1030 | Nov. 1, 2014 | July 2, 2019 |
| 80383 | Hot-Mix Asphalt – Quality Control for Performance | Sections 406, 1030 | April 1, 2017 | July 2, 2019 |
| 80393 | Manholes, Valve Vaults, and Flat Slab Tops | Articles 602.02, 1042.10 | Jan. 1, 2018 | Mar. 1, 2019 |
| 80424 | Micro-Surfacing and Slurry Sealing | Sections 404, 1003 | Jan. 1, 2020 | Jan. 1, 2021 |
| 80428 | Mobilization | Article 671.02 | April 1, 2020 | |
| 80412 | Obstruction Warning Luminaires, LED | Sections 801, 822, 1067 | Aug. 1, 2019 | |
| 80359 | Portland Cement Concrete Bridge Deck Curing | Articles 1020.13, 1022.03 | April 1, 2015 | Nov. 1, 2019 |
| 80431 | Portland Cement Concrete Pavement Patching | Articles 701.17(e)(3)b, 1001.01(d), 1020.05(b)(5) | July 1, 2020 | |
| 80432 | Portland Cement Concrete Pavement Placement | Article 420.07 | July 1, 2020 | |
| 80300 | Preformed Plastic Pavement Marking Type D - Inlaid | Articles 780.08, 1095.03 | April 1, 2012 | April 1, 2016 |
| 80157 | Railroad Protective Liability Insurance (5 and 10) | Article 107.11 | Jan. 1, 2006 | |
| 80306 | Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS) | Section 1031 | Nov. 1, 2012 | Jan. 2, 2021 |
| 80407 | Removal and Disposal of Regulated Substances | Section 669 | Jan. 1, 2019 | Jan. 1, 2020 |
| 80419 | Silt Fence, Inlet Filters, Ground Stabilization and Riprap Filter Fabric | Articles 280.02, 280.04, 1080.02, 1080.03, 1081.15 | Nov. 1, 2019 | July 1, 2021 |
| 80408 | Steel Plate Beam Guardrail Manufacturing | Article 1006.25 | Jan. 1, 2019 | |
| 80413 | Structural Timber | Article 1007.03 | Aug. 1, 2019 | |
| 80298 | Temporary Pavement Marking | Section 703, Article 1095.06 | April 1, 2012 | April 1, 2017 |
| 80409 | Traffic Control Devices – Cones | Article 701.15(a), 1106.02(b) | Jan. 1, 2019 | |
| 80288 | Warm Mix Asphalt | Sections 406, 1030, 1102 | Jan. 1, 2012 | April 1, 2016 |
| 80414 | Wood Fence Sight Screen | Article 641.02 | Aug. 1, 2019 | April 1, 2020 |

**GUIDE BRIDGE SPECIAL PROVISION INDEX/CHECK SHEET**

Effective as of the: January 21, 2022 Letting

| Pg # | √ | File Name | Title | Effective | Revised |
|---|---|---|---|---|---|
| | | GBSP 4 | Polymer Modified Portland Cement Mortar | June 7, 1994 | April 1, 2016 |
| | | GBSP 13 | High-Load Multi-Rotational Bearings | Oct 13, 1988 | April 30, 2021 |
| | | GBSP 14 | Jack and Remove Existing Bearings | April 20, 1994 | April 13, 2018 |
| | | GBSP 15 | Three Sided Precast Concrete Structure | July 12, 1994 | Dec 21, 2016 |
| | | GBSP 16 | Jacking Existing Superstructure | Jan 11, 1993 | April 13, 2018 |
| | | GBSP 18 | Modular Expansion Joint | May 19, 1994 | Oct 23, 2020 |
| | | GBSP 21 | Cleaning and Painting Contact Surface Areas of Existing Steel Structures | June 30, 2003 | Oct 23, 2020 |
| | | GBSP 25 | Cleaning and Painting Existing Steel Structures | Oct 2, 2001 | Oct 23, 2020 |
| | | GBSP 26 | Containment and Disposal of Lead Paint Cleaning Residues | Oct 2, 2001 | Apr 22, 2016 |
| | | GBSP 28 | Deck Slab Repair | May 15, 1995 | April 13, 2018 |
| | | GBSP 29 | Bridge Deck Microsilica Concrete Overlay | May 15, 1995 | April 30, 2021 |
| | | GBSP 30 | Bridge Deck Latex Concrete Overlay | May 15, 1995 | April 30, 2021 |
| | | GBSP 31 | Bridge Deck High-Reactivity Metakaolin (HRM) Conc Overlay | Jan 21, 2000 | April 30, 2021 |
| | | GBSP 33 | Pedestrian Truss Superstructure | Jan 13, 1998 | Oct 23, 2020 |
| | | GBSP 34 | Concrete Wearing Surface | June 23, 1994 | Oct 4, 2016 |
| | | GBSP 45 | Bridge Deck Thin Polymer Overlay | May 7, 1997 | Feb 6, 2013 |
| | | GBSP 53 | Structural Repair of Concrete | Mar 15, 2006 | Aug 9, 2019 |
| | | GBSP 55 | Erection of Curved Steel Structures | June 1, 2007 | |
| | | GBSP 59 | Diamond Grinding and Surface Testing Bridge Sections | Dec 6, 2004 | April 30, 2021 |
| | | GBSP 60 | Containment and Disposal of Non-Lead Paint Cleaning Residues | Nov 25, 2004 | Apr 22, 2016 |
| | | GBSP 61 | Slipform Parapet | June 1, 2007 | March 1, 2019 |
| | | GBSP 67 | Structural Assessment Reports for Contractor's Means and Methods | Mar 6, 2009 | Oct 5, 2015 |
| | | GBSP 71 | Aggregate Column Ground Improvement | Jan 15, 2009 | Oct 15, 2011 |
| | | GBSP 72 | Bridge Deck Fly Ash or GGBF Slag Concrete Overlay | Jan 18, 2011 | April 30, 2021 |
| | | GBSP 78 | Bridge Deck Construction | Oct 22, 2013 | Dec 21, 2016 |
| | | GBSP 79 | Bridge Deck Grooving (Longitudinal) | Dec 29, 2014 | Mar 29, 2017 |
| | | GBSP 81 | Membrane Waterproofing for Buried Structures | Oct 4, 2016 | March 1, 2019 |
| | | GBSP 82 | Metallizing of Structural Steel | Oct 4, 2016 | Oct 20, 2017 |
| | | GBSP 83 | Hot Dip Galvanizing for Structural Steel | Oct 4, 2016 | Oct 20, 2017 |
| | | GBSP 85 | Micropiles | Apr 19, 1996 | Oct 23, 2020 |
| 310 | X | GBSP 86 | Drilled Shafts | Oct 5, 2015 | Oct 4, 2016 |
| | | GBSP 87 | Lightweight Cellular Concrete Fill | Nov 11, 2011 | Apr 1, 2016 |
| | | GBSP 88 | Corrugated Structural Plate Structures | Apr 22, 2016 | April 13, 2018 |
| | | GBSP 89 | Preformed Pavement Joint Seal | Oct 4, 2016 | Oct 23, 2020 |
| | | GBSP 90 | Three Sided Precast Concrete Structure (Special) | Dec 21, 2016 | April 13, 2018 |
| 322 | X | GBSP 91 | Crosshole Sonic Logging Testing of Drilled Shafts | Apr 20, 2016 | Aug 9, 2019 |
| | | GBSP 92 | Thermal Integrity Profile Testing of Drilled Shafts | Apr 20, 2016 | |
| | | GBSP 93 | Preformed Bridge Joint Seal | Dec 21, 2016 | Oct 23, 2020 |
| | | GBSP 94 | Warranty for Cleaning and Painting Steel Structures | Mar 3, 2000 | Nov 24, 2004 |
| 326 | X | GBSP 96 | Erection of Bridge Girders Over or Adjacent to Railroads | Aug 9, 2019 | |

LIST ANY ADDITIONAL SPECIAL PROVISIONS BELOW

| |
|---|
| |

# STATE OF ILLINOIS
# SPECIAL
# PROVISIONS

## CONTRACT SPECIFICATIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," (SSRBC) adopted January 1, 2022 and the latest edition of the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways" (ILMUTCD) 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 F.A.P. Route 67 (Madison Street), F.A.P. Route 67A (Jefferson Street) in the City of Springfield, Sangamon County. 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 begins immediately north of Enterprise Street on the Norfolk Southern rail corridor and extends south to south of Edwards Street, a distance of approximately 6,670 ft. It extends from 9th Street to 11th Street along Madison Street, Jefferson Street, Washington Street, Monroe Street, and Capitol Avenue.

## DESCRIPTION OF IMPROVEMENT

The roadway reconstruction sections consist of the removal of existing pavement including portions of parking lots, curb and gutter, driveway entrances, sidewalk, fencing, abandon utilities and street appurtenances in the existing right of way and within the proposed right of way along Madison Street, Jefferson Street, Washington Street, Monroe Street, and Capitol Avenue, drainage structures, storm sewer, sanitary sewer, erosion control items, retaining walls, roadway pavement, curb and gutter, sidewalk, pavement marking, lighting, and fencing.

The railway reconstruction section consists of earth excavation, building removal, track removal, and the removal of existing street and parking lot pavement. The proposed improvements include grading, interim track and future tracks, sub-ballast, drainage items, erosion control, and fencing. It also includes construction of two railroad structures over Madison Street, two railroad bridges over Jefferson Street, and associated retaining walls.

The NS work forces will install all ballast and track work, remove existing signals and gates and install new signals, gates, and crossing surface at street crossings.

## PRE-BID SITE VISIT

Interested parties are encouraged to attend the non-mandatory, pre-bid site visit to view the inside

of the existing buildings that are to be demolished as part of this contract. Building No. 3 will not be available for viewing. The site visit will begin on January 7th, 2022 at 9:00 a.m. at 221 N. 11th Street, Springfield, IL 62703, and will conclude at 12:00 p.m.

## CONSTRUCTION SEQUENCE AND SCHEDULE

The Contractor shall prepare a progress schedule as required by Section 108 of the Standard Specifications. The Contractor shall coordinate items of work in order to keep hazards and traffic inconvenience to homes and businesses to a minimum. The Contractor shall also not interfere with NS railway operations while on NS right-of-way except as approved by the NS. Construction shall be staged as shown on the plans and as listed below to meet the following requirements:

- Cooperation between CWLP Electric and Water utilities for the work they are performing should be included in progress schedules and anticipated staging.
- Cooperation between other utilities for the work they are performing should be included in progress schedule and anticipated staging.
- Lane closures on Madison and Jefferson Streets will not be allowed until a firm date for delivery of structural steel is established.
- Full closure of Madison and Jefferson Streets will not be allowed until Stage 1A items are complete as listed in the staging plans and all necessary rail construction materials have been delivered to the site and a construction schedule has been furnished by the NS unless approved by the Engineer.
- A minimum of two lanes of traffic shall remain open at all times on Madison Street and Jefferson Street except as noted below.
- Madison and Jefferson Streets shall be fully closed for a maximum of 420 consecutive calendar days. No other full closures will be allowed. Should the Contractor fail to satisfy this time requirement, the Contractor shall be liable to the Department for liquidated damages of $6,775 per calendar day for each day beyond the 420 calendar days that Madison and Jefferson Streets are fully closed. The liquidated damages shall be administered in accordance with Article 108.09 at the Standard Specifications and any other additional special provisions which may be attached here in which supplements Article 108.09.
- Liquidated Damage will not be charged for a closure day in excess of 420 calendar days for Madison and Jefferson Streets if the closure day is solely due to delays by the railroad company in completing their force account work. The determination if closure days are solely due to railroad company delays will be made by the Engineer.
- Capitol Avenue may be closed a maximum of 182 calendar days. One lane in each direction will remain open at all other times. Capitol Avenue shall not be closed at the same time that Madison or Jefferson Streets are closed except during Stage III.
- Washington Street may be closed a maximum of 182 calendar days. Two lanes shall remain open at all other times.
- The Contractor shall be liable to the Department for liquidated damages of $1275 per day at Capitol Avenue and Washington Street for any closures in excess of the 182 calendar days.
- Liquidation damages will not be charged for closure days caused by railroad delays as

described above. The anticipated duration of NS construction activity is shown on the anticipated construction activity bar chart in the plans. A railroad delay will be considered any additional calendar days beyond what is anticipated for the railroad to complete their work on the anticipated construction activity bar chart.

## WORKING DAYS

Working days shall be according to Section 108.04 of the SSRBC. The Contractor shall complete the work within 200 working days. A construction progress schedule indicating project milestones shall be completed and strictly adhered to by the Contractor unless a request to modify the schedule is submitted in writing and approved by the Engineer.

Working days may be suspended by the Engineer at such time that the construction activities by railroad personnel inhibit or become the controlling item of work.

## TRAFFIC CONTROL PLAN

**Description:** Traffic control shall be in accordance with the applicable sections of the Standard Specifications for Road and Bridge Construction (SSRBC), the applicable guidelines contained in the Illinois Manual on Uniform Traffic Control Devices for Streets and Highways, these Special Provisions, any special details and Highway Standards contained herein and in the plans.

**General:** Special attention is called to Sections 107 and 701 through 705 of the Standard Specifications for Road and Bridge Construction, and as amended by the Supplemental Specifications, Recurring Special Provisions, the Special Provisions contained herein, and the following highway standards relating to traffic control.

701006, 701601, 701606, 701701, 701801, 701901, BLR 21

The Contractor shall notify the Engineer and the City of Springfield Department of Public Works at least 72 hours in advance of activating the traffic control to close any traffic lanes. District 6 Operations Traffic Signal Section shall be contacted at (217) 524-9161 to allow for adjustment of traffic signals, if necessary, near the lane closures. City of Springfield Public Works phone number is (217) 789-2255.

The Contractor shall coordinate the items of work in order to keep hazards and traffic inconveniences to a minimum, as specified below.

Traffic Control and Protection Standard 701006 shall be used for construction within 15 feet of traffic and as shown on the plans.

Traffic Control and Protection Standard 701601, 701606, and 701701 shall be used for lane closures and as shown on the plans.

Traffic Control and Protection Standard 701801 shall be used for all sidewalk closures and as

shown on the plans.

Traffic Control and Protection Standard 701901 shall be used for traffic control devices during construction.

Traffic Control and Protection Standard BLR 21 shall be used for full road closures which will require additional Type III barricades. Prior to beginning any work on the structure or roadway that are included in this project, the Contractor shall erect break away post mounted "Road Construction Ahead" signs, W20-I103(O)-48, as shown on the staging plans.

Finishing earth embankment, HMA surface course, curb and gutter, seeding, and pavement markings may be completed after the road is back open to normal traffic utilizing flaggers in accordance with Traffic Control and Protection, Standards 701601 for necessary lane closures.

The Contractor shall provide, erect, and maintain all the necessary barricades, cones, drums, and lights for the warning and protection of traffic, as required by Sections 107 and 701 through 703 of the Standard Specifications, and as modified.

All advance warning signs shall be in new or like new condition at the start of the project. If an advanced warning sign is damaged or becomes unreadable, the sign shall be replaced by a new or like new sign.

Traffic shall be maintained as described in the traffic control standards or as directed by the Engineer. All debris shall be removed from the pavement and shoulders prior to removal of traffic control.

In addition, to the flaggers required by the various standards, additional flaggers shall be provided by the Contractor, if required by the Engineer, and they will be paid in accordance with Article 109.04 of the Standard Specifications.

The Contractor will be responsible for the traffic devices at all times during construction activities and throughout any winter shutdown periods.

Traffic Control and Protection Standards included in these plans shall always be installed and operational during construction of this section.

All commercial and private entrances along the mainline, which are part of this improvement, shall have suitable access, as determined by the Engineer, at all times during construction of this project. All weather access shall be a minimum of 10.0 ft wide. The Contractor may not deviate from this provision, except when he/she has written permission from the owner/tenant to cut off access to their property for a specific period of time.

Furnishing, placing and removing all traffic control and protection (such as Type III barricades, drums, vertical panels, stop signs, etc.) required will not be measured for payment separately and will be considered as part of the traffic control and protection pay items included in the contract. All permanent pavement markings will be paid for separately.

All other traffic control and protection required for the completion of this improvement will not be paid for separately but will be considered as part of the unit bid prices for the pay item included in the contract.

The contractor shall provide the name and phone number of a contact on a twenty-four (24) hour basis in the event an accident or other unforeseen damage occurs that necessitates replacement or resetting of traffic control items.

Traffic Control and Protection Standards 701606 and 701701 shall be paid for at the contract lump sum price.

During the road closures, the Contractor shall notify the Engineer at least 21 days in advance of each closure. The closure shall begin only after the City has notified the local emergency services, school system, and media. This notification must come at least two weeks in advance of the closure.

**Basis of Payment:** Traffic Control and Protection Standards 701006, 701601, 701801, 701901, and BLR 21 will not be paid for separately but will be included in the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (SPECIAL).

All temporary traffic signal modifications and any additional traffic control and protection, including those standards listed above, as shown on the plans and described in these specifications will be measured on a lump sum basis and paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION, (SPECIAL). This work shall include furnishing, placement, maintenance, replacement, relocating and removal of the work zone traffic control devices used for the purpose of regulating, warning, directing, closing and detouring traffic on the local streets impacted by the construction of the project.

## TRAFFIC SIGNAL TIMING

**Description:** Traffic signal timing shall be in accordance with the applicable sections of the Standard Specifications for Road and Bridge Construction (SSRBC), the applicable guidelines contained in the Illinois Manual on Uniform Traffic Control Devices for Streets and Highways.

**General:** The traffic signal timings for the intersections listed below are as follows:

**Carpenter and 9th**
Cycle Length = 90 seconds AM and PM

- Phase 1 shall be NB/SB protected lefts with a 4 sec. AM and 6 sec. PM green time
- Phase 2 shall be NB/SB thru with permitted lefts with a 21 sec. AM and 33 sec. PM green time
- Phase 3 shall be EB/WB protected lefts with a 21 sec. AM and 15 sec. PM green time
- Phase 4 shall be WB thru and WB left with 18 sec. AM and 6 sec. PM green time
- Phase 5 shall be WB/EB thru and permitted lefts with an 8 sec. AM and 12 sec. PM green time

| Phase | | 1 | | | 2 | | | 3 | | | 4 | | | 5 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Green time in seconds | AM | 4.0 | 4.0 | 0.0 | 21.0 | 4.0 | 1.0 | 21.0 | 4.0 | 0.0 | 18.0 | 0.0 | 0.0 | 8.0 | 4.0 | 1.0 |
| | PM | 6.0 | 4.0 | 0.0 | 33.0 | 4.0 | 1.0 | 15.0 | 4.0 | 0.0 | 6.0 | 0.0 | 0.0 | 12.0 | 4.0 | 1.0 |

**Carpenter and 11th**

Cycle Length = 90 seconds AM and PM

- Phase 1 shall be NB protected lefts with a 7 sec. AM / PM green time
- Phase 2 shall be NB/SB thru with permitted lefts with a 24 sec. AM and 29 sec. PM green time
- Phase 3 shall be EB/WB thru with permitted lefts with a 45 sec. AM and 40 sec. PM green time

| Phase | | 1 | | | 2 | | | 3 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Green time in seconds | AM | 7.0 | 4.0 | 0.0 | 24.0 | 4.0 | 1.0 | 45.0 | 4.0 | 1.0 |
| | PM | 7.0 | 4.0 | 0.0 | 29.0 | 4.0 | 1.0 | 40.0 | 4.0 | 1.0 |

**Madison and 9th**

Cycle Length = 60 seconds AM, 90 seconds PM

- Phase 1 shall be NB/SB thru with a 25 sec. AM and 44 sec. PM green time
- Phase 2 shall be EB thru with a 25 sec. AM and 36 sec. PM green time

| Phase | | 1 | | | 2 | | |
|---|---|---|---|---|---|---|---|
| Green time in seconds | AM | 25.0 | 4.0 | 1.0 | 25.0 | 4.0 | 1.0 |
| | PM | 44.0 | 4.0 | 1.0 | 36.0 | 4.0 | 1.0 |

**Madison and 11th**

Cycle Length = 60 seconds AM and PM

- Phase 1 shall be SB thru with protected left with a 10 sec. AM / PM green time
- Phase 2 shall be NB/SB thru with permitted left with a 40 sec. AM / PM green time

| Phase | | 1 | | | 2 | | |
|---|---|---|---|---|---|---|---|
| Green time in seconds | AM | 10.0 | 4.0 | 1.0 | 40.0 | 4.0 | 1.0 |
| | PM | 10.0 | 4.0 | 1.0 | 40.0 | 4.0 | 1.0 |

**Jefferson and 9th**

Cycle Length = 60 seconds AM and PM

- Phase 1 shall be NB thru with protected left with a 10 sec. AM / PM green time
- Phase 2 shall be NB/SB thru with permitted left with a 40 sec. AM / PM green time

| Phase | | 1 | | | 2 | | |
|---|---|---|---|---|---|---|---|
| Green time in seconds | AM | 10.0 | 4.0 | 1.0 | 40.0 | 4.0 | 1.0 |
| | PM | 10.0 | 4.0 | 1.0 | 40.0 | 4.0 | 1.0 |

**Jefferson and 11th**
Cycle Length = 60 seconds AM and PM

- Phase 1 shall be NB/SB thru with protected left with a 25 sec. AM / PM green time
- Phase 2 shall be WB thru with permitted left with a 25 sec. AM / PM green time

| Phase | | 1 | | | 2 | | |
|---|---|---|---|---|---|---|---|
| Green time in seconds | AM | 10.0 | 4.0 | 1.0 | 40.0 | 4.0 | 1.0 |
| | PM | 10.0 | 4.0 | 1.0 | 40.0 | 4.0 | 1.0 |

**Basis of Payment:** Any cost of altering the traffic signal timings shall be will not be paid for separately but will be included in the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (SPECIAL).

## CHANGEABLE MESSAGE SIGN

**Description:** This work shall consist of providing all equipment and labor for furnishing and placing portable changeable message signs.

**General:** This work shall be performed in accordance with the applicable Articles of Section 701 of the Standard Specifications except as modified herein.

All changeable message signs shall be supplied by the Contractor. The placement of any sign will begin no later than 14 calendar days in advance of the upcoming closure at locations as specified by the District Traffic Control Technician or Engineer. The changeable message signs are in addition to any changeable message sign that may be required and is noted on the applicable Traffic Control and Protection Highway Standards. Signs will be placed as shown on the detour plans or as designated by the Engineer. The message to be shown on the message board will also be at the discretion of the Engineer and will have to change for the road closures.

**Basis of Payment:** Changeable Message Signs shall be measured and paid for at the contract unit price per calendar day for CHANGEABLE MESSAGE SIGN. Changeable message signs specified in the Traffic Control and Protection Highway Standards shall be measured and paid for per the applicable pay item for that work.

## DETOUR SIGNING

**Description:** This work shall consist of furnishing, installation, maintenance, relocation, and removal of temporary detour signing as shown on the plans, as directed by the Engineer, in accordance with Section 701 of the Standard Specifications, and as herein specified.

**General:** Detour Signing required under this item is that which is required to implement temporary detours during the street closures. When detour signing shall be placed shall be coordinated with the Engineer and the City Traffic Engineer.

Detour Signing required under this item includes barricades/drums, Type III barricades, and all temporary signing necessary to mark the detours as shown on the plan detour sheets. This item will also include changing the message on the changeable message signs, though the changeable message signs will be paid for separately.

This work will also include covering existing signs that conflict with any of the detour signs and shall also include covering or removing the detour signs when the detour is not in effect as directed by the Engineer.

The Contractor shall coordinate the items of work to keep hazards and traffic inconveniences to a minimum.

All detour signs shall be in new or like new condition at the start of the project. If a sign is damaged or becomes unreadable, the sign shall be replaced by a new or like new sign.

**Basis of Payment:** All the work in this special provision will be paid for at the contract unit price per Lump Sum for DETOUR SIGNING.

## STATUS OF UTILITIES TO BE ADJUSTED

The following utilities are involved in this project. The utility companies have provided the estimated dates.

| Name & Address of Utility | Type | Location | Estimated Date of Relocation Completed |
|---|---|---|---|
| Ameren CILCO North<br>Mr. Alex Schroeder<br>825 North MacArthur Blvd.<br>Springfield, IL 62702<br>Phone: (217) 753-5107 | Gas | Throughout the Project | During Construction |
| Ameren CILCO North<br>Mr. Nicholas Reed<br>825 North MacArthur Blvd.<br>Springfield, IL 62702<br>Phone: (217) 753-6459 | Electric | Throughout the Project | During Construction |
| City Water, Light & Power<br>Mr. Michael Johnson<br>401 North 11th Street<br>Springfield, IL 62702<br>Phone: (217) 789-2323,<br>Ext. 1617 | Water | Throughout the Project | During Construction |
| City Water, Light & Power<br>Mr. Shaun Anders<br>1008 East Miller Street<br>Springfield, Illinois 62702<br>Phone: (217) 321-1323 | Electric | Throughout the Project | During Construction |

| | | | |
|---|---|---|---|
| City of Springfield<br>(Sewer Department)<br>Mr. Vince Smith<br>210 Municipal Center West<br>Springfield, IL 62701<br>Phone: (217) 789-2255 | Sewer | Throughout the Project | Completed By Contractor |
| City of Springfield<br>(Public Works)<br>Mr. Thomas Heavisides<br>Room 203 Municipal Center W.<br>300 S. 7th St.<br>Springfield, IL 62701<br>Phone: (217) 789-2255 | Fiber Optic/Traffic | Throughout the Project | Completed By Contractor |
| Sangamon County Water Reclamation District<br>Mr. Jason Jacobs<br>3000 North 8th Street<br>Springfield, IL 62707<br>Phone: (217) 528-0491 | Sewer | Throughout the Project | Completed By Contractor |
| Comcast<br>Mr. David Bly<br>711 South Dirksen Parkway<br>Springfield, IL 62703<br>Phone: (224) 229-5267 | Cable/Fiber Optic | Throughout the Project | During Construction |
| AT&T Distribution<br>Mr. Mike Osmond<br>1640 E. Hazel Dell Rd.<br>Springfield, IL 62703<br>Phone: (217) 789-5644 | Fiber Optic/Telephone | Throughout the Project | During Construction |
| CenturyLink<br>Mr. Bryan Hankins<br>624 White Oak Drive<br>Chatham, IL 62629<br>Phone: (720) 480-3364 | Fiber Optic | Throughout the Project | During Construction |
| Norfolk Southern Corporation<br>Mr. George “Brian” Taylor<br>650 West Peachtree Street NW<br>Box 45<br>Atlanta, GA 30308<br>Phone: (678) 333-4274 | RR Communication | Throughout the Project | During Construction |
| Windstream, KDL, Inc.<br>Mr. Jerome Light<br>1109 CR 450N<br>Toledo, IL 62468<br>Phone: (217) 254-0252 | Fiber Optic | Throughout the Project | During Construction |
| Stratus Networks, Inc.<br>Butch Forkell<br>4700 N. Prospect Rd.<br>Peoria Heights, IL 61616<br>Phone: (309) 696-6349 | Fiber Optic | Throughout | During Construction |
| ATT (Transmission)<br>Vanessa Ross | Buried Telephone | Washington St. | During Construction |

| | | | |
|---|---|---|---|
| 555 E. Cook Street<br>Springfield, IL 62703<br>Phone: (217) 814-2314 (W)<br>(217) 381-8284 (M) | | | |
| State of Illinois CMS<br>Robert Durkin<br>1200 W. Jefferson Street<br>Springfield, IL 62702<br>Phone: (217) 558-1130 (W)<br>(217) 299-9312 (M) | Fiber Optic | Adams St. | During Construction |
| Metro Communications Co.<br>Taylor Rich<br>8 Washington Street<br>Sullivan, IL 61951<br>Phone: (217) 728-3608 | Fiber Optic | Throughout | During Construction |
| Hospital Sisters Health System<br>Tim Ferguson<br>3215 Executive Park Drive<br>Springfield, IL 62794-9456<br>Phone: (217) 523-5420 | Buried Electric | Mason St. | During Construction |
| Horace Mann<br>Tom Brownfield<br>1 Horace Mann Plaza<br>Springfield, IL 62703<br>Phone: (217) 565-0499 (M) | Fiber Optic | Jefferson St. | During Construction |
| IDOT Signals<br>William Shaw<br>650 N. Lincoln Ave., Bldg E<br>Springfield, IL 62702<br>Phone: (217) 558-6695 | Fiber Optic/Traffic Signals | Madison St.<br>Jefferson St.<br>9th St. | During Construction |

The above represents the best information of the Department and is only included for the convenience of the bidder. The applicable provisions of 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. If any utility adjustments or relocations have not been completed when required by the Contractor's operations, the Contractor should notify the Engineer in writing. A request for an extension of time will be considered to the extent the Contractor's critical path schedule is affected.

## COOPERATION WITH DOWNTOWN TRAFFIC SIGNAL MODERNIZATION PROJECT

The City of Springfield is completing a downtown traffic signal modernization project. As part of the project, there will be new traffic signal controller equipment and possibly new fiber optic cable installed. The contractor shall be expected to cooperate and coordinate with the Downtown Signal Modernization Project so the City may complete their projected testing of the centralized traffic signal management system. The cost for this work shall be included in the unit prices bid

and no additional compensation will be allowed.

## ASSURANCES AND CERTIFICATIONS RELATED TO THE CITY'S RAISE GRANT

Contractor agrees to comply (and require any subcontractors, successors, transferees, and/or assignees to comply) with all applicable provisions governing the FRA's access to records, accounts, documents, information, facilities, and staff. Contractor must comply with any program or compliance reviews, and/or complaint investigations conducted by the FRA. Contractor must keep records, reports, and submit the material for review upon request to FRA, or its designee in a timely, complete, and accurate way. Additionally, contractor must comply with all other reporting, data collection, and evaluation requirements, as prescribed by law or detailed in program guidance.

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally assisted programs of the U.S. Department of Transportation, Federal Railroad Administration (FRA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 C.F.R. Part 21.

3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Nondiscrimination on the grounds of race, color, or national origin.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the FRA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the FRA, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the FRA may determine to be appropriate, including, but not limited to:

a. withholding payments to the contractor under the contract until the contractor complies; and/or

b. cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the FRA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:

Potentially Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 C.F.R. Part 21.

- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);

- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);

- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability); and 49 C.F.R. Part 27;

- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);

- Airport and Airway Improvement Act of 1982, (49 U.S.C. § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);

- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);

- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations at 49 C.F.R. Parts 37 and 38;

- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);

- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681 et seq).

## CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS – PRIMARY COVERED TRANSACTIONS

**C.F.R. Parts 180 and 1200**

These assurances and certifications are applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FRA approval or that is estimated to cost $25,000 or more – as defined in 2 C.F.R. Parts 180 and 1200.
By signing and submitting the Technical Application and by entering into this agreement , the Recipient is providing the assurances and certifications for First Tier Participants and Lower Tier Participants under this agreement, as set out below.

**1. Instructions for Certification – First Tier Participants:**

a. The prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "civil judgment," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 C.F.R. Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a Recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a Recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers to any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:**

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment, including a civil settlement, rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

**2. Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 C.F.R. Parts 180 and 1200)

a. The prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "civil settlement," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 C.F.R. Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a Recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a Recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the

certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -- Lower Tier Participants:**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

## REQUIREMENTS REGARDING DELINQUENT TAX LIABILITY OR A FELONY CONVICTION UNDER ANY FEDERAL LAW

As required by sections 415 and 416 of Title IV, Division L of the Consolidated Appropriations Act, 2014 (Pub. L. 113-76), and similar provisions in subsequent appropriations acts, and implemented through USDOT Order 4200.6, the funds provided under this contract shall not be used to enter into a contract, memorandum of understanding, or cooperative agreement with, make a grant to, or provide a loan or loan guarantee to, any corporation that:

(1) Has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, where the awarding agency is aware of the unpaid tax liability, unless an agency has considered suspension or debarment of the corporation and made a determination that suspension or debarment is not necessary to protect the interests of the Government; or

(2) Was convicted of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless an agency has considered suspension or debarment of the corporation and made a determination that suspension or debarment is not necessary to protect the interests of the Government.

The Recipient therefore agrees:

1. **Definitions.** For the purposes of this exhibit, the following definitions apply:

**"Covered Transaction"** means a transaction that uses any funds under this award and that is a contract, memorandum of understanding, cooperative agreement, grant, loan, or loan guarantee.

**"Felony Conviction"** means a conviction within the preceding 24 months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the United States Code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. 3559.

**"Participant"** means the Recipient, an entity who submits a proposal for a Covered Transaction, or an entity who enters into a Covered Transaction.

**"Tax Delinquency"** means an unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

2. **Mandatory Check in the System for Award Management.** Before entering a Covered Transaction with another entity, a Participant shall check the System for Award Management (the "SAM") at http://www.sam.gov/ for an entry describing that entity.

3. **Mandatory Certifications.** Before entering a Covered Transaction with another entity, a Participant shall require that entity to:

(1) Certify whether the entity has a Tax Delinquency; and

(2) Certify whether the entity has a Felony Conviction.

4. **Prohibition.** If

(1) the SAM entry for an entity indicates that the entity has a Tax Delinquency or a Federal Conviction;

(2) an entity provides an affirmative response to either certification in section 3; or

(3) an entity's certification under section 3 was inaccurate when made or became inaccurate after being made then a Participant shall not enter or continue a Covered Transaction with that entity unless the USDOT has determined in writing that suspension or debarment of that entity are not necessary to protect the interests of the Government.

5. **Mandatory Notice to the USDOT.**

(a) If the SAM entry for a Participant indicates that the Participant has a Tax Delinquency or a Felony Conviction, the Recipient shall notify the USDOT in writing of that entry.

(b) If a Participant provides an affirmative response to either certification in section 1, the Recipient shall notify the USDOT in writing of that affirmative response.

(c) If the Recipient knows that a Participant's certification under section 1 was inaccurate when made or became inaccurate after being made, the Recipient shall notify the USDOT in writing of that inaccuracy.

6. **Flow Down.** For all Covered Transactions, including all tiers of subcontracts and subawards, the Recipient shall:

(1) require the SAM check in section 2;

(2) require the certifications in section 3;

(3) include the prohibition in section 4; and

(4) require all Participants to notify the Recipient in writing of any information that would require the Recipient to notify the USDOT under section 5.

**[END OF ASSURANCES AND CERTIFICATIONS]**

## ROADWAY

## AGGREGATE SUBGRADE IMPROVEMENT

**Description:** This work shall be according to the BDE Special Provision AGGREGATE SUBGRADE IMPROVEMENT and the following requirements.

**Course Aggregate:** The aggregate gradation for the bottom 9 in. of the aggregate subgrade shall be RR01.

**Capping Aggregate:** The top 3 in. of the aggregate subgrade shall consist of aggregate gradations CA 06 or CA 10.

## ARTISTIC ELEMENTS ON CAPITOL AVENUE

This work shall consist of removing and relocating or stockpiling artistic elements as shown on the plans. Materials that have to be replaced due to relocating shall be new and at the same kind as, or equal to, the material being replaced. Artistic elements include the following: Interpretive markers, custom limestone planters, stone pillars, and precast planter edgers. Any artistic elements damaged during removal, stockpiling, or relocating shall be repaired or replaced by the contractor at no cost to the project. Elements to be stockpiled shall be placed on pallets and transported to city storage location as directed by the Engineer.

This work, will be paid for at the contract lump sum price for RELOCATE ARTISTIC ELEMENTS or REMOVE AND STOCKPILE ARTISTIC ELEMENTS.

## BENCH REMOVAL

This work shall consist of removing existing benches and transporting them to a city facility as directed by the Engineer. Any benches damaged during removal or transport shall be replaced by the contractor at no cost to the project.

This work will be paid for at the contract unit price each for BENCH REMOVAL.

## BOLLARD REMOVAL

**Description:** This work shall consist of removal of bollards at locations shown on the plans.

**General:** Bollards and any attached concrete shall be removed and disposed of according to Article 202.03. The void caused by the removal shall be backfilled with compacted embankment.

**Basis of Payment:** Removal of bollards shall be paid for at the contract unit price each for BOLLARD REMOVAL which shall include the cost of furnishing and placing the backfill.

## BUILDING REMOVAL

**Description:** This work shall consist of removing buildings listed in the table below according the following BDE Special Provisions:

Building Removal – Case II (Non-Friable Asbestos Abatement)

The asbestos abatement case for each building is identified in the table below.

In addition to the requirements of the BDE Special Provisions, basement floors shall be broken up or perforated to prevent entrapment of water.

BUILDING REMOVAL LIST

| Bldg No. | Parcel No. | Parcel Address | Building Type | Asbestos Abatement Case |
|---|---|---|---|---|
| 1 | SR0114 | 221 N. 11$^{TH}$ ST | COMMERCIAL | II |
| 3 | SR0127 | 1001 E. MONROE ST | COMMERCIAL | II |
| 4 | SR0306 | ON EXISTING ROW | COMMERCIAL | II |

The removal of Building No. 3 shall not occur until after May 31, 2022. The contractor shall verify with the Engineer that the building tenant has moved from the facility prior to demolition.

**Basis of Payment:** This work, including breaking or perforating basement floors and all work shown on the plans for Bldg No. 1 and Bldg No. 4 shall be included in the contract unit prices for Building Removal No. 1 and Building Removal No. 4.

## CLASS D PATCHES, TYPE I, 5 INCH

**Description:** This work shall be performed at the locations noted in the plans in accordance with the applicable portions of Section 442 of the Standard Specifications in addition to the following requirements.

**General:** At the proposed pump station entrance road, as detailed in the plans, the aggregate base or Class D Patch material shall be included in this pay item and shall be included in the contract unit price for CLASS D PATCHES, TYPE I, 5 INCH.

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for CLASS D PATCHES, TYPE I, 5 INCH.

## CLEARING

**Description:** This work shall be in accordance with Section 201 of the Standard Specifications. In addition to the items listed in Section 201.01(a), clearing shall include stockpiled railroad ties

or rail, poles, broken concrete and asphalt, concrete blocks, bricks, pallets, posts, pipes, scrap materials, bollards, temporary concrete barriers, parking blocks, discarded household furniture, appliances and goods, sheds and outbuildings not listed for payment and any other unclassified material at locations not specifically listed in the schedule of quantities as being measured for payment.

**Basis of Payment:** CLEARING will not be measured for payment.

## CONCRETE GUTTER (SPECIAL)

**Description:** This work shall consist of furnishing all labor, materials, and equipment for the construction of the concrete gutter at the locations detailed in the plans. The work shall be performed in accordance with plan details and applicable portions of Section 606 of the Standard Specifications.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for CONCRETE GUTTER (SPECIAL).

## CONCRETE PAVER PAVEMENT

**Description:** This work shall consist of constructing and installing pavement, sidewalk, or detectable warnings, composed of concrete pavers, on a prepared subbase according to Check Sheet LRS14, except as modified below, at locations shown on the plans or as directed by the Engineer.

**General:**

Submittals

- Paver manufacturer's material test data certifying pavers comply with specification.
- Paver samples representing actual size, shape, and color range.
- Paver contractor's methods and quality control plan/statements identifying milestones and procedures to receive approvals and to assure adherence to this specification. This must be tailored to this specific project with actual dates for mockups, approvals, and quality control meetings.

Environmental Requirements

- Do not install sand or pavers during heavy rain or snowfall.
- Do not install sand and pavers over frozen aggregate base materials.
- Do not install frozen sand or saturated sand.
- Do not install concrete pavers on frozen or saturated sand.

P.C.C. Pavers

- Acceptable Concrete Pavers P.C.C. Paver suppliers include all members of UNI-Group U.S.A. who can, or do, produce a P.C.C. Paver that matches the style, size, and colors of the P.C.C. Pavers specified.

- Compressive Strength: Greater than 8000 psi.

- Water Absorption: Maximum of 5 %; ASTM 936 and freeze-thaw testing per Section 8 of ASTM C-67.

- Basis for Design for Style, Size and Color as follows:
  - Type 1: Hollandstone Paver by Unilock, Inc.; 7 7/8" X 3 7/8" X 3 1/8"; Autumn Blend.
  - Type 2: Hollandstone Paver by Unilock, Inc.; 7 7/8" X 3 7/8" X 3 1/8"; Prairie Blend.
  - Type 3: Hollandstone Paver by Unilock, Inc.; 7 7/8" X 3 7/8" X 3 1/8"; Buff.
  - Type 4: Hollandstone Paver by Unilock, Inc.; 7 7/8" X 3 7/8" X 3 1/8"; Charcoal.
  - Type 5: Hollandstone Paver by Unilock, Inc.; 7 7/8" X 3 7/8" X 3 1/8"; Natural.
  - Type 6: Hollandstone Paver by Unilock, Inc.; 7 7/8" X 3 7/8" X 3 1/8"; Gold.

Installation of Pavers

- The "Aesthetic Mockup" shall be required on the project site for approval by the Engineer prior to installation.

- After the sand setting bed has been installed, carefully place the pavers in straight courses with "hand" tight joints and uniform top surface.

- Paver spacer bars will provide joints between pavers (joints may be between 1/16 in. and 3/16 in. wide and no more than 5% of the joints shall exceed 1/4 in. wide to achieve straight bond lines).

- Paver Joint lines shall not deviate more than ±< 1/2 in. over 50 ft from string lines.

- Fill gaps at the edges of the paved area with cut pavers or edge units.

- Cut pavers, to be placed along the edge, with a double blade paver splitter or masonry saw.

- Adjust paver pattern at pavement edges such that cutting of edge pavers is minimized.

- All cut pavers exposed shall be no smaller than one-third of a whole paver measured in the long direction (approximately 2 5/8") and no smaller than two-thirds of a whole paver measured in the short direction (approximately 2 9/16").

- Cut pavers edges are to abut pavers only; a paver spacer bar must abut the cut edge of a paver.

- Do not place cut paver edges against concrete.

- Keep skid steer and forklift equipment off newly laid pavers that have not received initial compaction and joint sand.

Field Quality Control

- The surface elevation of pavers shall be 1/8 inch to 1/4 inch above adjacent drainage inlets, concrete collars or channels.

- Lippage: No greater than 1/8 inch difference in height between adjacent pavers.

**Basis of Payment:** This work shall be paid for at the contract unit price per square yard for CONCRETE PAVER PAVEMENT.

## CONTROLLED LOW-STRENGTH MATERIAL

**Description:** This work shall consist of filling steam vaults, handholes or other structures according to Section 593 of the SSRBC at locations directed by the Engineer.

**General:** Abandoned utility manholes and vaults are potentially located within the project limits. The number, size and location of these are unknown, but if encountered, the Engineer should be contacted immediately. Any castings or lids encountered shall be stockpiled and delivered to the City of Springfield. The Contractor shall determine if any live utilities are located within the vault that would prevent it from being filled. The Contractor shall notify the Engineer whether or not any live utilities are located within the vault and whether it is acceptable to be filled. Should the vault be filled, all open pipe connections shall be grouted shut and the vault filled with controlled low-strength material to the level of the proposed subgrade.

Other structures not intended to be removed by other means as a part of the contract, encountered by the Contractor and known not to contain live utilities, shall be filled with controlled low-strength material, upon approval of the Engineer.

**Basis of Payment:** This work shall be paid for at the contract unit price per cubic yard for CONTROLLED LOW-STRENGTH MATERIAL.

## DRAINAGE STRUCTURES (PUMP STATION)

**General:** This work shall consist of constructing Drainage Structure No. 1 & Drainage Structure No. 2.

**Description:** Drainage Structures shall be furnished and installed in accordance with Sections 516 and 602 of the Standard Specifications with exceptions shown on the Plans and as specified herein.

Drainage Structures shall be excavated using a vertical shaft boring machine. The Contractor shall submit a detailed excavation plan and a detailed grout installation and drainage structure installation plan to the Engineer for approval prior to commencing work. The plans shall be sealed by a professional engineer. The plans shall include proposed shaft dimensions, proposed shoring, either permanent or temporary casing, and staging. The excavation plan shall include drawings and design calculations for temporary or permanent casing. The calculations shall be prepared and sealed by an Illinois Licensed Structural Engineer. This approval will not relieve the Contractor of responsibility for the safety of the excavation. The shoring shall be designed for earth loads and HS-20 live load for vehicle traffic. The plan should address completely filling the space between the structure and the rock face and shall address buoyancy issues during installation. Should there be groundwater present in the annular space between the structure and the rock face, the Contractor shall use a grout formulated for curing under water and shall install the grout from the bottom-up. The grout shall conform to ASTM C-1107 and shall have a minimum compressive strength of 5,000 psi after twenty-eight (28) days. In lieu of non-shrink grout, may use Class DS concrete with 8-10" slump.

Each Drainage Structure shall be excavated, installed, and backfilled completely prior to commencing construction on another Drainage Structure. At no time shall there be simultaneous construction on multiple drainage structures.

Material removed from the excavation shall be disposed of in accordance with Section 202.03 of the Standard Specifications.

Once each of the vertical shafts have been excavated, a 12-in. bedding of CA-7 aggregate or class SI concrete shall be placed in the bottom of the shaft and leveled to form a flat base to set the Drainage Structures.

Drainage Structures shall be precast reinforced concrete manholes conforming to ASTM C-478 and ART. 1042 of SSRBC "Precast concrete products." The structures shall be water-tight. The precast manhole shall have a minimum compressive strength of 4,000 psi at twenty-eight (28) days.

All penetrations through the walls of the drainage structure shall be sealed with a link style seal or a non-shrink grout as identified on the plans. The link style seal shall form a watertight seal between a pipe and a concrete structure. The Contractor shall coordinate the sizing with link seal supplier. The seal shall be installed per manufacturer's recommendations forming a watertight seal with the structure.

The drainage structure sections shall be a minimum of 4-ft tall with the exception of the final section. Each section shall be sealed with two (2) strips of butyl rubber sealant. Joints in the butyl rubber sealant shall be overlapped to prevent gaps.

The drainage structure shall be checked after the installation of each section to ensure a true vertical installation. If the alignment is off, the Contractor shall take corrective action to shim the structure back to level.

The exterior and the bottom of the base of the structures shall receive two coats of asphalt emulsion waterproofing in accordance with Section 503.18 of the Standard Specifications.

The annular space between the structures and the edge of the shaft shall be filled with non-shrink grout between the elevations shown on the plans. From the top of the grout to the surface, the annular space between the manhole and the edge of the shaft shall be filled with controlled low strength material, mix 2 in accordance with Section 593 of the SSRBC or non-shrink grout.

After installation is complete, if there are water leaks at joints, the Contractor shall waterproof the leaks using drilled ports around the leak and a hydrophilic grout.

Openings in the structures for pipes shall be blocked out during manufacturing with knockouts left in place during initial installation.

The top barrels of the Drainage Structures shall be flat. The precast lids shall be sealed to the top ring section with a double row of butyl mastic. The precast lids shall have a cast in place access frames and hatches per the plans. The frame and hatch design live load is AASHTO HS-20 truck load and alternate tandem loads.

Chamfered inverts shall be installed in the structures as shown on the plans. The invert shall be constructed of stiff non-shrink grout conforming to ASTM C-1107 and Section 1024 of the Standard Specifications. The chamfer and sloped sidewalls in Drainage Structures, shall be per the pump manufacturer's recommendations to provide sufficient space between the volute and the invert of the station. The sidewalls shall be sloped to direct debris to the pumps and promote self-cleaning of the structure invert.

**General:** This work includes all mobilization, excavation, temporary or permanent shoring/casing, labor, materials and equipment required to manufacture, furnish, and install the drainage structures, precast concrete, lid, access frame and hatch, non-shrink grout, controlled low strength material, butyl rubber sealant, asphalt emulsion waterproofing, CA-7, concrete, removal and disposal of excess material and other incidental items as shown on the plans.

**Basis of Payment:** This work will be paid for at the contract unit price per each for DRAINAGE STRUCTURES, NO. 1 and DRAINAGE STRUCTURES, NO. 2.

## EARTH EXCAVATION

**Description:** This work shall be according to Section 202 of the SSRBC in addition to the following requirements for drainage. All excavated material, other than unsuitable materials, and

non-special waste meeting the requirements of Article 669.05 (a) (5) of the SSRBC, shall remain on site and be used as embankment or disposed of at the optional earthwork staging area.

**Drainage:** The work shall be maintained so that positive drainage is provided at all times. Some drainage structures will have their outlet pipes constructed in later stages. Temporary ditches, temporary sump pumps or other methods determined by the Contractor shall be used to provide positive drainage during excavation and to protect adjacent property from damage. The method and procedure to provide positive drainage during excavation shall be submitted and approved by the Engineer prior to excavation. If the Engineer determines during construction that the positive drainage is not adequate, the Contractor shall correct this to the satisfaction of the Engineer. This work shall be included in the contract unit price for EARTH EXCAVATION.

**Optional Earthwork Staging Area:** The Contractor has the option to use the existing earthwork staging area south of Ash Street and east of the rail corridor at 830 East Ash Street in Springfield, Illinois for earthwork staging. As an example, the Contractor may elect to use material excavated from the staging areas to construct a portion of the Stage 1 embankment. The Contractor may also elect to dispose of surplus material at the staging areas. If the contractor elects to excavate material from the staging area, the staging area excavation must be filled back in by the completion of the project. The Contractor shall seed disturbed areas as necessary during earthwork staging to minimize erosion at no additional cost to the contract.

The contractor shall submit an excavation plan to the Engineer for approval showing slopes and limits of any work in the staging area.

At completion of the project, the optional staging areas shall be graded to drain in a manner consistent with the existing drainage, and the ground surface elevation shall be no more than 10 feet higher than the existing elevation.

Any additional excavation or fill material due to the Contractor's selected method of earthwork staging or use of the staging area will not be measure for payment. All temporary erosion control or seeding at the earthwork staging area will not be measured for payment.

## FENCE REMOVAL

**Description:** This work shall consist of removing existing fencing, posts, barbed wire, supports, foundations, gates and associated hardware according to Sections 201, 664 and 665 of the SSRBC and constructing end posts and associated hardware where required to terminate existing fence at locations shown on the plans or as directed by the Engineer.

**General:** All material included with this removal shall be disposed of off-site by the Contractor. End post and associated hardware to terminate existing chain link fence shall be according to Standard 664001 and Section 664 of the SSRBC. End posts and associated hardware to terminate existing woven wire fence shall be according to Standard 665001 and Section 665 of the SSRBC.

**Basis of Payment:** This work including end posts and associated hardware shall be paid for at the contract unit price per foot for FENCE REMOVAL.

## FENCE REMOVAL (SPECIAL)

**Description:** This work shall consist of removal of Horace Mann's fence at locations shown on the plans.

**General:** The Contract shall remove the fence and stockpile the fence at the location determined by Horace Mann. Any fencing damaged during removal or stockpiling shall be repaired or replaced by the Contractor at no additional cost.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for FENCE REMOVAL (SPECIAL).

## FOUNDATION REMOVAL

This work shall consist of removing concrete foundations at locations shown on the plans and in accordance with Section 501 of the Standard Specifications. This work shall also include filling the void caused by the removal with compacted embankment.

This work will be paid for at the contract unit price per cubic yard for FOUNDATION REMOVAL.

## GEOTECHNICAL FABRIC FOR GROUND STABILIZATION

**Description:** This work shall be according to Section 210 of the SSRBC in addition to the following requirements.

**Materials:** The GEOTECHNICAL FABRIC shall be woven fabric meeting the requirements of Article 1080.02.

The aggregate shall be AGGREGATE SUBGRADE IMPROVEMENT meeting the requirements of the project Special Provisions.

## IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL PROVISION (TPG)

Effective: August 1, 2012 Revised: February 2, 2017

In addition to the Contractor's equal employment opportunity (EEO) affirmative action efforts undertaken as required by this Contract, the Contractor is encouraged to participate in the incentive program described below to provide additional on-the-job training to certified graduates of the IDOT pre-apprenticeship training program, as outlined in this Special Provision.

IDOT funds, and various Illinois community colleges operate, pre-apprenticeship training programs throughout the State to provide training and skill-improvement opportunities to promote the increased employment of minority groups, disadvantaged persons and women in all aspects of the highway construction industry. The intent of this IDOT Pre-Apprenticeship Training Program Graduate (TPG) special provision (Special Provision) is to place these certified program graduates on the project site for this Contract in order to provide the graduates with meaningful on-the-job training. Pursuant to this Special Provision, the Contractor must make every reasonable effort to recruit and employ certified TPG trainees to the extent such individuals are available within a practicable distance of the project site.

Specifically, participation of the Contractor or its subcontractor in the Program entitles the participant to reimbursement for graduates' hourly wages at $15.00 per hour per utilized TPG trainee, subject to the terms of this Special Provision. Reimbursement payment will be made even though the Contractor or subcontractor may also receive additional training program funds from other non-IDOT sources for other non-TPG trainees on the Contract, provided such other source does not specifically prohibit the Contractor or subcontractor from receiving reimbursement from another entity through another program, such as IDOT through the TPG program. With regard to any IDOT funded construction training program other than TPG, however, additional reimbursement for other IDOT programs will not be made beyond the TPG Program described in this Special Provision when the TPG Program is utilized.

No payment will be made to the Contractor if the Contractor or subcontractor fails to provide the required on-site training to TPG trainees, as solely determined by IDOT. A TPG trainee must begin training on the project as soon as the start of work that utilizes the relevant trade skill and the TPG trainee must remain on the project site through completion of the Contract, so long as training opportunities continue to exist in the relevant work classification. Should a TPG trainee's employment end in advance of the completion of the Contract, the Contractor must promptly notify the IDOT District EEO Officer for the Contract that the TPG's involvement in the Contract has ended. The Contractor must supply a written report for the reason the TPG trainee involvement terminated, the hours completed by the TPG trainee on the Contract, and the number of hours for which the incentive payment provided under this Special Provision will be, or has been claimed for the separated TPG trainee.

Finally, the Contractor must maintain all records it creates as a result of participation in the Program on the Contract, and furnish periodic written reports to the IDOT District EEO Officer that document its contractual performance under and compliance with this Special Provision. Finally, through participation in the Program and reimbursement of wages, the Contractor is not relieved of, and IDOT has not waived, the requirements of any federal or state labor or employment law applicable to TPG workers, including compliance with the Illinois Prevailing Wage Act.

**Method of Measurement:** The unit of measurement is in hours.

**Basis of Payment:** This work will be paid for at the contract unit price of $15.00 per hour for each utilized certified TPG Program trainee (TRAINEES TRAINING PROGRAM

GRADUATE). The estimated total number of hours, unit price, and total price must be included in the schedule of prices for the Contract submitted by Contractor prior to beginning work. The initial number of TPG trainees for which the incentive is available for this contract is 8. The Department has contracted with several educational institutions to provide screening, tutoring and pre-training to individuals interested in working as a TPG trainee in various areas of common construction trade work. Only individuals who have successfully completed a PreApprenticeship Training Program at these IDOT approved institutions are eligible to be TPG trainees. To obtain a list of institutions that can connect the Contractor with eligible TPG trainees, the Contractor may contact: HCCTP TPG Program Coordinator, Office of Business and Workforce Diversity (IDOT OBWD), Room 319, Illinois Department of Transportation, 2300 S. Dirksen Parkway, Springfield, Illinois 62764. Prior to commencing construction with the utilization of a TPG trainee, the Contractor must submit documentation to the IDOT District EEO Officer for the Contract that provides the names and contact information of the TPG trainee(s) to be trained in each selected work classification, proof that that the TPG trainee(s) has successfully completed a Pre-Apprenticeship Training Program, proof that the TPG is in an Apprenticeship Training Program approved by the U.S. Department of Labor Bureau of Apprenticeship Training, and the start date for training in each of the applicable work classifications.

To receive payment, the Contractor must provide training opportunities aimed at developing a full journeyworker in the type of trade or job classification involved. During the course of performance of the Contract, the Contractor may seek approval from the IDOT District EEO Officer to employ additional eligible TPG trainees. In the event the Contractor subcontracts a portion of the contracted work, it must determine how many, if any, of the TPGs will be trained by the subcontractor. Though a subcontractor may conduct training, the Contractor retains the responsibility for meeting all requirements imposed by this Special Provision. The Contractor must also include this Special Provision in any subcontract where payment for contracted work performed by a TPG trainee will be passed on to a subcontractor.

Training through the Program is intended to move TPGs toward journeyman status, which is the primary objective of this Special Provision. Accordingly, the Contractor must make every effort to enroll TPG trainees by recruitment through the Program participant educational institutions to the extent eligible TPGs are available within a reasonable geographic area of the project. The Contractor is responsible for demonstrating, through documentation, the recruitment efforts it has undertaken prior to the determination by IDOT whether the Contractor is in compliance with this Special Provision, and therefore, entitled to the Training Program Graduate reimbursement of $15.00 per hour.

Notwithstanding the on-the-job training requirement of this TPG Special Provision, some minimal off-site training is permissible as long as the offsite training is an integral part of the work of the contract and does not compromise or conflict with the required on-site training that is central to the purpose of the Program. No individual may be employed as a TPG trainee in any work classification in which he/she has previously successfully completed a training program leading to journeyman status in any trade, or in which he/she has worked at a journeyman level or higher.

## INLETS WITH TYPE 3V FRAME AND GRATE

**Description:** This work shall consist of constructing inlets with frames and grates according to Section 602 of the SSRBC at locations shown on the plans or as directed by the Engineer.

**General:** The grate shall be in accordance with Standard 604011.

**Basis of Payment:** This work will be paid for at the contract unit price per each for INLETS, TYPE A, TYPE 3V FRAME AND GRATE and INLETS, TYPE B, TYPE 3V FRAME AND GRATE.

## IRRIGATION BED 0.5 GPH

This item of work shall consist of the installation of a complete irrigation system including the connection(s) to the supply manifold, piping, emitters, fittings, valves, and appurtenances necessary for a buried drip irrigation system.

The supply manifold connection shall be through glue joint fittings and shall include any necessary adapters to transition from PVC to PE.

The drip irrigation system shall consist of an interconnected grid of 5/8" PE pipe with integral pressure compensating non clogging drip emitters located at 18" intervals creating an 18" drip grid at the rate of 0.5 Gallons per Hour (GPH) per emitter in each of the planting areas. The grids shall be constructed per the plan details. The emitter pipe shall be installed and secured at a depth of 4" in each of the planting beds. The total length of emitter pipe installed in a single planting bed shall not exceed 502 ft without the addition of a supplemental connection to the supply manifold.

Each planting bed shall have a dual connection to the supply manifold. The upstream and any necessary intermediate connections shall be direct connections and the downstream connection shall include a spring operated check valve allowing the water to flow out of the irrigation bed.

Air release valves shall be tied into the irrigation beds at high points in the system as required by the manufacturer. Air release valves will be located in planting beds per the plan details.

Flush valves shall be installed at low spots and at the end of the irrigation supply manifolds for purging the system. Flush valves will be located in planting beds per the plan details.

The irrigation bed design including supporting documentation shall be supplied by the Contractor prior to approval for construction.

**Basis of Payment:** This work shall be paid for at the contract price per square foot for IRRIGATION BED 0.5 GPH.

## IRRIGATION BED 1.0 GPH

This item of work shall consist of the installation of a complete irrigation system including the connection(s) to the supply manifold, piping, emitters, fittings, valves, and appurtenances necessary for a buried drip irrigation system.

The supply manifold connection shall be through glue joint fittings and shall include any necessary adapters to transition from PVC to PE.

The drip irrigation system shall consist of an interconnected grid of 5/8" PE pipe with integral pressure compensating non clogging drip emitters located at 18" intervals creating an 18" drip grid at the rate of 1.0 Gallons per Hour (GPH) per emitter in each of the planting areas. The grids shall be constructed per the plan details. The emitter pipe shall be installed and secured at a depth of 4" in each of the planting beds. The total length of emitter pipe installed in a single planting bed shall not exceed 502 ft without the addition of a supplemental connection to the supply manifold.

Each planting bed shall have a dual connection to the supply manifold. The upstream and any necessary intermediate connections shall be direct connections and the downstream connection shall include a spring operated check valve allowing the water to flow out of the irrigation bed.
Air release valves shall be tied into the irrigation beds at high points in the system as required by the manufacturer. Air release valves will be located in planting beds per the plan details.

Flush valves shall be installed at low spots and at the end of the irrigation supply manifolds for purging the system. Flush valves will be located in planting beds per the plan details.

The irrigation bed design including supporting documentation shall be supplied by the Contractor prior to approval for construction.

**Basis of Payment:** This work shall be paid for at the contract price per square foot for IRRIGATION BED 1.0 GPH.

## IRRIGATION PIPING

This item of work shall consist of the furnishing and placement of the irrigation manifold piping as specified in the Plans.

Pipe Materials

All irrigation supply piping shall be PVC Schedule 40 meeting ASTM D-1785. PVC Schedule 40 pipe will utilize solvent cement joints per ASTM D2672.

Pressure Testing

All piping shall be pressure tested to 50 psi prior to connection to the irrigation beds. All tees and interconnects will be temporarily capped, and the main flushed and pressurized to 50 psi. The pressure shall hold for 1 hour. Any loss of pressure shall be considered a failure.

Flushing

All irrigation piping shall be flushed prior to any connections to the irrigation beds.

Blowoff Valves

The Contractor shall furnish and install blow off valves at location shown on the plans or as diected by the Engineer. The cost, including installation and testing, shall be incidental to the installation of the irrigation piping.

Tracer Wire

The Contractor shall furnish and install, along the entire route of the irrigation line , #12 AWG, THW single-conductor, copper locator wire. The wire shall be installed just above the crown of the pipe, shall be brought into each junction box, flush valve box and air release box. Any necessary splicing shall be made using a direct bury splice kit such as 3M Part No. 054007-09053, or equivalent. The tracer wire shall be tested for continuity prior to final acceptance by the Owner. The cost of the locator wire, including installation and testing, shall be incidental to the installation of the irrigation piping.

**Basis of Payment:** This work shall be paid for at the contract price per foot for PVC, SCHEDULE 40 PIPE, of the size specified.

## MAINTENANCE MOWING

**Description:** This work shall consist of mowing vegetated rights of way, easements and excess parcels as directed by the Engineer to maintain the project site in compliance with the City of Springfield's nuisance ordinance throughout the duration of the contract.

**General:** The Engineer shall notify the Contractor in writing when mowing is required. The notice will include delineation of areas to be mowed on scalable drawings or on parcel maps with

parcels of known acreage. Mowing shall be performed in accordance with Section 250.06(b) except that mowing of slopes as great as 1:2 (V:H) will be required. Mowing shall be completed within 10 days of the written notification.

**Method of Measurement:** Mowing will be measured in acres with areas computed from plan drawings or known parcel acreages.

**Basis of Payment:** Each satisfactorily completed mowing notification will be paid for at the contract unit price per acre for MAINTENANCE MOWING. Only the initial mowing for each notification will be paid for. Any subsequent mowing required to obtain a height of not more than 3 in. or to disperse mowed material will be considered as included in the cost of the initial mowing.

## MANHOLES

Manholes shall be in accordance with Section 602 of the Standard Specifications except that those noted on the plans as sanitary manholes shall have the additional requirements noted below.

Manholes shall be precast reinforced concrete. All joints shall be made with an approved bitumastic material on an approved rubber gasket. The completed manhole shall be watertight.

Where shown on the plans, drop connections shall be constructed in accordance with drawing No. 6 in the Standard Specifications for Water and Sewer Main Construction. Cost for drop connections shall be included in the contract unit price for manholes of the size and type specified.

Manhole steps, when required, shall be gray cast iron ASTM A48 or polypropylene coated steel reinforcing rods with load and pullout ratings meeting OSHA standards.

Channels shall be made to conform in shape and slope to that of the connecting sewers and shall be brought together smoothly with well-rounded junctions, satisfactory to the ENGINEER, and in conformance with details shown on the plans.

All manholes shall be tested by the Contractor for watertightness by either of the following methods in conformance with the requirements specified:

A. ASTM C969: “Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.”
B. ASTM C 1244: “Standard Test Method for Concrete Sewer Manholes by the Negative Pressure (Vacuum) Test.”

The manholes will be paid for the size and type specified, which price shall include the precast structures, gaskets, concrete fill, risers, cones or flat top slabs, frames and lids, steps, sand cushion, concrete trough, and all excavation and backfilling. The unit price per each for the size and type specified shall also include any connection to existing or proposed sewers, temporary shoring, excavation and backfill to complete the connection, the removal of existing storm sewer,

if necessary, and staging and temporary construction to maintain flow during construction.

The temporary soil retention systems at each manhole will be according to Section 522 of the IDOT SSRBC and payment for these systems will be included in the unit price each for the size and type of manhole specified.

The unit price per each for the size and type specified shall also include any connection to existing or proposed sewers, temporary shoring, excavation and backfill to complete the connection, the removal of existing storm sewer, if necessary, and staging and temporary construction to maintain flow during construction.

This work will be paid for at the contract unit price per each for MANHOLES of the type and size specified.

## MANHOLE, SEWER RELOCATION

**Description:** This work shall be performed at the proposed sewer relocations in accordance with the applicable portions of Section 602 of the Standard Specifications in addition to the following requirements.

**Construction Requirements:** A temporary soil retention system (TSRS) may be required for construction of and connection to the proposed manhole. TSRS may also be required to maintain flow of the existing sewer during construction. If required, the TSRS shall be according to Section 522. The Contractor shall submit design computations and shop drawings of the temporary soil retention system to the Engineer for approval prior to beginning work. Design computations and shop drawings shall be submitted according to Article 522.05.

Flow in the existing sewer shall be maintained during construction. Staging ad temporary construction may be required to maintain flow.
**Method of Measurement:** The manholes will be paid for the size and type specified, which price shall include the structures, gaskets, concrete fill, risers, cones or flat top slabs, frames and lids, steps, sand cushion, concrete trough, temporary shoring, temporary soil retention system, excavation and backfill to complete the connection, the removal of existing storm sewer, if necessary, and staging and temporary construction to maintain flow during construction.

**Basis of Payment:** This work will be paid for at the contract unit price per each for MANHOLES TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID, SPECIAL and MANHOLES, TYPE A, 6'-DIAMETER, TYPE 1 FRAME, CLOSED LID, SPECIAL.

## MANHOLE, SPECIAL

This work shall consist of constructing pipe tee manholes with steps, frame, and lid as shown on the plans and in accordance with Section 602 of the Standard Specifications. Precast concrete slabs shall be in accordance with Standard 602411 and used at pipe size reductions as indicated on the plans.

This work, including pipe, tee, riser, steps, frame, grate, slabs, and all work necessary to construct the manhole will be paid for at the contract unit price each for MANHOLE, SPECIAL.

## ORNAMENTAL FENCE

**Description:** This work shall consist of all labor, material and equipment necessary for the installation of ornamental fence at locations shown on the plans and as detailed in the plans.
The Contractor shall submit shop drawings and structural calculations signed and sealed by a licensed structural engineer in Illinois. Shop drawings shall include plans, elevations, sections, and detail views. Detail the posts, rails, and fittings. Indicate post and panel types, sizes, orientations, and locations.

The Contractor shall warranty for a period of one year against failure of assembly and installation. The fence shall have a twenty-year manufacturer's warranty against product failure.

Fence shall be designed for a 90 mph (3-second gust) in accordance to ASCE 7-05. Wind load on an iced fence to be designed using a wind speed of 40 mph (3-second gust). Design fence for wind exposure Category C. Wind Exposure Category C is defined as open terrain with scattered obstructions having heights generally less than 30 feet. This category includes flat open country with grasslands.

The fence shall also be designed to resist a single concentrated load of 200 pounds applied in any direction at any point on the top rail. The fence shall also be designed to resist a load of 50 pounds/foot applied at any direction along the top rail. This load need not be applied at the same time as the 200-pound concentrated load.

The fence shall include:

1. The fence and posts shall be galvanized steel with factory finish in accordance with the manufacturer's specifications. Color to be black. Hardware for attachments shall also be galvanized.

2. Hardware for an attachment of fence post to concrete surface to be in accordance with details as shown on the plans and to include:
    i. 7½" x 6" x ½" thick A36 steel plate, drilled for anchor bolt holes, to be welded to fence post at point of fence post manufacture. Weld shall be made smooth and flush and shall be in accordance with the AWS Welding code. Weld to be applied prior to galvanizing. The steel plate shall receive the same galvanizing as the fence components.

    ii. Anchor bolts shall be as shown on the plans.

Fence installation:

1. The fence shall be installed on the proposed wall at locations shown on the plans and as directed by the Engineer.

2. Posts shall be set plumb. Fence sections shall be securely fastened to posts according to manufacturer's recommendations, taking care to protect the posts and fence from scuffing and other damage.

3. Welding of fence material in the field shall not be performed.

4. Any damage to product or site will be repaired or replaced to the satisfaction of the engineer.

5. Fence shall be cleaned to the satisfaction of the Engineer.

**Basis of Payment:** This work shall be paid for at the contract unit price per foot for ORNAMENTAL FENCE which price shall include all labor, material and equipment necessary to properly install the fence as shown on the plans and to the satisfaction of the Engineer.

## PARKING METER POSTS TO BE REMOVED

**Description:** This work shall consist of removal of parking meters and posts at locations shown on the plans.

**General:** Posts and any attached concrete shall be removed and disposed of according to Article 202.03. The void caused by the removal shall be backfilled with compacted embankment.

Parking meters shall be removed and delivered to City of Springfield Public Works.

**Basis of Payment:** Removal of posts shall be paid for at the contract unit price each for PARKING METER POSTS TO BE REMOVED which shall include the cost of furnishing and placing the backfill and removing and delivering meters.

## PAVEMENT REMOVAL (SPECIAL)

This work shall be in accordance with Section 440 of the Standard Specifications except as follows:

1. Pavement thickness and material type to be removed is not shown on the plans at all locations. Brick pavement removal is included in this work.

2. This work shall include removing asphalt, concrete pavement, brick, aggregate, earth, and curb and gutter at designated locations and for sewer installation. The pavement removal will be to a depth of 18 in. below the surface of the existing pavement and will include all materials within that depth. Any removal required below the 18 in. depth will be paid for as earth excavation. No adjustments will be made for variations in thickness.

3. Paragraph 440.07(c) is deleted.

4. When embankments are constructed over an existing pavement, Section 205.03 shall be

followed. The cost for this shall be included in this work.

This work will be paid for at the contract unit price per square yard for PAVEMENT REMOVAL (SPECIAL).

## PAVEMENT REPLACEMENT, SPECIAL

**Description:** This work shall comply with Section 208, 353, and 406 of the IDOT SSRBC.

This work shall be in conjunction with sewer replacements in existing streets. The existing pavement shall be removed by saw cutting to a minimum depth of 9 inches, removal of the existing pavement, and removal of the existing subbase. The contractor shall take care during the removal of the pavement to prevent damage to the adjacent pavement. Removal of the subgrade to the elevation of the sewer replacement shall be included in the cost of the sewer.

Once the proposed elements are in place, the trench shall be backfilled according to Section 208 to the bottom of the proposed pavement. Twelve (12) inches of aggregate subgrade improvement, 8 inches of Portland Cement Concrete Base Course and 1 ½" of HMA Surface Course shall be placed on top of the backfill. The HMA surface course should be flush with the adjacent existing pavement.

Pavement Replacement, Special shall be required at any location where the existing pavement is to be removed and will not be replaced within the limits of the roadway construction. These areas include, but may not be limited to, manhole and sewer replacements, casting removal, and access points for filling existing sewers.

**General:** This work includes the removal, backfill, subgrade improvement, pavement, and prime coat required for replacing existing pavement.

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for PAVEMENT REPLACEMENT, SPECIAL. Backfilling the trench will be paid for at the contract unit price per cubic yard for TRENCH BACKFILL.

## PIPE ELBOWS

Pipe elbows shown on the plans will not be measured separately for payment but will be paid for at the contract unit price per foot of the size and type of pipe specified. Elbows will be measured at the centerline of the pipe.

## PORTLAND CEMENT CONCRETE PAVEMENT

**General:** Except as otherwise specified hereafter, the current Standard Specifications for Road and Bridge Construction, Section 420-Portland Cement Concrete Pavement, shall apply to all work under this section.

**Dowel Bar Assemblies:** the light coating of oil applied uniformly to the dowel bars shall be Valvoline TECTYL 506, TECTYL 506 by Daubert Chemical Company, or BCG6116 DSMA by Bradley Coating Group.

## PORTLAND CEMENT CONCRETE SIDEWALK 4 INCH, SPECIAL

**Description:** This work shall consist of constructing a stamped and integral (full depth) colored concrete sidewalk according to the lines, grades and herringbone brick pattern shown in the plans and shall be in accordance with Section 424 of the SSRBC. The colored concrete shall be a "slate" or "charcoal" color. The color and stamp pattern samples shall be submitted to the Engineer for approval prior to use.

The concrete color admixture shall be added according to the manufacturer's recommendation. The concrete mix used with pigment added shall meet the requirements of the manufacturer's recommendations. The aggregate, cement, and integral color shall be from the same source throughout the entire project. The material sources and mix proportions used during the project shall be accurately recorded and furnished to the Engineer at the completion of the project. The Pigment shall comply with ASTM C 979. Color pigments shall be light fast, wettable, weather resistant, alkali resistant, and free of deleterious fillers and extenders.

Do not start finishing stamped colored concrete until the bleed water has evaporated. Finishing too early causes discoloration and a weak, non-durable surface. Use mechanical float or trowel, if possible. The one-way motion of the blades creates a more uniform colored surface than the back and forth motion used in hand finishing. Move concrete edgers in one direction only to produce a more uniform color. Time the pour to avoid having sunlit and shaded area. The stamp pattern shall be applied according to the manufacturer's recommendation. While concrete is plastic, accurately align mats in sequence and uniformly press into concrete to produce imprint pattern, texture, and depth of imprint as recommended by manufacturer. Touch-up pattern and finish edges with hand tools as necessary.

All surfaces shall be broomed to provide a textured, non-skid surface when completed.

Concrete Sealer shall be applied to the entire sidewalk surface and included in the cost of the sidewalk.

**Basis of Payment:** All material, equipment and labor to perform this work shall be paid for at the contract unit price per square foot for PORTLAND CEMENT CONCRETE SIDEWLK 4 INCH, SPECIAL.

## PRECAST CONCRETE PARKING BLOCK

Parking blocks shall be air entrained (5%-7%) precast reinforced concrete 4,000 PSI minimum strength, length 6 ft, height 5 in. width 9 in. with pin holes and 2 to 4 reinforcement bars. Base should be raised to allow for drainage. Parking blocks shall be yellow.

This work, including furnishing and installing parking blocks with metal pins, will be paid for at the contract unit price each for PRECAST CONCRETE PARKING BLOCKS.

## PUMP STATION ELECTRICAL BUILDING

**Description:** The work to be included under this item shall be the designing, furnishing and installing of all materials and equipment necessary to provide a complete package fiberglass reinforced polymer shelter building at the Pump Station.

The material and equipment shall be from Shelter Works, Orenco Composites, or Plasti-Fab for the design as specified herein and shown on the drawings.

Building manufacturer shall have at least 10 years' experience in shelter buildings and shall have production throughput to provide work required for this project without delay. The manufacturer shall have an entire fiberglass panel destructive tested by an accredited Testing Laboratory and Third-Party Quality Control Agency and upon request shall furnish to the Engineer and/or Owner the certified and stamped test results of the laboratory testing. The accredited Testing Laboratory must be accredited to ISO 17020 and 17025. The manufacturer shall maintain a quality assurance program that is reviewed and approved by a Third-Party Quality Control Agency.

**Submittals:** Contractor shall provide shop drawings for all building materials. Shop drawings shall clearly indicate proposed items, characteristics and details in conformance with the Plans and Specifications. The respective manufacturer shall certify dimensions, special features, etc.

1) Dimensions, weight, materials, parts, devices, and all other information required to verify compliance with these Specifications.
2) Manufacturer's Literature and Technical Data: Drawings and Specifications for proposed system.
3) Selection Samples for exterior finish and color.
4) Drawings prepared specifically for this Project:
    a. Materials and Details: Show materials, details of components (including doors and other accessories), finishes, fastenings, methods of joining, sealants, anchor bolt details, structural members and bracing, and openings.
    b. Anchorage details of structure to foundation.
5) Operations and Maintenance Manual including installation instructions to be provided after building ships.
6) Manufacturer Warranty - The shelter will be free from manufacturing defects in workmanship and will not appreciably deteriorate under conditions of normal use and regular service and maintenance when installed properly, for a period of twenty-five (25) years from the original date of purchase.

**Building:**

The building shall be a fiber reinforced polymer (FRP) shelter building with an exterior width of 8 ft. x 10 ft., interior width of 9 ft. – 8(1/2) in. x 7 ft. – 8 (1/2) in., and 10 ft. wall heights. The roof shall be wind-resistant "hip" design sloping up from all four sides. Roof shall form a permanent weather-proof connection with a seamless exterior appearance that uses low-maintenance silicone caulk matching the shelter's exterior color. Roof deck is compliant with ASTM E 108/ULC S107 (class C) with <13' Flame Spread. Roof shall not overhang walls in order to maximize shelter's wind speed rating. The roof slope shall allow drainage where pitch of roof shall be 12° to 17°.

The FRP building shall be on a formed and poured concrete pad Class SI with frost wall foundation per Sections 503 and 1020 of the Standard Specifications. The foundation shall be reinforced Class SI Portland cement concrete. The building slab shall be a minimum of 6" thick with 6x6-W2.9xW2.9 reinforcement and contraction joints where identified on the Plans. The building shall be attached to the slab and foundation with base flanges or embedded anchor plates per size, design, and location as specified by building manufacturer on approved shop drawings.

The Contractor shall submit plans and calculations for the building shelter that are signed and sealed by an Illinois Licensed Structural Engineer prior to ordering or manufacturing the building shelter. The structure shall be designed for the building's own dead load, a wind load of 90 mph per ASCE 7-10 and a seismic load per local building code and International Building Code (IBC).

The building shall have through-wall lifting/tie-down eyes at the top of each corner to facilitate handling.

Each wall shall be one single monolithic piece with smooth exterior. Panelized construction is not acceptable. Wall panels shall overlap to form a permanent weather-proof connection with a seamless exterior appearance that uses low-maintenance silicone caulk matching the shelter's exterior color. Internal connections shall use stainless steel hardware spaced no more than 12" on center.

Walls, roof and doors shall be seamless, one-piece panels laminated with 1/8" thick sprayed fiberglass outside surface, core material, and 1/8" thick sprayed fiberglass inside surface. Walls, roof and doors shall have continuous FiberBeam laminations (floor to ceiling and top-of-wall to ridge) every 12" to permanently bond inner FRP surface with outer FRP surface to provide structural integrity and prevent de-lamination of the fiberglass from the core material.

Roof shall have minimum R-12 insulation with core consisting of minimum 1.5" thick foam.

Walls shall have minimum R-18 insulation with core consisting of minimum 2.5" thick foam.

Fiberglass Laminate Properties:

- Tensile Strength (ASTM D 638) 16,000 (psi)

- Flexural Strength (ASTM D 790) 33,700 (psi)
- Flexural Modulus (ASTM D 790) 1,160,000 (psi)
- Tensile Modulus (ASTM D 638) 1,300,000 (psi)
- Barcol Hardness 45
- Izod Impact – Notched ((ft.-lbs)/in) 16.30
- Izod Impact – Unnotched ((ft.-lbs)/in) 21.79

Foam shall be rigid closed cell, polyisocyanurate with a density of 1.5 – 1.9 pounds per cubic foot.

- Flame Spread (ASTM E 84) <75
- Smoke Development (ASTM E 84) <450

All exterior surfaces shall have 18-20 mils of superior performance marine grade gel coat, incorporating ultra violet inhibitors. Exterior color shall be storm gray (light gray).

All interior surfaces shall be sprayed with 18-20 mils of Polycor 944 high quality isophthalic white gel coat finish offering the same characteristics as the exterior surfaces without ultra-violet inhibitors. Interior surface shall not contain any visible surface-mounted strut or other unsightly channel.

The building shall have an FRP mounting flange around the entire interior perimeter, ¼" thick x minimum 2" wide. Pockets which reduce the wall's full insulation value shall not be accepted. A butyl mastic sealant shall be provided for a weather-proof connection below the shelter's base. Flange shall be pre-drilled with 7/16" diameter holes 24" on center.

The building shelter shall have a double pedestrian door. Each door shall be 3'-0" wide x 6'-8" high doors centered in the 10 ft. long wall as shown on plans. Pedestrian doors shall be made of fiberglass reinforced polymer (FRP). Pedestrian doors shall be hung with stainless steel ball bearing type hinges equipped with tamper-resistant, non-removable pins. Hinges shall be oriented with no fasteners exposed when door is closed. Pedestrian doors shall be sealed with a weather-tight gasket along the entire perimeter of the door. Pedestrian doors shall have a 2.5" deep aluminum rain drip molding located above. All pedestrian doors must be able to be set in 'open' position with no hands. Doors must be able to be removed from 'open' position and closed with no hands. Doors must have hydraulic closer to prevent wind damage to door. Closure system is 3-point, pad-lockable with anti-entrapment. Each door shall have a threshold ½" tall, low profile aluminum.

The building shelter shall house the electrical equipment for the pump station with other electrical equipment and accessories identified on the Plans and in these Special Provisions.

Within the building, the motor control center (MCC) for the pump station shall be placed on a three (3) inch tall housekeeping pad. The contractor shall coordinate with the MCC manufacturer for overall dimensions of MCC and accompanying housekeeping pad.

The building shall include a combined heating and air-conditioning unit, PTAC style unit

provided by the Building Manufacturer. The PTAC style unit shall be placed withing the FRP building shelter wall and sealed in place for a weatherproof connection per Building Manufacturer recommendations. The unit shall be thermostatically-controlled, 240 Volt, 24,000 Btu/H cooling, single-phase electric and at least 2 Kw.

The building shall have interior and exterior illumination. The lights shall be vapor-tight, LED light fixtures providing at least 80 lumen/sf. Interior lights shall be operated by (1) 2-way switch with weatherproof cover. Exterior light shall be a 40 Watt LED flood light operated by photocell. The exterior light shall provide lighting to the pedestrian doors. Inside the building shall be (1) exit sign above door, red LED letters with battery backup and 150 lumens of egress illumination for 90 minutes in case of power outage.

**Fire Extinguishers**

A. Furnish and install two fire extinguishers. Fire extinguishers shall be UL rating of at least 4A:60B:C, 10 pound dry chemical.

H. TERMINATION. Electrical terminations in PVC NEMA 4X junction box.

I. RECEPTACLE: (1) GFCI duplex each with weather-proof-when-not-in-use cover.

Schedule 40 PVC conduit installed around the interior perimeter of the shelter, along the top of the wall. All conduit and fittings shall be UL Listed. Conduit and wiring shall be installed in accordance with the most recent National Electric Code (NEC). Minimum 12 gauge shall be used for wiring in conduit. Wiring shall not be loaded above 60º C temperature rating.

Handling and Installation

The Contractor shall have not less than two (2) years experience in the offloading and installation of prefabrication structures.

The building and the accessory items shall be carefully transported, stored, handled and set in place in a manner that will prevent distortion, misalignment or other damage to the units. During storage prior to installation and following installation, but prior to placing in service, the manufacturer's recommendations regarding handling shall be followed.

Contractor shall install concrete foundation and slab per plans and herein. The slab shall be true and level to a maximum surface variance of 3/16” where the building interfaces the slab. The ground immediately surrounding the building perimeter shall be graded to drain away from the building.

At the time of installation, the concrete slab shall be clean and dry. The contractor shall follow the building manufacturer’s instructions and recommendations for offloading and installation.

**General:** This work includes all excavation, labor, materials and equipment required to furnish, and install the FRP shelter building, concrete slab and foundation, housekeeping pad, lighting, PTAC heating/air conditioning unit, accessories, and other incidental items as shown

on the plans.

**Basis of Payment:** This work will be paid for at the contract lump sum price for PUMP STATION ELECTRICAL BUILDING which shall include all labor, equipment, materials, hardware, concrete work, tools, operational instructions, utility service work, and coordination required to complete the installation of the pump station control building. The accessories and equipment within the building shall be installed by the Electrical Contractor. The furnishing of the motor control center control panel and pump manufacturer representative's services shall not be included with this item and shall be included in the contract price for PUMPING STATION. The installation of the motor control center and all associated electrical work and coordination shall be included in the contract unit price for PUMP STATION ELECTRICAL WORK.

## PUMP STATION ELECTRICAL WORK

**General:** The work to be included under this item shall be the furnishing, installing, and testing of all materials and electrical equipment necessary in order to provide a complete and operational electrical system at the Pump Station.

The Contractor shall furnish and install all equipment and materials necessary for a complete and operational installation of the electrical equipment. The complete installation and wiring shall be done in a neat, workmanlike manner. All electrical work shall comply with the requirements of NFPA 70 – National Electrical Code (NEC), current issue in force, and all other applicable local codes, laws, ordinances, and requirements in force. Electrical equipment shall be installed in conformance with the respective manufacturer's directions and recommendations for the respective application. Any installations which void the UL listing, FM Approval, Intertek Testing Services Verification/ETL listing (or other third party listing), and/or the manufacturer's warranty of a device will NOT be permitted.

The electrical work and equipment specified is based on equipment of the type and size as noted on the Plans and specified herein. Pump motor sizes and equipment may vary depending upon manufacturer. Circuit breakers, motor starter, VFD's, conduits, and wiring shall be sized for the respective pump motors and equipment furnished. Verify requirements with the respective pump motor manufacturer or equipment manufacturer. Should the proposed pump motors (or any other proposed loads) exceed the ratings of the electrical equipment specified, the General Contractor shall be solely responsible for furnishing any and all modifications necessary in order to provide a fully functional system to the satisfaction of the Engineer at no change to the contract cost. The Contractor shall also be required to submit for review, sufficient information determined by the Engineer to be necessary to review such alternates or modifications.

Per Illinois Environmental Protection Agency Title 35: Environmental Protection, Subtitle C: Water Pollution, Chapter II: Environmental Protection Agency Part 370: Illinois Recommended Standards for Sewage Works all electrical equipment installed in a sewage pump station wet well shall be suitable for Class I, Division 1, Group D hazardous location. In addition equipment located in a sewage wet well shall be suitable for use under corrosive conditions. All electrical

installations associated with a sewage pump station shall conform to the applicable sections of NEC 500, 501, and 504 in addition to the other applicable sections of NEC. Where electrical equipment is installed in a classified hazardous location it shall be UL-listed, Factory Mutual-listed, or ETL-listed suitable for use in the respective classified hazardous location.

Per Illinois Department of Transportation Manual, dated July 2011, Chapter 13 Pump Stations, Part 13-204 Safety it notes the following:
All elements of the pump station should be carefully reviewed for safety of operation and maintenance. Ladders, stairwells, and other access points should facilitate use by maintenance personnel. Adequate space should be provided for the operation and maintenance of all equipment. Particular attention should be given to guarding moving components such as drive shafts and providing proper and reliable lighting. It may also be prudent to provide air-testing equipment in the station so maintenance personnel can be assured of clean air before entering.

Pump stations may be classified as a confined space, in which case, access requirements and any safety equipment are all defined by code. Pump stations should be designed to be secure from entry by unauthorized personnel and as few windows as possible should be provided.
All electrical equipment including motors should be explosion proof and should be located above the allowable high-water elevation. Even submersible pump motors should be explosion proof because they may not always be submerged. Their control panels should not be in the wet well but in a non-hazardous location.

Per NFPA 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities, a wastewater pumping station wet well (with no ventilation or ventilated at less than twelve (12) air changes per hour) is classified as a Class I, Division 1, Group D hazardous location. All electrical installations associated with the pumping station wet well shall conform to the applicable sections of NEC 500, 501, and 504 in addition to the other applicable sections of NEC. Where electrical equipment is installed in a classified hazardous location it shall be UL-listed, Factory Mutual-approved, or ETL-listed suitable for use in the respective classified hazardous location.

All work, power outages, and/or shut down of existing systems shall be coordinated with the respective facility owner's representative. Once shut down, the circuits shall be labeled as such to prevent accidental energizing of the respective circuits. All personnel shall follow U.S. Department of Labor Occupational Safety & Health Administration (OSHA) 29 CFR Part 1910 Occupational Safety & Health Standards for electrical safety and lockout/tagout procedures, including, but not limited to, 29 CFR Section 1910.147 the control of hazardous energy (lockout/tagout).

Contractor shall comply with NFPA 70E Standard for Electrical Safety in the Workplace.

Contractor shall keep a copy of the latest National Electrical Code in force on site at all times during construction for use as a reference.

Contractor and respective electrical contractor shall keep a set of construction plans and specifications with all addenda and copies of any applicable change orders on site at all times.

Contractor shall apply for and obtain the required building/electrical permits from the authority of jurisdiction.

All electrical equipment shall be properly labeled in accordance with the requirements of NFPA 70-National Electrical Code, NFPA-70E-Standard for Electrical Safety in the Workplace, as detailed on the plans and in accordance with the authority of jurisdiction.
Contractor shall provide Arc Flash Report and appropriate labels on electrical equipment in accordance with NEC and NFPA 70E.

**Submittals:** Contractor shall provide shop drawings for all electrical equipment. Shop drawings shall clearly indicate proposed items, capacities, characteristics and details in conformance with the Plans and Specifications. The respective manufacturer shall certify capacities, dimensions, special features, etc. Shop Drawings for all items shall be prepared immediately upon award of Contract. The Contractor shall submit electronic PDF copies of shop drawings. No materials shown thereon shall be ordered until Shop Drawings are reviewed and approved by the Engineer. When a submittal is marked "Revise and Resubmit," "Rejected," and/or "Submit Specified Item" do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations, resubmit, and repeat if necessary to obtain a different action mark such as "No Exceptions Taken" or "Furnish as Corrected". Contractor is responsible for compliance with the specified characteristics. Contractor's responsibility for error and omissions in submittals is not relieved by the Engineer's review of submittals. Accompany each submittal with a transmittal letter that includes the date, project title and number, Contractor's name and address, the number of shop drawings, product data, and/or samples submitted, notification of any deviations from the Contract, and any other pertinent data. Shop drawing submittals shall include the following:

A. Date and revision dates.

B. Project title and number(s).

C. Identification of product or material.

D. Certified outline and installation drawings.

E. Performance data and operating characteristics.

F. Arrangement drawings showing piping, controls and accessory equipment.

G. Drawings on non-standard components and accessories.

H. Catalog data marked to indicate materials being furnished.

I. Operation and Maintenance/Instruction Manuals.

J. Specified standards, such as ASTM numbers, ANSI numbers, UL listing/standard, NEMA ratings, etc.

K. A blank space, 3 in. x 5 in., for Architect/Engineer's stamp.

L. Identification of previously approved deviation(s) from Contract documents.

M. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract documents.

N. Space for Prime Contractor's approval stamp.

EQUIPMENT AND MATERIALS

Conduit and Fittings

Comply with IDOT Standard Specifications and the following.

**Galvanized Rigid Steel Conduit:** Rigid Steel Conduit and fittings shall be hot-dipped, galvanized, UL-listed, and produced in accordance with UL Standard 6 – Rigid Metal Conduit and ANSI C80.1 – Rigid Steel Conduit, Zinc Coated. Couplings, connectors, and fittings for rigid steel conduit shall be threaded, galvanized steel or galvanized, malleable iron, specifically designed and manufactured for the purpose. Fittings shall conform to ANSI C80.4 – Fittings Rigid Metal Conduit and EMT and UL 514B – Conduit, Tubing, and Cable Fittings. Set screw type fittings are not acceptable.

**Schedule 40 PVC and Schedule 80 PVC Conduit:** Conduit shall be Schedule 40 PVC or Schedule 80, 90 C, UL-rated. Material shall comply with NEMA Specification TC-2 (Conduit), TC-3 (Fittings-UL-514), and UL-651 (Standard for rigid nonmetallic conduit). The conduit and fittings shall carry a UL label (on each 10 ft length of conduit and stamped or molded on every fitting). Conduit and fittings shall be identified for type and manufacturer and shall be traceable to location of plant and date manufactured. The markings shall be legible and permanent. The conduit shall be made from polyvinyl chloride C- 300 compound which includes inert modifiers to improve weatherability, heat distortion. Clean rework material, generated by the manufacturer's own conduit production, may be used by the same manufacturer, provided the end products meet the requirements of this Specification. The conduit and fittings shall be homogeneous plastic material free from visible cracks, holes, or foreign inclusions. The conduit bore shall be smooth and free of blisters, nicks or other imperfections which could mar conductors or cables. Conduit, fittings and cement shall be produced by the same manufacturer to assure system integrity.

**Rigid Aluminum Conduit:** Rigid Aluminum conduit shall be heavy wall type fabricated from 6063 aluminum alloy, T-1 temper, (former designation T-42). Aluminum rigid conduit shall comply with Underwriter's Laboratories UL-6, latest revision, and American National Standards Institute (ANSI) C80.5 – Rigid Aluminum Conduit.

**PVC Coated Rigid Aluminum Conduit:** PVC coated rigid aluminum conduit and fittings shall be as manufactured by Robroy Industries, Inc., Thomas & Betts or Plasti-Bond. The conduit, prior to coating, shall be new, unused material and shall conform to UL 6, Standard for Safety

for Rigid Metal Conduit. An exterior gray PVC coating of a nominal 40 mils, (.040 in.), shall be applied to the conduit and conduit couplings. The PVC coating shall conform to all applicable requirements of NEMA RN-1, Standard for PVC Coated Conduit. An interior red polyurethane coating of 2 mils (.002 in.), shall be applied to the conduit and conduit couplings. The polyurethane coating shall conform to all applicable requirements of NEMA RN- 1, Standard for PVC Coated Conduit. Conduit having areas of thin or no coating shall be unacceptable. The PVC and polyurethane coatings applied to conduit shall have sufficient flexibility to permit field bending without cracking or flaking at temperatures above 30 degrees F (-1 degrees C). All male threads on conduit and all female threads on conduit couplings shall be protected by a coat of red polyurethane.

**PVC-Coated, Galvanized, Rigid Steel Conduit:** PVC-coated, galvanized, rigid steel conduit shall be manufactured by Robroy Industries, Inc., Thomas & Betts or Plasti-Bond PVC coating shall be a minimum of 40 Mils permanently fused to hot dipped, galvanized, rigid steel conduit. An interior red polyurethane coating of 2 mils (.002 in.), shall be applied to the conduit and conduit couplings.

**Explosion-Proof Flexible Conduit (where applicable):** Explosion-proof, flexible conduit shall be suitable for use in Class I, Division 1, Group D hazardous locations, and liquid-tight for wet locations. Conduit shall have an interior insulating liner to protect conductors from abrasion under vibrating conditions. Conduit shall provide a continuous electrical path. Explosion-proof, flexible conduit shall be Crouse-Hinds, O-Z/Gedney ECGJH, ECLK Series, or Appleton EXGJH or EXLK Series Flexible Coupling.

**Liquid-Tight, Flexible Metal Conduit (Non-Explosion Proof):** Liquid-tight, flexible metal conduit shall consist of polyvinyl jacket over flexible, hot-dip, galvanized steel tubing. The flexible conduit shall be completely sealed from liquids, dust, dirt, and fumes and be resistant to oil, gasoline, grease, and abrasion. Jacket shall also be sunlight-resistant. Liquid-tight, flexible metal conduit shall be UL-listed, suitable for use as a grounding conductor, and comply with Article 350 of the NEC. Liquid-tight, flexible metal conduit and associated fittings shall be UL-listed to meet the requirements of NEC 350.6. Where liquid-tight, flexible metal conduit is installed in a Class I, Division 2 classified hazardous location it shall also be listed suitable for use in Class I, Division 2 classified hazardous locations. Liquid-tight, flexible metal conduit shall not be installed in a Class I, Division 1 classified hazardous location except for use with intrinsically safe wiring. Do not install liquid-tight, flexible metal conduit that is not UL listed. Contractor shall confirm liquid-tight, flexible metal conduit bears the UL label prior to installation.

**Explosion-Proof Conduit Seal-Off Fittings:** Explosion-proof conduit seals shall be listed suitable for use in Class I, Division 1, Group D hazardous location. Explosion-proof conduit seals shall be Crouse-Hinds EYS or EZS Series, Appleton EYS, ESU, or EY Series, or O-Z/Gedney EYA, EY, EZS Series explosion-proof sealing fitting. Explosion proof conduit seal-off fittings shall have maximum conduit fill of 25% unless specifically listed for a larger fill.

**Miscellaneous Fittings:** Fittings shall be suitable for use with conduits and ducts supplied. All fittings for use with rigid metal conduit shall be threaded. Set screw type fittings are not acceptable. All conduit bodies, fittings, and boxes installed in classified hazardous locations

(Class I, Division 1 or 2, Group D) shall be suitable for use in Class I, Division 1, Group D locations. Fittings shall be as manufactured by Appleton, Crouse-Hinds, Hubbel-Killark, or O- Z/Gedney.

Conductors

**XHHW Wire:** Cable shall be UL-listed as Type XHHW-2 per UL Standard 44 for Rubber-Insulated wires and cables. Cable shall also conform to ICEA S-95-658/NEMA WC70 and Federal Specification J-C-30B. Conductors shall be Class B stranded annealed uncoated copper per UL Standard 44. Insulation shall be rated for 600-Volt. Insulation shall be cross-linked polyethylene complying with the physical and electrical requirements of UL Standard 44 for Type XHHW-2. Service conductors shall be Service Wire, Encore Wire or General Cable Type XHHW-2.

**THWN Wire:** Cable shall be 1/C sized as indicated on the Plans. Cable shall comply with Underwriters' Laboratories Standard UL-83 and shall be UL-listed as VW-1. Conductor shall be soft annealed uncoated copper and shall comply with ASTM B3 and B8. Insulation shall be rated for 600-Volt. Insulation shall be polyvinyl-chloride conforming to Underwriters' Laboratories requirements for Type THW. The outer covering shall be nylon conforming to Underwriters' Laboratories for type THHN or THWN-2. Cable shall be UL-listed and marked THWN. Power and control wiring shall be Southwire, Encore Wire or General Cable Type THWN-2.

Supporting Devices

Strut supports for exterior applications shall be 304 stainless steel strut support 1 5/8 in. x 1 5/8 in. 12 gauge thickness with 9/16 in. slot at 2 in. spacing. Strut support for equipment located in the wet well, valve vault, or other corrosive areas shall be stainless steel or reinforced fiberglass material as manufactured by Unistrut, B-Line, or Aickinstruct. Provide necessary hardware, such as floor flanges, etc., as required to install equipment as specified and as shown on the Plans. All hardware shall be stainless steel.

Provide materials, sizes and types of anchors, fasteners, and supports necessary to carry the loads of equipment and conduits. Consider weights of conduit when selecting products.

Fasteners and anchors shall be corrosion resistant, stainless steel. Where suitable, nonmetallic clamps and fasteners may be used.

Cable hangers shall be heavy duty nylon saddle rack with 3 in. throat opening. Cable hangers shall be adequately sized to accommodate the respective cables. Secure cables to cable hangers with corrosion resistant cable ties listed suitable for the application.

Safety Switches

Furnish and install a safety switch for the service disconnect and/or other equipment as detailed

on the Plans and specified herein. Safety switches shall be heavy duty, UL-listed, with amperage, voltage, number of poles, and type (fusible or not fusible), and accessories as detailed on the Plans. Safety switches used for service equipment applications shall be UL listed suitable for service entrance. Safety switches shall be pad lockable in the off position. Include ground lugs or grounding kits with all safety switches. Safety switches located outdoors, or in damp areas shall be in NEMA 4X stainless steel enclosures. Safety switches located in hazardous classified areas shall be UL-listed or FM approved s suitable for the respective location. Safety switches shall be as manufactured by Square D, Eaton Cutler-Hammer, or GE. Include fuses sized as detailed on the plans, in accordance with the respective equipment manufacturer recommendations, and in accordance with National Electrical Code. Provide 3 spare fuses of same manufacturer, type, and size.

Circuit Breakers

Circuit breakers for feeder circuits shall be thermal magnetic, molded case, with frame size, trip rating, and AMP interruption capacity rating as detailed on the plans and suitable for the application. Cutler-Hammer, Square D or GE. Alternate products will be allowed but must meet this specification and be approved by the Engineer. Breakers shall have "on", "off" and "tripped" positions and shall be UL-listed. Breakers shall be sized as required for the respective equipment in accordance with NEC and the respective equipment manufacturer's recommendation. Enclosure shall be NEMA 4X stainless steel with a hinged door and be pad lockable in the off position. Include a separate ground lug. Cutler-Hammer, Square D or GE. Alternate products must be approved by the Engineer.

CONSTRUCTION METHODS

**Temporary Power:** The Contractor shall make necessary arrangements and provide all temporary electric service and lighting required during entire construction period including required fees and permits. Cost of electricity used shall be borne by the Contractor. The temporary service shall comply fully with all NEC and OSHA requirements for temporary service.

Electric services shall be of sufficient capacity and characteristics to supply proper current for various types of construction tools, motors, welding machines, lights, heating plant, ventilation system, pumps and other work required. All necessary temporary wiring, panelboard, outlets, switches, lamps, fuses, controls and accessories shall be provided by the Contractor. All 120 VAC, 15-Amp and 20-Amp receptacles shall be ground fault circuit interrupter type.

Materials used for temporary service shall not be used in permanent system unless specific approval is given by the Engineer. Temporary service shall be so constructed and arranged as not to interfere with progress of other trades. This systems hall be erected and maintained strictly in accordance with all ordinances and requirements for temporary service pertaining thereto inclusive of OSHA and NEC, (most current issue in force).

The serving electric utility company for the work site is as follows: City Water Light and Power (CWLP) 401 N. 11th Street Springfield, IL (217) 321-1354

The Contractor who has installed a temporary utility connection as herein specified, shall, prior to final acceptance, remove temporary connections and installations and leave premises restored to condition in which it was found.

**Electric Service Entrance:** Contractor shall furnish and install electric service entrance as detailed on the Plans and specified herein. As part of the service entrance work, the Contractor shall coordinate with the serving utility:

A. The installation of a 480/277 VAC, three (3)-phase, four (4)-wire service sufficient to handle the loads of the respective pump station and associated equipment located at the site. The Contractor shall coordinate the new electric service with the serving electric utility company. The service entrance shall include, but not be limited to, all service entrance equipment, labor and materials as detailed on the Plans and specified herein, in order to provide a complete and operational electrical system.

B. City Water Light and Power (CWLP): Major work items to be performed by CWLP (not in contract) shall be as follows:

1. The furnishing of power for a 480/277 VAC, three (3)-phase, four (4)-wire secondary service sufficient to handle the loads for a 400-Amp service (or as detailed on the plans).
2. Shall furnish & connect the service entrance conductors from the primary line location to the pad mounted transformer.
3. Shall furnish and install the meter base and meter.
4. Shall furnish and install grounding electrode for service entrance ground system.
5. CWLP shall retain the right to review and approve drawings prior to installation.

C. Contractor: Major work items to be performed by the Contractor (in Contract) shall be as follows: (all work, labor, equipment, and materials shall be as detailed on the Plans specified herein, and per the serving electric utility's requirements, where applicable).

1. Furnishing and installing electric service equipment, and support hardware as detailed on the plans.
2. Furnishing and installing service conductors and conduit from the utility transformer to the service equipment.
3. Furnishing and installing grounding electrodes, grounding electrode conductors, and conduits.
4. Verifying all requirements with serving electric utility.
5. Coordinating the electric service entrance work and billing arrangements with the serving electric utility company.
6. Additional work as required by the serving electric utility and as required to provide a complete and operational electric service entrance system.
7. Extend service conduit and conductors from the secondary of the

service transformer to the pump station service disconnect switch.

8. Coordinate a second utility service to serve the new lighting system and controller.

Installation of Conduits

A. Comply with IDOT Standard Specifications and the following.

B. All exterior above grade exposed conduit shall be PVC Coated galvanized rigid steel (GRSC) or PVC coated rigid aluminum as detailed on the Plans.

C. All work shall be laid out with sleeves for openings through slabs, pump station or valve vault walls, etc. as required. If sleeves and inserts are not properly installed, the Contractor will be required to do all necessary cutting and patching to accommodate conduits.

D. Conduit size and fill requirements shall comply with Chapter 9 and Annex C of the NEC. It should be noted these are minimum requirements and larger conduit sizes or smaller fill requirements shall be used whenever specified or detailed on the Plans.

E. Ream conduits only after threads are cut. Cut joints square to butt solidly into couplings. Where necessary to join two pieces of conduit and it is impossible to use standard coupling, use three (3)-piece malleable iron conduit coupling. The use of running thread is prohibited. This applies to all rigid conduit installations, underground or otherwise.

F. Make all joints in steel underground conduit water-tight with approved joint compound. Temporarily plug conduit openings to exclude water, concrete or any foreign materials during construction. Clean conduit runs before pulling in conductors.

G. Hickey bends will not be acceptable for conduits 1-in. and larger. Use manufactured elbows or bends fabricated with bending machine. Field bending of all PVC conduit shall be accomplished with the use of equipment approved by the conduit manufacturer. Open flame bending equipment will not be acceptable.

H. A run of conduit between a junction box, pull box, and/or fitting shall not contain more than the equivalent of four (4) quarter bends, including bends immediately at the respective box or fitting.

I. Where conduits enter a box or fitting, provide a steel locknut and an insulated metallic bushing. Use this method to terminate conduit in panels, pull boxes, safety switches, etc. Conduit terminations in service equipment shall have grounding bushings with ground wire connections between the bushing and the ground bus.

J. Run exposed conduits parallel with respective walls or supporting structure and at right angles to the respective building, vault, etc., not diagonally. Make bends and turns with pull boxes or hot-dipped galvanized malleable iron fittings and covers.

K. Conduit terminations shall include bushings to protect cables and wires from damage from conduit.

L. Set screw type fittings are prohibited.

M. Use only screws, bolts, washers, etc. fabricated from rust resisting metals for the supporting of boxes.

N. Schedule 80 PVC conduit and/or sleeves shall be used for grounding electrode conductors.

O. Metal conduit in direct contact with earth or concrete shall be PVC-coated GRSC or PVC coated rigid aluminum conduit.

P. Per Illinois Environmental Protection Agency Title 35: Environmental Protection, Subtitle C: Water Pollution, Chapter II: Environmental Protection Agency Part 370: Illinois Recommended Standards for Sewage Works all electrical equipment installed in a sewage pump station wet well shall be suitable for Class I, Division 1, Group D hazardous location. In addition equipment located in a sewage wet well shall be suitable for use under corrosive conditions. All electrical installations associated with a sewage pump station shall conform to the applicable sections of NEC 500, 501, and 504 in addition to the other applicable sections of NEC. Where electrical equipment is installed in a classified hazardous location it shall be UL-listed, Factory Mutual-listed, or ETL-listed suitable for use in the respective classified hazardous location.

Q. Perform all work in classified hazardous locations as defined by the NEC in strict accordance with the NEC for the particular "Class", "Division", and "Group" of hazardous locations involved or indicated on the drawings. Provide conduit and cable seals in accordance with the NEC.

R. All conduits installed in classified hazardous locations (including Class I, Division 1 or 2, Group D) shall be suitable for the respective location. All boxes and fittings installed in Class I, Division 1 locations shall be approved (FM approved or UL listed) suitable for Class I, Division 1 locations. All boxes and fittings installed in Class I, Division 2 locations shall conform to the requirements of NEC 501.10 (B)(4).

S. Per Article 501.15 (C) (6) of the NEC and UL Standard 886, the cross sectional area for conductors installed in a conduit seal off fitting shall not exceed 25 percent, unless the conduit seal off fitting has been specifically approved for a higher percentage of fill.

T. Install explosion proof conduit sealing fittings in conformance with the respective manufacturer's instructions. Contact the respective seal off manufacturer if assistance is required for direction of installing packing fiber to form a dam and pouring the sealing compound.

U. All conduits between the sewage pump station wet well and control panel shall be PVC coated rigid aluminum. No substitutions.

V. Aluminum rigid conduit may be used for conduits entering the wet well (between the pump control panel and the wet well of the pump station), provided it has corrosion protection (PVC coating) as detailed on the Plans and as specified herein.

W. Underground conduits shall be minimum 24-in. below finish grade to the top of conduit where located in areas not subject to vehicular traffic. Underground conduits shall be minimum 36-in. below grade where located in areas subject to vehicular traffic. Where shown on the Plans or where required to avoid obstructions and/or interferences with other underground utilities, deeper burial depths may be required.

X. Conduits shall be kept clean of concrete, dirt, or foreign substances during storage and construction. After conduit installation, a standard flexible mandrel shall be used for cleaning followed by a brush with stiff bristles. Mandrel shall be at least 12-in. long and have a diameter 1/4 in. less than the inside diameter of the conduit being cleaned. All obstructions in conduits shall be removed prior to pulling wires or final acceptance. Conduits unable to pass mandrel shall be replaced. All unused conduits shall be capped.

Y. Trench widths shall be held to a minimum.

Z. Examine all available site utility information in regard to existing utility lines and locate and protect existing lines. Repair all existing utility lines that are damaged by this construction.

AA. All excavations shall be barricaded, lighted (where applicable) and protected during construction.

AB. Contractor shall backfill all excavations.

Installation of Wire and Cable

A. Wire and cable shall be installed using accepted industry methods to prevent damage to conductors and insulation. Installation shall comply with all applicable sections of the NEC regarding conduit fill.

B. No splices shall be permitted in conduit bodies. All splices shall be made in

junction boxes provided for that purpose as detailed or required by need.

C. All conduits shall be swabbed until all moisture and grit is removed before any wires are pulled.

D. Manufacturers recommended pulling tension shall not be exceeded during conductor installation. Use approved pulling lubricant on long pulls or when pulling No. 4 or larger wire.

E. Neatly train and lace wiring inside boxes, equipment and panelboards.

F. Color code conductor insulation for #6 AWG and smaller. Color code conductors with tape or colored insulation for #4 AWG and larger. Where conductors are color coded with tape, they shall be identified (color coded) at all points of access. Insulated ground wires shall have green colored insulation for all conductor AWG and/or Kcmil to comply with NEC 250.119. Neutral conductors shall have white colored insulation for No. 6 AWG and smaller to meet the requirements of NEC 200.6. Color coding shall be as follows:

| **480/277 VAC. 3-PHASE, 4-WIRE SYSTEM** | |
|---|---|
| PHASE A | BROWN |
| PHASE B | ORANGE |
| PHASE C | YELLOW |
| NEUTRAL | GRAY |
| GROUND | GREEN |

| **208/120 VAC. 3-PHASE, 4-WIRE SYSTEM** | |
|---|---|
| PHASE A | BLACK |
| PHASE B | RED |
| PHASE C | BLUE |
| NEUTRAL | WHITE |
| GROUND | GREEN |

| **240/120 VAC. 3-PHASE, 4-WIRE SYSTEM** | |
|---|---|
| PHASE A | BLACK |
| PHASE B (HIGH LEG) | ORANGE |
| PHASE C | BLUE |
| NEUTRAL | WHITE |
| GROUND | GREEN |

| **120/240 VAC. 1-PHASE, 3-WIRE SYSTEM** | |
|---|---|
| PHASE A | BLACK |
| PHASE B | RED |
| NEUTRAL | WHITE |
| GROUND | GREEN |

G. Intrinsically safe wiring shall be with light blue colored insulation per ANSI/ISA RP 12.6 and NEC 504.

H. Splicing 600 volt wire shall be as follows:

1. Wire #8 and smaller, may use one of the following:

   a) Ideal "wing nut" type insulated connectors.
   b) Scotchlok R, B, and Y type insulated connectors.
   c) Thomas and Betts, PT-1, PT-2, and PT-3 insulated connectors.

2. Wire #6 and larger:

   a) For straight way connections, use compression connector with rubber shrink type insulating cover.
   b) For tee cable taps, use compression connector with rubber shrink type insulating cover.
   c) For taps in cutout cabinets, gutters, and other close locations, use O.Z., Burndy, or PLM fittings, type "PT" cable tape with type "PTC" insulating cover.

3. Use plastic tape on all uninsulated wire splices manufactured by Scotch, Okonite, Brady Co. or Plymouth.

4. Splice only in accessible junction or outlet boxes.

I. Connections and Terminations shall be as follows:

1. Identify each conductor in pump/motor control panels, panelboards, junction or pull boxes, or troughs with a permanent pressure sensitive label with suitable numbers or letters for easy recognition. Identify control wiring at each end and in junction boxes with numeric wire number corresponding to control wiring diagram.

2. Thoroughly clean wire before installing lugs and connectors.

3. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
4. Terminate spare conductors with electrical tape and roll up in box. Label spare conductors "SPARE."

J. Inspect wiring for physical damage and proper connection. All wire and cable shall be tested for continuity and short circuits prior to energizing circuits. Verify proper phasing where applicable.

Installation of Supporting Devices

Install products in conformance with manufacturer's instructions and as detailed on the Plans. Provide anchors, fasteners and supports in accordance with NECA Standard of Installation, and as recommended by the equipment manufacturer for the respective application.

Do not fasten/secure supports to pipes, ducts, mechanical equipment, or conduit. Do not use spring steel clips or clamps. Install surface-mounted cabinets, enclosures and panelboards with a minimum of four (4) anchors. Use spring-lock washers under all nuts. All supports installed in the wet well and/or valve vault shall be corrosion resistant. Install supports with stainless steel hardware.

Concrete work associated with support structures shall conform to Section 1020 PORTLAND CEMENT CONCRETE of the Standard Specifications for Road and Bridge Construction and as detailed on the Plans.

Installation of Separately Mounted Circuit Breaker or Safety Switch

Secure circuit breaker or safety switch to structure as shown on Plans. Provide stainless steel strut to secure electrical equipment. Mounting hardware shall be corrosion resistant stainless steel. Install equipment enclosures plumb.

Provide weatherproof, abrasion resistant, legend plates for circuit breaker or safety switch indicating function of the equipment and/or device being fed. Include legend plate with the maximum available fault current and the date of the calculation.

Bond all enclosures to ground with a ground lug or screw and a ground wire. Install grounding bushings with ground wire connections between the bushing and the ground bus at all metal conduit terminations to the enclosures.

Provide NEMA 4 hubs for all conduit entries into equipment enclosures that are rated NEMA 4X to maintain NEMA 4, 4X rating.

Inspect circuit breakers and safety switches for proper operation, tight and secure connections, and correctness. Adjust as necessary to assure proper operation.

Grounding Requirements

Grounding shall conform to the following as applicable: The Contractor shall furnish and install all grounding shown on the Plans and/or as may be necessary or required to make a complete grounding system as required by the latest National Electrical Code (NFPA 70) in force. The reliability of the grounding system is dependent on careful, proper installation and choice of materials. Improper preparation of surfaces to be joined to make an electrical path, loose joints, or corrosion can introduce impedance that will seriously impair the ability of the ground path to protect personnel and equipment and to absorb transients that can cause noise in communications circuits. The following functions are particularly important to ensure a reliable ground system:

A. All products associated with the grounding system shall be UL-listed and

labeled.

B. All bolted or mechanical connections shall be coated with a corrosion preventative compound before joining. Sanchem "NO-OX-ID A Special" compound, Burndy Penetrox E, or Gardner-Bender shall be used. Alternate products will be allowed but must meet this specification and be approved by the Engineer.

C. Metallic surfaces to be joined shall be prepared by the removal of all non-conductive material, per National Electrical Code Article 250-12.

D. Metallic raceway fittings shall be made up tight to provide a permanent low impedance path for all circuits. Metal conduit terminations in enclosures shall be bonded to the enclosure with UL-listed fittings suitable for grounding. Provide grounding bushings with bonding jumpers (from bushing to the respective ground connection/enclosure frame) for all metal conduits entering service equipment (meter bases, CT cabinet, service disconnects, service panelboards, main service breaker enclosure, etc.). Provide grounding bushings with bonding jumpers for all metal conduits entering an enclosure through concentric or eccentric knockouts that are punched or otherwise formed so as to impair the electrical connection to ground. Standard locknuts or bushings shall not be the sole means for bonding where a conduit enters an enclosure through a concentric or eccentric knockout.

E. Furnish and install ground fields, and or ground rods at all locations where shown on the Plans or specified herein. Ground rods for electrical installations shall be 3/4 in. diameter by 10 ft long, UL-listed, copper clad with 10 mil. minimum copper coating. Top of ground rods shall be a minimum of 30 in. below finish grade unless otherwise noted on the Plans. Ground rods shall be spaced as detailed on the Plans and in no case spaced less than one (1) rod length apart. All connections to ground rods and/or ground fields shall be made with exothermic weld type connectors, and shall be Cadweld by nVent Erico Products, Inc., Thermoweld by Continental Industries, or Ultraweld by Harger. Exothermic weld connections shall be installed in conformance with the respective manufacturer's directions using molds as required for each respective application. Bolted connections will not be permitted at ground rods or at buried grounding electrode conductors. Grounding electrode conductors shall be bare stranded copper sized as detailed on the Plans. In addition to the grounding work described herein and shown on the Plans, the Contractor shall test the made electrode ground field with an instrument specifically designed for testing ground field systems. If ground resistance exceeds 10 Ohms, contact the Engineer for further direction. Copies of ground field test results shall be furnished to the Engineer, upon request, for review and record purposes.

F. All connections, located above grade, between the different types of grounding conductors shall be made using UL-listed double compression crimp-type connectors or UL-listed bolted ground connectors. For ground connections to enclosures, cases and frames of electrical equipment not supplied with ground

lugs the Contractor shall drill required holes for mounting a bolted ground connector. All bolted ground connectors shall be Burndy, ILSCO Corporation, Penn-Union Corporation, or Thomas and Betts. Tighten connections to comply with tightening torques in UL Standard 486A to assure permanent and effective grounding.

G. All metal equipment enclosures, conduits, cabinets, boxes, receptacles, motors, etc. shall be bonded to the respective grounding system.

H. Each feeder circuit and/or branch circuit shall include an equipment ground wire. The equipment ground wire shall not be smaller than allowed by NEC Table 250-122 "Minimum Size Conductors or Grounding Raceway and Equipment." When conductors are adjusted in size to compensate for voltage drop, equipment-grounding conductors shall be adjusted proportionately according to circular mil area. All equipment ground wires shall be copper either bare or insulated green in color. Where the equipment grounding conductors are insulated, they shall be identified by the color green and shall be the same insulation type as the phase conductors.

I. Provide all boxes for outlets, switches, circuit breakers, etc. with grounding screws. Provide all control panel, transfer switch, etc. enclosures with grounding bars with individual screws, lugs, clamps, etc. for each of the grounding conductors that enter the respective enclosures. Do not terminate more than one (1) ground wire in ground lug or terminal unless the respective lug or terminal is rated for multiple conductors.

J. Equipment ground wires shall be identified with green colored insulation for all conductors AWG or Kcmil. Green tape shall not meet this requirement.

K. All utility transformer bank grounds shall be installed in accordance with the serving utility company's recommendation and in accordance with NEC.

L. Bond the main electrical service neutral to ground at the main service disconnect. Bond the service neutral to ground at one (1) location only per the National Electrical Code. A grounding connection shall not be made to any neutral circuit conductor on the load side of the service disconnecting means, except as permitted by NEC 250-24.

M. All exterior metal conduit, where not electrically continuous because of non-metallic junction boxes, etc., shall be bonded to all other metal conduit in the respective duct run, and at each end, with a copper bonding jumper sized in conformance with NEC 250-102. Where metal conduits terminate in an enclosure (such as a motor control center, switchboard, etc.) where there is not electrical continuity with the conduit and the respective enclosure, provide a bonding jumper from the respective enclosure ground bus to the conduit sized per NEC 250-102.

N. Where permitted by the authority of jurisdiction, install grounding electrode conductors, lighting protection down conductors and separate ground conductors in schedule 80 PVC conduit or exposed where acceptable to local codes. Where grounding electrode conductors, lightning protection down conductors or individual ground conductors are run in PVC conduit, DO NOT completely encircle conduit with ferrous and/or magnetic materials. Use non-metallic reinforced fiberglass strut support. Where metal conduit clamps are installed, use nylon bolts, nuts, washers and spacers to interrupt a complete metallic path from encircling the conduit. This is required to avoid girdling of ground conductors. Girdling of a ground conductor is the result of placing the conductor in a ring of magnetic material. This ring could be a metallic conduit, U-bolt or strut support pipe clamp, or other support hardware. The result of girdling ground conductors significantly increases the inductive impedance of the ground conductor. Inductive and capacitive impedance is a type of resistance that opposes the flow of alternating current. Any increase in the impedance of a ground conductor reduces its ability to effectively mitigate radio frequency noise in the ground system. The condition where a ground conductor is girdled during a lightning strike results in phenomena known as surge impedance loading. Surge impedance loading is a result of voltage and current reaching 500,000 volts and 10,000 amps for a short duration. Girdling further increases the impedance at lightning frequencies of 100 kilohertz. At these power and frequency levels any increase in the impedance of the ground conductor must be controlled. During lightning discharge conditions a low inductive impedance path is more important than a low DC resistance path.

O. If local codes dictate that individual grounding conductors must be run in metal conduit or raceway, then the conduit or raceway must be bonded at each end of the run with a bonding jumper sized equal to the individual grounding conductor or as required by 2017 NEC 250-102. Note this does not apply to AC equipment grounding conductors run with AC circuits. Confirm requirements with the authority of jurisdiction.

P. Never remove, alter, or attempt to repair conductors or conduit systems providing grounding or electrical bonding for any electrical equipment until all power is removed from equipment. Warn all personnel of the ungrounded condition of the equipment. Display appropriate warning signs, such as danger tags, to warn personnel of the possible hazards.

Q. Grounding work and modifications shall not be performed during a thunderstorm or when a thunderstorm is predicted in the area.

R. Where a conflict is determined with respect to grounding requirements per manufacturer installation instructions, NEC, and/or the contract documents, contact the project engineer for further directions.

LOCATE EXISTING UTILITIES

The location, size, and type of material of existing underground and/or aboveground utilities indicated on the Plans are not represented as being accurate, sufficient, or complete. Neither the Owner nor the Engineer assumes any responsibility whatsoever in respect to the accuracy, completeness, or sufficiency of the information. There is no guarantee, either expressed or implied, that the locations, size, and type of material of existing underground utilities indicated are representative of those to be encountered in the construction. It shall be the Contractor's responsibility to determine the actual location of all such facilities, including service connections to underground utilities. Prior to construction, the Contractor shall notify the utility companies of his operational plans, and shall obtain from the respective utility companies detailed information and assistance relative to the location of their facilit8ies and the working schedule of the companies for removal or adjustment, where required. In the event an unexpected utility interference is encountered during construction, the Contractor shall immediately notify the utility company of jurisdiction. The owner's representative shall also be immediately notified. Any damage to such mains and services shall be restored to service at once and paid for by the Contractor at no additional cost to the Contract.
All utility cables and lines shall be located by the respective utility. **Contact JULIE (Joint Utility Location Information for Excavators) for utility information, phone: 1-800-892-0123.** Also coordinate work with all aboveground utilities.

Contractor shall locate and mark all existing cables or other lines within ten (10) feet of proposed excavating/trenching area. Any cables or other lines found interfering with proposed excavation or cable/trenching shall be hand dug and exposed. Any damaged cables or other lines shall be immediately repaired to the satisfaction of the owner's representative at the Contractor's expense.

Payment for locating and marking underground utilities and cables will not be paid for separately, but shall be considered incidental to the respective work for which it is required.

INSTALLATION AND TESTING OF PUMP CONTROL PANEL

Installation

A. Control panel shall be installed per manufacturer's recommendations as detailed on the Plans and as specified herein.

B. All conduit entries into the panel enclosure shall have water-tight threaded hubs, UL-listed for the use with the respective NEMA 4, 4X enclosure to maintain the NEMA 4, 4X rating of the panel enclosure.

C. Seal conduit openings in the panel enclosure with duct seal.

D. Conduits with intrinsically safe wiring, including level switch cables, shall terminate in the control panel at the intrinsically safe wiring section. Non-intrinsically safe wiring including, but not limited to, power feeder conductors, branch circuit conductors, and pump motor cables shall not enter the control panel at the intrinsically safe wiring section and shall maintain a minimum separation distance inside the control panel from the intrinsically safe conductors as required

by NEC 504 and ANSI/ISA RP12.6.

E. Install explosion-proof conduit seal-off fittings as detailed on the Plans and in conformance with manufacturer's instructions. Contact the respective conduit seal-off manufacturer if assistance is required for direction of installing the packing fiber to form a dam and pouring the sealing compound.

F. Install level switches as detailed on the Plans and per manufacturer's directions and recommendations. Verify level elevations with Engineer and Pump Manufacturer's Service Representative and adjust as required. Secure slack level switch cable to cable hangers with corrosion resistant nylon cable ties. Connect equipment ground wires from individual level switches to the respective equipment ground bar in the pump control panel.

G. Terminate all equipment ground wires on the pump control panel equipment ground bar. Where pump motor cables include an equipment ground wire and an additional "ground check" wire both ground wires shall be terminated on the equipment ground wire. Where level switch cables include an equipment ground wire terminate the respective ground wire on the control panel equipment ground bar.

Testing

Contractor shall provide services of the pump control panel manufacturer's representative for the purpose of inspection, check-out, testing, start-up, instruction of user personnel, and any other required services to provide a complete and operational system. All tests shall be conducted in the presence of the Engineer. Contractor shall provide water as/if required to test pumps under load. Contractor shall furnish three (3) copies of test results to Engineer. Contractor shall also furnish three (3) copies of Operation and Maintenance Manuals, for operator personnel use, to the Engineer.

Start-up procedure and tests shall include, but not be limited to, the following, as well as other tests and requirements specified herein:

A. Conduct megger test on each motor, (see Motor Start Up Certification and Testing Report).

B. Inspect control panel for correct terminal connections and tightness, correct and tighten as required.

C. Check level switches and corresponding circuitry for proper operation.

D. Check oil in motors (where applicable).

E. Check for correct rotation of pump motors, correct as required.

F. Check for proper pump installation and operation.

G. Measure voltage at no load (pumps off) and at pumps running under load for each

pump motor.

H. Measure current in each phase with motor running under load for each pump motor.

I. Verify proper operation of pump motor thermal sensors (where applicable).

J. Run the pumps in automatic and manual modes of operation. Verify proper operation of alternator.

K. Simulate alarm conditions and verify proper annunciation of each alarm on the automatic phone dialer system.

L. Verify a label is provided on the pump control panel with the name, address, phone number, and emergency phone number of the service representative.

M. Verify proper operation of all pilot lights and alarm lights.

N. Test receptacles for proper output power and proper operation.

O. Instruct user personnel about the operation of the control panel and components; indicating items for routine maintenance check, operation modes, failure modes, alarm conditions, etc.

P. Conduct any additional tests as recommended or required by the manufacturer.

Q. Correct any defects or deficiencies and retest after corrective and/or repair work has been performed to confirm proper operation of the system.

MARKING AND LABELING

Legend plates shall be provided for all equipment. Legend plates shall be provided to identify the equipment controlled, the power source, and the function of each device. Each individual circuit breaker, control panel, safety switch, shall be furnished with a phenolic engraved legend plate that identifies the respective device, the power source, and the respective voltage, phase, and wire. Furnish additional phenolic engraved legend plates as detailed on the Plans and/or where required by code. Legend plates shall be weatherproof and abrasion resistant phenolic/plastic engraved material and fastened with contact type permanent adhesive, screws, or rivets. Installation shall not break, crack, or deform the legend plate. Lettering shall be 1/4 in. high or larger. Equipment that is powered from a utility power source only (for example the main service disconnect) shall have black lettering on a white background. Equipment that is powered from an emergency source only (for example the generator breaker) shall have black lettering on a yellow background. Equipment that is normally powered from the utility and backed up by portable generator (for example the manual transfer switch) shall have white lettering on a red background.

Furnish and install weatherproof warning label for each meter socket, enclosed circuit breaker, disconnect switch, and control panel to warn persons of potential electric arc flash hazards, per the requirements of NEC 110.16 Arc-Flash Hazard Warning. Labels shall also conform to ANSI

Z535.4- 2002 "American National Standard for Product Safety Signs and Labels." NEC 110.16 requires that switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn qualified persons of potential arc flash hazards. The markings shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment. This new requirement is intended to help reduce the occurrence of serious injury or death due to arcing faults to those working on or near energized electrical equipment. The warning labels are to indicate to a qualified worker who intends to open the equipment for analysis of work that a serious hazard exists and that the worker should follow appropriate work practices and wear appropriate personal protective equipment (PPE) for the specified hazard. Labels shall be as detailed on the Plans or shall include at least the following information: Warning – Potential Arc-Flash Hazards existing while working on this energized equipment. Appropriate PPE Required."
Provide Arc-Flash warning labels in accordance with NFPA 70E Standard for Electrical Safety in the Workplace, Article 130 Work Involving Electrical Hazards, Part 130.5 Arc-Flash Risk Assessment, (H) Equipment Labeling which notes the following:

(H) Equipment Labeling. Electrical equipment such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are in other than dwelling units and that are likely to require examination, adjustment, servicing, or maintenance while energized shall be marked with a label containing all the following information:

(1) Nominal system voltage
(2) Arc flash boundary
(3) At least one of the following:
    a. Available incident energy and the corresponding working distance, or the arc flash PPE category in Table 130.7(c)(15)(a) or 130.7(c)(15)(b) for the equipment, but not both
    b. Minimum arc rating of clothing
    c. Site-specific level of PPE

Provide legend plates for service equipment, motor control centers, and panel boards, with the information on the maximum available fault current and the date the fault current calculation was performed to meet the requirements of NEC 110.24 "Available Fault Current".

**Measurement and Payment:** This work will be paid for at the contract lump sum price for PUMP STATION ELECTRICAL WORK, which shall include all labor, equipment, materials, associated supports, hardware, concrete work, tools, operational instructions, utility service work, coordination, and testing required to complete the installation of the pump station and to place it into proper working order.

## PUMP STATION MECHANICAL WORK

**Description:** This work shall consist of the ductile iron piping, pipe bracing, gauge, fittings, valves, vents, steel pipe supports, and the Schedule 40 drain with check valve in the valve vault, and Drainage Structure No. 1 and Drainage Structure, No. 2.

**Ductile Iron Piping**

The ductile iron piping with flanged joints shall conform to ANSI/AWWA C115/A21.15. The pipe shall have a cement mortar lining with asphaltic coating inside and out conforming to ANSI/AWWA A21.4. Gaskets shall be constructed of molded SBR rubber meeting ANSI/AWWA C111/A21.11. Fastening hardware shall be low carbon steel conforming to ASTM A307.

All pressure main fittings shall be flanged joint (FL.) ductile iron for above ground service, unless otherwise indicated on the Plans. All fittings shall conform to ANSI A21.10 (AWWA C110), or ANSI A21.53 (AWWA C153), where possible. Minimum pressure rating shall be 350 psi. If shown or specified fittings are unavailable in the above standards, the manufacturer's standard may be used upon approval of the ENGINEER. All rubber gaskets shall conform to ANSI A21.11 (AWWA C111). All fittings shall have cement mortar lining and seal coat per ANSI A21.40 (AWWA C104).

**Pipe Bracing**

Steel bracing, as detailed in the plans, shall be placed around the 20" diameter ductile iron pipe within each Drainage Structure No. 2 where the vertical pipe bends 90 degrees prior to exiting the drainage structure to the valve vault. The bracing shall be bolted to the drainage structure wall. All material of the steel bracing shall be galvanized. Verify as-built location of the 20" diameter ductile iron pipe prior to fabricating the holes in the connection plates and HSS steel brace.

**Pressure Gauge**

Pressure gauge shall include force main tap and all accessories of the proposed force main. An oil filled pressure gauge shall be installed on the forcemain in the valve vault prior to the air release/vacuum valve. Pressure gauge shall measure at a minimum 0 to 50 psi.

Pressure gauge shall connect to ¾ - inch copper piping via threaded connection. Piping shall be copper annealed, seamless, and conform to ASTM B88, Type K rating.

A ¾" corporation stop shall be direct tapped into the side of the ductile iron forcemain. The corporation stop shall have a compression coupler for type K copper.

Contractor shall install a ¾" ball valve between the tap and the pressure gauge for isolation of the gauge.

**Make-up Flange**

Make-up flanges, restrained flange adapter type, shall join plain end pipe to plain end pipe or plain end pipe to integral flanges without welding or threading.

Flange adapters shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C110/A21.10. Restraint for the flange adapter shall consist of a plurality of individual actuated gripping wedges to maximize restraint capability. Torque limiting actuating screws shall be used to insure proper initial set of gripping wedges. The

flange adapter shall be capable of deflection during assembly, or permit lengths of pipe to be field cut, to allow a minimum of 0.6" gap between the end of the pipe and the mating flange without affecting the integrity of the seal.

All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat. All casting bodies shall be surface pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.
For ductile iron pipe, the flange adapter shall have a safety factor of 2:1 minimum. Flange adapter shall be installed per manufacturer's instructions.

**Air Release/Vacuum Valve**

Combination air release/vacuum valves shall include the forcemain tap and accessories over the proposed forcemain. The air release/vacuum valve shall be a complete package of one manufacturer. The air release valve shall be installed per the valve manufacturer's instructions.

The air release valve shall be connected to the ductile iron forcemain via a flanged tapping saddle.

Air release/vacuum valve shall be specifically designed for operation on sewage or waste media. The valve shall be of compact design and shall have a 6 inch flanged connection. The valve shall automatically provide the release of larger volumes of air during pipeline filling. The valves will remain closed and will not reopen when the system is full and under positive pressure. The valves will open under negative pressure to admit large volume of air during pipeline draining to prevent vacuum.

The air release valve shall be connected to the forcemain per the plans using a stainless steel service tapping saddle with a 6 inch 150# flange.

The valve shall incorporate two stainless steel floats directly connected by a stainless steel stem, to maintain an air gap between the bottom concave float and top shut-off float. The valve shall allow large volume of air to escape during pump start up. Valve shall also allow air to escape during pumping cycle.

An air gap shall prevent waste solids from fouling or clogging the top shut-off float.

All valve internals shall be easily removed through the top cover without removing the main valve from the line. Valve internal baffle shall be fitted with a guide bushings and act to protect the shut-off float from direct airflow. The baffle shall retain the resilient seat without distortion and shall provide drip tight shut off.

Valve shall have standard two year written warranty from the manufacturer.

**Swing Check Valve**

Swing check valves shall be flanged with a weighted lever arm and shall be the end product of one manufacturer. The swing check valves shall be installed per the valve manufacturer's instructions.

Swing check valves shall conform to ANSI/AWWA C508, Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) MMS-SP-71 and MMS-SP-80, and ASTM D-1784.

The swing check valve shall utilize a thru-valve disc hinge shaft, with outside lever and weight. The valve shall be designed for either horizontal or vertical installation, as shown on the drawings. The valve shall provide a resilient material to metal seat, and a full waterway design, as defined in AWWA C508.

Swing check valve body shall be ASTM A126 Class B cast iron. The valve body shall be flanged and of one-piece construction and constructed in a globe pattern. The valve outlet flange shall be integrally cast with the valve body and shall be one nominal pipe size larger than the valve inlet flange. Valve body shall be full waterway type, designed to provide a net flow area not less than the nominal inlet pipe size area when swung open no more than 25 degrees. Valve shall have a replaceable bronze body seat. Body seat materials shall be either cast bronze meeting AWWA C508.

Swing check valve shall provide full pipeline flow area with disc at 25 degrees open, and shall allow for 45 degrees total disc rotation. The disc shall be stopped in its full open position by a built-in stop in the valve body. The disc shall be constructed of cast or ductile iron with a minimum strength of 30,000 psi. The disc seat ring (resilient seal) shall be a rubber like material, and shall be selected by the manufacturer in accordance with potable water requirements, as given in AWWA C508. The disc attachment arm shall be constructed of ductile iron or steel with a minimum strength of 65,000 psi. The disc attachment arm shall be prevented from rotation on the disc hinge shaft by a machined keyway and stainless steel key.

The counterweight arm(s) shall be constructed of steel, and shall be secured to the disc hinge shaft by a stainless steel key. The counterweight shall be constructed of cast iron, and shall be secured in position on the counterweight lever by a stainless steel lock screw.
The swing check valve body assembly shall incorporate a circular flanged cover of the same construction as the valve body. The cover shall be of adequate size to permit field inspection, maintenance and replacement of all internal valve components. The valve seat, disc seal ring, and mating surface shall be field removable and replaceable without removing the valve from the pipeline.

The Contractor, in conjunction with the swing check valve manufacturer, shall make adjustments in the position of the lever weight to achieve optimum no-slam operation.

**Plug Valves**

Plug valves shall be flanged with gear operators and hand wheel, and shall be the end product of one manufacturer. The plug valves shall be installed per the valve manufacturer's instructions. Plug valves shall be of the non-lubricating, eccentric type and shall be designed for a working pressure of 150 psi. Valves shall provide tight shut-off at rated pressure.
The valve shall have a 100 percent port design. The valve body shall be cast iron ASTM A126 Class B with welded in overlay of 99 percent nickel allow content on all surfaces contacting the face of the plug. The valve plug shall be ductile iron ASTM A-536, Grade 65-45-12 with Buna N resilient seating surface to mate with the body seat.

The plug valves shall be furnished with permanently lubricated sleeve type bearings conforming to AWWA C517. Bearings shall be of sintered oil impregnated type 316 stainless steel ASTM A-743 Grade CF-8M or bronze ASTM B-127.

Valve shaft seals shall be of the "U" cup type, in accordance with AWWA C517. Seals shall be self-adjusting and re-packable without moving the bonnet from the valve.

**Steel Pipe Supports**

Steel pipe supports shall be utilized within the valve vault for the fittings, and valves. Pipe supports shall be bolted to the floor of the vault and shall be designed to cradle the diameter of pipe they are supporting.

**Valve Vault Drain**

Polyvinyl Chloride (PVC) pipe shall be ASTM D2665 drain, waste, vent pipe. The drain shall be furnished and installed in accordance with Section 20 of the Standard Specifications for Water & Sewer Main Construction in Illinois, as shown on the Plans and as specified herein.

The backfill for the piping shall be controlled low strength material, mix 2 when in the vicinity of the Drainage Structures No. 2 and the valve vault. The Contractor is responsible for any additional fittings required to plumb the drain from the valve vault to the Drainage Structures No. 2.

The pipe shall be sealed with a link style seal where it penetrates the walls of the valve vault and drainage structure. The link style seal shall form a watertight seal between a pipe and a concrete structure. The Contractor shall coordinate the sizing with link seal supplier. The seal shall be installed per manufacturer's recommendations forming a watertight seal with the structure.
The check valve shall be a ball check with integral unions to connect to the drain pipe. The check valve shall be able to be installed in a vertical or horizontal position and still function. The check value shall be the same diameter as the drain pipe.

**General:** This work includes all excavation, labor, materials and equipment required to furnish, and install the ductile iron pipe both flanged and push on, galvanized steel bracing, gauge, fittings, valves, steel pipe supports, 2-in. Schedule 40 drain pipes, 2-in. check valves, pipe and rail supports, backfilling, accessories, testing, and other incidental items as shown on the plans.

**Basis of Payment:** This work will be paid for at the contract lump sum price for PUMP STATION MECHANICAL WORK.

## PUMPING STATION

Pumping station consists of the pumping equipment and accessories, motor control center, supervisory controls, and testing as well as the valve vaults.

The valve vaults shall be precast reinforced concrete conforming to ASTM C913. A sump pit shall be cast in the base of the valve vault as shown on the plans. The Contractor shall submit plans and calculations for the valve vault that are signed and sealed by an Illinois Licensed Structural Engineer prior to ordering or manufacturing the valve vault. The structure shall be designed for earth loads and HS-20 live load for vehicle traffic.

Once the vault is installed and piping in place, the space between the valve vault and the limits of excavation shall be backfilled with controlled low strength material, mix 2.

The lid of the valve vault shall be removable, flat and shall be sealed to the top of the valve vault with a double row of butyl mastic. The removable concrete lid shall be one-piece, designed for HS-20 live load traffic and shall have lifting hardware embedded into the concrete lid. The lifting hardware shall be flush with the top of lid or recessed in the lid. The Contractor shall submit plans and calculations for the valve vault removable lid that are signed and sealed by a licensed structural engineer in the State of Illinois prior to ordering and manufacturing the lid. The lid shall have a cast in place aluminum access frame and hatch. The hatch shall be hinged with a flush locking mechanism and a 36-inch by 36-inch minimum clear opening. The access frame and hatch shall be HS-20 load rated. Contractor shall coordinate hatch fabrication with the pump manufacturer.

Openings in the structure for pipes shall be sealed with a link style seal. The link style seal shall form a watertight seal between a pipe and a concrete structure. The Contractor shall coordinate the sizing with link seal supplier. The seal shall be installed per manufacturer's recommendations forming a watertight seal with the structure.

After installation is complete, if there are water leaks at joints, the Contractor shall waterproof the leaks using drilled ports around the leak and a hydrophilic grout.

### Submersible Pumps and Accessories

Drainage Structure, No. 1 shall have one (1) submersible wastewater pump with two-vane non-clogging radial flow design impeller.

Each Drainage Structures, No. 2 shall have one (1) submersible wastewater pump with "Angle Flow" non-clogging radial flow design impeller.

Each pump shall be equipped with a submersible electric motor connected for operation on existing electrical service with 75-feet of submersible cable suitable for submersible pump applications. The power cable shall meet NEC and ICEA standards for submersible pumps. The pump shall be supplied with a discharge. Each pump shall be fitted with minimum 50-

feet of stainless steel chain. The working load of the lifting system shall be 50% greater than the pump unit weight.

Submersible pumps and motors shall be designed specifically for raw stormwater use, including totally submerged operation during a portion of each pumping cycle and shall meet the requirements of National Electrical Code (NEC) for such units. Pump motor cords shall be designed for flexibility and serviceability under conditions of extra hard usage and shall meet the requirements of the NEC for flexible cords in sewage pumping stations. Ground fault interruption protection shall be used to de-energize the circuit in the event of any failure in the electrical integrity of the cable.

Pumps shall be manufactured by companies whose management system is registered to ISO-9001:2000.

The Contractor shall furnish and install totally submersible electric operated stormwater pumps of the sizes, number, and capacities shown below. The motors shall be non-overloading at any point on the pump curve, from shut-off to zero head conditions, and shall be of the specified horsepower, operating at 480 volt, 3 phase. The pumps, discharge elbows, and associated mounting hardware shall be as manufactured by the pump manufacturer. Information associated with the equipment from Fairbanks Nijhuis was used as the basis for the design as specified herein and shown on the drawings.

At minimum the submittal data shall include a list of 10 references for pumps of the same size or larger operating in Illinois for more than 10 years, certified pump installation drawings, certified pump curves, certified motor drawings and motor data sheets, complete pump specifications. Submittal data shall also include a specific list of deviations from the project specifications. If items are not listed or omitted in the pre-approval submittal it will be the responsibility of the installing contractor, at no additional cost to the project or owner, make any and all required modifications to the supplied equipment to meet the project specifications. All modifications to the product shall be in accordance with the manufactures recommendations and shall in no way limit or void the original manufactures factory warranty. If modifications cannot be made to meet the project specifications the installing contractor shall at no cost to the project or owner purchase the specified products.

The services of a manufacturer's representative are required at the time of start-up.

**Pump Design**

The pumps shall be furnished as one complete pump system, all of the system components supplied by one manufacturer. The pumps shall be vertical, submersible, solids handling type pump, designed to handle gritty sludge and raw stormwater, and shall be capable of passing spherical solids as follows.

| Pump Size | Minimum Allowable Solids Handling Capacity | Minimum Pump Base Discharge Size |
|---|---|---|
| 4” | 3” | 6” |
| 18” | 6.75” | 18” |

The pump base shall have flanged outlet connection. The design shall be such that the pump unit will be automatically connected to the discharge piping when lowered into place on its mating discharge connection, permanently installed in the manhole. The pump shall be easily removable for inspection or services, requiring no bolts, nuts, or other fastenings to be disconnected. For this purpose, there shall be no need for personnel to enter the manhole. It shall be fitted with a lifting hoop of adequate strength to permit raising and lowering the pump for inspection or removal. A stainless steel chain or cable shall be attached to this lifting hoop and extended to the top of the manhole. A stainless steel hook rack shall be installed just below the frame and access hatch in each Drainage Structure and shall have at least three hooks per pump (min. 6 hooks). The pump, with its appurtenances and cable, shall be capable of continuous submergence underwater without loss of water-tight integrity to a depth of 75-feet.

**Pump Construction**

All major parts, such as the stator casing, oil casing, sliding bracket, volute and impeller shall be gray iron. All exposed bolts and nuts shall be of stainless steel.

A wear ring system shall be installed to provide efficient sealing between the volute and impeller. The impeller shall be gray cast iron of non-clogging design coated with Pota Pox Plus Tnemec N140, capable of handling solids, fibrous material, and other matter found in normal stormwater applications. The impeller shall be dynamically balanced. Static and dynamic balancing operations shall not deform or weaken it. The impeller shall be retained with a non-corroding Allen head bolt.

The pump shall be provided with a mechanical rotating shaft seal system running in an oil reservoir having separate lubricated seal faces. No seal damage shall result from operating the pumping unit out of its liquid environment. The seal system shall not rely upon the pumped media for lubrication. Provision for determining the condition of the lower seal unit without disassembly of the pump shall be provided.

Pump shall be a standard production pump with attached rail guides and discharge elbow. Rail guides shall be fastened to pump so that all lifting loads will come on the guide supports and not on the pump or motor housing. Guide mechanism on the pump shall be constructed of bronze, shall be non-sparking per FM and/or UL-Listed. Any pumps supplied under this contract that are not currently using certified non-sparking materials shall be tested in accordance with FM or UL protocols. Pumps not meeting the FM / UL-Listing for the non-sparking guide mechanisms are specifically not acceptable.

Installation of the pump unit to the discharge connection shall be the result of a simple linear downward motion of the pump unit guided by no less than two guide bars. No other motion of the pump unit, such as tilting or rotating, shall be required.

The discharge flange of each pump shall be designed to automatically seal with the discharge elbow when the pump is lowered into place and the pump is in operation. The seal shall be capable of remaining reliable for water-tightness in the environment into which it will be located. Discharge elbow shall have 125 lb. standard flanges.

If a pump mounting base is furnished, these plates shall include adjustable guide rail supports and discharge elbow with flange to align the pumps with the flange. Plates and fitting shall be coated with tar base epoxy paint.

The motor cable entry water seal design shall be such that it precludes specified torque requirements to insure a water-tight and submersible seal. Pump motor cable shall be suitable for submersible pump applications and this shall be indicated by a code or legend permanently embossed on the cable. Cable sizing shall conform to NEC Specifications for pump motors. Pump power cable shall be continuous without splices from the pump to the control cabinet. The cable shall be at least 75-feet in length.

All mating surfaces of major parts shall be machined and fitted with nitrile O-rings where water-tight sealing is required. No other sealing compounds shall be required nor used.

The 4-in pump shall have a low flow capacity of 427 GPM at a total head of 28.2-feet when operating at 890 RPM with a pump efficiency of 65% or greater and have a high flow capacity of 470 GPM at a total head of 27.1-feet when operating at 890 RPM with a pump efficiency of 72% or greater. Pump motor shall be a minimum of 7.5 horsepower. The pump and motor shall be UL-listed, FM-listed, or ETL-listed suitable for Class I Division 1 Group D hazardous location. A Fairbanks 4" 5433 MV with 210T frame meets the requirements of this special provision.

The 18-in pump shall have a low flow capacity of 4,135 GPM at a total head of 25-feet when operating at 592 RPM with a pump efficiency of 79% or greater and have a high flow capacity of 6,155 GPM at a total head of 20.2-feet when operating at 592 RPM with a pump efficiency of 74% or greater. Pump motor shall be a minimum of 60 horsepower. The pump and motor shall be UL-listed, FM-listed, or ETL-listed suitable for Class I Division 1 Group D hazardous location. A Fairbanks 18" D5731 MV with 400T frame meets the requirements of this special provision.

**Pump Assembly Configuration**

Cooling System - Motors are cooled by the surrounding environment or pumped media. Pumps requiring jackets for recirculation of either pumped media or internally reticulated cooling fluid of any type are not acceptable.

Cable Entry Seal - The cable leads are to enter at the top of the motor, and are to allow the cable-to-motor connection to be accomplished in the field without soldering cable. All power and control lead wires are to be double sealed as it enters the motor in such a manner that cable wicking will not occur. This sealing system shall consist of a rubber grommet followed by epoxy that is high in adhesive qualities and has a low coefficient of expansion. Each cable wire

is to have a small section of insulation removed to establish a window area of bare wire and each wire is to be untwisted and surrounded by epoxy potting material. A cable strain relief mechanism shall be an integral part of this sealing system. Cable sealing system shall be capable of withstanding an external pressure test of 1200 PSI as well as a cable assembly pull test as required by Underwriters Laboratories. Singular grommet or other similar sealing systems are not acceptable. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 75 feet or greater. Leads are connected to a water-tight fully O-ringed terminal board with brass lugs.

Total grommets or other similar sealing systems are not acceptable. Motor shall be supplied with 75 feet of multi-conductor type W, SOW & SOOW cable and control cable. Cable sizing shall conform to NEC specifications.

Separate terminal board, which is fully o-ringed and each terminal individually o-ringed, to form a water tight barrier.

**Electric Motor**

Motors shall be rated for Class I, Division I, Group D.
The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class F insulation. The stator-winding and lead shall be insulated with moisture-resistant Class F insulation for continuous duty in 40 C rise liquids. The motor shall be designed for continuous duty capable to minimum of ten (10) starts per hour. Motor shaft shall be 416 stainless steel: the rotor and shaft together is to be dynamically balance to meet NEMA vibration limits: all hardware to be stainless steel.

Thermal switches set to open at 311F shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The motor and the pump shall be produced by the same manufacturer.

The combined service factor shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics.

Power and control leads shall be terminated on a sealed terminal board. The terminal board and its bronze lugs shall be O-ring sealed.

The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out. Pumps shall be sized based on the total hydraulic capacity based on test data, reduction in the head range or chopped pump curves are not acceptable.

Bearings - The pump shaft shall rotate on two sets of bearings. Motor bearings shall be

permanently grease lubricated. The lower bearing shall compensate for axial thrust and radial forces. The lower shaft bearing shall be locked in place to prevent shaft movement and to take thrust loads. Bearing shall be prelubricated at the factory.
Mechanical Seal - Pump(s) shall be provided with two separate tandem mounted mechanical seals to prevent the pumped liquid from entering the rotor/stator cavity area to ensure reliability of operation. The upper and lower seals are mounted to rotate in the same direction.

The lower mechanical seal mating surfaces are to be immersed in an oil bath, sealing the pump volute chamber from the oil cavity. Oil in this cavity shall also lubricate the upper mechanical seal faces. Seal faces of both the upper and lower mechanical seals shall be held in contact by independent polymeric elastomer bellows, which act as a spring mechanism. Seals require neither maintenance nor adjustment, but shall be easily inspected and replaced. Pressure generated by the pump assists in sealing the mating surfaces of the lower seal.

Component material for the upper seal shall consist of a composite elastomer body, carbon steel snap ring, Buna-N O-ring, carbon rotating face and ceramic stationary face. Lower seal component construction shall include a composite elastomer body, stainless steel clamp and set screws, Buna-N O-ring, silicon carbide rotating face and tungsten carbide stationary face.

Two moisture detection probes shall be installed so that they will detect moisture in either the seal or stator cavity measuring resistivity between the probes. They shall be wired internally to the control cable connection at the top of the motor. Float type devices located in the rotor/stator area or single probe-to-ground moisture detectors measuring continuity are not acceptable. O-ring sealed inspection plugs shall be provided in the mechanical seal oil chamber for ease of inspection, draining and filling of oil.

The motor shall be able to operate unsubmerged up to 15 minutes without damage while pumping under load.

Seal lubricant shall be FDA Approved, nontoxic.

Pump Shaft - Pump and motor shaft shall be the same unit. The shaft shall be 416 stainless steel. The use of stainless steel sleeves will not be considered equal to stainless steel shafts.

Impeller - The impeller for the 4" pump shall be of the balanced non-clogging type matched to its constant velocity equalizing pressure volute and be made of close-grained cast iron conforming to ASTM C48 CL30. It shall be of one-piece construction, single suction, enclosed two-vane, radial flow design with well-rounded leading vanes and then tapered toward the trailing edge for a circular flow pattern to prevent accumulatio of solids and stringy materials. The impeller shall be one piece, single suction, enclosed two-vane, radial flow design for the 18" pump, each with well-rounded leading vane edges and thick hydrofoil shape which prevents the accumulation of solids and stringy material through the impeller. Impeller shall be of the balanced non-clogging type matched to its constant velocity equalizing pressure volute and made of close-grained cast iron conforming to ASTM A48 CL30. It is to be dynamically balanced and secured to the shaft by means of a key and fastener.

Wiper vanes are not allowed. The impeller waterways and clearance between the impeller

periphery and volute cutwater shall be capable of passing a 6.75" spherical solid for the 18" pump and a 3" spherical solid for the 4" pump. There shall be provisions for adjustable shims behind the impeller to maintain clearance between the impeller and suction head wear rings. Semi open impellers or impellers without hard metal wear rings are not acceptable. Coated wear rings are not acceptable. Impeller shall be designed to be fully trimmable. Semi open type impellers or impellers that will not accept wear rings are not allowed.

The impeller shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in storm water up to 3%.

Wear rings shall be provided on both the impeller and fronthead so that clearances can be maintained throughout the life of the rings and minimize recirculation. Impeller wear rings shall be of the axial- or face-type. Fronthead wear rings shall be of the axial- or face-type.
Wear rings shall be attached to the impeller and fronthead using an interference fit and Loctite. Wear rings shall be stainless steel, with the impeller wear ring approximately 50 Brinell softer than the fronthead wear ring. Wear ring clearance adjustment shall be attained through impeller adjustment shims. Axial wear rings constructed of:

- Front Head: Stainless Steel A743-CA40 Or A276-410 with minimum BHN 300-350
- Impeller: Stainless Steel A743-CA15 Or A276-410 minimum BHN 190-241

Volute-Suction Cover - Volute is to be cast with extra thick walls made of close-grained cast iron conforming to ASTM A48, Class 30. The pump volute shall be a single piece with smooth passages of sufficient size to pass any solids that may enter the impeller. Inlet and discharge size shall be as specified. Spiral grooved suction volute insert plates that act as the impeller enclosing shroud and wear surface and that do not pass the listed solids clearance are specifically not acceptable.

The volute shall be provided with a replaceable hard metal insert/wear ring, which shall be fully axially field adjustable. Ensure effective sealing between the impeller and volute housing. Non-hardened or elastomer or rubber coated metal or stainless steel wear rings are not acceptable.

The pump discharge shall be provided with an integrally cast flange. The seal between the pump discharge and discharge piping shall be watertight.

Guide/Bracket - Guide rails shall be provided by the general contractor on which the pump rides when being raised or lowered in the sump and mount on the discharge base/elbow. The rails shall align the pump with the discharge elbow as it is lowered into place. An upper rail guide shall be furnished to support and align the rails at the top of the sump. Intermediate guide bracket support shall be provided every 5-feet vertically and shall be coordinated through the pump manufacturer. The guide brackets shall also support the discharge pipe with both the pipe and guide rail supports affixed to the pump station walls.

Guide rails shall be provided on which the pump rides when being raised or lowered in the sump and mounted on the discharge base/elbow. The rails shall align the pump with the discharge elbow as it is lowered into place.

Guide bars shall be stainless steel and the diameter shall be as recommended by the pump manufacturer.

An upper rail guide shall be furnished to support and align the rails at the top of the sump.

The guide rail system shall be non-sparking and approved for use in Class 1, Division 1, Group D hazardous locations.

Discharge Base - A rigid discharge straight thru discharge/base to support the total weight of the pumping unit shall be provided. The base is to be bolted directly to the floor with the 90 degree 125lb. ANSI flange discharging horizontally.

Protection - All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. The thermal switches shall open at 311F, stop the motor and activate an alarm.

A leakage sensor shall be available to detect water below the upper seal and in the stator housing.

Spare Parts (for each pump unit provided) - 2 sets of all gaskets. Mechanical seal set. Complete replacement bearing set. Any special tools required for pump disassembly.

*Materials of Construction*

| | |
|---|---|
| Impeller | Cast Iron A48-CL30 |
| Impeller Bolt | Steel SAE Bolt Steel GR-8 |
| Impeller Nut | SAE Bolt Steel |
| Impeller Washer | A108 GR12L14 |
| Volute | Cast Iron A48-CL30 |
| Fronthead | Cast Iron A48-CL30 |
| Impeller wearing ring | A743-CA15 stainless steel (190 - 241BHN) |
| Volute wearing ring | A743-CA40 stainless steel (300-350BHN) |
| Discharge Base Elbow | Cast Iron A48 CL-30 |
| Impeller Key | Steel A108 GR1018 |
| Guide Bracket | Brass B584 AL836 – FM Listed |
| Volute Gasket | Tagboard F104 |
| Bearing Shims | Steel A108 Commercial |
| Volute Handhole Cover | Cast Iron A48-CL30 |
| Volute Handhole Cover Gasket | Tagboard F104 |
| Upper Guide Bracket | Steel |
| Upper Guide Bracket Bushing | Rubber |
| Guide Mechanism | Bronze / non-sparking – FM Listed |
| Discharge Coupling | Non-Sparking |
| Lower Mechanical Seal Faces | Silicon Carbide vs. Tungsten Carbide Upper Mechanical |
| Seal Faces | Carbon vs. Ceramic |

**Installation**

The Contractor shall install the pump assemblies in the permanent locations as shown on the drawings and in accordance with the manufacturer's instructions.

Contractor shall install interconnecting electrical wiring, conduit, etc. between submersible pumps and control equipment so that when power and control wiring is brought to the control equipment, the submersible pump system will be a complete operational system.

**Testing**

The pump manufacturer shall perform the following inspections and tests on the pump before shipment from factory.

1. Impeller motor rating and electrical connections shall first be checked for compliance to the customer's purchase order.
2. A motor and cable insulation test for moisture content or insulation defects.
3. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.
4. The pump shall be run for 30 minutes submerged, a minimum of 6 ft under water.
5. After operational test No. 4, the insulation test (No. 2) is to be performed again.
6. Each pump shall be tested for flow versus head at the design conditions in accordance level 1U p e r the latest edition of the Hydraulic Institute Standards.

A written report with certified flow versus head curves stating the foregoing items have been done shall be supplied with the pump at the time of shipment. The curves indicated shall include head, capacity, horsepower, efficiency and input KW.

After all factory testing has been completed, but before shipment the pump motors shall be megger tested.

Manufacturer shall be certified ISO 9001

Prior to system operation, all equipment shall be inspected for proper alignment, quiet operation, proper connection and satisfactory performance by means of a functional test.

Field Testing

Functional Test - required. Performance Test - required.

Before final acceptance of the pumps specified herein, the Contractor shall submit five (5) copies of certified and properly identified performance curves which shall reflect the operating characteristics of each pump model and impeller combination being supplied. The curves shall indicate head, capacity, horsepower, efficiency and input KW.

**Finishes**

Shop - All pump assemblies supplied under this section shall receive finishes that are in

accordance with the pump manufacturer's standard finish.

Field - All pump assemblies shall be touch-up painted with matching paint supplied by the pump manufacturer.

Drive Motors - All pump drive motors furnished under this section shall only receive finishes that are in accordance with the motor manufacturer's standard finish. DO NOT apply shop or field coatings to the drive motors.

**Manufacturer's Services**

The Contractor shall include with his bid the services of the equipment manufacturer's field service technician for a period of one (1) trip for a period of two (2) 8-hour days at the site. This service shall be for the purpose of check-out, initial start-up, certification, and instruction of plant personnel. A written report covering the technician's findings and installation certification shall be submitted to the Engineer covering all inspections and outlining in detail any deficiencies noted.

**Motor Control Center (MCC)**

The MCC shall be 480 volt, 3-phase, 3-wire, 60 hertz unless otherwise indicated. The incoming service to the MCC shall be 480/277 VAC, 3-Phase 4-wire. MCC shall be equipped for Main Lugs Only (MLO) to receive power feed from separate main disconnect.

The MCC shall conform to UL 845, current revision, Canadian Standards Association (CSA), Electrical Equipment Manufacturers Association of Canada (EEMAC), NEMA ICS 18, the NEC, and the Canadian Electrical Code. The MCC shall be manufactured in an ISO 9001 certified facility.

The low voltage industrial MCCs and required accessories shall be from a single source with resources to produce products of consistent quality in appearance and physical properties without delaying the work. Any materials which are not produced by the manufacturer shall be acceptable to and approved by the manufacturer.

Manufacturer of the MCC and supervisory controls shall be a firm engaged in the manufacture of low voltage industrial MCCs of types and sizes required, and whose products have been in satisfactory use in similar service for a minimum of five years. Information associated with the equipment from Square D was used as the basis for the design as specified herein and shown on the drawings.

A supervisory pump Control Section shall be as an integral part of the MCC. The MCC and Supervisory Controls shall be supplied by the System Integrator to ensure full integration, coordination, and testing of all components and supervisory controls as a fully functional system. The System Integrator is responsible for provision of Class 2, Type B wiring and interconnect drawings between Supervisory Control Section and FVNR and VFD motor control sections.

Contractor shall submit wiring diagrams detailing power, signal, and control systems, clearly differentiating between manufacturer-installed wiring and field-installed wiring, and between components provided by the manufacturer and those provided by others.

**MCC Unit Design**

Each MCC shall consist of one or more vertical sections of heavy gage steel bolted together to form a rigid, freestanding assembly. A removable 7 gage structural steel lifting angle shall be mounted full width of the MCC shipping block at the top. Removable 7 gage bottom channel sills shall be mounted underneath front and rear of the vertical sections extending the full width of the shipping block. Vertical sections shall be made of welded side-frame assembly formed from a minimum of 12 gage steel. Internal reinforcement structural parts shall be of 12 gage and 14 gage steel to provide a strong, rigid assembly. The entire assembly shall be constructed and packaged to withstand normal stresses included in transit and during installation.

Steel material shall comply with UL 845 and CSA requirements.

MCC Structures shall be totally enclosed, deadfront, freestanding assemblies. Structures shall be capable of being bolted together to form a single assembly.

The overall height of the MCC shall not exceed 90 inches, not including base channel or lifting angle. Base channels, 1.5 inches in height, and lifting angles, 3 inches in height, shall be removable. The total width of one section shall be 20 inches. Widths of 25 inches, 30 inches, and 35 inches can be used for larger devices.

Structures shall be NEMA/EEMAC Type 1A (gasketed general purpose).

Each 20 inch wide standard section shall have all the necessary hardware and bussing for modular plug-on units to be added and moved around. Unused space shall be covered by hinged blank doors or appropriate cover plate and equipped to accept future units. Vertical bus openings shall be covered by manual bus shutters.

Each section shall include, but shall not be limited to, a top plate (single piece or two-piece). NEMA/EEMAC Type 12 shall also include a bottom plate. Top and bottom plates shall be removable for ease in cutting conduit entry openings.

Structures shall contain a minimum 12 inch high horizontal wireway at the top of each section and a minimum 6 inch high horizontal wireway at the bottom of each section. These wireways shall run the full length of MCC to allow room for power and control cable to connect between units in different sections.

A full-depth vertical wireway shall be provided in each MCC section that shall accept modular plug-on units. The vertical wireway shall connect with both the top and bottom horizontal wireway. The vertical wireway shall be 4 inches wide minimum with a separate hinged door. There shall be a minimum of 60 square inches of cabling space available for 15 inch deep sections and 80 square inches of cabling space available for 20 inch deep sections. Access to the wireways shall not require opening control unit doors. Structures that house a single, full

section control unit are not required to have vertical wireways. Those control units shall open directly into the MCC horizontal wireways.

Power bussing and splice connections shall be isolated from the unit compartments and the wireways. The horizontal bus shall be mounted onto a glass-filled polyester support assembly that shall brace the bus against the forces generated during a short circuit. The horizontal bus shall be isolated from the top horizontal wireway by a two-piece rigid non-conductive barrier. The barrier design shall allow qualified personnel to slide the barriers both left and right, to allow access to the bus and connections for maintenance without having to remove the barrier. Barrier sliding shall occur via an upper and lower track system.

The vertical bus shall be housed in a molded glass-filled polyester support that shall provide bus insulation and shall brace the bus against the forces generated during a short circuit. These supports shall have openings every 3 inches for unit stab-on connections. Each opening shall be provided with a manual shutter to close off the stab opening. These shutters shall be attached to the structure so that when they are removed (to allow a stab connection) they shall be retained in the structure and shall be readily accessible for use should a plug-in unit be removed from the MCC.

Barriers shall be provided in the vertical structure and unit designs to prevent the contact of any energized bus or terminal by a fishtape inserted through the conduit or wireway areas.

Bussing and connectors shall be tin-plated copper.

The main horizontal bus shall be rated at 600 amperes continuous and shall extend the full length of the MCC. Bus ratings shall be based on 149° F maximum temperature rise in a 104° F ambient. Provisions shall be provided for splicing additional sections onto either end of the MCC.

The horizontal bus splice bars shall be pre-assembled into a captive bus stack. This bus stack shall be installed into the end of the MCC power bus to allow the installation of additional sections. The main bus splice shall utilize four (4) bolts, two on each side of the bus split, for each phase. Additional bolts shall not be required when splicing higher amperage bus. The splice bolts shall secure to self-clenching nuts installed in the bus assembly. It shall be possible to maintain any bus connection with a single tool.

Each section that accepts plug-in units shall be provided with a vertical bus for distributing power from the main bus to the individual plug-in starter units. This bus shall be of the same material and plating as the main bus, and shall be rated at 300 amperes continuous. The vertical bus shall be connected directly to the horizontal bus stack without the use of risers or other intervening connectors. It shall be possible to maintain the vertical to horizontal bus connection with a single tool. Nut-and-bolt bus connections to the power bus shall not be permitted. When a back-to-back unit arrangement is utilized, separate vertical bus shall be provided for both the front and rear units.

A tin-plated copper ground bus shall be provided that shall run the entire length of the MCC. The ground bus shall be 0.25 inch by 1 inch and shall be rated for 300 amperes. The ground

bus shall be provided with six (6) 0.38 inch holes for each vertical section to accept user-supplied ground lugs for any loads requiring a ground conductor.

Each vertical section shall have a copper vertical ground bus that shall be connected to the horizontal ground bus. This vertical ground bus shall be installed so that the plug-in units engage the ground bus prior to engagement of the power stabs and shall disengage only after the power stabs are disconnected upon removal of the plug-in unit.

The system shall be rated for an available short circuit capacity 65,000 amperes rms.

The MCC shall be warranted to be free from defects in materials and workmanship for a period of 18 months from date of invoice from manufacturer or authorized sales channel. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents

**MCC Unit Construction**

Units with circuit breaker disconnects through 400 ampere frame, and fusible switch disconnects through 400 amperes, shall connect to the vertical bus through a spring reinforced stab-on connector. Units with larger disconnects shall be connected directly to the main horizontal bus with appropriately sized cable or riser bus.

Conducting parts on the line side of the unit disconnect shall be shrouded by a suitable insulating material to prevent accidental contact with those parts.

Unit mounting shelves shall include, but shall not be limited to, hanger brackets to support the unit weight during installation and removal. Plug-on units shall use a twin-handle camming lever located at the top of the bucket to rack in and out the plug-on unit. The cam lever shall work in conjunction with the hanger brackets to ensure positive stab alignment.

A lever handle operator shall be provided on each disconnect. With the unit stabs engaged onto the vertical phase bus and the unit door closed, the handle mechanism shall allow complete on/off control of the unit. Circuit breaker operators shall include, but shall not be limited, a separate tripped position to clearly indicate a circuit breaker trip condition. It shall be possible to reset a tripped circuit breaker without opening the control unit door. Clear indication of disconnect status shall be provided, by adhering to the following operator handle positions:

1. Handle on position shall be up or to the left and within 45 degrees of being parallel to the face of the equipment.

2. Handle off position shall be down or to the right and within 45 degrees of being parallel to the face of the equipment.

3. The minimum separation between the on and off positions shall be 90 degrees.

4. On circuit breaker disconnects, the handle tripped position shall be perpendicular to the face of the equipment ±30 degrees. Minimum separation between on and tripped shall be 30 degrees. Minimum separation between tripped and off shall be 45 degrees.

A mechanical interlock shall prevent the operator from opening the unit door when the disconnect is in the on position. Another mechanical interlock shall prevent the operator from placing the disconnect in the on position while the unit door is open. It shall be possible for authorized personnel to defeat these interlocks.

A non-defeatable interlock shall be provided to prevent installing or removing a plug-on unit unless the disconnect is in the off position.

The plug-in unit shall have a grounded stab-on connector which shall engage the vertical ground bus prior to, and shall release after, the power bus stab-on connectors.

Provisions shall be provided for locking disconnects in the off position with up to three (3) padlocks.

Handle mechanisms shall be located on the left side to encourage operators to stand to the left of the unit being switched.

Unit construction shall combine with the vertical wireway isolation barrier to provide a fully compartmentalized design.

Surfaces (back, side, and bottom plates) of the unit interior shall be painted white.

Combination Starters:

1. Combination starters shall use a unit disconnect as described in Typical Unit Construction Article above. Magnetic starters shall be furnished in combination starter units. Starters shall utilize NEMA/EEMAC rated contactors. Starters shall be provided with a three-pole, external manual reset, overload relay for solid state thermal overload units.

2. When provided, control circuit transformers shall include, but shall not be limited to, two primary protection fuses and one secondary fuse (in the non-ground secondary conductor). The transformer shall be sized to accommodate the contactor(s) and connected control circuit loads. The transformer rating shall be fully visible from the front when the unit door is opened.

3. When a unit control circuit transformer is not provided, the disconnect shall include, but shall not be limited to, an electrical interlock for disconnection of externally powered control circuits.

4. Auxiliary control circuit interlocks shall be provided where indicated. Auxiliary interlocks shall be field convertible to normally open or normally closed operation.

NEMA/EEMAC Size 1-4 starters shall be mounted directly adjacent to the wireway so that power wiring (motor leads) shall connect directly to the starter terminals without the use of interposing terminals. Larger starters shall be arranged so that power wiring may exit through the bottom of the starter cubical without entering the vertical wireway.

Terminal Blocks:

1. When Type B wiring is specified, starter units shall be provided with unit control terminal blocks.
2. Terminal blocks shall be the pull-apart type with a minimum rating of 250 volts and 10 amperes. Current carrying parts shall be tin-plated. Terminals shall be accessible from inside the unit when the unit door is opened. Terminal blocks shall be DIN rail-mounted with the stationary portion of the block secured to the unit bottom plate. The stationary portion shall be used for factory connections, and shall remain attached to the unit when removed. The terminals used for field connections shall face forward so they can be wired without removing the unit or any of its components.
3. When Type C wiring is specified, starter units shall be provided with unit control terminal blocks as described for Type B wiring along with power terminal blocks for Size 1-3 units. An additional set of terminal blocks shall be provided in a terminal compartment located in each section. These terminal blocks shall be pre-wired to the unit terminals so that field control connections can be made at the terminal compartments.

Nameplates:

Provide engraved phenolic nameplates for each MCC, VFD, and unit compartment. Provide gray background with white letters, measuring a minimum of 1.5 inches high by 6.25 inches wide total outside dimensions.

Pilot Device Panel:

Each combination starter unit shall be proved with a hinged/removable control station plate, which can accommodate up to five (5) 0.87 inch pilot devices or three (3) 1.18 inch pilot devices. The control station plate can be deleted if no local unit pilot devices are required.

Units with circuit breaker disconnects through 250 ampere frame and fusible switch disconnects through 100 amperes shall connect to the vertical bus through a spring-reinforced, stab-on connector. Stab-on plug-on units shall be cable connected to the unit disconnect. Six inch (fusible units shall accept Class J fuses only.

Conducting parts on the line side of the unit disconnect shall be shrouded by a suitable insulating material.

Unit mounting shelves shall include, but shall not be limited to, hanger brackets to support the unit weight during installation and removal. Six inch plug-on units shall be installable without the assistance of a camming device so as to allow maximum accessibility with the unit installed.

A lever handle operator shall be provided on each disconnect. With the unit stabs engaged into the vertical phase bus and the unit door closed, the handle mechanism shall allow complete on/off control of the unit disconnect with clear indication of the disconnects status. Circuit

breaker operators shall include, but shall not be limited to, a separate tripped position to clearly indicate a circuit breaker trip condition. It shall be possible to reset a tripped circuit breaker without opening the control unit door.

1. A mechanical interlock shall prevent an operator from opening the unit door when the disconnect is in the on position. Another mechanical interlock shall prevent an operator from placing the disconnect in the on position while the door is open. It shall be possible for authorized personnel to defeat these interlocks.

2. A non-defeatable interlock shall be provided between the handle operator and the structure to prevent installing or removing a plug-on unit unless the disconnect is in the off position. The plug-on unit shall have a grounded stab-on connector which shall engage the vertical ground bus prior to, and shall release after, the power bus stab-on connectors.

Provisions shall be made for locking disconnects in the off position with up to three padlocks.

Handle mechanisms shall be located on the bottom left side of the unit and operate horizontally to encourage operators to stand to the left of the unit being switched.

Unit construction shall combine with the vertical wireway isolation barrier to provide a fully compartmentalized design.

Up to a maximum of twelve (12) 6 inch units shall be able to be installed per vertical section without placement restrictions in new or existing applications.

Six Inch Combination Starters

1. Six inch combination starters shall use a unit disconnect as described in Six Inch Unit Construction Article above. Starters shall use NEMA/EEMAC rated contactors. Starter units shall be provided with a 3-pole, external manual reset, overload relay solid state (NEMA rated units only).

2. When provided, control circuit transformers shall include, but shall not be limited to, two primary protection fuses and one secondary fuse (in the non-ground secondary conductor). The transformer shall be sized to accommodate the contactor(s) and connected control circuit loads.

3. When a unit control circuit transformer is not provided, the disconnect shall include, but shall not be limited to, an electrical interlock for disconnection of externally powered control circuits.

4. Auxiliary control circuit interlocks shall be provided where indicated. For NEMA rated starters, auxiliary interlocks shall be field convertible to normally open or normally closed operation.

5. NEMA/EEMAC Size 1 starters shall be mounted directly adjacent to the wireway so that power wiring (motor leads) shall connect directly to the starter terminals.

Terminal Blocks for Six Inch Units:

1. Starter units shall be provided with unit control terminal blocks.

2. Terminal blocks shall be pull-apart type, 250 volts, and rated for 10 amperes. Current-carrying parts shall be tin-plated. Terminals shall be accessible from inside the unit when the unit door is opened. The stationary portion of the terminal block shall be used for factory connections and shall remain attached to the unit when the portion used for field connections is removed. The terminals used for field connections shall be accessible so they can be wired without removing the unit or any of its components.

Nameplates:

Engraved phenolic nameplates shall be provided for each MCC and unit compartment. Each nameplate shall have a gray background, white lettering, and shall measure a minimum of 1.5 inches high by 6.25 inches wide total outside dimensions.

Pilot Device Control Panel:

Each unit shall be provided with a control panel for up to a maximum of four pilot devices Control panel shall be removable by loosening two semi-captive fasteners for user access.

**Variable Frequency Drive (VFD) Units**

The AC drive controller unit shall be a combination disconnect-drive MCC style unit. The input circuit breaker shall provide NEC required branch circuit protection. The branch circuit protection shall have an external operator. The adjustable frequency drives shall be constant torque AC drives. Wiring between the AC drive and the disconnect shall not be disturbed when removing or installing the AC drive controller unit from the MCC.

Units shall be of modular construction so that it shall be possible to readily interchange units of the same size without modifications to the MCC structure.

Conducting parts on the line side of the unit disconnect shall be isolated to prevent accidental contact with those parts.

AC drive controller units up to 50 horsepower variable torque shall be plug-on units which shall connect to the vertical bus through a spring-reinforced, stab-on connector. Units larger than 50 horsepower variable torque shall be connected directly to the main horizontal bus with appropriately sized cable or riser bus.

AC drive controller unit interior mounting panels shall be white for better visibility.

A disconnect operator shall be provided per this special provision.

Plug-on AC drive controller units shall have a grounded stab-on connector which shall engage the vertical ground bus prior to, and shall release after, the power bus stab-on connectors engage/release.

AC drive controller units shall be provided with unit control terminal blocks for use in terminating field wiring. Terminal blocks shall be pull-apart type, 250 volts, and rated for 10 amperes. Current-carrying parts shall be tin-plated. Terminals shall be accessible from inside the unit when the unit door is opened. The stationary portion of the terminal block shall be used for factory connections and shall remain attached to the unit when the portion used for field connections is removed. The terminals used for field connections shall be accessible so they can be wired without removing the unit or any of its components.

The AC drive controller unit shall incorporate a self-contained, air-based cooling system. Air exhaust vents shall be louvered to help direct air flow away from personnel operating the AC drive controller unit. Fans, ductwork, or filters shall be easily accessible for maintenance.

The AC drive controller unit cooling system shall be sized to cool the drive regardless of mounting location within the MCC. The AC drive controller unit shall not be restricted to a specific location in the MCC.

An internal overtemperature trip shall be provided to detect cooling system failure or blockage. Upon occurrence of an overtemperature trip, the cooling system fans shall continue running to provide a rapid cool down.

Power for the cooling system shall be provided internal to the AC drive controller unit by use of a control power transformer that shall include, but shall not be limited to, two primary fuses and one secondary fuse (in the non-ground secondary conductor).

Electrical Ratings:

1. The AC drive controller unit shall be designed to operate from an input voltage of 480volts AC, ±10 percent.

2. The AC drive controller unit shall operate from an input voltage frequency range of 57 to 63 hertz.

3. The displacement power factor shall not be less than 0.95 lagging under any speed or load condition.

4. The efficiency of the AC drive at 100 percent speed and load shall not be less than 96 percent.

5. The variable torque overtorque capacity shall be 130 percent for 1 minute.

6. The output carrier frequency of the AC drive shall be selectable between 1 kHz and 16 kHz, depending on inverter rating for low noise operation. The output carrier frequency of the AC drive shall be randomly modulated to avoid resonance.

7. AC drive controller unit feeder equipment, including, but not limited to, conductors, lugs, disconnects, contactors, etc., shall be sized per NEC Article 430 for the AC drive input current rating. An impedance range corresponding to a 22,000 to 100,000 amperes fault availability level shall be assumed for the input current rating.

Protection:

1. The AC drive controller unit shall be protected against fault currents up to and including 100,000 amperes rms symmetrical at 480 volts AC and shall be UL 845 listed as verification.

2. Upon power-up, the AC drive shall automatically test for valid operation of memory, option module, loss of analog reference input, loss of communication, dynamic brake failure, DC-to-DC power supply, control power, and the pre-charge circuit.

3. The AC drive controller unit shall be protected against short circuits between output phases, between output phases and ground, on the internal power supplies, and on the logic and analog outputs.

4. The AC drive controller unit shall have a minimum AC undervoltage power loss ride-through of 200 milliseconds (12 cycles). The AC drive shall have the user-defined option of frequency fold-back to increase the duration of the power-loss ride-through.

5. The AC drive shall have a selectable ride-through function which shall allow the logic to maintain control for a minimum of 1 second (60 cycles) without faulting.

6. For a fault condition other than a ground fault, short circuit, or internal fault, an auto restart function shall provide restart attempts for a period of 5 minutes and up to an unlimited amount time depending on setting. The restart attempts shall be separated by increasingly longer waiting periods to allow the condition to be cleared.

7. The deceleration mode of the AC drive shall be programmable. The stop modes shall include, but shall not be limited to, freewheel stop, ramp stop, fast stop, and DC injection braking.

8. Upon loss of the analog process follower reference signal, the AC drive shall be programmable to fault and freewheel stop, ramp stop, fast stop, stop without trip, automatically restart, run at last speed, or maintain an user-defined low speed setting.

9. The AC drive shall have solid-state $I^2t$ protection that shall be UL listed, shall meet UL 508 as a Class 10 overload protection, and shall meet IEC 60947. The minimum adjustment range shall be from 25 to 150 percent of the nominal current rating of the AC drive controller unit.

10. The AC drive shall have three skip frequency ranges with hysteresis adjustment that can each be programmed independently, back-to-back, or overlapping.

11. The AC drive shall be include, but shall not be limited to, an adjustable thermal alarm which can be assigned to a relay or logic output to indicate the drive temperature has reached the thermal alarm setting.

Adjustment and Configuration:

1. The AC drive shall have a user-selectable auto tune feature. The auto tune shall automatically send motor-rated current to the connected motor and store the resulting resistance data into memory. The AC drive shall automatically optimize the operating characteristics according to the stored data.

2. The AC drive motor and control parameters shall be factory preset to operate most common applications. Necessary adjustments for factory supplied unit operator controls and sequencing shall be pre-programmed and tested by the manufacturer.

3. A choice of three types of acceleration and deceleration ramps shall be available in the AC drive software; linear, S curve, and U curve, as well as custom.

4. The acceleration and deceleration ramp times shall be adjustable from 0.01 to 6000 seconds.

5. The volts per frequency ratios shall be user selectable to meet variable torque loads, normal, and high torque machine applications.

6. The memory shall retain and record run status and fault type of the past eight faults for operator review.

7. The software shall have an energy saving function that shall optimize the energy consumed. A constant volts/hertz ratio shall be maintained during acceleration. The output voltage shall then automatically adjust to meet the torque requirement of the load.

8. Slip compensations shall be a software-enabled function.

9. The AC drive shall offer programmable DC injection braking that shall brake the AC motor by injecting DC current and creating a stationary magnetic pole in the stator. The level of current shall be adjustable between 10 to 110 percent of rated current and available from 0.1 to 30 seconds continuously. For continuous operation after 30 seconds, the current shall be automatically reduced to 50 percent of the nameplate current of the motor.

10. Sequencing logic shall coordinate the engage and release thresholds and time delays for the sequencing of the AC drive output, mechanical actuation, and DC injection braking in order to accomplish smooth starting and stopping of a mechanical process.

Graphic Display Terminal Interface:

1. The graphic display terminal shall provide eight lines of 240 by 160 pixels in plain English to control, adjust, and configure the AC drive, including, but not limited to, electrical values, bar charts, configuration parameters, I/O assignment, application and

activity function access, faults, local control, adjustment storage, self-test, and diagnostics. There shall be a standard selection of six additional languages built into the operating software as standard.

2. The AC drive model number, torque type, software revision number, horsepower, output current, motor frequency, and motor voltage shall be listed on the drive identification display as viewed on the graphic display terminal.

3. The graphic display shall be able to indicate one, two, or five digital values, or up to two values by bar graph. As a minimum, the selectable display values shall consist of speed reference, output frequency, output current, motor torque, output power, output voltage, line voltage, DC voltage, motor thermal state, drive thermal state, elapsed time, motor speed, machine speed reference, and machine speed.

4. The graphic display terminal shall consist of programmable function keys. The functions shall allow both operating commands and programming options to be preset by the operator.

5. The graphic display terminal shall offer levels of settings from simple start-up to advanced user menus consisting of parameter setting, I/O map, fault history, and drive configuration. Password protection shall be available to limit unauthorized access to various levels of the menus.

6. The navigation wheel shall provide the ability to scroll through menus and screens, select or activate functions, or increase the value of a selected parameter.

7. An escape key shall allow a parameter to return the existing value if adjustment is not required and the value is displayed. The escape function shall also return to a previous menu display.

8. A run key and a stop key shall command normal starting and stopping as programmed when the AC drive is in keypad control mode. The stop key shall be active in all control modes.

9. A detachable graphic terminal display user interface shall be provided.

10. The keypad shall store up to four user configuration programs in nonvolatile memory. An operator shall have the ability to download a stored configuration to multiple AC drives.

11. The operator interface shall be MCC door-mounted on the AC drive controller unit for ease of access and increased visibility.

12. Door-mounted controls shall be NEMA/EEMAC Type 12 rated.

Control:

1. Pilot devices shall be industrial rated 0.87 inch type control operators and used independently of the keypad display. Software assignments for control inputs and

outputs to operate factory-supplied controls shall be pre-configured from the factory. The following basic controls shall be provided:

Hand-off-auto selector switch. The hand mode shall allow manual operation of start, stop, and speed control. The AC drive shall start when the control operation is in the hand mode. A door-mounted, manual speed potentiometer shall be used to control speed in the hand mode. The AC drive shall run at the low speed setting or higher as required by the position of the manual speed potentiometer. This mode shall function as 2-wire control and automatically restart after a power outage or auto restart after a fault. The off position of the control operation shall stop the AC drive and prevent it from restarting. The auto (automatic) mode shall receive an serial link command to control starting and stopping of the AC drive. Speed control shall be from a user supplied 4–20 mAdc signal.

b. Fault pilot light, red, push-to-test.

c. Run pilot light, green, push-to-test.

2. Two-wire or 3-wire control strategy shall be defined within the software.

3. The control power for the digital inputs and outputs shall be 24 volts DC.

4. The internal power supply shall incorporate an automatic current fold-back that shall protect the internal power supply if incorrectly connected or shorted. The transistor logic outputs shall be current limited and shall not be damaged if shorted or if excess current is pulled.

5. Logic connections shall be furnished on pull-apart terminal strips.

6. There shall be two software assignable analog inputs with interference filtering. The analog inputs shall be software selectable and consisting of user defined configurations: x-y mA or x-y V.

7. There shall be five software assignable logic inputs that shall be selected and assigned in the software. The selection of assignments shall consist of forward, reverse, jog, plus/minus speed (two inputs required), setpoint memory, preset speeds (up to eight inputs), auto/manual control, controlled stop, terminal or keypad control, output contactor (two inputs required), motor switching, and fault reset.

8. There shall be two software assignable analog outputs with interference filtering. The analog outputs shall be able to be selected and assigned in the software. The analog output assignments shall be proportional to the following motor characteristics: frequency, current, power, torque, voltage, and thermal state. The output signal shall be user-defined configurations: x-y mA or x-y V.

9. Two voltage-free Form C relay output contacts shall be provided. One of the contacts shall indicate AC drive fault status. The other contact shall be user assignable.

10. Drives shall include, but shall not be limited to, network communication interface for data acquisition only over Ethernet (Modbus TCP. Drive control and speed control via PLC hardwired I/O shall include, but shall not be limited to, the following:

    a. PLC analog output (4–20 mA) speed reference signal.

    b. PLC analog input (4–20 mA) speed feedback signal.

    c. PLC digital output drive start control

Optional Harmonic Study:

1. A harmonic distortion analysis shall be performed and priced as a separate line item by the AC drive manufacturer based upon system documentation supplied by the Contractor. The documentation shall consist of one-line diagrams, distribution transformer information (kVA, %Z, and X/R ratio), and emergency standby generator performance specifications. The harmonic distortion analysis report shall be part of the shop drawing process, submitted to the Architect/Engineer for review and acceptance. If the calculations determine that harmonic distortion values are higher than the voltage and current values specified in IEEE 519, the drive manufacturer shall provide the equipment specified in Optional Harmonic Equipment Paragraph below to meet the IEEE specified values.

Optional Harmonic Equipment:

2. Five percent impedance line reactor shall be provided that shall be mounted in the MCC enclosure, factory wired and tested with the AC drive controller unit.

**Communication Cabling**

The MCC shall employ a pre-engineered communication cabling system to interconnect units within the MCC. Network cabling shall be routed through the lower horizontal wireway to isolate the network from the horizontal bussing routed through the top. The full-depth vertical wireway shall serve to separate communications from power cabling to prevent noise interference on the network cable.

The communication cabling installation shall meet Class 2 wiring practices under the provisions of NEC Articles 725 and 800. Provisions for appropriate terminators and grounding shall be provided. Addition, removal, or rearrangement of units shall not interrupt the trunk line and shall not affect the cabling of other units attached to the trunk line.

Cable assemblies shall use 5-pole micro-style connectors with a single keyway and shall comply with SAE H1738-2 specifications. Connectors shall be epoxy-coated for a 500-hour salt-spray test per MIL-STD-202. Cable coupler design shall include, but shall not be limited to, a vibration-resistant ratchet to prevent loosening.

The system shall be constructed of molded PVC material.

The Ethernet (Modbus TCP) communications network shall be configured in a star topology.

The cabling system shall consist of multiple, custom length Ethernet patch cables that each connect a single network device to a central Ethernet switch unit located in the MCC.

Ethernet switches located in the MCC shall be Connexium, Hirschmann, or Phoenix.

**MCC Installation**

The Contractor shall install low voltage industrial MCCs in accordance with reviewed product data, final shop drawings, manufacturer's written instructions and recommendations, these special provisions, and as indicated on the Plans.

MCCs shall not be placed in hazardous locations. The area chosen shall be well ventilated and totally free from humidity, dust, and dirt. The temperature of the area shall be no less than 32 degrees F (0 degrees C) and no greater than 104 degrees F (40 degrees C). Protection shall be provided to prevent moisture entering the enclosure.

MCCs shall be located in an area with a minimum of 3 feet of free space in front of front-of-board construction. A minimum of 0.5 inch space shall be provided between the back of front-of-board MCCs and a wall, 6 inches required for damp locations.

The MCCs shall be assembled in the factory on a smooth level surface so that sections are properly aligned. A similar smooth and level surface shall be provided for installation. An uneven foundation will cause misalignment of shipping blocks, units, and doors. The surface under a MCC shall be of a non-combustible material unless bottom plates are installed in each vertical section.

The MCC shall be separated into shipping blocks no more than three vertical sections each. Shipping blocks shall be shipped on their sides to permit easier handling at the job site. Each shipping block shall include, but shall not be limited to, a removable lifting angle, which shall allow an easy means of attaching an overhead crane or other suitable lifting equipment. If the MCC cannot be placed into service reasonably soon after its receipt, store it in a clean, dry, and ventilated building free from temperature extremes. Acceptable storage temperatures are from 32 degrees F to 104 degrees F.

**MCC Finishes**

Steel parts shall be provided with UL and CSA listed acrylic/alkyd baked enamel paint finish or triglycidyl isocyanurate (TGIC) powder coat, except plated parts used for ground connections. Painted parts shall undergo a multi-stage treatment process, followed by the finishing paint coat.

Pre-treatment shall include, but shall not be limited to, hot alkaline cleaner to remove grease and oil, and iron phosphate treatment to improve adhesion and corrosion resistance.

The paint shall be applied using an electro-deposition process to ensure a uniform paint coat with high adhesion.

The standard paint finish shall be tested to UL 50 per ASTM B117 (5 percent ASTM salt spray) with no greater than 0.125 inch (3.18 mm) loss of paint from a scribed line.

Paint color shall be #49 medium light gray per ANSI Z55.1 (60 to 70 gloss) on all surfaces unless specified otherwise. Control station plates and escutcheon plates shall be painted a contrasting gray. Unit interior saddles shall be painted white for better visibility inside the unit.

**MCC Testing**

The manufacturer shall perform the following inspections and test on the MCC before shipment from factory.

1. Physical Inspection of the structure, and the electrical conductors (including bussing, general wiring, units, etc.).
2. Electrical Tests:
    a. General electrical tests shall include, but shall not be limited to, the following:
        1) Power circuit phasing.
        2) Control circuit wiring.
        3) Instrument transformers.
        4) Meters.
        5) Ground fault system.
        6) Device electrical operation.
    b. AC dielectric tests shall be performed on the power circuit.
3. Markings/labels include, but shall not be limited to, instructional type., UL/CSA, and Inspector's stamps.
4. Each device shall be configured and addressed to correspond with software settings.
5. A read/write test shall be performed prior to shipment on network devices, including, but not limited to, overloads, drives, and soft starters.
6. Testing shall be designed to verify system operation and shall include, but shall not be limited to, these verifications as a minimum:
        a. Drawings and bill of materials.
        b. I/O addressing.
        c. Correct device operation by I/O address.
        d. Host communications.
        e. Control network interface.

7. The manufacturer shall use integral quality control checks throughout the manufacturing process to ensure that the MCC meets operating specifications.

**Supervisory Controls**

The Supervisory Pump Controls specified herein will be mounted in the Supervisory Control Section of the Motor Control Center (MCC).

The Supervisory Control Section shall operate on 120VAC Single-phase power fed from Panel 4A located in the MCC.

Supervisory Pump Controls and MCC shall be provided by the System Integrator. The Contractor shall be responsible for mounting and installation of MCC, conduit, wire ducts, power and load wiring, and field wiring terminations including instrumentation.

Systems Integrator shall be a firm engaged in the integration of low voltage industrial MCC's, Controls, and SCADA for municipal water and wastewater applications, and whose products have been in satisfactory use in similar service for a minimum of five years.

Supervisory Control Section Construction:

The Supervisory Control Section of the MCC shall house the Pumps Controls and Alarm Monitoring equipment for this project. The Control section will be placed in the upper third of section 4 of the MCC lineup as shown on the plan drawings. This section shall include the following:

1. DC Power supply / battery backup
2. Main Pump Controller (MPC) – door mounted, with back-panel mounted expansion I/O modules as required.
3. Float Backup Controller
4. Alarm Monitoring RTU.
5. Interposing relays, interconnect and customer terminals, surge arrestors, analog isolators, etc.

Supervisory Control Description:

The control system for this project will consist of a Main Pump Controller. The Controller will control one FVNR 7.5HP submersible Duty Pump and two 75HP submersible Primary Pumps with VFD's based on the wet well level. The Primary Pumps are sized such that one pump can handle full in-flow capacity of the pump station.

The Supervisory Pump Controls will interface to the Duty Pump Motor starter bucket and Primary VFD sections of the MCC. All control and stats signals will be hard-wired.

A programmable, microprocessor-based pump controller shall be provided to monitor wet well level via submersible level transducer as specified hereinafter and provide Triplex pump down mode pump control. The duty pump shall start and stop as required to maintain an acceptable level up to a point where the storage pipes are full. Once the available storage is full, the controller will start a primary pump at a reduced speed. The controller will monitor wet well levels and increase the pump speed if wet well levels continue to rise. The controller will operate in a flow pacing mode with the primary pump operating at a range between full speed and a lower limit to be specified during startup operations that falls within the normal operating range of the installed pump.

The pump controller shall be equipped with on-board digital and analog I/O points as required to interface with the pump motor starters, VFD's, instrumentation, and alarm monitoring system. The controller shall be capable of supporting expansion I/O modules as required for the application.

The following I/O shall be provided:

Local I/O Listing:

AI = Analog Input, AO = Analog Output, DI = Digital Input, DO = Digital Output

| **Tag Description** | **I/O Type** | **Range / EU** | **Source** | **Destination** |
|---|---|---|---|---|
| Wet Well Level | AI | 0-XXX.X FT | Submersible Level Transducer | MPC, Alarm RTU |
| High Level Alarm | DI | | Float Switch | MPC |
| Float Backup Control Active | DI | | Float Controller | MPC |
| Float Backup Control Reset | DI | | Pushbutton | MPC |
| Duty Pump 1 Run | DI | | Duty Pump MS Aux | MPC |
| Duty Pump 1 Fail | DI | | Duty Pump MS OL Trip | MPC |
| Duty Pump 1 Start | DO | | MPC | Duty Pump 1 Pilot Circuit |
| Duty Pump 2 HOA in Auto | DI | | Duty Pump HOA | CTU |

| | | | | |
|---|---|---|---|---|
| Primary Pump 1 HOA in Auto | DI | | Primary Pump 2 HOA | CTU |
| Primary Pump 1 Run | DI | | VFD | CTU |
| Primary Pump 1 VFD Fault | DI | | VFD | CTU |
| Primary Pump 1 Start | DO | | MPC | VFD |
| Primary Pump 1 VFD Speed Reference | AO | 0-100% | MPC | VFD |
| Primary Pump VFD 1 Speed Feedback | AI | 0-100% | VFD | MPC |
| **Tag Description** | **I/O Type** | **Range / EU** | **Source** | **Destination** |
| Primary Pump 2 HOA in Auto | DI | | Primary Pump 2 HOA | CTU |
| Primary Pump 2 Run | DI | | VFD | CTU |
| Primary Pump 2 VFD Fault | DI | | VFD | CTU |
| Primary Pump 2 Start Command | DO | | CTU | VFD |
| Primary Pump 2 VFD Speed Reference | AO | 0-100% | MPC | VFD |
| Primary Pump VFD 2 Speed Feedback | AI | 0-100% | VFD | MPC |
| Wet Well High Level | DO | | Float Backup Circuit | Alarm RTU |
| AC Power Failure | DO | | Battery Backup Circuit | Alarm RTU |
| Duty Pump Run | DO | | Duty Pump MS Aux | Alarm RTU |
| Duty Pump Fail | DO | | Duty Pump MS OL Trip | Alarm RTU |
| Primary Pump 1 Run | DO | | VFD | Alarm RTU |
| Primary Pump 1 Fail | DO | | VFD | Alarm RTU |
| Primary Pump 2 Run | DO | | VFD | |

| | | | | |
|---|---|---|---|---|
| Primary Pump 2 Fail | DO | | VFD | |

The Pump Controller will be equipped with a 6" color touchscreen. Graphic screens will be developed to display 1) Wet Well and pump status screen, Pump Soft HOA's, pump ETM's, 2) Control and alarm setpoint screen, 3) Diagnostic screens will be provided for monitoring and scaling of analog inputs and outputs, monitoring of digital inputs and outputs, 4) Active Alarm / Alarm History screens, and 5) Trending Screen for Wet Well level.

An Alarm Monitoring system shall interface with the Primary Pump Controller. Wet Well Level and status / alarms will be received from the Primary Pump Controller:

a. Wet Well Level (isolated 4-20mA Input)

b. AC Power Failure

c. Duty Pump Run, OL Fail, Seal Fail, Over temp

d. Primary Pump 1 & 2 run, VFD Fault, Seal Fail, Over temp

e. Station High Level Alarm - Float Backup System engaged

System Operation.

Under normal flow conditions, the Duty Pump will cycle on and off to maintain the wet well at a desired level. The Duty Pump will continue to run until the water level falls to the specified off level setpoint. If the water level continues to rise in the wet well and reaches a predefined level, the Duty Pump will be turned off and one of the Primary Pumps will be call into operation. The controller will vary the Primary Pump VFD speed as the wet well level rises. As the station flow subsides and the wet well drops to normal levels, the Primary Pump will turn off and the Duty Pump will resume normal operation. The station will not allow two of the primary pumps to run at the same time. The controller shall incorporate timer-based alternation between the two Primary Pumps.

The Controller shall be programmed with adjustable level control setpoints:

The following adjustable setpoints shall be programmed into the CTU and RTU's as noted. Setpoints will be adjustable from the CTU, Designated RTU's and SCADA (if provided). Last change will update all sites. System Control and Alarm Setpoints:

| **Description** | **Process Variable** | **Site Access (Last Entry Overrides)** | **Range** | **Action** |
|---|---|---|---|---|
| Wet Well High Level | Wet Well Level | MPC | 0-____Ft | Alarm |

| | | | | |
|---|---|---|---|---|
| Duty Pump Start | Wet Well Level | CTU | 0-____Ft | Control |
| Duty Pump Stop | Wet Well Level | CTU | 0-____Ft | Control |
| Well Pump Stop | Wet Well Level | CTU | 0-____Ft | Control |
| | | | | |
| **Description** | **Process Variable** | **Site Access (Last Entry Overrides)** | **Range** | **Action** |
| Primary Pump Start | Wet Well Level | CTU | 0-____Ft | Control |
| Primary Pump Stop | Wet Well Level | CTU | 0-____Ft | Control |
| Primary Pump Ramp Control Setpoints | | | | |
| Primary Pump Minimum Ramp Speed | Wet Well Level | CTU | 0-____Ft | Control |
| Primary Pump Maximum Ramp Speed | Wet Well Level | CTU | 0-____Ft | Control |
| Primary Pump Minimum Speed % | Ramp Variable | MPC | 0-100% | Control |
| Primary Pump Maximum Speed % | Ramp Variable | MPC | 0-100% | Control |
| Primary Pump Forced Alternation Time | | MPC | 0-1440 Minutes | Control |

An independent Float Backup Controller shall be provided to operate the pumps in the event of a Level transducer Failure or Primary Controller Failure. If the Wet Well High Levell Alarm float is tripped, the Float Backup System will engage. A Manual Float Backup Reset pushbutton must be pressed to return to Primary Control after failures have been resolved.

Control Panel Construction and Components:

Prior to shipment from the manufacturer's facility to the jobsite for installation, the completed pump control panel(s) shall be inspected by an Underwriter's Laboratories (U.L.) representative. Upon successful completion of the inspection, the panel shall be assigned the required 508 serialized U.L. label, indicating the equipment is built in accordance with the practices and requirements of this Underwriter's Laboratories category.

While the use of U.L. listed, components is encouraged, their use alone will not be considered an acceptable or satisfactory alternate to the UL508 serialized label specified above. Upon request from the Engineer, the panel manufacturer shall supply documentation to the Owner proving they are a U.L. recognized manufacturing facility for the type of equipment required. Only the labeled products of U.L.508 recognized panel manufacturer shall be considered acceptable for use on this project.

Supervisory controls shall operate from a source of 120 volts, 1 phase, 60 Hz. All controls shall be protected from lightning or other transient voltages by the MCC Surge Protection Device.

All DC power supplies required for operation shall be provided. Power supplies shall be sized to have a minimum of 40% spare capacity providing increased reliability and allowing for the addition of future equipment.

All wiring shall be minimum 600-volt UL type MTW or AWM and have a current-carrying capacity of not less than 125% of the full load current. The conductors shall be in complete conformity with the national electric codes, state, local and NEMA electrical standards. For ease of servicing and maintenance, all wiring shall be color-coded. The wire color code shall be clearly shown on the drawings, with each wire's color indicated.

All low voltage (120 volt or less) control wiring shall be contained within plastic/PVC wiring duct with covers. Where dimensional constraints prevent the use of wiring duct, wires shall be trained to panel components in groupings. The wire groupings shall be bundled and tied not less than every 3 inches with nylon self-locking cable ties. Every other cable tie shall be fastened to the enclosure door or inner device panel with a cable tie mounting plate with pressure tape. Where wiring crosses hinged areas such as when trained from the inner device panel to the enclosure door, spiral wrap shall be used.

The control panel(s) shall be constructed in compliance with Underwriter's Laboratories Category 508 - enclosed industrial control panel listing and following-up service. The control panel(s) shall bear the Underwriter's Laboratories serialized “508” label. Enclosed Industrial Control Panels listing and following-up. The control panel(s) shall bear the Underwriter's Laboratories serialized label for “Enclosed Industrial Control Panel”.

While the use of U.L. listed, components is encouraged, their use alone will not be considered an acceptable or satisfactory alternate to the “Enclosed Industrial Control Panel” serialized label specified above. Upon request from the Engineer, the panel manufacturer shall supply documentation to the owner proving they are a U.L. recognized manufacturing facility for the type of equipment required. Only the labeled products of U.L.508A “Enclosed Industrial

Control Panel" recognized panel manufacturer shall be considered acceptable for use on this project.

PLC & HMI:

The operator interface shall be a 6 inch color TFT touch screen display with the following:

a) Resolution: 640x480

b) Color: 16-bit (65,536)

c) Screen Memory: 27MB

d) User-programmable Screens: 1023 Max

e) Backlight: LED 30,000 hour life

Expected screen lifetime shall be greater than 1,000,000 operations. It shall include no less than 27 MB of memory and display up to 10 screens with 20 objects per screen. An alarm handling system shall be provided as described above. The alarm log shall store at least 100 entries before overwriting the oldest entry.

Screens:

a) Station Overview Screen showing overall Station process and assets.

b) Pump Detail Screens for each pump with soft HOA's and Control Setpoint pop-ups for view & adjustment

c) Diagnostic Screen – View I/O status, Enable/ Disable functions, Comm and power status.

d) Alarm / Alarm History Screen - Show active and historical alarm status, time & date-stamped.

e) Trending Screen

The operator interface shall be suitable for Type 12, 4 & 4X environments. Additionally, the front panel shall be manufacture from a UV resistant polyester substrate. The Operator interface shall be suitable for installation in Class 1, Div. 2, group A, B, C & D environments. CE, UL and C-UL labels shall be provided.

The PLC shall include an integral Operator interface and on-board I/O . Expansion I/O shall interface to the PLC vis Ethernet (CAT5) Cable.

The PLC Processor shall scan no less than 1K of memory every 0.2 seconds. A real –time clock shall be provided. 32 KB of register memory and 256KB of ladder logic memory shall be provided.

A 2 GB FLASH card shall be provided. When delivered it shall have a copy of the latest PLC and HMI programs and routine for loading them in the PLC and HMI. All process variables shall be written to the flash card at 1-minute intervals. Daily run time and starts shall be written to the card at the end of each day.

The PLCs embedded Ethernet shall be capable of supporting and hosting of HTML based web pages and FTP sites, remote data access, and remote programming.

The processor and I/O system shall be capable of monitoring 2048 digital inputs, 2048 digital outputs, 512 analog inputs, and 512 analog outputs. A wide selection of I/O module shall be available. They shall include DC inputs with ESP, AC inputs, DC outputs PNP & NPN, AC outputs, relay outputs, combination input output, analog input, analog output, isolated analog output, combination analog input & output.

Three serial ports (2, RJ-45 type RS-232/RS-485; 1 DB-25 type RS-232/RS-485 Protocols supplied shall include: Modbus RTU Master & Slave, Modbus ASCII read/write, Healy-Ruff PRO-Line Modem. CAN network or DeviceNet Slave.

The PLC I/O shall communicate with the Operator interface and PLC processor via Ethernet I/P (CAT6 cable). A managed switch shall be provided if needed for setup and field service.

Supported Ethernet Protocols shall include TCP/IP, Modbus TCP, FTP, SRTP, EDG, ICMP, ASCII.

The processor and I/O system shall be capable of monitoring 2048 digital inputs, 2048 digital outputs, 512 analog inputs, and 512 analog outputs. A wide selection of I/O module shall be available. They shall include DC inputs with ESP, AC inputs, DC outputs PNP & NPN, AC outputs, relay outputs, combination input output, analog input, analog output, isolated analog output, combination analog input & output.

PLCs & HMIs shall be manufactured by the same company to ensure cross platform compatibility of hardware and software. PLC and HMI shall be PRIMEX VPAC Series.

FIREWALL APPLIANCE / ROUTERS / SWITCHES:

Appliance / Routers shall be provided for all remote access to the Control System including Web-hosted SCADA and or Virtual Private Network (VPN) access. Firewall Appliance / Routers shall be managed 4 or 8 port as required by the application, and be fully IEEE 802.3 compliant.

All routers and media converters shall be manufactured by of the same manufacturer. They shall be specifically designed for an industrial environment and suitable for wall mounting. Equipment shall be Cisco 5506X series.

Analog Loop Surge Protection:

Transient protection shall be provided with all equipment to protect all instrumentation and telemetry devices either receiving or sending signals.

The transient protectors shall be a three-stage surge suppression device which shall effectively arrest most transients encountered in an instrumentation environment. Transient protectors utilizing single or dual stage suppression devices shall not be acceptable.

The first stage of the transient protector shall consist of a gas tube arrestor connected across the signal wires and to ground. This stage shall be designed to suppress transients greater than 150 to 300 volts.

The second stage of the transient protector shall consist of two varistors each connected between a signal line and ground. This stage shall suppress any transients less than 150 to 300 volts and clamps them to 56 volts.

The third stage of the transient protector shall consist of two special purposes, high speed Zener diodes which suppress any remaining transients to 51 volts. 50 ohm, 5 watt resistors shall be connected between the stages to dissipate the potential energy of the transients.

Back-up Float Controller:

The Contractor shall provide a 3 - Float Backup controller as a back-up controller for the Main Pump Controller. Only the Primary Pumps will operate under backup mode. Only one Primary pump will run any given pump cycle.

Provide float switches for the following:

1) High Level Alarm Float – Activates High Level Alarm and engages float backup control.

2) Pump Start Float – Starts pump for subsequent pump cycles.

3) Pump Stop Float – Stops pump, alternates pumps.

The Backup Control will engage when the High Level Alarm float switch is activated. The Lead Primary pump will start and ramp to 100% speed. The pump will run at full speed until the level drops below the Pump Stop float switch. The Backup System will retain control until the Float Backup Reset pushbutton is pressed.

Controller shall operate on 120VAC power and shall include relay outputs for Pump 1 and 2 start, high level alarm and horn/back-up.

Backup Pump Controller shall be Primex (DPC-4F), APG, or Waterline Controls.

Cellular Based Communication System: Mission M850 RTU

The Contractor shall furnish and install a factory wireless data cellular based communication system for the purpose of monitoring and controlling various equipment operations. The supplier of the communication system shall be responsible for coordination required to insure equipment compatibility. The communication system shall be provided complete, in place, as specified herein and needed for a complete, proper installation.

The Contractor shall be responsible for coordinating the instrumentation equipment, communication equipment and other related equipment so that all elements are compatible and form a complete working system. Shop drawing submittals shall include sufficient information regarding component compatibility to demonstrate compliance with this requirement.

Qualifications of Manufacturers Products used in the work of this Section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of satisfactory production acceptable to the Engineer.

The submitting Company shall provide evidence of, and warrant compliance with, substantially all below listed requirements.

1) The submitting Company shall have been in business providing remote facility monitoring and control services through the data side of the cellular system to the water distribution / wastewater collection industry or a substantially similar industry for at least six (6) years.

2) The submitting Company shall be the actual manufacturer and operator, or a duly authorized and trained agent of the manufacturing company or a combination of both, who will actually provide, maintain, and warranty the proposed system.

3) The Manufacturing Company of the field equipment shall also be the provider of all monitoring related services associated with the field equipment and all ongoing service agreements will be with the actual company providing the monitoring service, not a subcontractor or agent.

4) The submitting company shall have a primary central monitoring and control center and a fully redundant, physically separate, backup-computer monitoring center. Either center shall have the capability of operating all the remote monitoring and control field RTU's.

5) The submitting Company shall offer and provide 24 x 7, 365 technical support.

System Components:

The Microprocessor Based Field Remote Terminal Unit (RTU) shall incorporate a radio that utilizes the data side of any cellular system to transmit the data and alarms monitored, as well as receive manual or automated control commands.

Cellular radios from all cellular carriers shall be able to mount in the same mounting port on the motherboard and consequently be interchangeable in no more than 10 minutes.

RTU shall have Microprocessor Feature Updates. Microprocessor features like data transmission rates shall be able to be adjusted through the cellular system without any site visits necessary.

RTU Inputs and Outputs:

RTU shall have eight (8) digital inputs. These eight (8) inputs shall have end of line resistor supervision, or similar supervision, that can detect normal alarm trip inputs and detect input wiring disconnection/shorting as a distinctly different signal and report.

RTU shall have an optional expansion board of an additional eight (8) digital inputs

The digital inputs shall be user selectable as normally open (NO) or normally closed (NC).

In M800 Models eight of the RTU digital inputs on main board shall be capable of being programmed to record and report pump run times in one minute increments or less as indicated by a relay opening and closing. If only two pumps are monitored then the unit shall also be capable of recording and reporting simultaneous pump run times.

RTU shall have built-in alarms for input wiring fault, AC failure, communication failure and low battery detection.

RTU shall have two (2) analog inputs measuring four (4)-20mA or 1-5 VDC at 10 bit resolution with four (4) alarm thresholds per input.

RTU shall have an optional expansion board of an additional four (4) analog inputs

RTU shall have an optional expansion board of an additional eight (8) digital inputs

RTU shall have an optional expansion board of an additional two (2) analog outputs.

RTU shall have an optional expansion board of two (2) pulse counter inputs

RTU shall have an electronic key reader input to monitor on-site personnel. The RTU shall utilize an audible tone to verify key reading. Each key in the system shall provide unique identification of the key holder when they are on site vs. “someone” is on site.

RTU shall have three (3) digital normally open or closed output relays rated 1/2 ampere@ 120VAC

Status LED’s on Motherboard:

LED’s above each digital input shall visually display the status of the digital input

Radio signal strength shall be displayed by at least eight (8) LED’s in 5db increments between -75db and -110db to facilitate accurate antenna placement

Operational and diagnostic status of at least eight (8) criteria shall be displayed by individual LED’s.

Power Requirements:

The RTU shall be powered by 12 volts AC and have a built in battery backup capable of keeping the RTU powered for 30 hours in case of primary AC failure.

Terminations inside the RTU enclosure shall be low voltage AC or DC (28 volts or less).

Communication Links:

Wireless communication links shall be through the data side of the cellular system. The voice side of the cellular system and satellite based links are not acceptable. The submitting company shall have direct relationships with the cellular companies and shall not use third parties to affect data transport through the cellular companies.

The RTU shall have an interchangeable data cellular radio that will communicate through third generation GPRS (ATT), CDMA (Verizon) or iDEN (Nextel) to maximize the likelihood of reliable communication.

If a GPRS (ATT) radio is used, the submitting company shall have PTCRB approval from ATT to use the radio, contract and product acceptance with ATT. If an iDEN radio is used the submitting company shall be have certified partner status, contract and product acceptance with Sprint/Nextel.

The Owner shall not have or have to purchase cellular data contracts direct with the carrier(s).

Security Protocols:

All the cellular radios shall all make continuous, secure socket connections (SSL) from the radio, through the cellular system, to the submitting company's servers and web pages.

The RTU shall utilize a transmission scheme that encrypts the transmitted data utilizing a 128 bit encryption method that meets or exceeds the advanced encryption standard (AES). The 128 bit AES encryption shall be at all stages of data transfer and storage

The cellular radios shall all have private IP addresses

The submitting company shall have established multiple, private gateways through the cellular system, completely behind firewalls, with at least one of the cellular providers.

Data Transmission Rates:

All alarms regardless of unit type shall be transmitted immediately upon occurrence; delays can be added by the Owner at the RTU or the supplier's website.

The RTU shall continuously transmit all digital state changes on an as occurs basis; analog and pulse inputs will be transmitted at least once every two minutes on M800 models.

The RTU shall have an effective, continuous, transfer rate of at least 19,200 baud.

Communication Link Structure and Performance Criteria:

The communication link structure shall be a secure socket connection from the RTU through

the cellular system to the supplier's servers, and it shall be a continuous connection, 24 x 7, 365.
Receipt of all data sent from the RTU to the server center shall be acknowledged by the server center back to the RTU in real time for every data packet sent. Such structure is called end-to-end data acknowledgement.

The secure socket connection shall be from the RTU through the cellular system direct to the system supplier; no third parties shall receive the data from the cellular carrier and then pass it to the system supplier.

The above mentioned secure socket connection shall be monitored for end-to-end uptime with interruptions as small as 15 seconds being captured.

Both end-to-end uptime and the number of times the link was disconnected/reconnected shall be reported for each RTU continuously with daily summary statistics posted on the Owner's website. All the end-to-end uptime history of each RTU shall be available on the Owner's web site from when it first powered up to the present. Weekly management summaries of each RTUs end-to-end uptime shall be automatically emailed to the Owner.

Centralized Server Centers: Hardware and Software Requirements:

The server center housing shall have at least six (6) separate and redundant, on-site power generating facilities to backup the local utility power such that there can be stand-alone operation of the center for at least twenty-four (24) hours.

The server center shall house the manufacturers completely redundant and hot linked.

All data links shall be behind firewalls, 128 bit encrypted and never accessible, addressable or viewable via the general public Internet. Private IP's are required, pooled public IP's will not be accepted.

RTU Locations:

The RTU shall be located at the Jefferson Pump Station and shall be furnished with an omnidirectional antenna at grade plus 8 ft. Provide a support pole and foundation for the antenna. The antenna shall be grounded to a driven ground rod.

Monitoring Points per RTU

The inputs to be monitored are as follows:

Digital inputs

DI-1 Pump 1 Run

DI-2 Pump 2 Run

DI-3 Pump 3 Run

DI-4 Pump 1 Alarm

DI-5 Pump 2 Alarm

DI-6 Pump 3 Alarm

DI-7 Pump 1 Runtime

DI-8 Pump 2 Runtime

DI-9 Pump 3 Runtime

DI-7 Power Failure

DI-8 Wet Well High Level Alarm Backup

Analog inputs with four (4) hi/low threshold alarms

AI-1 Pressure Transducer

AI-2 Spare

Relay Outputs

R-1 Spare

R-2 Spare

R-3 Spare

RELAYS & TIMERS

Control relays shall be rated for general purpose duty. They shall have four single pole double throw contacts. Contacts shall carry a UL inductive and resistive rating of 5 amps at 240 volts. They shall have a mechanical life expectance of 50,000,000 operations and an electrical life expectancy of 200,000 operations with a 3 amp120 VAC load. A LED shall be provided to indicate relay coil status.

Time delay relays shall be rated for general purpose duty. They shall have four single pole double throw contacts. Contacts shall carry a UL inductive rating .8 amps and a resistive rating of 3 amps at 240 volts. They shall have a mechanical life expectance of 50,000,000 operations and an electrical life expectancy of 200,000 operations with a 3 amp120 VAC load. LEDs shall be provided to indicate “power on” and timing “out.” The timing range shall be adjustable from .1 second to 10 minutes.

All relays and timers shall be mounted on DIN rail with 14 blade sockets.

PILOT DEVICES

Selector switches shall include removable 10 amp, 600-volt double make double break contacts. All pilot lights, selector switches and pushbuttons shall be rated for NEMA/UL 4 applications. They shall be not less than [22mm] [30mm] diameter. Pilot lights shall be provided with high intensity LED lamps. Pilot light status (on vs. off) shall be easily distinguishable in all types of light including direct sunlight

SUBMERSIBLE LEVEL TRANSMITTER

A loop-powered submersible level transmitter shall be provided to sense the level of the Wet Well. The level transmitter shall sense level by measuring the hydrostatic head pressure associated with water levels above the base of the diaphragm. The transmitter shall provide a linear and proportional 4-20 mA output signal in response to the sensed level. The transmitter shall be installed in accordance with manufacturer's instructions. The level transmitter shall be a PRIMEX Level Rat™ and shall meet the following requirements:

1) Operate on loop power supply ranging from 11 to 28 VDC.

2) Include circuitry that provides protection from overvoltage, reverse polarity and shorted output.

3) Wetted materials shall be 316L stainless steel, Polyamide, Fluorocarbon.

4) PE-jacketed cable shall be protected from chemical interactions using Tefzel material.

5) Sensing diaphragm shall be not less than 19.5 mm (0.77 inches) across. It shall be a flush, non-stick diaphragm made from Kynar, with superior abrasion and puncture resistance.

6) Shall have built in 16-bit internal digital error correction providing static error of ≤ 0.25% full scale with a total error band of ≤ 0.5% over the entire range of the transmitter.

7) Sensing element shall exhibit non-measurable hysteresis and be able to withstand overpressures to 200% of rated range without damage.

8) Barometric pressure compensation via breather tube system.

9) Guaranteed lightning protection

10) Shall be NSF/ANSI 61 and NSF/ANSI 372 drinking water certified.

11) Shall meet USA ARRA Section 1605 compliance.

12) Transmitter unit shall be warranted for 2 years.

13) The pressure transmitter shall be certified by FM, UL, and CSA for installation in a Class I, Division 1, Groups A, B, C, and D, Class II, Division 1, Groups E, F, and G, Class III, Division 1 hazardous location when connected to associated apparatus manufactured by PR Electronics, Turk, or R.G. Stahl and others. The transmitter shall be installed in accordance with manufacturer's instructions.

The pressure transmitter shall be mounted as shown on the plan drawings and per manufacturer's instructions. A minimum of 75 feet of cable shall be provided.

The cable shall be 0.3" outside diameter Polyurethane or Tefzel® material. Cable shall have non-stretch Kevlar reinforcement strands bundled within the cable to provide additional strength. Cable strength shall allow up to 200 pounds of pulling strength.

A sealed breather tube shall extend from the top of the cable to the transmitter assembly to provide barometric compensation to the transmitter.

Breather system will be sealed and maintenance free. Systems that use gaps in wire cable and or desiccant filters that require periodic replacement shall not be considered.

Transmitter Mounting:

The transmitter shall be mounted in an area allowing full measurement of the level monitored and in such a manner as to not be adversely affected by motor operation or incoming flow streams. Transmitter shall be mounted so that it is approximately 6" above the base of the sensed well. The transmitter shall be furnished with a stainless steel suspension mounting kit.

Spare Parts for Supervisory Controls:

As part of this contract, the Contractor shall furnish a minimum of one (1) each of the following spare parts:

a) PLC Processor
b) Input/Output modules (one each type),
c) PLC power supply module
d) Pump Controller / I/O (base unit)
e) Analog isolator module.
f) Radio Transceiver
g) Fuses – 10% or a minimum of one of each types and size

**General:** This work includes all excavation, backfill, temporary shoring, labor, materials and equipment required to manufacture, furnish, and install the valve vault, lid, access frame and hatch, butyl rubber sealant, pumps, pump bases, rails, lift chain, cable and chain brackets, pump rail brackets, motor control center, supervisory controls, testing, and other incidental items as shown on the plans and identified in this special provision.

**Basis of Payment:** This work will be paid for at the contract lump sum price for PUMPING STATION.

## REMOVE EXISTING SURVEILLANCE CAMERA EQUIPMENT

**Description:** This work shall consist of removal of existing surveillance camera equipment at

locations shown on the plans.

**General:** Existing surveillance camera equipment shall be removed and disposed of according to Article 202.03

**Basis of Payment:** Removal of existing surveillance camera equipment shall be paid for at the contract unit price each for REMOVE EXISTING SURVEILLANCE CAMERA EQUIPMENT.

## REMOVE AND RE-ERECT OR REPLACE SIGN PANEL

This work shall be in accordance with the plans and section 720 of the Standard Specifications. Sign panels to be re-erected shall be stored in a manner to prevent damage. Panels and associated hardware damaged during removal, storage, or re-erection shall be replaced by the contractor at no cost to the contract. Disposal of sign panels shall be in accordance with Section 202.03 of the Standard Specifications.

This work will be paid for at the contract unit price per each for REMOVE, STOCKPILE, AND REPLACE SIGN PANEL AND SIGN PANEL ASSEMBLY (SPECIAL).

## REMOVE AND REINSTALL PARKING BLOCKS, OR REMOVE EXISTING PARKING BLOCKS

This work shall consist of removing and disposing of or relocating existing concrete parking blocks and providing and installing new concrete parking blocks. Parking blocks to be relocated that are damaged during removal or installation shall be replaced by the contractor at no cost to the project. Parking blocks to be removed and not relocated shall become the property of the contract and disposed of off site.

This work, including furnishing and installing parking blocks with metal pins, will be paid for at the contract unit price each for REMOVE AND REINSTALL PARKING BLOCKS, or REMOVE EXISTING PARKING BLOCKS.

## REMOVE AND RESET ORNAMENTAL FENCE

This work shall consist of removing and reinstalling existing ornamental fence at locations shown on the plans and in accordance with section 664 of the Standard Specifications and delivering fencing that is not reinstalled to the City of Springfield. All replacement hardware and connections shall match existing, and fence components damaged during removal and reinstallation shall be repaired or replaced to match existing at no cost to the project.
This work, including any new hardware, railing modifications, connections, foundations, or other appurtenance will be paid for at the contract price per foot for REMOVE AND RESET ORNAMENTAL FENCE.

## QC/QA OF CONCRETE MIXTURES - APPLICABLE ITEMS

The Special Provision for "Quality Control/Quality Assurance of Concrete Mixtures" (Recurring Special Provision Check Sheet Item #23) shall only apply to the following:

| | |
|---|---|
| Pay Item: | All Items Utilizing Self-Consolidating Concrete |
| Location: | All Applicable |

| | |
|---|---|
| Pay Item: | PCC Pavement 7” and 10” Jointed |
| Location: | Streets |

All other Portland Cement Concrete utilized in the construction of this project shall be produced in accordance with Check Sheet Item #22 for "Quality Control of Concrete Mixtures at the Plant."

## REMOVAL OF UNCLASSIFIED MATERIAL

**Description:** This work shall consist of removing any unclassified material including culverts, broken concrete, and existing roadway surface found on this project as designated by the Engineer.

The material shall be disposed of beyond the limits of the right of way in accordance with Article 202.03 of the Standard Specifications, and as directed by the Engineer.

Compliance with this Special Provision will not be paid for separately but will be included in the project contract.

## REMOVE EXISTING BRICK PAVERS

This work shall consist of removing existing pavers without damaging portions of the underlying pavement or any other items to remain. This work shall be in accordance with Section 440 of the Standard Specifications. Removed pavers shall be stockpiled on pallets and transported to City storage locations as determined by the Engineer.
This work will be paid for at the contract unit price per square foot for REMOVE EXISTING BRICK PAVERS.

## REMOVAL OF POLE FOUNDATION

**Description:** This work shall consist of removal and disposal of railroad signal foundations, traffic signal foundations, sign foundations, light pole foundations, cell tower foundations and other miscellaneous foundations.

**General:** The Contractor shall remove and dispose of the existing concrete foundations

according to Article 845.05 of the SSRBC. The void caused by removal of the foundations shall be backfilled according to Article 841.02 of the SSRBC. The Contractor will remove and dispose of existing railroad foundations but the NSRR will remove the existing railroad signals and gates.

**Basis of Payment:** The work will be paid for at the contract unit price per each for REMOVAL OF POLE FOUNDATION.

## RETAINING WALL REMOVAL

**Description:** This work shall be in accordance with Section 501 of the Standard Specifications. This work consists of removing existing concrete retaining walls at locations shown on the plans. The limits of removal will be determined by the Engineer and may include wall footings. Partial removal of retaining walls may be necessary and shall be in accordance with Section 501.05.

All rubbish, concrete, reinforcement bars, and other debris as the result of the removal operations shall be disposed of by the contractor at off-site locations provided by the contractor.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for RETAINING WALL REMOVAL.

## SANITARY SEWER

This work will be in accordance with Section 550 of the Standard Specification for Road and Bridge Construction except as follows:

**Materials:** Except as noted below, all pipe shall be reinforced concrete conforming to ASTM designation C76 of the size and Class shown on the plans. The material for all pipe within 10 ft of any water line crossing shall be in accordance with the Special Provisions for Storm Sewer – Water Main Requirements. Concrete pipe joints shall conform to ASTM C361 or C443 for flexible gasket material. All pipe shall be marked with the pipe type, grade and standard. All pipe to manhole connectors shall be A-Lok, Kor-N-Seal or Press-Seal type, cast in the structure connectors.

**Water Main Separation:**

Sanitary sewers shall be separated from water lines (horizontal and vertical) as required by Section 41-2 of the Standard Specifications for Water and Sewer Main Construction in Illinois.

**Testing and Inspection:**

In addition to the requirements of the Standard Specifications for Road and Bridge Construction, all sanitary sewers shall be tested and inspected by exfiltration of air under pressure in accordance with Section 31-1.12 of the current edition of the Standard Specifications for Water and Sewer Main Construction in Illinois.

**Sanitary Sewer Line Connections:**

Sanitary sewer line connections to existing trunks, mains, laterals or side sewers shall be left uncovered until after an acceptance inspection has been made. The Engineer will make such inspection within two (2) working days after notification by the Contractor. After approval of the connection, the trench shall be backfilled as specified.

No existing sanitary sewer shall be connected to a new sanitary sewer unless specifically authorized in each instance by the Engineer.

**Bypass Pumping:**

Temporary bypass pumping will be from structure to structure. Any damage to or holes cut in existing or proposed pipes or structures will result in replacement of the pipe or structure. Patching will not be allowed.

**Basis of Payment:** This work, including elbows and any water main quality pipe, will be paid for at the contract unit price per foot measured along the centerline of pipes and elbows for SANITARY SEWER of the size shown on the plans. Payment for associated items listed in Section 550.10 shall be paid for in accordance with that section except that pipe elbows will not be measured separately for payment.

## SAWING PAVEMENT (FULL DEPTH)

**Description:** This work shall be used in the removal of driveway pavement, sidewalk, pavement, curb, gutter and combination curb and gutter to ensure a satisfactory transition between replacements and the portion remaining in place. The contractor shall saw cut a joint between the portion of the driveway pavement, sidewalk, pavement and curb and gutter to be removed and that to be left in place in order to prevent the surface from spalling when the concrete is broken out. This work shall be done in such a manner that a straight joint will be secured.

**Basis of Payment:** This work will not be measured separately but shall be included in the contract unit price for the item to be removed.

## SEWER IN METAL LINER

**Description:** This work shall consist of constructing reinforced concrete sanitary sewer in a metal liner at locations shown on the plans according to the special provision "STORM SEWERS JACKED IN PLACE, except that the liner may be installed by open cut method.

All pipe shall be reinforced concrete conforming to ASTM designation C76 of the class shown on the plans. Concrete pipe joints shall conform to ASTM C361 or C443 for flexible gasket material. All pipe shall be marked with the pipe type, grade and standard. All pipe to manhole connectors shall be A-Lok, Kor-N-Seal or Press-Seal type, cast in the structure connectors.

**Testing and Inspection:**

In addition to the requirements of the Standard Specifications for Road and Bridge Construction, all sanitary sewers shall be tested and inspected in accordance with Section 31-1.12 of the current

edition of the Standard Specifications for Water and Sewer Main Construction in Illinois.

Trench excavation, foundation preparation, and backfill for the metal liner shall be according to Article 550 of the SSRBC except as follows:

Aggregate for bedding and backfill shall be crushed stone with a top size of aggregate no greater than 2 in. and no more than 5 percent passing the number 200 sieve.

Backfill shall be in accordance with Section 208 of the SSRBC and shall be placed in loose 6 in. lifts and compacted to at least 95 percent of its maximum density with a moisture content that is no more than 1 percent greater of 2 percent less than the optimum moisture as determined according to AASHTO T 99 (Method C). When backfill is within 3 ft of the top of sub-ballast elevation, a compaction of at least 98 percent will be required.

**Installation:**

The Contractor may install the metal liner by jacking rather than open cut methods at the Contractor's option.

**Basis of Payment:** This work, regardless of whether installed by jacking or open cut methods, will be paid for at the contract unit price per foot for SEWER IN METAL LINER of the diameter specified which price shall include the concrete sanitary sewer, metal liner, including grouting all voids between the sewer and metal liner, and all other materials and equipment necessary to install the sewer and all excavation except excavation in rock. The Contractor may install the sewer in metal liner by jacking rather than open cut at no additional cost to the contract. Backfill will be paid for as TRENCH BACKFILL.

## SIDEWALK REMOVAL

**Description:** This work shall be in accordance with Section 440 of the Standard Specification and shall include removal of concrete steps.

Steps will be measured for payment in place. Only the horizontal surface will be measured and the area computed in square feet. The vertical risers of steps will not be measured for payment.
**Basis of Payment:** The work will be paid for at the contract unit price per square foot for SIDEWALK REMOVAL.

## SIGN REMOVAL

**Description:** This work consists of the removal and stockpiling or disposal of the existing specialty signs.

**General:** This work shall include the removal of the sign panels, posts, footings, and foundations to at least 2 ft below grade, and hardware associated with the existing signs. Salvageable material shall be delivered by the Contractor to the location designated by the

Owner. Disposal of unsalvageable and unwanted material shall be in accordance with Section 202.03. The void caused by removal shall be backfilled according to Article 841.02 of the SSRBC.

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

## STORM SEWER CONNECTION

**Description:** This work shall consist of furnishing and installing 36-in. diameter ductile iron pipe, tunnel excavation, and grout with fill and vent pipes. The Storm Sewer Connection shall be constructed after Drainage Structures No. 1 and No. 2 have been installed and backfilled.

North and South Drainage Structures No. 2 shall be connected by a 36-in. diameter ductile iron pipe. Drainage Structures No. 1 and No. 2 will have block-outs for the pipe cast into the riser sections as shown in the plans. The block-outs should be a minimum of 2-in. larger than the outside diameter of the ductile iron pipe. The 36-in. diameter pipe shall be installed by short tunnel excavation or micro- tunneling to remove the rock and grout between the Drainage Structures. The excavation limits shall extend just beyond the outside diameter of the 36-in. diameter ductile iron pipe. The 36-in. class 52 ductile iron pipe shall meet AWWA C151.

The grout shall meet the requirements of Section 1024 of the Standard Specifications and shall have a minimum strength of 5,000 psi at twenty-eight (28) days.

Once the tunnel has been excavated, and the 36-in. diameter ductile iron pipe has been installed, the pipe shall be sealed to Drainage Structures No. 1 and No. 2 with a non-shrink grout and 2-in. diameter grout fill and vent ports.

Once the sealing grout has cured, the annular space between the rock and the pipe shall be grouted with a non-shrink low density, high flow grout until the material exits the vent. Once the grout has cured, the grout pipes shall be cut off flush with the interior of Drainage Structures No. 1 and No. 2.

All rock, dirt, and debris in the Drainage Structures shall be completely removed and disposed of in accordance with Section 202.03 of the Standard Specifications.

**General:** This work includes the excavation, labor, materials and equipment required to furnish and install the 36-in. diameter ductile iron pipe, grout, vent and fill ports, and other incidental items as shown on the plans.

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

## STORM SEWERS JACKED IN PLACE

**Description:** This work shall consist of furnishing and installing by jacking a steel liner and then installing a sanitary sewer inside the liner in accordance with Section 552 of the Standard Specifications and this Special Provision. The metal liner shall be installed first, then the sanitary sewer installed inside the liner.

The smooth steel liner pipe shall meet the following minimum requirements:

Material – Steel ASTM A-36 or AWWA C-206
Inside Diameter – Shown on Plans
Wall Thickness – Shown on Plans
Manufacture – Rolled/Welded
Grade – FY = 36 KSI minimum
Joints – Full Depth Single "V" Groove Butt Weld
Coating – Coal tar epoxy or bituminous asphalt

The sanitary sewer pipe (carrier pipe) shall be reinforced concrete pipe conforming to ASTM designation C76, of the class shown on the plans.

Concrete pipe joints shall conform to ASTM C361 or C443 for flexible gasket material. All pipe shall be marked with the pipe type, grade and standard. All pipe to manhole connectors shall be A-Lok, Kor-N-Seal or Press-Seal type, cast in the structure connectors.

In addition to the requirements of the Standard Specifications for Road and Bridge Construction, all sanitary sewers shall be tested and inspected in accordance with Section 31-1.12 of the current edition of the Standard Specifications for Water and Sewer Main Construction in Illinois.

The following Norfolk Southern Railroad (NS) requirements shall also apply:

<u>General Requirements</u>

A. Bored, jacked or tunneled installations shall have a bore hole essentially the same as the outside diameter of the pipe plus the thickness of the protective coating.

B. The use of water or other liquids to facilitate casing emplacement and spoil removal is prohibited.

C. If during installation an obstruction is encountered which prevents installation of the pipe in accordance with this specification, the pipe shall be abandoned in place and immediately filled and grout. A new installation procedure and revised plans must be submitted to, and approved by, NS before work can resume.

<u>Jacking (Steel Pipe) Installation Method</u>

A. This method consists of pushing sections of pipe into position with jacks placed against a backstop and excavation performed by hand from within the jacking shield at the head of the pipe. Ordinarily 36-in. (914 mm) pipe is the least size that should be used, since it is not practical to work within smaller diameter pipes.

B. Jacking shall be in accordance with the current American Railway Engineering Association Specifications, Chapter 1, Part 4 "Earth Boring and Jacking Culvert Pipe Through Fills." This operation shall be conducted without hand-mining ahead of the pipe and without the use of any type of boring, auguring, or drilling equipment.

C. Bracing and backstops shall be so designed and jacks of sufficient rating used so that the jacking can be progressed on a 24-hour basis without stoppage (except for adding lengths of pipe) until the leading edge of the pipe has reached the receiving pit.

D. Immediately upon completion of jacking operation, the installation shall be pressure grouted as per this specification.

Grouting

A. For jacked and tunneled installations a uniform mixture of 1:6 (cement:sand) cement grout shall be placed under pressure through the grout holes to fill any voids which exist between the pipe or liner plate and the undisturbed earth.

B. Grouting shall start at the lowest hole in each grout panel and proceed upwards simultaneously on both sides of the pipe.

C. A threaded plug shall be installed in each grout hole as the grouting is completed in that hole.

D. When grouting tunnel liner plates, grouting shall be kept as close to the heading as possible, using grout stops behind the liner plates if necessary. In no event shall more than 6 lin. ft of tunnel be progressed beyond the grouting.

E. The space between the carrier pipe and casing pipe shall be pressure grouted using a uniform mixture of 1:6 (cement:sand).

Soil Stabilization

A. Pressure grouting of the soils or freezing of the soils before jacking, boring, or tunneling may be required at the direction of NS to stabilize the soils, control water, prevent loss of material and prevent settlement or displacement of embankment. Grout shall be cement, chemical or other special injection material selected to accomplish the necessary stabilization.

B. The materials to be used and the method of injection shall be prepared by a Registered Professional Soils Engineer or by an experienced and qualified company specializing in this work and submitted for approval to NS before the start of work. Proof of experience and competency shall accompany the submission.

Dewatering

A. When water is known or expected to be encountered, pumps of sufficient capacity to handle the flow shall be maintained at the site, provided the contractor has received approval from NS to operate them. Pumps in operation shall be constantly attended on a 24-hour basis until, in the sole judgment of NS, the operation can be safely halted. When dewatering, close observation shall be maintained to detect any settlement or displacement of railroad embankment, tracks, and facilities.

Safety Requirements

A. All operations shall be conducted so as not to interfere with, interrupt, or endanger the operation of trains nor damage, destroy, or endanger the integrity of railroad facilities. All work on or near NS property shall be conducted in accordance with NS safety rules and regulations. The Contractor shall secure and comply with the NS safety rules and shall give written acknowledgement to NS that they have been received, read, and understood by the Contractor and its employees. Operations will be subject to NS inspection at any and all times.

B. All cranes, lifts, or other equipment that will be operated in the vicinity of the railroads' electrification and power transmission facilities shall be electrically grounded as directed by NS.

C. At all times when the work is being progressed, a field supervisor for the work with no less than 12 months experience in the operation of the equipment being used shall be present. If boring equipment or similar machines are being used, the machine operator also shall have no less than 12 months experience in the operation of the equipment being used.

D. Whenever equipment or personnel are working closer than 15 ft (4.6 m) from the centerline of an adjacent rack, that track shall be considered as being obstructed. Insofar as possible, all operations shall be conducted no less than this distance. Operations closer than 15 ft (4.6) from the centerline of a track shall be conducted only with the permission of, and as directed by, a duly qualified NS railroad employee present at the site of the work.

E. Crossing of tracks at grade by equipment and personnel is prohibited except by prior arrangement with, and as directed by, NS.

Blasting

A. Blasting will not be permitted.

Protection of Drainage Facilities

A. If, in the course of construction, it may be necessary to block a ditch, pipe or other drainage facility, temporary pipes, ditches or other drainage facilities shall be installed to maintain adequate drainage, as approved by NS. Upon completion of the work, the temporary facilities shall be removed and the permanent facilities restored.

B. Soil erosion methods shall be used to protect railroad ditches and other drainage facilities during construction on and adjacent to NS right-of-way.

Support of Excavation Adjacent to Track

1.0 Launching and Receiving Pits

A. The location of the near edge of all pits is shown on the plans. The dimension of the pits shall be determined by the Contractor and be shown in the pit design plans submitted by the Contractor. The distance from centerline of adjacent track to face of pit or excavation shall be clearly labeled. Also, the elevation of the bottom of the pit or excavation must be shown on the profile.

B. The face of all pits shall be located a minimum of 25 ft (7.6 m) from centerline of adjacent track, **measured at right angles to track**, unless otherwise approved by NS.

C. If the bottom of the pit excavation intersects the theoretical railroad embankment line interlocking steel sheet piling, driven prior to excavation, must be used to protect the track stability. The use of trench boxes or similar devices are not acceptable in this area.

D. Design plans and computations for the pits, stamped by a Professional Engineer, must be submitted by the Contractor prior to start of construction. The Contractor shall obtain NS approval prior to beginning any work on or which may affect NS property.

E. The sheeting shall be designed to support all lateral forces caused by the earth, railroad and other surcharge loads.

F. After construction and backfilling, all sheet piling within 10 ft (3.0 m) of centerline track must be cut off 18 in. (457 mm) below final grade and left in place.

G. All excavated areas are to be illuminated (flashing warning lights not permitted), fenced and otherwise protected as directed by NS.

2.0 Parallel Trenching and Other Excavation

A. When excavation for a pipeline or other structure will be within the theoretical railroad embankment line of an adjacent track, interlocking steel sheet piling will be required to protect the track.

B. The design and construction requirements for this construction shall be in accordance with the requirements of Section 1.0 Launching and Receiving Pits, included in this specification.

3.0 Inspection and Testing

A. For pipelines carrying flammable or hazardous materials, ANSI Codes, current at time of constructing the pipeline, shall govern the inspection and testing of the facility on NS property, except as follows:
   (1) One hundred percent of all field welds shall be inspected by radiographic examinations, and such field welds shall be inspected for 100 percent of the circumference.
   (2) The proof testing of the strength of carrier pipe shall be in accordance with ANSI requirements.

4.0 Reimbursement of NS Costs
   A. All NS costs associated with the pipe installation (inspection, flagging, track work, protection of signal cables, etc.) will be reimbursed by the Department as Force Account Work according to the Construction Agreement with the railroads.

The Contractor shall follow all of the requirements contained in the NS Special Provision for Protection of Railway Interests.

Pipeline Marker Sign

The Contractor shall install pipeline marker signs directly above the centerline of the storm sewer at the railroad right-of-way limits, as shown in the plans. The signs shall be durable, weatherproof signs approved by the Engineer and shall show the following information:

CITY OF SPRINGFIELD
SEWER DIVISION
ROOM 203 MUNICIPAL CENTER WEST
300 SOUTH 7TH STREET
SPRINGFIELD, IL 62701
(217) 789-2255
COMBINED ** IN. SEWER
DEPTH TO TOP OF CASING * FT

** Diameter of sewer.
*As-built depth to be determined by Contractor.

**Backfill:** Jacking and/or receiving pits located beneath future track locations shall be backfilled in accordance with Section 208 (trench backfill) of the Standard Specifications.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for STORM SEWERS JACKED IN PLACE of the diameter shown on the plans which price shall include the sewer, metal liner, grouting all voids between the sewer and metal liner, all other materials and equipment necessary to install the sewer and pipeline marker signs, and all excavation except excavation in rock.

## STORM SEWER, GAS MAIN AND WATER MAIN REMOVAL

**Description:** This work shall consist of the removal of water mains, gas mains, storm sewers,

sanitary sewer or combined sewers in accordance with Section 551 of the Standard Specifications.

Sewers and mains less than or equal to 6" will not be measured for removal.

**Basis of Payment:** This work, regardless of the type of sewer and water main, will be paid for at the contract unit price per foot for STORM SEWER REMOVAL or WATER MAIN REMOVAL, of the diameter specified, and gas main will be paid for at the contract unit price per foot for REMOVE ABANDONED GAS MAIN.

## STORM SEWER TO BE FILLED

**Description:** This work shall consist of filling existing storm, sanitary or combined sewer or utility pipe to be abandoned, as designated on the plans or as directed by the Engineer, with Controlled Low Strength Material (CLSM) according to Articles 593.02 and 593.03 of the SSRBC and as specified in this special provision.

**Materials:** CLSM shall meet the requirements of Section 1019 of the SSRBC.

Select rubble shall be pieces of natural rock, broken concrete without protruding metal bars, bricks, or reclaimed asphalt pavement with no expansive aggregate. The pieces shall have a minimum dimension no less than ten (10) times the maximum aggregate size of the CLSM and a maximum dimension no greater than 20 percent of the minimum dimension of the space to be filled. Select rubble shall be free of regulated waste material.

**Construction Requirements:** The portion of the sewer or utility pipe to be filled shall be inspected to identify connections, locate obstructions, and assess the condition of the pipe prior to CLSM placement. The Engineer shall be notified of any connections that were not identified in the plans to be abandoned, removed, or redirected and reconnected. Connections of existing pipes that are in service shall be reconnected to the new sewer. Irregularities in sewer pipe, obstructions, open joints, or broken pipe shall be documented and the calculated fill volume shall be adjusted to account for the anomalies.

Termini of sewers or utility pipe to be filled shall be plugged with Class SI concrete or brick and mortar. The plug shall be adequate to withstand the hydrostatic load created during the filling operation. If the plugs fail during construction, the Contractor shall be responsible for the cost of repairing the plug, and filling the remainder of the pipe.

CLSM shall be placed in a manner that allows all air or water to be displaced as the CLSM fills the pipe and intermediate structures.

The tops of intermediate manholes shall be removed to a depth of 2 ft below finished grade. The structure may be removed to a greater depth, but not deeper than 18 in. above crown of the abandoned sewer. The remaining structure shall be filled with CLSM or select rubble with voids filled with CLSM. After the CLSM has set, the hole formed by removal of the top of the structure shall be backfilled with sand and the sand compacted to 3 in. below finished grade. The upper 3 in. shall be filled with embankment free from debris and clods and stones larger than 2 in. in the largest dimension.

All excess material resulting from filling the sewers and intermediate structures and partial removal of intermediate structures shall be disposed of by the contractor according to Article 202.03 of the SSRBC.

**Method of Measurement:** STORM SEWER TO BE FILLED shall be measured in place and the volume computed in cubic yards.

**Basis of Payment:** This work, regardless of the type of sewer or utility pipe, will be paid for at the contract unit price per cubic yard for STORM SEWER TO BE FILLED. The unit price shall include the cost of removal, disposal, and backfill of the tops of intermediate manholes. The unit price shall include connections of existing pipes, identified and not identified in the plans, that are in service to the new sewer.

## SUBGRADE PREPARATION

**Description:** This work shall be according to Section 301 of the SSRBC in addition to the following requirements for the roadway cut section.

**General:** In an effort to obtain the required density and stability to the roadway subgrade in a cut section, the Contractor shall cut temporary ditches graded to temporary sump pumps or other efforts as approved by the Engineer to drain the underpass area. This work shall be done at least two weeks prior to Step 2 in Article 301.04 of the SSRBC.

**Method of Measurement:** This work will not be measured for payment but shall be included in the cost of EARTH EXCAVATION.

## SUNSHELTER

**Description:** This work shall consist of the design, fabrication, storage, delivery and erection of a welded steel, prefabricated sunshelter with roof according to the dimensions shown in the plans. Also included in this work shall be the furnishing and installation of a concrete foundation, if required by manufacturer, and miscellaneous items as indicated on the plans.

**Materials:**

**Tube Support and Roof Frame**

Structural steel shall conform to the requirements of Section 1006 of the Standard Specifications, ASTM A500, Gr. B square and rectangular tubing, ASTM A36 structural steel, as applicable, unless otherwise shown on the plans or approved by the Engineer. All structural steel field connections shall be bolted with high strength bolts. The high strength bolts shall be mechanically galvanized according to the requirements of Article 1006.08(a) of the Standard Specifications. Structural steel shall be detailed, fabricated, and erected in accordance with the latest edition of the American Institute of Steel Construction (AISC) Specification Manual. All welding is performed by American Welding Society certified welders and conforms to the latest

edition of AWS D1.1 or D1.3 as required.

**Roofing**
The materials shall comply with the applicable portions of the materials section of the Standard Specifications.

The metal roofing shall be 24 Gage and shall be galvanized per ASTM A653 with a G90 min. coating designation. Installing, fastening, trimming, cutting and overlapping the metal roofing shall be according to the manufacturer.

**Concrete Foundation**
The concrete foundation, if required by the manufacturer shall conform to the requirements of Section 878 of the Standard Specifications.

**Design:** The control panel support and sunshelter shall conform to the clear height, clear width, and configuration shown on the contract plans. The design and detailing shall be completed by the manufacturer. The design shall be according to the International Building Code (IBC).

Prior to beginning construction or fabrication, the Contractor shall submit design calculations and shop drawings for each sunshelter and concrete foundations to support the sunshelter to the Engineer for review and approval.

**Construction:** Sunshelter erection procedures shall be according to the manufacturer's instruction.

**Basis of Payment:** The sunshelter will be paid for at the contract unit price per each for SUNSHELTER which price shall include the concrete foundation, if required by the manufacturer.

## TEMPORARY CHAIN LINK FENCE (PORTABLE)

**Description:** This work shall consist of furnishing, installing, maintaining and removing temporary chain link fence to control pedestrian traffic along the work area at locations shown on the plans or as directed by the Engineer.

**General:** The temporary fence shall be chain link fence and a minimum of 6 ft high with posts placed a maximum of 10 feet apart. The posts shall be self-standing and fixed to the ground with sand bags to ensure that the fence will not move or fall over. Moving the temporary fence to complete construction of work items in conflict with temporary fencing will not be measured for payment but included in the contract unit price for TEMPORARY CHAIN LINK FENCE (PORTABLE).

**Basis of Payment:** This work will be paid for at the contract unit price per foot for TEMPORARY CHAIN LINK FENCE (PORTABLE.)

## TEMPORARY CONCRETE BARRIER

**Description:** This work shall consist of all labor and equipment necessary for the installation of temporary concrete barrier at the locations as shown in the plans. This work shall be completed in accordance with the applicable portions of Section 704 of the IDOT SSRBC and as directed by the Engineer. Some temporary concrete barrier will be left in place after construction is complete and become the property of the City of Springfield when shown on the plans.

This item shall also include any removal and relocation of this barrier required for the different stages of the project as directed by the Engineer.

**Basis of Payment:** This work shall be paid for at the contract unit price per foot for TEMPORARY CONCRETE BARRIER which price shall include all labor and equipment necessary to install, remove and relocate the barrier as many times as is necessary to complete the project to the satisfaction of the Engineer.

## TEMPORARY FENCE

**Description:** This work shall consist of furnishing, installing, maintaining and removing temporary fence to control pedestrian traffic along the work area at locations shown on the plans or as directed by the Engineer.

**General:** The temporary fence shall be chain link fence or woven wire fence. The fence shall be at least 6 ft high with posts spaced a maximum of 10 ft apart and shall include lockable gates for construction access at locations selected by the Contractor and approved by the Engineer.

Fence shall be erected prior to commencing other construction activities on site and shall be maintained until the Engineer authorizes its removal. Fence shall be removed, postholes filled, and surface restored to the satisfaction of the Engineer. Temporary fencing with bracing adjacent to permanent gates shall be permanently left in place. Cost of leaving temporary fencing in place shall be included in the cost of temporary fence.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for TEMPORARY FENCE. Temporary gates will be included in the measured length of fence.

## TRANSVERSE DRAINS COMPLETE

**Description:** This work consists of constructing transverse drains at locations shown in the plans or directed by the Engineer. Transverse drains shall be constructed according to the details

shown in the plans and applicable portions of Section 601 of the Standard Specifications.

Perforated pipe shall be corrugated polyethylene pipe with a smooth interior meeting the requirements of Article 1040.04. All pipes shall have a 4 in. inside diameter.

Backfill and bedding aggregate shall consist of CA-16 gravel or crushed gravel or FA-4 natural sand. All aggregate shall be reasonably free of objectionable deleterious material. Limestone CA-16 or sand shall not be allowed. Backfill aggregate shall be compacted in separate operations to the satisfaction of the Engineer.

**General:** This work shall be applied to the transverse drains beneath the Madison and Jefferson Streets pavement at the locations shown in the plans. Included in this pay items is the excavation for the trench, the granular backfill needed to fill the trench, the 4 in. pipe underdrain, and the pipe connection to the specified drainage structure.

**Basis of Payment:** This work shall be paid for at the contract unit price per each for TRANSVERSE DRAINS COMPLETE.

## TREE REMOVAL

Tree removal shall be in accordance with Section 201 of the Standard Specifications except that it will not be measured for payment.

## TREE TRANSPLANT

**Description:** This work shall consist of removing and planting trees from their current location to another location on the project site as directed by the Engineer. This work shall be in accordance with Section 253 of the Standard Specifications. Tree removal shall be in such a manner to not damage the tree and shall include a large enough root ball to ensure the continued survival of the tree after transplant.

Any tree damaged during transplant shall be replace by the contractor at no cost to the project.

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

## WATER MAIN

**Description:** This work shall consist of constructing the outlet pipe from the pump station in accordance with Section 561 of the Standard Specifications except as follows:

Pipe shall be ductile iron with restrained joints. Restrained joint shall be rated up to 3,500 psi working pressure. The pipe shall have a cement mortar lining with asphaltic coating inside and out conforming to ANSI/AWWA A21.4.

Pipe shall be pressure tested at 150 PSI for a period of two hours with a maximum 2 PSI pressure drop. Tracker wire shall be installed and tested for continuity.

A stainless steel tapping saddle shall connect discharge forcemain from Drainage Structure, No. 1 to the discharge forcemain from South Drainage Structure, No. 2 where identified on plans. A tapping valve and valve with box shall be placed in pavement with valve box lid flush with pavement.
Disinfection will not be required.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for DUCTILE IRON WATER MAIN of the diameter specified.

## WATER MAIN REMOVAL

**Description:** This work consists of removal of existing water mains at locations shown on the Plans. CWLP will specify locations in which to terminate the existing water line. After these locations are determined, the contractor will remove the remaining existing water line and appurtenances. The excavation should be according to relevant procedures found in section 550.04. Disposal shall be according to section 202.03.

**Basis of Payment:** This work, including any necessary excavation, shall be paid for at the contract unit price per foot of WATER MAIN REMOVAL of the size specified. Removal of water lines smaller than 6 in. diameter shall not be measured for payment but shall be included in the cost of Earth Excavation. Removal of valves, meters and other appurtenances within the limits of water line removal is included in the cost of removing the water line.

## RAILWAY

## ARCHAEOLOGY PHASE II SURVEY

Upon commencement of construction activities, the Contractor, working with the project archaeologist, shall remove portions of the existing parking lot pavement and subsurface gravels and/or underlayment to a depth at or near the base of the parking lot gravels. The portion of this pavement removal shall be within existing and proposed railroad right-of-way at the locations shown for Site 4 and 5 on the location map. These locations are along the rail corridor between Madison and Jefferson Streets. The Contractor shall allow this area to remain open for a period of time sufficient for the project archaeologist to conduct subsurface trenching and subsequent archaeological investigations, if required by the Illinois Historic Preservation Agency. It is estimated that the time needed by the archaeological crew to conduct this work will be approximately two months. The excavated material from the archaeologist/trenching will be deposited adjacent to their trenches, within the same parcel. Upon approval by the archaeologist, the Contractor shall backfill and compact the excavated areas with the same material removed by the archaeologists. The backfilling and compaction shall meet the Special Provision

requirements of EMBANKMENT AND SUBGRADE PREPARATIONS. The cost of subsurface trenching and archaeological investigation will be paid by the Department. The pavement removal work will be paid for at the contract unit price per square yard for DRIVEWAY PAVEMENT REMOVAL which shall include removal of the aggregate base in the areas indicated. Backfilling and compacting the excavated areas will not be paid for separately but will be included in the contract unit price per cubic yard for EARTH EXCVATION.

There is an additional ongoing archeology phase II survey underway on parcel SR0110 owned by the City of Springfield. This archeology survey is located within the footprint of the building removal to be completed by others on this parcel. Work by the Contractor at this archeology survey location shall not begin until September 19, 2022 unless the archeologist has completed their investigation. The Contractor shall not proceed with any work at the archeology site without written permission from the Engineer. The excavated material from the archaeologist/trenching will be deposited adjacent to their trenches, within the same parcel. Upon approval by the archaeologist, the Contractor shall backfill and compact the excavated areas with the same material removed by the archaeologists. The backfilling and compaction shall meet the Special Provision requirements of EMBANKMENT AND SUBGRADE PREPARATIONS. The cost of subsurface trenching and archaeological investigation will be paid by the Department. Backfilling and compacting the excavated areas will not be paid for separately but will be included in the contract unit price per cubic yard for EARTH EXCVATION.


**BALLAST**

**Description:** This work shall consist of furnishing and placing ballast to cover the waterproof

membrane of each UPRR bridge deck.

**General:** Work and material shall conform to the requirements for Mainline Ballast in the Norfolk Southern Standard Specifications for Materials and Construction, as presented below:

1. Ballast must originate from an NSRR approved quarry, such as Iron Mountain Trap Rock, in Iron Mountain Lake, Missouri, or National Lime and Stone in Findlay, Ohio.
2. Ballast shall be approved by the Engineer prior to installation.
3. Ballast material type shall be granite meeting the material quality specifications.

**Material Quality:**

1. Prepared ballast shall be crushed stone composed of hard durable particles, free from objectionable amounts of deleterious substances and conforming to the requirements of this specification.
2. Prepared ballast shall meet the following specifications:
   a. Gradation, as determined using ASTM C 136, using square opening sieves conforming to ASTM E 11. One test shall be performed each 1000 tons or fraction thereof of material loaded for delivery.
      i. Mainline ballast shall comply with the NS-modified AREMA gradation #3, as shown in Table 1 below.

**Table 1: Ballast Gradations**

| Percent Passing Standard Sieve Size by Weight | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Type** | **2-1/2"** | **2"** | **1-1/2"** | **1"** | **¾"** | **½"** | **3/8"** | **#4** | **#200** |
| **AREMA #3 Mod.** | **100** | **95-100** | **30-65** | **0-15** | | **0-5** | | | **0.5 max** |

***Note: All gradation testing shall be performed according to AASHTO T-27.***

   b. Clay lumps and friable material – percentage as determined by ASTM C 142 shall not exceed 0.5%.
   c. Material finer than #200 sieve – percentage as determined by ASTM C 117 shall not exceed 0.5%.
   d. Absorption – as determined by ASTM C 127 shall not exceed 1.0%.
   e. Sodium sulfate soundness – average weighted loss after five (5) cycles shall not exceed 2.5%, as determined by ASTM C 88.
   f. Resistance to degradation – as determined by ASTM C 535, grading type 2 (Los Angeles Abrasion Test 535-2) shall not result in a wear percentage greater than 27.5% for granite, or 25.0% for limestone.
   g. Flat and/or elongated particles – as determined by ASTM D 4791-89, using a 3:1 ratio shall not exceed 5.0%.
3. Contractor shall furnish a certification of compliance stating that the material meets or exceeds the requirements of this specification. For sources not currently approved by NSRR, the Contractor shall provide independent certification as required by the Engineer.
4. Graded aggregates subject to on site stockpiling prior to placement shall be reblended

as directed by the Engineer to ensure compliance with the original grading specified.

**Delivery:**

1. If ballast is specified by the project contract to be furnished by the Contractor:
    a. Rail Delivery:
        i. The Contractor shall be responsible for arranging rail delivery and unloading using cars furnished by NSRR.
        ii. The Contractor is responsible for all freight charges.
        iii. If direct unloading of ballast is not possible, the Contractor shall be responsible for arranging rail delivery to the nearest available track. The Contractor shall be responsible for prompt unloading of the cars and for the transport of the material to the job site for installation or stockpiling.
    b. Truck Delivery:
        i. The Engineer, or person(s) designated by the Engineer, shall collect quarry tickets for each load of ballast delivered to the job site by truck.
2. The Engineer may refuse acceptance, at no cost to the project, if the material being supplied is unsuitable or not in accordance with these specifications.
3. If material is stockpiled, the Contractor shall limit the movement of wheeled or tracked machines over the stockpile.

**Installation:** Uncompacted ballast shall be placed evenly to completely cover the waterproof membrane at a thickness of 6 in. Placement of material shall be done in a manner that shall not damage or destroy the waterproof membrane.

**Basis of Payment:** This work shall be paid for at the contract unit price per cubic yard for BALLAST.

## CHAIN LINK FENCE (SPECIAL)

**Description:** This work shall consist of furnishing and constructing chain link fence with a barbed wire top, gates and accessories at the locations shown on the plans or as directed by the Engineer.

**General:** Except as modified below, the work and materials shall conform to the requirements of Section 664 and Article 1006.27 of the SSRBC. Barbed wire top shall conform to Article 1006.28 of the SSRBC. The materials including all fabric, posts, fasteners, wires, braces, tops, support arms, and 3 rows of barbed wire shall be included in the cost of the work. All labor, materials, and equipment shall be included in the cost of CHAIN LINK FENCE 8 ' (SPECIAL) and CHAIN LINK GATES (SPECIAL).

Barbed wire support arms shall be pressed steel, cast iron, or cast aluminum alloy fitted with clips or slots for attaching three strands of barbed wire. Arms shall be set on a 45° angle and be capable of supporting a 250 pound load at outer barbed wire connecting point without causing permanent deflection.

**Basis of Payment:** This work shall be paid for at the contract unit price per foot for CHAIN LINK FENCE (SPECIAL) of the height specified, and at the contract unit price per each for CHAIN LINK GATES (SPECIAL) of the opening sizes and types specified.

## DIRECTIONAL BORING

**Description:** This work shall consist of furnishing and installing, by jacking, pipe of the required diameter at locations shown on the plans. This method of installation consists of pushing the pipe into the earth with a boring auger rotating within the pipe to remove the spoil.

**General:** Installations shall have a bore hole essentially the same as the outside diameter of the pipe plus the thickness of the protective coating.

The use of water or other liquids to facilitate casing emplacement and spoil removal is prohibited.

If during installation an obstruction is encountered which prevents installation of the pipe in accordance with this specification, the pipe shall be abandoned in place and immediately filled with grout. The abandoned pipe shall be completely filled with a sand and cement grout mixture consisting of 4 parts sand to 1 part cement and enough clean water to facilitate pumping. A new installation procedure and revised plans must be submitted to, and approved by, the Engineer, who will forward to the Railroad Engineer, before work can resume.

If the grade of the pipe at the jacking or boring end is below the ground surface, suitable pits or trenches shall be excavated for the purpose of conducting the jacking or boring operation and for placing end joints of the pipe. The pits shall be outside of the shoring zone defined as a 2h:1v line that begins 14’ horizontally from track center and 3.6’ below the top of rail. Temporary guard rail shall be provided for protection of the pit or trench when specified by the Engineer. Excavations greater than 5’ in depth shall be protected in accordance with OSHA Trench Safety Guidelines.

**Materials:**

A. Pipe installed by the Jack and Bore method shall be limited to Smooth Steel Pipe.

B. The steel pipe shall conform to ASTM Specifications A 139 Grade B (No Hydro). The minimum yield strength of this pipe shall be 35,000 psi. The minimum wall thickness is as follows:

| Nominal Size | Minimum Wall Thickness |
|---|---|
| (Inches) | (Inches) |
| 18 | 0.312 |

C. The pipe shall be coated externally with coal tar epoxy or bituminous asphalt. The pipe shall be shop cut with ends square with centerline, leveled and welded so that the entire length of the pipe shall be straight and true. Weld seams in the field shall be field applied with coal tar epoxy or bituminous asphalt.

PIPE CONNECTIONS

Smooth steel pipe shall be connected by welding using a full depth, single "V" groove butt weld. Welding shall be performed by skilled welders, welding operators, and tackers who have had adequate experience in the type of materials to be used. Welders shall be qualified under the provisions of ANSI/AWS D1.1 by an independent local, approved testing agency not more than 6 months prior to commencing work on the pipe. Machines and electrodes similar to those used in the work shall be used in qualifications tests. The Contractor shall be responsible for all material and bear the expense of qualifying welders.

SUBMITTALS

Plans and description of the jack and bore arrangement to be used shall be submitted to the Engineer, who will forward to the Railroad Engineer, for approval and no work shall proceed until such approval is obtained.

DEWATERING

A. When water is known or expected to be encountered, pumps of sufficient capacity to handle the flow shall be maintained at the site, provided the contractor has received approval from the Railroad Engineer to operate them.

B. Pumps in operation shall be constantly attended on a 24-hour basis until, in the sole judgment of the Railroad Engineer, the operation can be safely halted.

C. When dewatering, close observation shall be maintained to detect any settlement or displacement of railroad embankment, tracks, and facilities.

INSTALLATION

A. Directional boring of the pipe shall be accomplished by the dry auger boring method without jetting, sluicing, or wet boring. The hole shall be bored and cased through the soil by a cutting head on a continuous auger mounted inside the pipe. The boring of the hold and installation of the pipe shall be simultaneous.

B. Unless otherwise approved by the Railroad Engineer, The boring operation shall be progressed on a 24- hour basis without stoppage (except for adding lengths of pipe) until the leading edge of the pipe has reached the receiving pit.

C. The Contractor shall inspect the site where the pipe is to be installed and familiarize himself with the conditions under which the work will be performed and with all necessary details as to the orderly prosecution of the work. The omission of any details for the satisfactory installation of the work in its entirety, which may not appear herein, shall not relieve the Contractor of full responsibility.

D. The front of the pipe shall be provided with mechanical arrangements or devices that will positively prevent the auger from leading the pipe so that no unsupported excavation is ahead of the pipe.

E. The auger and cutting head arrangement shall be removable from within the pipe in the event an obstruction is encountered. If the obstruction cannot be removed without excavation in advance of the pipe, procedures as outlined in Section 1.D of this specification must be implemented immediately.

F. The over-cut by the cutting head shall not exceed the outside diameter of the pipe by more than 1/2 inch. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe (plus coating) by more than approximately 1 inch, grouting or other methods approved by the Railroad Engineer, shall be employed to fill such voids. The face of the cutting head shall be arranged to provide a reasonable obstruction to the free flow of soft or poor material.

G. Construction shall be carried on in such a manner that settlement of the ground surface above the pipe line shall be held to an absolute minimum. The installation of the pipe line shall follow the heading or boring excavation as soon as possible.

H. If, in the opinion of the Railroad Engineer, the installation of the pipe is being conducted in an unsafe manner, the Contractor will be required to stop work and bulkhead the heading until suitable agreements are reached between the Contractor and the Railroad Engineer. The Railroad will not be responsible and shall be saved harmless in the event of delays to the Contractor's work resulting from any cause whatsoever.

I. Immediately upon completion of the pipe installation, the pits or trenches excavated to facilitate jacking or boring operations shall be backfilled with granular embankment in accordance with Section 206 of the SSRBC.

TRACK MONITORING

For all Jack and Bore Operations, Track Monitoring will be required in accordance with Norfolk Southern's Special Provisions for Protection of Railway Interests, Section 5.I.

SAFETY REQUIREMENTS

At all times when the work is being progressed, a field supervisor for the work with no less than twelve (12) months experience in the operation of the equipment being used shall be present. If boring equipment or similar machines are being used, the machine operator also shall have no less than twelve (12) months experience in the operation of the equipment being used.

**Method of Measurement:** This work will be measured for payment in place in feet.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for DIRECTIONAL BORING.
Excavation in rock will be paid for according to Article 502.13 of the SSRBC.

## EMBANKMENT AND SUBGRADE PREPARATION

**Description:** This work shall consist of the construction of embankments underneath railroad track by depositing, placing and compacting earth, stone, gravel, or other materials of acceptable quality above the natural ground or other surface and shall consist of preparing the completed or existing earthwork underneath railroad track as an unimproved subgrade prior to constructing the sub-ballast.

**General:** Except as modified below, the work and materials shall conform to the requirements of Sections 205 and 301 of the SSRBC.

For embankments:

1. All lifts between 0 ft and 3 ft below the top of the subgrade shall be compacted to not less than 100 percent of the standard laboratory density and all lifts more than 3 ft below the top of the subgrade shall be compacted to not less than 95 percent of the standard laboratory density.

2. The moisture content of the soil shall be between 0 and 6 percentage points above the optimum moisture determined according to AASHTO T-99 (Method C).

3. New railway embankments should not be constructed over existing pavements as detailed in Section 205. All old pavements shall be removed

4. Broken concrete, bricks, rock, stone, reclaimed asphalt pavement or other construction or demolition activities or materials generally considered as debris as detailed in Section 202.03 that was referenced from Section 205 should NOT be used in new railway embankment construction.

In locations beneath the sub-ballast:

1. The Contractor shall scarify the top 12 in. of subgrade, adjust the moisture content to between 0 and 6 percentage points above the optimum moisture determined according to AASHTO T-99 (Method C), and compact to not less than 100 percent of the standard laboratory density.

Suitable material taken from drilled shafts, drainage structure excavation, or structure excavation may be used for construction of embankment.

Existing ballast and clean sub-ballast material may be used within the core of the embankment only if the coarse material is thoroughly mixed with fine material. The mixed coarse material shall be homogenous and contain at least 35 percent finer than the No. 200 sieve.

**Method of Measurement:** This work will not be measured for payment.

**Basis of Payment:** Subgrade preparation, embankment and any additive or water applied will not be paid for directly but shall be considered as included in the various items of excavation, and their construction shall be included in the unit prices for these items.

## NS RAIL OPERATIONS

All work by the Contractor shall be performed in accordance with the NS Special Provisions for Protection of Railway Interests. Train movements along the NS track may limit the times that the Contractor may work on NS right-of-way (ROW). The NS yard between Laurel and Cook Streets is no longer active. The Contractor shall schedule his work in coordination with NS operations.

No charge or claims of the Contract against either the Department or the railroad will be allowed for hindrance or delay on account of railway traffic, any work by the railroad or any other delay incident to the necessary or safe maintenance of railway traffic.

# NS SPECIAL PROVISION FOR PROTECTION OF RAILWAY INTERESTS

Norfolk Southern Railway Company

## E. Norfolk Southern – Special Provisions for Protection of Railway Interests

1. AUTHORITY OF RAILROAD ENGINEER AND SPONSOR ENGINEER:

   Norfolk Southern Railway Company, hereinafter referred to as "Railroad", and their authorized representative shall have final authority in all matters affecting the safe maintenance of railroad traffic including the adequacy of the foundations and structures supporting the railroad tracks. For Public Projects impacting the Railroad, the Railroad's Public Projects Engineer, hereinafter referred to as "Railroad Engineer", will serve as the authorized representative of the Railroad.

   The authorized representative of the Project Sponsor ("Sponsor"), hereinafter referred to as the "Sponsor's Engineer", shall have authority over all other matters as prescribed herein and in the Project Specifications.

   The Sponsor's Prime Contractor, hereinafter referred to as "Contractor" shall be responsible for completing any and all work in accordance with the terms prescribed herein and in the Project Specifications. These terms and conditions are subject to change without notice, from time to time in the sole discretion of the Railroad. Contractor must request from Railroad and follow the latest version of these provisions prior to commencing work.

2. NOTICE OF STARTING WORK:

   A. The Contractor shall not commence any work on railroad rights-of-way until he has complied with the following conditions:

      1. Signed and received a fully executed copy of the required Norfolk Southern Contractor Right of Entry Agreement.

      2. Given the Railroad written notice in electronic format to the Railroad Engineer, with copy to the Sponsor's Engineer who has been designated to be in charge of the work, at least ten days in advance of the date he proposes to begin work on Railroad rights-of-way.

      3. Obtained written approval from the Railroad of Railroad Protective Liability Insurance coverage as required by paragraph 14 herein. It should be noted that the Railroad does not accept notation of Railroad Protective insurance on a certificate of liability insurance form or Binders as Railroad must have the full original countersigned policy. Further, please note that mere receipt of the policy is not the only issue but review for compliance. Due to the number of projects system-wide, it typically takes a minimum of 30-45 days for the Railroad to review.

      4. Obtained Railroad's Flagging Services as required by paragraph 7 herein.

      5. Obtained written authorization from the Railroad to begin work on Railroad's rights-of-way, such authorization to include an outline of specific conditions with which he must comply.

      6. Furnished a schedule for all work within the Railroad's rights-of-way as required by paragraph 7.B.1.

B. The Railroad's written authorization to proceed with the work shall include the names, addresses, and telephone numbers of the Railroad's representatives who are to be notified as hereinafter required. Where more than one representative is designated, the area of responsibility of each representative shall be specified.

3. INTERFERENCE WITH RAILROAD OPERATIONS:

A. The Contractor shall so arrange and conduct his work that there will be no interference with Railroad's operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad or to poles, wires, and other facilities of tenants on the rights-of-way of the Railroad. Whenever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor which requires flagging service or inspection service shall be deferred by the Contractor until the flagging service or inspection service required by the Railroad is available at the job site.

B. Whenever work within Railroad's rights-of-way is of such a nature that impediment to Railroad's operations such as use of runaround tracks or necessity for reduced speed is unavoidable, the Contractor shall schedule and conduct his operations so that such impediment is reduced to the absolute minimum.

C. Should conditions arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of the Railroad, the Contractor shall make such provisions. If in the judgment of the Railroad Engineer, or in his absence, the Railroad's Division Engineer, such provisions is insufficient, either may require or provide such provisions as he deems necessary. In any event, such unusual provisions shall be at the Contractor's expense and without cost to the Railroad or the Sponsor.

D. "One Call" Services do not locate buried Railroad utilities. The contractor shall contact the Railroad's representative 2 days in advance of work at those places where excavation, pile driving, or heavy loads may damage the Railroad's underground facilities. Upon request from the Contractor or Sponsor, Railroad forces will locate and paint mark or flag the Railroad's underground facilities. The Contractor shall avoid excavation or other disturbances of these facilities. If disturbance or excavation is required near a buried Railroad facility, the contractor shall coordinate with the Railroad to have the facility potholed manually with careful hand excavation. The facility shall be protected by the Contractor during the course of the disturbance under the supervision and direction of the Railroad's representative.

4. TRACK CLEARANCES:

A. The minimum track clearances to be maintained by the Contractor during construction are shown on the Project Plans. If temporary clearances are not shown on the project plans, the following criteria shall govern the use of falsework and formwork above or adjacent to operated tracks.

1. A minimum vertical clearance of 22'-0" above top of highest rail shall be maintained at all times.

2. A minimum horizontal clearance of 13'-0" from centerline of tangent track or 14'-0" from centerline of curved track shall be maintained at all times. Additional horizontal

clearance may be required in special cases to be safe for operating conditions. This additional clearance will be as determined by the Railroad Engineer.

3. All proposed temporary clearances which are less than those listed above must be submitted to Railroad Engineer for approval prior to construction and must also be authorized by the regulatory body of the State if less than the legally prescribed clearances.

4. The temporary clearance requirements noted above shall also apply to all other physical obstructions including, but not limited to: stockpiled materials, parked equipment, placement or driving of piles, and bracing or other construction supports.

B. Before undertaking any work within Railroad right-of-way, and before placing any obstruction over any track, the Contractor shall:

1. Notify the Railroad's representative at least 72 hours in advance of the work.

2. Receive assurance from the Railroad's representative that arrangements have been made for flagging service as may be necessary.

3. Receive permission from the Railroad's representative to proceed with the work.

4. Ascertain that the Sponsor's Engineer has received copies of notice to the Railroad and of the Railroad's response thereto.

5. CONSTRUCTION PROCEDURES:

A. General:

1. Construction work and operations by the Contractor on Railroad property shall be:

a. Subject to the inspection and approval of the Railroad Engineer or their designated Construction Engineering Representative.

b. In accordance with the Railroad's written outline of specific conditions.

c. In accordance with the Railroad's general rules, regulations and requirements including those relating to safety, fall protection and personal protective equipment.

d. In accordance with these Special Provisions.

2. Submittal Requirements

a. The Contractor shall submit all construction related correspondence and submittals electronically to the Railroad Engineer.

b. The Contractor shall allow for 30 days for the Railroad's review and response.

c. All work in the vicinity of the Railroad's property that has the potential to affect the Railroad's train operations or disturb the Railroad's Property must be submitted and approved by the Railroad prior to work being performed.

d. All submittals and calculations must be signed and sealed by a registered engineer licensed in the state of the project work.

e. All submittals shall first be approved by the Sponsor's Engineer and the Railroad Engineer, but such approval shall not relieve the Contractor from liability.

f. For all construction projects, the following submittals, but not limited to those listed below, shall be provided for review and approval when applicable:

(1) General Means and Methods
(2) Ballast Protection
(3) Construction Excavation & Shoring
(4) Pipe, Culvert, & Tunnel Installations
(5) Demolition Procedure
(6) Erection & Hoisting Procedure
(7) Debris Shielding or Containment
(8) Blasting
(9) Formwork for the bridge deck, diaphragms, overhang brackets, and protective platforms
(10) Bent Cap Falsework. A lift plan will be required if the contractor want to move the falsework over the tracks.

g. For Undergrade Bridges (Bridges carrying the Railroad) the following submittals in addition to those listed above shall be provided for review and approval:

(1) Shop Drawings
(2) Bearing Shop Drawings and Material Certifications
(3) Concrete Mix Design
(4) Structural Steel, Rebar, and/or Strand Certifications
(5) 28 day Cylinder Test for Concrete Strength
(6) Waterproofing Material Certification
(7) Test Reports for Fracture Critical Members
(8) Foundation Construction Reports

Fabrication may not begin until the Railroad has approved the required shop drawings.

h. The Contractor shall include in all submissions a detailed narrative indicating the progression of work with the anticipated timeframe to complete each task. Work will not be permitted to commence until the Contractor has provided the Railroad with a satisfactory plan that the project will be undertaken without scheduling, performance or safety related issues. Submission shall also provide a listing of the anticipated equipment to be used, the location of all equipment to be used and insure a contingency plan of action is in place should a primary piece of equipment malfunction.

B. Ballast Protection

1. The Contractor shall submit the proposed ballast protection system detailing the specific filter fabric and anchorage system to be used during all construction activities.

2. The ballast protection is to extend 25' beyond the proposed limit of work, be installed at the start of the project and be continuously maintained to prevent all contaminants from entering the ballast section of all tracks for the entire duration of the project.

C. Excavation:

1. The subgrade of an operated track shall be maintained with edge of berm at least 10'-0" from centerline of track and not more than 24-inches below top of rail. Contractor will not be required to make existing section meet this specification if substandard, in which case existing section will be maintained.

2. Additionally, the Railroad will require the installation of an OSHA approved handrail and orange construction safety fencing for all excavations of the Railroad right-of-way.

D. Excavation for Structures and Shoring Protection:

1. The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles or sheeting for footings adjacent to tracks to provide adequate lateral support for the tracks and the loads which they carry, without disturbance of track alignment and surface, and to avoid obstructing track clearances with working equipment, tools or other material.

2. All plans and calculations for shoring shall be prepared, signed, and sealed by a Registered Professional Engineer licensed in the state of the proposed project, in accordance with Norfolk Southern's Overhead Grade Separation Design Criteria, subsection H.1.6.E-Construction Excavation (Refer to Norfolk Southern Public Projects Manual Appendix H). The Registered Professional Engineer will be responsible for the accuracy for all controlling dimensions as well as the selection of soil design values which will accurately reflect the actual field conditions.

3. The Contractor shall provide a detailed installation and removal plan of the shoring components. Any component that will be installed via the use of a crane or any other lifting device shall be subject to the guidelines outlined in section 5.G of these provisions.

4. The Contractor shall be required to survey the track(s) and Railroad embankment and provide a cross section of the proposed excavation in relation to the tracks.

5. Calculations for the proposed shoring should include deflection calculations. The maximum deflection for excavations within 18'-0" of the centerline of the nearest track shall be 3/8". For all other cases, the max deflection shall not exceed ½".

6. Additionally, the Railroad will require the installation of an OSHA approved handrail and orange construction safety fencing for all excavations of the Railroad right-of-way.

7. The front face of shoring located to the closest NS track for all shoring set-ups located in Zone 2 as shown on NS Typical Drawing No. 4 – Shoring Requirements (Appendix I) shall remain in place and be cut off 2'-0" below the final ground elevation. The remaining shoring in Zone 2 and all shoring in Zone 1 may be removed and all voids must be backfilled with flowable fill.

E. Pipe, Culvert, & Tunnel Installations

1. Pipe, Culvert, & Tunnel Installations shall be in accordance with the appropriate Norfolk Southern Design Specification as noted below:

   a. For Open Cut Method refer to Norfolk Southern Public Projects Manual Appendix H.4.6.
   b. For Jack and Bore Method refer to Norfolk Southern Public Projects Manual Appendix H.4.7.
   c. For Tunneling Method refer to Norfolk Southern Public Projects Manual Appendix H.4.8.

2. The installation methods provided are for pipes carrying storm water or open flow run-off. All other closed pipeline systems shall be installed in accordance Norfolk Southern's Pipe and Wire Program and the NSCE-8

F. Demolition Procedures

1. General

   a. Demolition plans are required for all spans over the track(s), for all spans adjacent to the track(s), if located on (or partially on) Railroad right-of-way; and in all situations where cranes will be situated on, over, or adjacent to Railroad right-of-way and within a distance of the boom length plus 15'-0" from the centerline of track.

   b. Railroad tracks and other Railroad property must be protected from damage during the procedure.

   c. A pre-demolition meeting shall be conducted with the Sponsor, the Railroad Engineer or their representative, and the key Contractor's personnel prior to the start of the demolition procedure.

   d. The Railroad Engineer or his designated representative must be present at the site during the entire demolition procedure period.

   e. Existing, obsolete, bridge piers shall be removed to a sufficient depth below grade to enable restoration of the existing/proposed track ditch, but in no case less than 2'-0" below final grade.

2. Submittal Requirements

   a. In addition to the submittal requirements outlined in Section 5.A.2 of these provisions, the Contractor shall submit the following for approval by the Railroad Engineer:

      (1) A plan showing the location of cranes, horizontally and vertically, operating radii, with delivery or disposal locations shown. The location of all tracks and other Railroad facilities as well as all obstructions such as wire lines, poles, adjacent structures, etc. must also be shown.

(2) Rating sheets showing cranes or lifting devices to be adequate for 150% of the actual weight of the pick, including all rigging components. A complete set of crane charts, including crane, counterweight, and boom nomenclature is to be submitted. Safety factors that may have been "built-in" to the crane charts are not to be considered when determining the 150% factor of safety.

(3) Plans and computations showing the weight of the pick must be submitted. Calculations shall be made from plans of the existing structure showing complete and sufficient details with supporting data for the demolition the structure. If plans do not exist, lifting weights must be calculated from field measurements. The field measurements are to be made under the supervision of the Registered Professional Engineer submitting the procedure and calculations.

(4) The Contractor shall provide a sketch of all rigging components from the crane's hook block to the beam. Catalog cuts or information sheets of all rigging components with their lifting capacities shall be provided. All rigging must be adequate for 150% of the actual weight of the pick. Safety factors that may have been "built-in" to the rating charts are not to be considered when determining the 150% factor of safety. All rigging components shall be clearly identified and tagged with their rated lifting capacities. The position of the rigging in the field shall not differ from what is shown on the final plan without prior review from the Sponsor and the Railroad.

(5) A complete demolition procedure, including the order of lifts, time required for each lift, and any repositioning or re-hitching of the crane or cranes.

(6) Design and supporting calculations for the temporary support of components, including but not limited to the stability of the superstructure during the temporary condition, temporary girder tie-downs and falsework.

3. Overhead Demolition Debris Shield

a. The demolition debris shield shall be installed prior to the demolition of the bridge deck or other relevant portions of the superstructure over the track area to catch all falling debris.

b. The demolition debris shield shall provide a minimum vertical clearance as specified in Section 4.A.1 of these provisions or maintain the existing vertical clearance if the existing clearance is less than that specified in Section 4.A.1.

c. The Contractor shall include the demolition debris shield installation/removal means and methods as part of the proposed Demolition procedure submission.

d. The Contractor shall submit the demolition debris shield design and supporting calculations for approval by the Railroad Engineer.

e. The demolition debris shield shall have a minimum design load of 50 pounds per square foot plus the weight of the equipment, debris, personnel, and other loads to be carried.

f. The Contractor shall include the proposed bridge deck removal procedure in its demolition means and methods and shall verify that the size and quantity of the demolition debris generated by the procedure does not exceed the shield design loads.

g. The Contractor shall clean the demolition debris shield daily or more frequently as dictated either by the approved design parameters or as directed by the Railroad Engineer.

4. Vertical Demolition Debris Shield

a. A vertical demolition debris shield may be required for substructure removals in close proximity to the Railroad's track and other facilities, as determined by the Railroad Engineer.

G. Erection & Hoisting Procedures

1. General

a. Erection plans are required for all spans over the track(s), for all spans adjacent to the track(s), if located on (or partially on) Railroad right-of-way; and in all situations where cranes will be situated on, over, or adjacent to Railroad right-of-way and within a distance of the boom length plus 15'-0" from the centerline of track.

b. Railroad tracks and other Railroad property must be protected from damage during the erection procedure.

c. A pre-erection meeting shall be conducted with the Sponsor, the Railroad Engineer or their representative, and the key Contractor's personnel prior to the start of the erection procedure.

d. The Railroad Engineer or his designated representative must be present at the site during the entire erection procedure period.

e. For field splices located over Railroad property, a minimum of 50% of the holes for each connection shall be filled with bolts or pins prior to releasing the crane. A minimum of 50% of the holes filled shall be filled with bolts. All bolts must be appropriately tightened. Any changes to previously approved field splice locations must be submitted to the Railroad for review and approval. Refer to Norfolk Southern's Overhead Grade Separation Design Criteria for additional splice details (Norfolk Southern Public Projects Manual Appendix H.1, Section 4.A.3.).

2. Submittal Requirements

a. In addition the submittal requirements outlined in Section 5.A.2 of these provisions, the Contractor shall submit the following for approval by the Railroad Engineer:

(1) As-built beam seat elevations - All as-built bridge seats and top of rail elevations shall be furnished to the Railroad Engineer for review and verification at least 30 days in advance of the erection, to ensure that minimum vertical clearances as approved in the plans will be achieved.

(2) A plan showing the location of cranes, horizontally and vertically, operating radii, with delivery or staging locations shown. The location of all tracks and other Railroad facilities as well as all obstructions such as wire lines, poles, adjacent structures, etc. must also be shown.

(3) Rating sheets showing cranes or lifting devices to be adequate for 150% of the actual weight of the pick, including all rigging components. A complete set of crane charts, including crane, counterweight, and boom nomenclature is to be submitted. Safety factors that may have been "built-in" to the crane charts are not to be considered when determining the 150% factor of safety.

(4) Plans and computations showing the weight of the pick must be submitted. Calculations shall be made from plans of the proposed structure showing complete and sufficient details with supporting data for the erection of the structure. If plans do not exist, lifting weights must be calculated from field measurements. The field measurements are to be made under the supervision of the Registered Professional Engineer submitting the procedure and calculations.

(5) The Contractor shall provide a sketch of all rigging components from the crane's hook block to the beam. Catalog cuts or information sheets of all rigging components with their lifting capacities shall be provided. All rigging must be adequate for 150% of the actual weight of the pick. Safety factors that may have been "built-in" to the rating charts are not to be considered when determining the 150% factor of safety. All rigging components shall be clearly identified and tagged with their rated lifting capacities. The position of the rigging in the field shall not differ from what is shown on the final plan without prior review from the Sponsor and the Railroad.

(6) A complete erection procedure, including the order of lifts, time required for each lift, and any repositioning or re-hitching of the crane or cranes.

(7) Design and supporting calculations for the temporary support of components, including but not limited to temporary girder tie-downs and falsework.

H. Blasting:

1. The Contractor shall obtain advance approval of the Railroad Engineer and the Sponsor Engineer for use of explosives on or adjacent to Railroad property. The request for permission to use explosives shall include a detailed blasting plan. If permission for use of explosives is granted, the Contractor will be required to comply with the following:

    a. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Contractor and a licensed blaster.

    b. Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way radios.

    c. No blasting shall be done without the presence of the Railroad Engineer or his authorized representative. At least 72 hours advance notice to the person designated in the Railroad's notice of authorization to proceed (see paragraph 2.B) will be required to arrange for the presence of an authorized Railroad representative and such flagging as the Railroad may require.

    d. Have at the job site adequate equipment, labor and materials and allow sufficient time to clean up debris resulting from the blasting without delay to trains, as well as correcting at his expense any track misalignment or other damage to Railroad property resulting from the blasting as directed by the Railway's authorized representative. If his actions result in delay of trains, the Contractor shall bear the entire cost thereof.

    e. The blasting Contractor shall have a copy of the approved blasting plan on hand while on the site.

    f. Explosive materials or loaded holes shall not be left unattended at the blast site.

    g. A seismograph shall be placed on the track shoulder adjacent to each blast which will govern the peak particle velocity of two inches per second. Measurement shall also be taken on the ground adjacent to structures as designated by a qualified and independent blasting consultant. The Railroad reserves the option to direct the placement of additional seismographs at structures or other locations of concern, without regard to scaled distance.

    h. After each blast, the blasting Contractor shall provide a copy of their drill log and blast report, which includes number of holes, depth of holes, number of decks, type and pounds of explosives used per deck.

    i. The Railroad may require top of rail elevations and track centers taken before, during and after the blasting and excavation operation to check for any track misalignment resulting from the Contractor's activities.

2. The Railroad representative will:

   a. Determine approximate location of trains and advise the Contractor the appropriate amount of time available for the blasting operation and clean up.

   b. Have the authority to order discontinuance of blasting if, in his opinion, blasting is too hazardous or is not in accord with these special provisions.

3. The Contractor must hire, at no expense to the Railroad, a qualified and independent blasting consultant to oversee the use of explosives. The blasting consultant will:

   a. Review the Contractor's proposed drilling and loading patterns, and with the blasting consultant's personnel and instruments, monitor the blasting operations.

   b. Confirm that the minimum amounts of explosives are used to remove the rock.

   c. Be empowered to intercede if he concludes that the Contractor's blasting operations are endangering the Railway.

   d. Submit a letter acknowledging that he has been engaged to oversee the entire blasting operation and that he approves of the blasting plan.

   e. Furnish copies of all vibration readings to the Railroad representative immediately after each blast. The representative will sign and date the seismograph tapes after each shot to verify the readings are for that specific shot.

   f. Advise the Railroad representative as to the safety of the operation and notify him of any modifications to the blasting operation as the work progresses.

4. The request for permission to use explosives on the Railroad's Right-of-Way shall include a blasting proposal providing the following details:

   a. A drawing which shows the proposed blasting area, location of nearest hole and distance to Railway structures, all with reference to the centerline of track.

   b. Hole diameter.

   c. Hole spacing and pattern.

   d. Maximum depth of hole.

   e. Maximum number of decks per hole.

   f. Maximum pounds of explosives per hole.

   g. Maximum pounds of explosives per delay.

   h. Maximum number of holes per detonation.

i. Type of detonator and explosives to be used. (Electronic detonating devices will not be permitted). Diameter of explosives if different from hole diameter.

j. Approximate dates and time of day when the explosives are to be detonated.

k. Type of flyrock protection.

l. Type and patterns of audible warning and all clear signals to be used before and after each blast.

m. A copy of the blasting license and qualifications of the person directly in charge of the blasting operation, including their name, address and telephone number.

n. A copy of the Authority's permit granting permission to blast on the site.

o. A letter from the blasting consultant acknowledging that he has been engaged to oversee the entire blasting operation and that he approves of the blasting plan.

p. In addition to the insurance requirements outlined in Paragraph 14 of these Provisions, A certificate of insurance from the Contractor's insurer stating the amount of coverage for XCU (Explosive Collapse and Underground Hazard) insurance and that XCU Insurance is in force for this project.

q. A copy of the borings and Geotechnical information or report.

I. Track Monitoring

1. At the direction of the Railroad Engineer, any activity that has the potential to disturb the Railroad track structure may require the Contractor to submit a detailed track monitoring program for approval by the Railroad Engineer.

2. The program shall specify the survey locations, the distance between the location points, and frequency of monitoring before, during, and after construction. Railroad reserves the right to modify the survey locations and monitoring frequency as necessary during the project.

3. The survey data shall be collected in accordance with the approved frequency and immediately furnished to the Railroad Engineer for analysis.

4. If any movement has occurred as determined by the Railroad Engineer, the Railroad will be immediately notified. Railroad, at its sole discretion, shall have the right to immediately require all Contractor operations to be ceased and determine what corrective action is required. Any corrective action required by the Railroad or performed by the Railroad including the monitoring of corrective action of the Contractor will be at project expense.

J. Maintenance of Railroad Facilities:

1. The Contractor will be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from his operations and provide and maintain any erosion control measures as required. The Contractor will promptly

repair eroded areas within Railroad rights-of-way and repair any other damage to the property of the Railroad or its tenants.

2. If, in the course of construction, it may be necessary to block a ditch, pipe or other drainage facility, temporary pipes, ditches or other drainage facilities shall be installed to maintain adequate drainage, as approved by the Railroad Engineer. Upon completion of the work, the temporary facilities shall be removed and the permanent facilities restored.

3. All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

K. Storage of Materials and Equipment:

1. Materials and equipment shall not be stored where they will interfere with Railroad operations, nor on the rights-of-way of the Railroad without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.

2. All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Railroad, and any associated, controlled or affiliated corporation, harmless from and against all losses, costs, expenses, claim or liability for loss or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

L. Cleanup:

1. Upon completion of the work, the Contractor shall remove from within the limits of the Railroad rights-of-way, all machinery, equipment, surplus materials, falsework, rubbish or temporary buildings of the Contractor, and leave said rights-of-way in a neat condition satisfactory to the Railroad Engineer or his authorized representative.

6. DAMAGES:

A. The Contractor shall assume all liability for any and all damages to his work, employees, servants, equipment and materials caused by Railroad traffic.

B. Any cost incurred by the Railroad for repairing damages to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid directly to the Railroad by the Contractor.

7. FLAGGING SERVICES:

A. Requirements:

1. Flagging services will not be provided until the Contractor's insurance has been reviewed & approved by the Railroad.

2. Under the terms of the agreement between the Sponsor and the Railroad, the Railroad has sole authority to determine the need for flagging required to protect its operations. In general, the requirements of such services will be whenever the Contractor's personnel or equipment are or are likely to be, working on the Railroad's right-of-way, or across, over, adjacent to, or under a track, or when such work has disturbed or is likely to disturb a Railroad structure or the Railroad roadbed or surface and alignment of any track to such extent that the movement of trains must be controlled by flagging.

3. Normally, the Railroad will assign one flagman to a project; but in some cases, more than one may be necessary, such as yard limits where three (3) flagmen may be required. However, if the Contractor works within distances that violate instructions given by the Railroad's authorized representative or performs work that has not been scheduled with the Railroad's authorized representative, a flagman or flagmen may be required full time until the project has been completed.

4. For Projects exceeding 30 days of construction, Contractor shall provide the flagmen a small work area with a desk/counter and chair within the field/site trailer, including the use of bathroom facilities, where the flagman can check in/out with the Project, as well as to the flagman's home terminal. The work area should provide access to two (2) electrical outlets for recharging radio(s), and a laptop computer; and have the ability to print off needed documentation and orders as needed at the field/site trailer. This should aid in maximizing the flagman's time and efficiency on the Project.

B. Scheduling and Notification:

1. The Contractor's work requiring Railroad flagging should be scheduled to limit the presence of a flagman at the site to a maximum of 50 hours per week. The Contractor shall receive Railroad approval of work schedules requiring a flagman's presence in excess of 40 hours per week.

2. Not later than the time that approval is initially requested to begin work on Railroad right-of-way, Contractor shall furnish to the Railroad and the Sponsor a schedule for all work required to complete the portion of the project within Railroad right-of-way and arrange for a job site meeting between the Contractor, the Sponsor, and the Railroad's authorized representative. Flagman or Flagmen may not be provided until the job site meeting has been conducted and the Contractor's work scheduled.

3. The Contractor will be required to give the Railroad representative at least 10 working days of advance written notice of intent to begin work within Railroad right-of-way in accordance with this special provision. Once begun, when such work is then suspended at any time, or for any reason, the Contractor will be required to give the Railroad representative at least 3 working days of advance notice before resuming work on Railroad right-of-way. Such notices shall include sufficient details of the proposed work to enable the Railroad representative to determine if flagging will be required. If such notice is in writing, the Contractor shall furnish the Engineer a copy; if notice is given verbally, it shall be confirmed in writing with copy to the Engineer. If flagging is required, no work shall be undertaken until the flagman, or flagmen are present at the job site. It may take up to 30 days to obtain flagging initially from the Railroad. When flagging begins, the flagman is usually assigned by the Railroad to work at the project site on a continual basis until no longer

needed and cannot be called for on a spot basis. If flagging becomes unnecessary and is suspended, it may take up to 30 days to again obtain from the Railroad. Due to Railroad labor agreements, it is necessary to give 5 working days notice before flagging service may be discontinued and responsibility for payment stopped.

4. If, after the flagman is assigned to the project site, an emergency arises that requires the flagman's presence elsewhere, then the Contractor shall delay work on Railroad right-of-way until such time as the flagman is again available. Any additional costs resulting from such delay shall be borne by the Contractor and not the Sponsor or Railroad.

C. Payment:

1. The Sponsor will be responsible for paying the Railroad directly for any and all costs of flagging which may be required to accomplish the construction.

2. The estimated cost of flagging is the current rate per day based on a 10-hour work day. This cost includes the base pay for the flagman, overhead, and includes a per diem charge for travel expenses, meals and lodging. The charge to the Sponsor by the Railroad will be the actual cost based on the rate of pay for the Railroad's employees who are available for flagging service at the time the service is required.

3. Work by a flagman in excess of 8 hours per day or 40 hours per week, but not more than 12 hours a day will result in overtime pay at 1 and 1/2 times the appropriate rate. Work by a flagman in excess of 12 hours per day will result in overtime at 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2 and 1/2 times the normal rate.

4. Railroad work involved in preparing and handling bills will also be charged to the Sponsor. Charges to the Sponsor by the Railroad shall be in accordance with applicable provisions of Subchapter B, Part 140, Subpart I and Subchapter G, Part 646, Subpart B of the Federal-Aid Policy Guide issued by the Federal Highway Administration on December 9, 1991, including all current amendments. Flagging costs are subject to change. The above estimates of flagging costs are provided for information only and are not binding in any way.

D. Verification:

1. Railroad's flagman will electronically enter flagging time via Railroad's electronic billing system. Any complaints concerning flagging must be resolved in a timely manner. If the need for flagging is questioned, please contact the Railroad Engineer. All verbal complaints will be confirmed in writing by the Contractor within 5 working days with a copy to the Sponsor's Engineer. Address all written correspondence electronically to Railroad Engineer.

2. The Railroad flagman assigned to the project will be responsible for notifying the Sponsor Engineer upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he performs such services for each separate period that services are provided. The Sponsor's Engineer will document such notification in the project records. When requested, the Sponsor's Engineer will also sign the flagman's diary showing daily time spent and activity at the project site.

8. HAUL ACROSS RAILROAD TRACK:

   A. Where the plans show or imply that materials of any nature must be hauled across Railroad's track, unless the plans clearly show that the Sponsor has included arrangements for such haul in its agreement with the Railroad, the Contractor will be required to make all necessary arrangements with the Railroad regarding means of transporting such materials across the Railroad's track. The Contractor or Sponsor will be required to bear all costs incidental to such crossings whether services are performed by his own forces or by Railroad personnel.

   B. No crossing may be established for use of the Contractor for transporting materials or equipment across the tracks of the Railroad unless specific authority for its installation, maintenance, necessary watching and flagging thereof and removal, until a temporary private crossing agreement has been executed between the Contractor and Railroad. The approval process for an agreement normally takes 90 days.

9. WORK FOR THE BENEFIT OF THE CONTRACTOR:

   A. All temporary or permanent changes in wire lines or other facilities which are considered necessary to the project are shown on the plans; included in the force account agreement between the Sponsor and the Railroad or will be covered by appropriate revisions to same which will be initiated and approved by the Sponsor and/or the Railroad.

   B. Should the Contractor desire any changes in addition to the above, then he shall make separate arrangements with the Railroad for same to be accomplished at the Contractor's expense.

10. COOPERATION AND DELAYS:

   A. It shall be the Contractor's responsibility to arrange a schedule with the Railroad for accomplishing stage construction involving work by the Railroad or tenants of the Railroad. In arranging his schedule he shall ascertain, from the Railroad, the lead time required for assembling crews and materials and shall make due allowance therefore.

   B. No charge or claim of the Contractor against either the Sponsor or the Railroad will be allowed for hindrance or delay on account of railroad traffic; any work done by the Railroad or other delay incident to or necessary for safe maintenance of railroad traffic or for any delays due to compliance with these special provisions.

11. TRAINMAN'S WALKWAYS:

   A. Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than 10 feet from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while Railroad's protective service is provided shall be removed before the close of each work day. If there is any excavation near the walkway, a handrail, with 10'-0" minimum clearance from centerline of track, shall be placed and must conform to AREMA and/or FRA standards.

12. GUIDELINES FOR PERSONNEL ON RAILROAD RIGHT-OF-WAY:

   A. The Contractor and/or the Sponsor's personnel authorized to perform work on Railroad's property as specified in Section 2 above are not required to complete Norfolk Southern Roadway

Worker Protection Training; However the Contractor and the Sponsor's personnel must be familiar with Norfolk Southern's standard operating rules and guidelines, should conduct themselves accordingly, and may be removed from the property for failure to follow these guidelines.

B. All persons shall wear hard hats. Appropriate eye and hearing protection must be used. Working in shorts is prohibited. Shirts must cover shoulders, back and abdomen. Working in tennis or jogging shoes, sandals, boots with high heels, cowboy and other slip-on type boots is prohibited. Hard-sole, lace-up footwear, zippered boots or boots cinched up with straps which fit snugly about the ankle are adequate. Wearing of safety boots is strongly recommended. In the vicinity of at-grade crossings, it is strongly recommended that reflective vests be worn.

C. No one is allowed within 25' of the centerline of track without specific authorization from the flagman.

D. All persons working near track while train is passing are to lookout for dragging bands, chains and protruding or shifted cargo.

E. No one is allowed to cross tracks without specific authorization from the flagman.

F. All welders and cutting torches working within 25' of track must stop when train is passing.

G. No steel tape or chain will be allowed to cross or touch rails without permission from the Railroad.

13. GUIDELINES FOR EQUIPMENT ON RAILROAD RIGHT-OF-WAY:

A. No crane or boom equipment will be allowed to set up to work or park within boom distance plus 15' of centerline of track without specific permission from Railroad official and flagman.

B. No crane or boom equipment will be allowed to foul track or lift a load over the track without flag protection and track time.

C. All employees will stay with their machines when crane or boom equipment is pointed toward track.

D. All cranes and boom equipment under load will stop work while train is passing (including pile driving).

E. Swinging loads must be secured to prevent movement while train is passing.

F. No loads will be suspended above a moving train.

G. No equipment will be allowed within 25' of centerline of track without specific authorization of the flagman.

H. Trucks, tractors or any equipment will not touch ballast line without specific permission from Railroad official and flagman. Orange construction fencing may be required as directed.

I. No equipment or load movement within 25' or above a standing train or Railroad equipment without specific authorization of the flagman.

J. All operating equipment within 25' of track must halt operations when a train is passing. All other operating equipment may be halted by the flagman if the flagman views the operation to be dangerous to the passing train.

K. All equipment, loads and cables are prohibited from touching rails.

L. While clearing and grubbing, no vegetation will be removed from Railroad embankment with heavy equipment without specific permission from the Railroad Engineer and flagman.

M. No equipment or materials will be parked or stored on Railroad's property unless specific authorization is granted from the Railroad Engineer.

N. All unattended equipment that is left parked on Railroad property shall be effectively immobilized so that it cannot be moved by unauthorized persons.

O. All cranes and boom equipment will be turned away from track after each work day or whenever unattended by an operator.

P. Prior to performing any crane operations, the Contractor shall establish a single point of contact for the Railroad flagman to remain in communication with at all times. Person must also be in direct contact with the individual(s) directing the crane operation(s).

14. INSURANCE:

A. In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the Prime Contractor will be required to carry insurance of the following kinds and amounts:

1. a. Commercial General Liability Insurance having a combined single limit of not less than $2,000,000 per occurrence for all loss, damage, cost and expense, including attorneys' fees, arising out of bodily injury liability and property damage liability during the policy period. Said policy shall include explosion, collapse, and underground hazard (XCU) coverage, shall be endorsed to name Railroad specified in item A.2.c. below both as the certificate holder and as an additional insured, and shall include a severability of interests provision.

b. Automobile Liability Insurance with a combined single limit of not less than $1,000,000 each occurrence for injury to or death of persons and damage to or loss or destruction of property. Said policy or policies shall be endorsed to name Railroad specified in item A.2.c. below both as the certificate holder and as an additional insured and shall include a severability of interests provision.

2. Railroad Protective Liability Insurance having a combined single limit of not less than $2,000,000 each occurrence and $6,000,000 in the aggregate applying separately to each annual period. If the project involves track over which passenger trains operate, the insurance limits required are not less than a combined single limit of $5,000,000 each occurrence and $10,000,000 in the aggregate applying separately to each annual period. Said policy shall provide coverage for all loss, damage or expense arising from

bodily injury and property damage liability, and physical damage to property attributed to acts or omissions at the job site.

The standards for the Railroad Protective Liability Insurance are as follows:

a. The insurer must be rated A- or better by A.M. Best Company, Inc. **NOTE: NS does not accept from insurers Chartis (AIG or Affiliated Company including Lexington Insurance Company), Hudson Group or Liberty or Affiliated Company, American Contractors Insurance Company and Erie Insurance Company including Erie Insurance Exchange and Erie Indemnity Company.**

b. The policy must be written using one of the following combinations of Insurance Services Office ("ISO") Railroad Protective Liability Insurance Form Numbers:
   (1) CG 00 35 01 96 and CG 28 31 10 93; or
   (2) CG 00 35 07 98 and CG 28 31 07 98; or
   (3) CG 00 35 10 01; or
   (4) CG 00 35 12 04; or
   (5) CG 00 35 12 07; or
   (6) CG 00 35 04 13.

c. The named insured shall read:

   Norfolk Southern Corporation and its subsidiaries
   Three Commercial Place
   Norfolk, Virginia 23510-2191
   Attn: Risk Manager

   **(NOTE: Railroad does not share coverage on RRPL with any other entity on this policy)**

d. The description of operations must appear on the Declarations, must match the project description in this agreement, and must include the appropriate Sponsor project and contract identification numbers.

e. The job location must appear on the Declarations and must include the city, state, and appropriate highway name/number. **NOTE: Do not include any references to milepost, valuation station, or mile marker on the insurance policy.**

f. The name and address of the prime Contractor must appear on the Declarations.

g. The name and address of the Sponsor must be identified on the Declarations as the "Involved Governmental Authority or Other Contracting Party."

h. Endorsements/forms that rea **required** are:

(1) Physical Damage to Property Amendment
(2) Terrorism Risk Insurance Act (TRIA) coverage must be included

i. Other endorsements/forms that will be accepted are:
(1) Broad Form Nuclear Exclusion – Form IL 00 21
(2) 30-day Advance Notice of Non-renewal or cancellation
(3) Required State Cancellation Endorsement
(4) Quick Reference or Index Form CL/IL 240

j. Endorsements/forms that are NOT acceptable are:
(1) Any Pollution Exclusion Endorsement except CG 28 31
(2) Any Punitive or Exemplary Damages Exclusion
(3) Known injury or Damage Exclusion form CG 00 59
(4) Any Common Policy Conditions form
(5) An Endorsement that limits or excludes Professional Liability coverage
(6) A Non-Cumulation of Liability or Pyramiding of Limits Endorsement
(7) An Endorsement that excludes TRIA coverage
(8) A Sole Agent Endorsement
(9) Any type of deductible endorsement or amendment
(10) Any other endorsement/form not specifically authorized in item no. 2.h above.

B. If any part of the work is sublet, similar insurance, and evidence thereof as specified in A.1 above, shall be provided by or on behalf of the subcontractor to cover its operations on Railroad's right of way.

C. All insurance required under the preceding subsection A shall be underwritten by insurers and be of such form and content, as may be acceptable to the Company. Prior to entry on Railroad right-of-way, the original electronic Railroad Protective Liability Insurance Policy shall be submitted by the Prime Contractor to the Department at the address below for its review and transmittal to the Railroad. In addition, certificates of insurance evidencing the Prime Contractor's and any subcontractors' Commercial General Liability Insurance shall be issued to the Railroad and the Department at the addresses below, and forwarded to the Department for its review and transmittal to the Railroad. The certificates of insurance shall state that the insurance coverage will not be suspended, voided, canceled, or reduced in coverage or limits without (30) days advance written notice to Railroad and the Department. No work will be permitted by Railroad on its right-of-way until it has reviewed and approved the evidence of insurance required herein.

SPONSOR:

RAILROAD:
Risk Management
Norfolk Southern Corporation and its subsidiaries
Three Commercial Place
Norfolk, Virginia 23510-2191
NSRISK3@NSCORP.COM

D. The insurance required herein shall in no way serve to limit the liability of Sponsor or its Contractors under the terms of this agreement.

E. Insurance Submission Procedures

1. Railroad will only accept initial insurance submissions via email to NSRISK3@NSCORP.COM. Railroad will NOT accept initial insurance submissions via hard copies that would be sent either US Mail or Overnight carrier or faxes as only electronic versions only are to be submitted to Railroad. **Please provide point of contact information with the submission including a phone number and email address.**

2. Railroad requires the following two (2) forms of insurance in the initial electronic insurance submission to NSRISK3@NSCORP.COM to be submitted under a cover letter providing details of the project and containing the contact information:

   a. The full original or certified true electronic countersigned copy of the railroad protective liability insurance policy in its entirely inclusive of all declarations, schedule of forms and endorsements along with the policy forms and endorsements.

   b. The Contractor's commercial general, automobile, and workers' compensation liability insurance certificate of liability insurance evidencing a combined single limit of a minimum of $2M per occurrence of general and $1M per occurrence of automobile liability insurance naming Norfolk Southern Corporation and its subsidiaries, Three Commercial Place, Norfolk, VA 23510 as the certificate holder and as an additional insured on both the general and automobile liability insurance policy.

3. It should be noted that the Railroad does not accept notation of Railroad Protective insurance on a certificate of liability insurance form or Binders as Railroad must have the full original or certified true electronic countersigned policy. Further, please note that mere receipt of the policy is not the only issue but review for compliance. Due to the number of projects system-wide, it typically takes a minimum of 30-45 days for the Railroad to review.

15. FAILURE TO COMPLY:

A. In the event the Contractor violates or fails to comply with any of the requirements of these Special Provisions:

   1. The Railroad Engineer may require that the Contractor vacate Railroad property.

   2. The Sponsor's Engineer may withhold all monies due the Contractor on monthly statements.

B. Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Sponsor's Engineer.

16. PAYMENT FOR COST OF COMPLIANCE:

A. No separate payment will be made for any extra cost incurred on account of compliance with these special provisions. All such costs shall be included in prices bid for other items of the work as specified in the payment items.

Norfolk Southern Railway Company

17. PROJECT INFORMATION
    A. Date: _____
    B. NS File No.: _____
    C. NS Milepost: _____
    D. Sponsor's Project No.: _____

## PIPE DRAINS (SPECIAL)

**Description:** This work shall consist of constructing pipe drains of the required diameter according to Sections 601 of the SSRBC at locations shown on the plans or as directed by the Engineer, except that the materials shall be as specified on the detail in the plans.

**General:**

A. Pipe shall be limited to Smooth Steel Pipe.

B. The steel pipe shall conform to ASTM Specifications A 139 Grade B (No Hydro). The minimum yield strength of this pipe shall be 35,000 psi. The minimum wall thickness is as follows:

| Normal Size (Inches) | Minimum Wall Thickness (Inches) |
|---|---|
| 12 | 0.250 |
| 15 | 0.3125 |
| 18 | 0.3125 |
| 24 | 0.4375 |

C. The pipe shall be coated externally with coal tar epoxy or bituminous asphalt. The pipe shall be shop cut with ends square with centerline, leveled and welded so that the entire length of the pipe shall be straight and true. Weld seams in the field shall be field applied with coal tar epoxy or bituminous asphalt.

Pipe Connections

Smooth steel pipe and pipe connected by welding using a full depth, single "V" groove butt weld. Welding shall be performed by skilled welders, welding operators, and tackers who have had adequate experience in the type of materials to be used. Welders shall be qualified under the provisions of ANSI/AWS D1.1 by an independent local, approved testing agency not more than 6 months prior to commencing work on the pipe. Machines and electrodes similar to those used in the work shall be used in qualifications test. The Contractor shall be responsible for all material and bear the expense of qualifying welders.

Trenches for pipe drains (special) shall be backfilled with sub-ballast or with material meeting the requirements of Section 208 of the SSRBC.

At locations noted on the plans, the pipe drains will be constructed in stages. The pipe connection between stages shall be field welded.

**Basis of Payment:** This work including all elbows, tees, wyes, connections and backfill shall be paid for at the contract unit price per foot for PIPE DRAINS (SPECIAL) of the diameter specified.

**PIPE UNDERDRAINS 6" (MODIFIED)**

**Description:** This work shall consist of constructing a perforated pipe encased in fabric, of the required diameter within a trench filled with aggregate according to Section 601 of the SSRBC at locations shown on the plans or as directed by the Engineer. Work shall also consist of removal and proper disposal of the underdrain pipes in the construction stage indicated on the plans.

**General:** The materials shown in the plans, including all elbows, tees, wyes, backfill, and connections to pipe drain outlets shall be included in the cost for the work. All excavation, labor, equipment, and materials necessary for completing the work shall be included in the cost for PIPE UNDERDRAINS 6" (MODIFIED).

**Basis of Payment:** This work shall be paid for at the contract unit price per foot for PIPE UNDERDRAINS 6" (MODIFIED).

**PIPE UNDERDRAINS, TYPE 2**

**Description:** This work shall consist of constructing pipe underdrains of the required diameter within a trench filled with aggregate according to Section 601 of the SSRBC and the details included in the plans at locations shown on the plans or as directed by the Engineer.

**General:** The materials shown in the plans, including all cleanouts, cleanout covers, elbows, tees, wyes, geotechnical fabric, and backfill shall be included in the cost for the work. All excavation, labor, equipment and materials necessary for completing the work shall be included in the cost for PIPE UNDERDRAINS, TYPE 2 of the diameter specified.

**Method of Measurement:** Measurement of payment shall be in accordance with paragraph 601.07. The vertical segments of pipe underdrains will be measured for payment along with the horizontal segments.

**Basis of Payment:** This work shall be paid for at the contract unit price per foot for PIPE UNDERDRAINS, TYPE 2 of the diameter specified.

**REMOVE EXISTING UNDERDRAINS**

**Description:** This work shall be performed at the locations noted in the plans in accordance with the applicable portions of Section 551 of the Standard Specifications in addition to the following requirements.

**Construction Requirements:** Designated railroad underdrains as noted on the plans, shall be removed.

**Method of Measurement:** Designated railroad underdrains as noted in the plans, shall be measured, and paid. Other existing underdrains that are not quantified for removal will not be measured and paid.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for REMOVE EXISTING UNDERDRAINS.

## SUB-BALLAST

**Description:** This work shall consist of furnishing, placing, and compacting sub-ballast on the prepared subgrade at locations shown on the plans.

**General:** Work and material shall conform to the requirements of Section 311 of the SSRBC for Subbase Granular Material, Type A with the following modifications:

1. The maximum lift thickness shall be 6 in.

2. The compaction requirement shall be not less than 100 percent of the standard laboratory density.

3. The material shall be crushed stone in accordance with Article 1004.04 of the SSRBC.

4. The gradation shall be CA-6 in accordance with Article 1004.04 of the SSRBC, except that the gradation of the No. 200 sieve shall be 3-8 percent.

**Submittals:** Submittals shall be made in accordance with Section 106 of the SSRBC and the Bureau of Materials and Physical Research's Policy Memorandum "Aggregate Gradation Control System". Weekly stockpile/loadout tests shall be submitted to the Engineer.

**Basis of Payment:** This work shall be paid for at the contract unit price per cubic yard for SUB-BALLAST.

## TRACK REMOVAL

**Description:** This work shall be in accordance with this Special Provision.

Track material shall be removed during the proper stage of construction and in locations shown on the plans. Contractor shall coordinate the limits and sequencing of all track material removal with Norfolk Southern (NS) during each stage of construction so that NS operations are not impeded.

Track material includes rails, cross ties, tie plates, spikes, joint bars, rail anchors, frogs, switches and appurtenances, and other track material. No cutting of rails will be allowed unless approved by the Engineer.

Track material within the designated limits of removal, as shown on the plans or modified by the Engineer, shall become the property of the Contractor and shall be removed from the project area and salvaged or properly disposed of.

Contractor will be responsible for shaping, smoothing, and compacting the roadbed after removal of track or turnouts. The roadbed shall be free of ruts and depressions and shaped to allow for proper drainage. Cost for this work shall be included in the cost of TRACK REMOVAL.

Removal of pavement and sidewalk within tie width shall be included in the cost of TRACK REMOVAL.

**General:** This work will include all labor, materials and equipment required to dismantle and remove track and turnouts from locations shown on the plans, or as directed by the Engineer.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for TRACK REMOVAL.

## WOVEN WIRE FENCE

**Description:** This work shall be in accordance with Section 665 of the Standard Specifications except that the barbed wire shall be omitted, and the design number of the fence fabric shall be either 1047-6-11 or 1047-6-12 ½.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for WOVEN WIRE FENCE of the height specified, and at the contract unit price per each for WOVEN WIRE GATES of the opening sizes specified.

## WOVEN WIRE FENCE AND GATES

**Description:** This work shall consist of installing woven wire fence and gates according to Section 665 of the SSRBC at locations shown on the plans or as directed by the Engineer. The fence and gates shall be installed at the beginning at the project prior to the initial grading of railway embankment. The Contractor shall maintain and avoid damaging the fence and gates during construction. Any maintenance required or damage to the fence or gates by the Contractor during construction shall be repaired to the satisfaction of the Engineer at no additional cost to the contract.

## STRUCTURAL

## CONCRETE STRUCTURES

**General:** Except as otherwise specified hereafter, the current Standard Specifications for Road and Bridge Construction, Section 503 – Concrete Structures, shall apply to all work under this section.

**Material Requirements:** The minimum concrete compressive strength at fourteen (14) days

shall be 4,000 psi.

Fly Ash, Silicafume and/or slag cement and any other admixtures, approved by the Engineer, shall be in addition to the minimum cement content listed in the Standard Specifications for Road and Bridge Construction, Section 1020 – Portland Cement Concrete, not in lieu of cement.

Self-Consolidating concrete shall be used for the bridge cast-in-place concrete facing that utilize form liners. Self-Consolidating admixtures shall be according to Section 1021.05 of the Standard Specifications.

## CONCRETE STRUCTURES (RETAINING WALL)

**General:** Except as otherwise specified hereafter, the current Standard Specifications for Road and Bridge Construction, Section 522 – Concrete Structures Retaining Walls, shall apply to all work under this section.

**Material Requirements:** The minimum concrete compressive strength at fourteen (14) days shall be 4,000 psi.

Fly Ash, Silicafume and/or slag cement and any other admixtures, approved by the Engineer, shall be in addition to the minimum cement content listed in the Standard Specifications for Road and Bridge Construction, Section 1020 – Portland Cement Concrete, not in lieu of cement.

Self-Consolidating concrete shall be used for the retaining wall cast-in-place concrete facing that utilize form liners. Self-Consolidating admixtures shall be according to Section 1021.05 of the Standard Specifications.

## CONCRETE SUPERSTRUCTURE

**General:** Except as otherwise specified hereafter, the current Standard Specifications for Road and Bridge Construction, Section 503 – Concrete Structures and GBSP #78 Bridge Deck Construction, shall apply to all work under this section.

**Material Requirements:** Fly Ash, Silicafume and/or slag cement and any other admixtures, approved by the Engineer, shall be in addition to the minimum cement content listed in the Standard Specifications for Road and Bridge Construction, Section 1020 – Portland Cement Concrete, not in lieu of cement.

## CONCRETE SURFACE COLOR TREATMENT

**Description:** This work shall consist of furnishing all labor, materials, and equipment for the application of a concrete surface color treatment and water based polyurethane concrete sealer to the locations shown on the plans.

**General:** The concrete surface color treatment shall be a two-part, colored cementitious coating. This coating shall be opaque, high-strength, extremely UV-resistant and suitable to apply to vertical surfaces. BRICKFORM Cem-Coat shall be used for the Concrete Surface Color Treatment.

The protection system shall be a water-based polyurethane concrete sealer that forms a high-solids coating with a clear matte finish, provides a chemical-resistant barrier coating that seals and protects the concrete under heavy use conditions, and shall be completed in accordance with this specification, manufacturer's recommendations and applicable sections of Section 587 of the Standard Specifications for Road and Bridge Construction. BRICKFORM UreMax WB shall be used for the Protection System.

**Construction Requirements:**

Surface Color Treatment: The preparation of the concrete surfaces and application of the concrete coating shall be done in such a manner as to not damage the concrete and according to the manufacturer's written instructions.

The color of the concrete coating should be Blue, Munsell No. 10B 3/6 for the locations shown on the plans. Submit samples to the Engineer, for approval, on actual substrate in the blue color to verify preliminary selections made under sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

Store the coating materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 degrees F to protect from freezing.

Prior to the application of the concrete coating, the surface shall be clean and free of laitance, dirt, films, paint, coatings, or other foreign matter. Surfaces are to be dry prior to application. The coating should only be applied after the concrete has fully cured, at least twenty-eight (28) days.

The Contractor shall use the moisture vapor evaporation rate test per ASTM F1869 to ensure that the rate of moisture vapor emission from the concrete surface is not exceeding 5 pounds per 1,000 sq. ft per twenty-four (24) hours. The Contractor shall also perform relative humidity tests per ASTM F2170 to ensure the humidity is below 75 percent.

The coating shall either be sponge, roll or brush applied to the concrete surfaces. If a second coat is required, the second coat shall be applied after two hours of the previous coat but within twenty-four hours. Apply each coat according to the manufacturer's written instructions. Use equipment recommended in writing by the manufacturer for material and texture required, and apply the material at not less than manufacturer's recommended spreading rate.

Mix prepackaged ingredients together according to the manufacturer's written instructions. Mix together with mechanical mixer or by hand to required consistency. Mix proportions of the ingredients vary by manufacturer and application equipment type.

Apply coating only when temperature of surfaces to be coated and ambient air temperatures are between 55 and 80 degrees F.

The concrete coating should be allowed to cure before the application of the concrete sealer. Clean spattered coating by washing, scraping, or other methods without damaging the concrete or coating.

Comply with the manufacturer's written instructions for recommendations on curing procedures.

Concrete Sealer: The Contractor shall provide all necessary equipment for the application of the concrete sealer.

The preparation of the concrete surfaces and application of the concrete sealer shall be done in such a manner as to not damage the concrete and/or the colored cementitious coating and according to the manufacturer's written instructions.

The concrete sealer shall produce a clear matte finish. Before applying product, test the product for desired results in a discrete location on the back face of the retaining walls. The sealer test area shall be approved by the Engineer.

Store the concrete sealant materials not in use indoors away from heat and direct sunlight, and at a minimum ambient temperature of 45 degrees F to protect from freezing.

Prior to application of the concrete sealer, the surface shall be clean and free of laitance, dirt, films or other foreign matter. Surfaces are to be dry prior to application. The sealer should only be applied after the concrete (minimum of twenty-eight (28) days) and/or colored cementitious coatings have fully cured.

The concrete sealer shall be applied to the manufacturer's written instructions. If a second coat is required, the second coat shall be applied within four to eight hours of the previous coat. Use equipment recommended in writing by the manufacturer for material and texture required, and apply the material at not less than manufacturer's recommended spreading rate.

Mix prepackaged ingredients together according to the manufacturer's written instructions. Mix together with mechanical mixer or by hand to required consistency. Mix proportions of the ingredients vary by manufacturer and application equipment type.

The concrete sealer shall only be applied when the surface or ambient temperature is between 45 and 95 degrees F. Do not apply the sealer if the ambient temperature is expected to fall below 32°F within the curing cycle of the sealer.

The concrete sealer shall be allowed to cure before any foot traffic is allowed adjacent to the retaining wall. Before the sealer dries, clean spattered locations without damaging the concrete, sealer, and/or colored cementitious coating.
Comply with the manufacturer's written instructions for recommendations on curing procedures.

**Method of Measurement:** This work will be measured for payment in units of square feet, at the locations specified.

**Basis of Payment:** This work will be paid for at the contract unit price per square foot for CONCRETE SURFACE COLOR TREATMENT. Price shall be payment in full for all

labor, materials, and equipment necessary for the application of the coating and sealer.

## CROSSHOLE SONIC LOGGING TESTING OF DRILLED SHAFTS

Description: This work shall be according to all applicable sections of the GBSP #91, Crosshole Sonic Logging Testing of Drilled Shafts, except as noted below.

- The Engineer will perform the CSL testing, analysis, and reporting will not be measured for payment.
- Contractor shall furnish and install access ducts in specific drilled shafts identified on the plans.

## DRAINAGE SYSTEM

**Description:** This work shall consist of furnishing all labor, materials, and equipment for the installation of the deck drainage system as shown in the plans, including all drain pipes, fittings, steel strap pipe hanger, threaded rods, carriage bolts, and all other items shown on the plans for the drainage system.

**General:** The drainage system shall be a longitudinal collection system capable of disposing runoff without permitting it to enter the compacted granular backfill behind the bridge abutment.

**Construction Requirements:** The drain pipe shall be Class 52 ductile iron with 6 in. I.D.

The drainage system shall be a closed system and tie into the pipe underdrain system behind either abutment.

All ductile iron pipe and fittings shall be handled and installed according to guidelines and procedures recommended by the manufacturer or supplier of the material.

**Method of Measurement:** This work will be measured for payment in units of each for the entire drainage system.

**Basis of Payment:** This work will be paid for at the contract unit price each for DRAINAGE SYSTEM, at the locations shown on the plans. Price shall be payment in full for all labor, materials, and equipment necessary for the installation of the drainage system.

## DRILLED SOLDIER PILE RETAINING WALL

**Description:** This work shall consist of providing all labor, materials, and equipment necessary to install a non-gravity cantilever wall consisting of closely-spaced, W-section beams set in drilled excavations. All work shall be according to the details shown on the plans, Article 522.08 of the SSRBC, GBSP #86 “Drilled Shafts” and as directed by the Engineer in addition to the following requirements.

**Materials:** The materials used shall satisfy the following requirements:

1. Temporary casing shall be produced by electric seam, butt, or spiral welding to produce a smooth wall surface, fabricated from steel satisfying ASTM A252 Grade 2. The minimum wall thickness shall be as required to resist the anticipated installation and dewatering stresses, as determined by the Contractor, but in no case less than 1/4 in. The temporary casing shall have rock teeth on the bottom of the casing and slots in the top of the casing for twisting the casing into rock. Temporary casing of the appropriate size shall be onsite during drilling operations.

**Submittals:** Qualifications and installations procedure submittals shall be according to Article 516.04 GBSP #86 "Drilled Shafts." In addition to these requirements the Contractor's installation procedure submittal shall include details of soldier pile placement, timber lagging placement and CLSM placement.

**Soldier Pile Installation:** If the top of rock encountered is below or above that estimated on the plans, the quantities for drilling and setting soldier piles shall be recomputed. Soldier pile lengths and tip elevations shall not be modified.

At locations where shaft excavation is within 75 ft of an active rail line, the Temporary Casing Method of installation shall be used. Temporary casing shall extend at a minimum from the ground surface to the top of rock. Casing shall be socketed into rock as required to prevent loss of ground and control ground water infiltration until encasement concrete can be placed.

The following construction tolerances shall apply instead of Article 522.08(b)(3)a.

a. The top center of the soldier pile shall be within 3 in. of the plan station and -1/2 in. to +3 in. offset. ( - offset towards C.I.P facing).

**Geocomposite Wall Drain:** Seal all splices, edges, and fastener penetrations against intrusion by self-consolidating concrete.

**Excavation:** Excavation for the wall to place lagging, geocomposite wall drain and concrete facing will be paid for according to Section 202 of the SSRBC.

**Basis of Payment**: This work shall be measured and paid for in accordance with Section 522 of the SSRBC.

Excavation through existing utilities, existing sewers, and existing structures where shown on the plans shall not be considered extra work, but shall be included in the cost for DRILLING AND SETTING SOLDIER PILES (IN SOIL) and DRILLING AND SETTING SOLDIER PILES (IN ROCK).

## DRILLED TANGENT PILE RETAINING WALL

**Description:** This work shall consist of providing all labor, materials, and equipment necessary to install a non-gravity cantilever wall (including walls for bridge abutments) consisting of closely-spaced, reinforced drilled shafts and unreinforced secant lagging. All work shall be according to the details shown on the plans, GBSP #86 "Drilled Shafts" and as directed by the Engineer in addition to the following requirements.

The remainder of the retaining wall components as shown on the plans, such as concrete facing, reinforcement bars in the concrete facing, railings, and various drainage items etc., are not included in this Special Provision but are paid for as specified elsewhere in this Contract.

**Materials:** The materials used shall satisfy the following requirements:

1. Temporary casing shall be produced by electric seam, butt, or spiral welding to produce a smooth wall surface, fabricated from steel satisfying ASTM A252 Grade 2. The minimum wall thickness shall be as required to resist the anticipated installation and dewatering stresses, as determined by the Contractor, but in no case less than 1/4 in. (6 mm). The temporary casing shall have rock teeth on the bottom of the casing and slots in the top of the casing for twisting the casing into rock. Temporary casing of the appropriate size shall be onsite during drilling operations.

**Submittals:** Submittals shall be according to Article 516.04 GBSP #86 "Drilled Shafts." In addition to these submittal requirements the Contractor's installation method shall maintain the C.I.P. concrete facing location and minimum facing thickness shown in the plans. This method shall be detailed in the installation plan submittal.

**General:** No shaft excavation, casing installation, or casing removal with a vibrator hammer shall be made within four shaft diameters center to center of a shaft with concrete that has a compressive strength less than 1,500 psi, nor adjacent to secant lagging until the CLSM has reach sufficient strength to maintain its position and shape unless otherwise approved by the Engineer. The site-specific soil strengths and installation methods selected will determine the actual required minimum spacing, if any, to address vibration and blow out concerns.

**Construction Tolerances:** The following construction tolerances shall apply to all drilled shafts in addition to the revision requirements to GBSP #86 "Drilled Shafts."

1. Center of Shaft. The center of the drilled shaft shall be within 3 in. of the plan station and -1/2 in. to +3 in. offset at the top of the shaft. (- offset towards C.I.P facing).

2. Diameter of Drilled Shaft. Oversized production drilled shafts that exceed the construction tolerance provided by the retaining wall concrete facing will require concrete removal for portions of the drilled shaft that exceed the construction tolerance. Concrete removal shall be limited to areas where the concrete facing is installed and provide the minimum concrete facing thickness. The concrete removal method shall not damage the drilled shaft and shall be approved by the Engineer prior to removing. Cost for concrete removal will be at the expense of the Contractor and to the satisfaction of the Engineer.

3. Center of Reinforcement Cage. The center of the reinforcement cage shall be within 1 1/2 in. of plan station and -1/2 in. to +1 1/2 in. offset at the top of the shaft (- offset towards C.I.P. facing).

**Excavation:** Excavation in front of the drilled shafts as necessary to place a concrete facing and complete the roadway work shall be made and paid for according to Section 202. The additional excavation necessary to place geocomposite wall drain between the shafts shall be included in this work.

**Geocomposite Wall Drain**: When required by the plans, the geocomposite wall drain shall be installed and paid for according to Section 591 except that the drain shall be fastened to the soil face. The pervious (fabric) side of the drain shall be installed to face the soil.

**Demonstration Shaft:**

1. Demonstrate equipment and methods, prior to construction of the first production drilled shaft, by installing a non-production drilled shaft. This non-production drilled shaft shall have CSL tubes installed according to the General Notes of the bridge plans. Install shaft on site at a location the Engineer determines. The demonstration shaft shall not be at a location of a permanent shaft required for the wall or bridge construction.

2. Construct a 5 ft – 0 in. diameter demonstration shaft a minimum of 6 ft into bedrock. The shaft shall be constructed using a temporary casing. A reinforcing steel cage, designed by the Contractor, to adequately support the CSL tubes will be required for the demonstration shaft. Concrete shall be placed in the shaft according to the specifications.

3. Construct the demonstration shaft according to the requirements of this specification.

4. The Contractor shall excavate 6 ft below the top of the demonstration shaft to expose the upper portion of the shaft. This excavation shall be all-around the shaft. This will facilitate in determining the approximate as-built shaft size due to oversizing the drilled hole to install the temporary casing and verify if the shaft will satisfy the construction tolerances provided by the concrete retaining wall facing.

5. If the demonstration shaft installation demonstrates the equipment and methods used to construct drilled shafts to the requirements of this specification are inadequate, the Engineer will require appropriate alterations in equipment or methods, or both, to eliminate the unsatisfactory results. The Contractor may be required to perform additional demonstration shafts until an adequate procedure is demonstrated and approved by the Engineer. Additional demonstration shafts, alterations to equipment and/or methods will be at the expense of the Contractor.

6. Do not begin constructing production drilled shafts until the Engineer approves the methodology and reviews the CSL report. The CSL testing will be completed by the Engineer at no additional cost to the Contractor. The Engineer will complete the review process within five (5) working days of receiving the CSL report.

7. Cost for installing the demonstration shaft and excavating around the drilled shaft will not be measured or paid for but shall be included in the cost of DRILLED SHAFT IN SOIL and DRILLED SHAFT IN ROCK.

Drilling and placing CLSM secant lagging shall be measured for payment in cubic feet of the shaft excavation required to install the secant lagging as shown in the plans. This volume shall be the theoretical volume computed using the diameter(s) shown on the plans and the difference in elevation between the as built shaft excavation bottom and the ground surface at the time of the CLSM placement.

**Basis of Payment**: The secant lagging will be paid for at the contract unit price per cubic foot (cubic meter) for SECANT LAGGING. The required shaft excavation and CLSM backfill required to fill that excavation shall be included in this item.

Mitigation of undisclosed obstructions shall be paid for according to Article 109.04.

Excavation through existing utilities and sewers where shown on the plans shall not be considered extra work, but shall be included in the cost for DRILLED SHAFT IN SOIL.

No additional compensation, other than noted above, will be allowed for removing and disposing of excavated materials, for furnishing and placing concrete, CLSM, bracing, lining, temporary casings placed and removed or left in place, or for any excavation made or concrete placed outside of the plan diameter(s) of the shaft(s) specified.

## FORM LINER TEXTURED SURFACE

**Description:** This work shall consist of designing, developing, furnishing and installing form liners and forming concrete using reusable, high-strength urethane form liners to achieve the concrete treatment as shown in the drawings and specifications. Form lined surfaces shall include areas of the wall facing, where shown in the plans. Work shall be performed in accordance with applicable portions of Sections 503 and 504 of the Standard Specifications.

Form liners shall be installed 12 in. below finish grade unless otherwise shown on the plans. The form liner shall match the exact size of concrete units and adhere to the provisions listed herein and in the Plans.

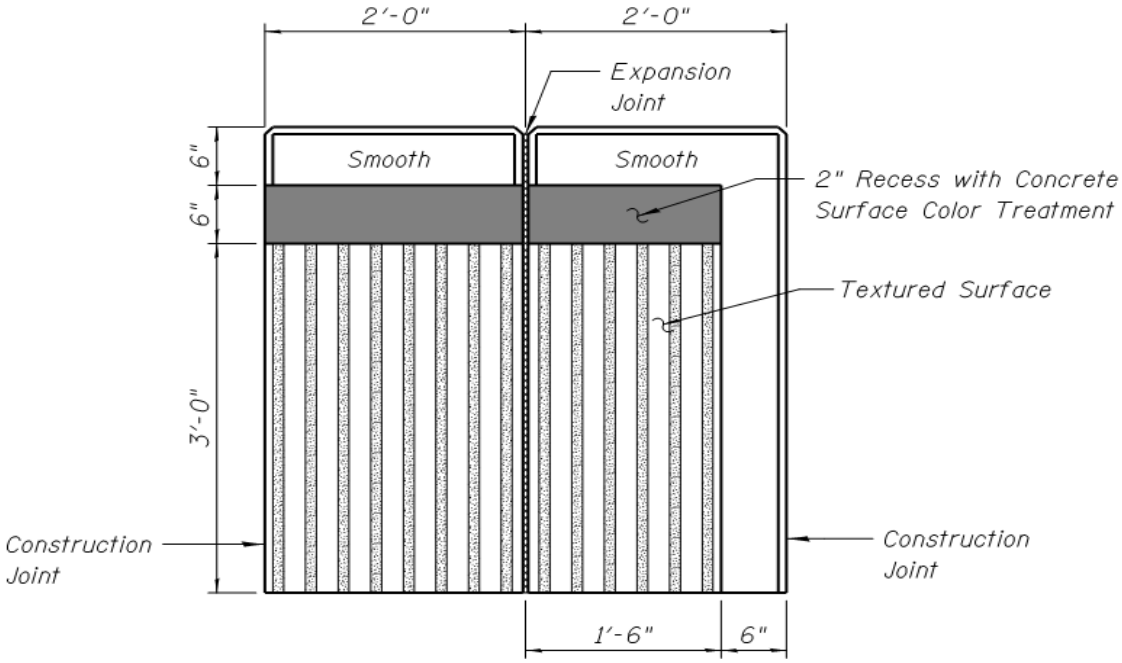
**Materials:** Form liners shall be high quality, highly reusable and capable of withstanding anticipated concrete pour pressures without causing leakage or causing physical defects.

Form liners shall attach easily to pour-in-place forms and be removable without causing concrete

surface damage or weakness in the substrate. Liners used for the texture shall be made from high-strength elastomeric urethane material which shall not compress more than 0.02 ft when poured at a rate of 10 vertical ft per hour. Form release agents shall be non-staining, non- residual, non-reactive and shall not contribute to the degradation of the form liner material.

**Form Liner Mockup:** The Contractor shall provide cast concrete mockup(s) containing the form liner surface.
Purpose of the mockup is to verify the pattern to be used, demonstrate details of form liner construction, and provide a visual quality standard.

1. Locate a mockup at construction location as directed by the Engineer. Mockup shall be readily accessible to construction personnel and the Engineer at all times during form liner construction.
2. The mockup shall be a minimum 4 ft x 4 ft x 6 in. thick and shall be cast in a vertical position, representative of the actual construction.
3. Include examples of each condition required for construction (i.e. liner joints, construction joints, expansion joints, edges of textured surface, form ties, etc.) See Exhibit A, provided below.
4. Upon receipt of comments from inspection of the mockup, adjustments or corrections shall be made where imperfections are found. If required, additional mockups shall be prepared when the initial mockup is found to be unsatisfactory.
5. After mockup is determined to be acceptable by the Engineer, construction of project may proceed.




*Include one horizontal and one vertical liner joint within textured surface.*

**Exhibit A- Elevation View of Mockup Panel**

**Formliner Pattern:** The form liner pattern shall be a large, vertical fractured fin. The uniform spacing between the raised, textured fins shall be not less than 2 in., nor more than 3 in. The maximum depth of the pattern shall be not less than 1.5 in., nor more than 2.0 in.

The following form liner manufacturers are known manufactures that provide a large fractured fin pattern form liner for use with the cast-in-place concrete units.

a. Fitzgerald Formliners, Santa Ana, CA, #16957 Harvard Fin
b. Scott System, Denver, CO, #101 Cleveland Flute
c. customrock, St. Paul, MN, #204 Fractured Fin

A pattern "Exhibit B" is provided below, illustrating the desired appearance.

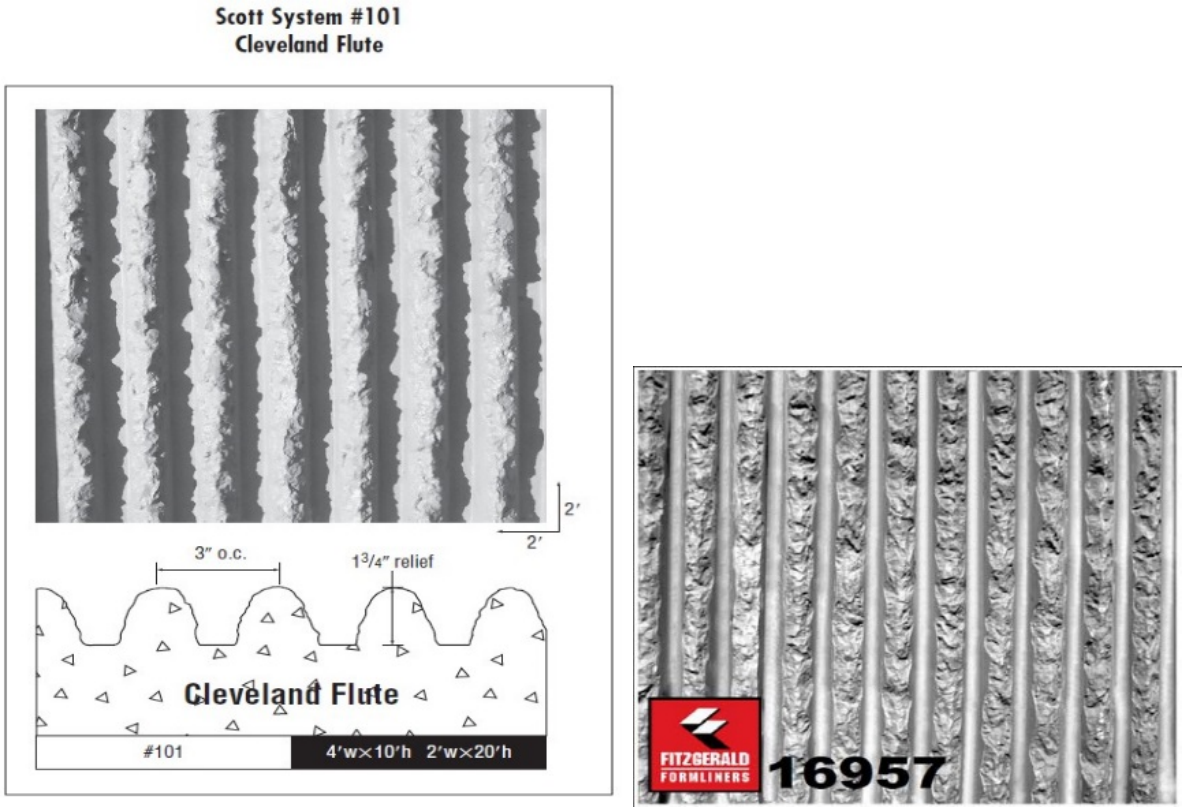



**Exhibit B- Cast-in-place Pattern**

**Installation:** Form liners shall be installed in accordance with the manufacturer's recommendations to achieve the highest quality concrete appearance possible. Form liners shall withstand concrete placement pressures without leakage causing physical or visual defects. A form release agent shall be applied to all surfaces of the liner which will come in contact with concrete as per the manufacturer's recommendations. After each use, liners shall be cleaned and made free of build-up prior to the next placement, and visually inspected for blemishes or tears. If necessary, the form liners shall be repaired in accordance with the manufacturer's recommendations. All form liner panels that will not perform as intended or are no longer

repairable shall be replaced. An on-site inventory of each panel type shall be established based on the approved form liner shop drawings and anticipated useful life for each form liner type.

The liner shall be securely attached to the forms according to the manufacturer's recommendations. Liners shall be attached to each other with flush seams and seams filled as necessary to eliminate visible evidence of seams in cast concrete. Liner butt joints shall be blended into the pattern so as to create no visible vertical or horizontal seams or conspicuous form butt joint marks. Liner joints must fall within pattern joints or reveals. Finished textures shall be continuous without visual disruption and properly aligned over adjacent and multiple liner panels. Continuous or single liner panels shall be used where liner joints may interrupt the intended pattern. Panel remnants shall not be pieced together.
The Contractor shall coordinate concrete pours to prevent visible differences between individual pours or batches. Concrete pours shall be continuous between construction or expansion joints. Adjust form liner to align concrete joints between fins of the textured surface. Construction joints may be shifted ±1 inch from plan location to achieve a continuous, uniformly spaced pattern. Wall ties shall be coordinated with the liner and form to achieve the least visible result. Liners shall be stripped between twelve (12) and twenty-four (24) hours as recommended by the manufacturer. Curing methods shall be compatible with the desired aesthetic result. Use of curing compounds will not be allowed.

The Contractor shall employ proper concrete placement and consolidation methods to ensure a high quality finish. A self-consolidating concrete is required in all wall facings where form liners are specified. The finished exposed formed concrete surfaces shall be free of visible vertical seams, horizontal seams, and butt joint marks. Grinding and chipping of finished formed surfaces shall be avoided.

**Method of Measurement:** This work will be measured for payment in place and the area computed in square feet.

Required adjustments or corrections needed to address mockup comments and the cost of additional mockups, if required, will not be paid for separately, but shall be included in respective pay item.

**Basis of Payment:** Form lined surfaces will be paid for at the contract unit price per square foot for FORM LINER TEXTURED SURFACE. The unit price bid shall include all labor and material costs associated with designing, developing, furnishing and installing form liners, forming, and disposal of forms, including satisfactory cast concrete mockup panel(s) to the requirements included herein.

## FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE

**Description:** This work shall consist of furnishing, fabricating, transporting, erecting and painting steel structure or portions thereof for the structures listed below.

SN 084-9968 (UPRR over Madison Street) – BRIDGE NO. 1
SN 084-9969 (NSRR over Madison Street) – BRIDGE NO. 2
SN 084-9970 (UPRR over Jefferson Street) – BRIDGE NO. 3

SN 084-9971 (NSRR over Jefferson Street) – BRIDGE NO. 4

**General:** Structural steel shall be fabricated to comply with the requirements indicated on the design drawings. The furnishing and erecting of structural steel shall be in accordance with this specification and applicable sections of Section 505 of the Standard Specifications for Road and Bridge Construction.

**Construction Requirements:** All structural steel supplied shall comply with the applicable ASTM standards listed in the plans.

Furnishing and installing the bearings shall comply with Section 521 of the Standard Specifications for Road and Bridge Construction.

The preformed fabric bearing pads, for the bearings, approved for use shall be Shock Pad Style No. 15175 as manufactured by Alert Manufacturing and Supply Company, Chicago, Illinois, or FABREEKA Pads as manufactured by Fabreeka Products Company, 1190 Adams Street, Boston, Massachusetts, or SORBTEX Pads as manufactured by Voss Engineering, Inc., Chicago, Illinois.

**Field Weld Inspection Requirements:** The Contractor shall be responsible for visual inspection and Nondestructive Testing (NDT) according to the ANSI/ASSHTO/AWS D1.5 Bridge Welding Code and necessary correction of all deficiencies in material and workmanship. Fillet welds joining steel deck plates to the top flange of the primary members shall be magnetic particle tested (MT) according to the bridge welding code. Costs of this shall be included in the unit price for FURNISHING AND ERECTING STRUCTURAL STEEL of the respective bridge.

**Method of Measurement:** This work will be measured for payment according to Section 505.12 of the Standard Specifications for Road and Bridge Construction.

**Basis of Payment:** This work will be paid for at the lump sum price for FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE NO. 1, FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE NO. 2, FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE NO. 3 and FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE NO. 4. Price shall be payment in full for all labor, materials, and equipment necessary for furnishing, erecting, fabricating, transporting, and painting structural steel.

The cost for furnishing and installing the bearings and anchor bolts shall be included in the lump sum price for FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE, NO. 1, NO. 2, NO. 3 or NO. 4.

## MECHANICALLY STABILIZED EARTH RETAINING WALLS

**Description:** This work shall be according to Section 522 of the SSRBC in addition to the following requirements.

**Leveling Pad:** The theoretical top of leveling pad line shall be 2 ft below finished grade line at the front face of the wall.

**Select Fill:** The select fill must be a course aggregate with 2±2 percent passing the #200 sieve. The course aggregate shall be CA 7 through CA 8, CA 11 and CA 13 through CA 16, except when epoxy coated steel, geosynthentic, or geotextile soil reinforcement is utilized the course aggregate shall be CA 13 through CA 16. The select fill detailed as backfill in the overexcavated area behind the MSE walls, as detailed in the plans, shall be included in the cost of MSE Retaining Walls.

**False Joint Rustication:** The Contractor may slightly alter the dimensions and shape of joint to allow for easier fabrication but this must be approved by the Engineer.

**Excavation:** Excavation necessary to place the MSE wall and select fill shall be paid for as EARTH EXCAVATION according to Section 202 except as noted on the retaining wall plans.

## MEMBRANE WATERPROOFING, SPECIAL

**Summary:**

A. Section Includes:

1. Bridge Membrane:
   a. Furnish labor, products and equipment required for the application of a seamless, spray elastomer coating system to suitable concrete, masonry or structural and miscellaneous metal surfaces.
   b. The membrane system shall be capable of sealing across the typical expansion joint system without the need to use a separate gland and bonding agents on the membrane.
      1) This will assure a continuous waterproofing membrane system across the entire deck.

2. Integrated Ballast Protection Mat:
   a. Furnish labor, products and equipment required for the application of a spray Integrated Ballast Mat system to suitable concrete, masonry or metal surfaces.
   b. The Integrated Ballast Mat system shall be a spray applied, 100 percent solids, fast cure, high build polymer system combined with proprietary SBR rubber blend.

3. Expansion Joints:
   a. Furnish labor, products and equipment required for the application of a preformed elastomeric expansion joint system to concrete and steel substrates as shown in the Plans and specified herein.

b. The joint system shall be a preformed, and constructed using a two-component, fast cure, high build coating system, and shall be chemically compatible with the structure waterproofing membrane system, so that both the joint system and waterproofing membrane form a continuous waterproofing system.
c. The joint system shall be secured to the concrete or steel structure using the same two-component, fast cure, high build coating system.

B. Related Specification Sections include but are not necessarily limited to:

1. IDOT Standard Specifications for Road and Bridge Construction

**Quality Assurance:**

A. Referenced Standards:

1. AREMA – American Railway Engineering and Maintenance-of-Way Association Manual for Railway Engineering
   a. C-8.29.9.10, Cold Liquid-Applied Elastomeric Membrane (2005)

2. ASTM International (ASTM):
   a. C661, Standard Test Method for Indention Hardness of Elastomeric-Type Sealants by Means of a Durometer.
   b. C836, Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
   c. D57, Standard Test Methods for DC Resistance or Conductance of Insulating Materials.
   d. D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
   e. D624, Standard Specification for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
   f. D6378, Standard Test Method for Tensile Properties of Plastics.
   g. D2240, Standard Test Method for Rubber Property – Durometer Hardness.
   h. D4060, Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
   i. D4541, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
   j. E96, Standard Test Method for Water Vapor Transmission of Materials.

3. The Society for Protective Coating (SSPC):
   a. SP 5, White Metal Blast Cleaning.
   b. SP 6, Commercial Blast Cleaning.

c. SP 10, Near-White Metal Blast Cleaning.
d. PA 2, Measurement of Dry Coating Thickness with Magnetic Gages.
e. PA 9, Measurement of Dry Coating Thickness on Cementitious Substrates using Ultrasonic Gages.

4. The Society for Protective Coatings/NACE International (SSPC/NACE):
   a. SP 13/NACE No. 6, Surface Preparation of Concrete.

B. Quality Control Provisions:

1. Manufacturer Qualifications;
   a. Use manufacturer with minimum five years experience providing similar systems on railroad bridge decks.
   b. The manufacturer should be a primary blender with proprietary formulations, an Authorized Applicator training program, capacity to provide field technical services as required and manufacturer to issue warrantee to Owner.
   c. List a manufacturer's batch numbers for each unit of product used in Work.

C. Quality Assurance Provisions:

1. Schedule pre-installation conference to review installation schedule, shut down and restricted access procedures.
   a. Indicate Owner's Representative and Contractor's Superintendent.
2. Inspect surface preparation, application procedures, and review proposed dry film thickness measurements at each installation location.
3. The membrane system shall pass Crack Bridging Test according to ASTM C836 at 80 mils, or the membrane thickness applied shall be at least equal to the thickness used by the manufacturer for ASTM C836 testing.
4. The membrane system shall meet AREMA C-29.9.10 cold applied waterproofing membrane, and shall be applied at a minimum thickness of 80 mils, or the membrane thickness applied shall be at least equal to the thickness used by the manufacturer to pass the Crack Bridging Test according to ASTM C 836.
   a. Primer is required for all membrane applications.
5. The base waterproofing membrane for the integrated ballast protection mat shall pass Crack Bridging Test according to ASTM C836 at the thickness applied and shall be at least equal to the thickness used by the manufacturer for the ASTM C836 testing.
6. Joint membrane material shall be subjected to cyclic displacement testing.
   a. Cyclic displacement testing shall include tests at seismic displacements and velocities.

**Definitions:**

A. Ballast: Rock or other material used to bed rail track ties.

B. Concrete Surface Preparation: SSPC-SP 13/NACE No. 6.

C. Metal Surface preparation: SSPC Metal Preparation Standards – SSPC-SP 5, White Metal Blast; SP 6, Commercial Blast; and SP 10 Near White Blast.

**Submittals:**

A. Submit product data sheets and installation Specification.

B. Submit MSDS sheets for product used in the Work.

C. Submit substrate preparation details.

D. Submit sample of proposed membrane.
1. 4 in. (100 mm) square sample shall include color, texture, and thickness of proposed membrane system.

E. Submit qualifications of applicator at least three weeks prior to installation.

F. Submit spray schedule to Engineer at least two weeks prior to installation.

**Project Conditions:**

A. Environmental Requirements:
1. Install system when air and substrate temperature is above -20 DegF and substrate is +5 DegF above dew point and rising, or as required by manufacturer.

B. Personnel Requirements:
1. Provide protective clothing, gloves, and respirators for use by installers as required.

**Approved Manufacturer:**

A. Bridge Preservation:
686 South Adams
Kansas City, KS 66105
913-321-9000

B. Alternative products will be allowed but must meet this specification and/or be approved by the Engineer and railroad.

**Materials:**

A. Primer
   1. Bridge deck concrete primer:
      a. 100 percent solids, two component polymer primer.
   2. Bridge deck steel primer:
      a. Single component modified polymer primer.

B. Bridge deck membrane:
   1. 100 percent solids, rapid curing elastomer.
      a. Spray Installed.

| Property, Cured Product | Test Method | Typical Value |
|---|---|---|
| Solids Content | | 100% |
| Shore Hardness | ASTM D 2240 | 50 D |
| Elongation | ASTM D 638 | .250% |
| Tensile Strength, psi Tear | ASTM D 638 | >2,000 |
| Strength, pli, Die C | ASTM D 624 | 390 |
| Tabor Abrasion, mg. Loss (1000 gm, 1000 rev, H-18) | ASTM D 4060 | 250 |
| Moisture Vapor Transmission | ASTM E 96 | <0.025 perms |
| Gel Time | | <10 Seconds |
| Tack Free | | <30 Seconds |
| Open to Light Traffic | | 1 Hour |
| Electrical Resistance | ASTM D 257-99 | $\geq 2.0 \times 10^{13}$ ohm-cm |
| Crack Bridging Test (80 Mils - 1/8 IN Opening @ -15 DegF, 25 cycles) | ASTM C 836-00 | Pass |
| Ballast Test (North American) | 2 Million Cycles | No Damage |

C. Integrated ballast mat:
   1. Bridge deck top coat:
      a. 100 percent solids, rapid curing elastomer.
      b. Spray Installed.

| Property, Cured Product | Test Method | Typical Value |
|---|---|---|
| Solids Content | | 100% |
| Shore Hardness | ASTM D 2240 | <50 D |
| Elongation | ASTM D 638 | >250% |
| Tensile Strength, psi | ASTM D 638 | >2,000 |
| Tear Strength, pli, Die C | ASTM D 624 | >390 |
| Tabor Abrasion, mg. Loss (1000 gm, 1000 rev, H-18) | ASTM D 4060 | >250 |
| Moisture Vapor Transmission | ASTM E 96 | <0.025 perms |
| Gel Time | | <90 Seconds |
| Tack Free | | <2 Minutes |
| Ballast Loading | | 1 Hour |
| Ballast Impact Test, Loading 9.2 - 28.1 Kips, 2,000,000 Cycles | | Pass |

D. Preformed Joint Materials:
   1. Expansion Joint:
      a. Preformed elastomeric expansion joint system designed specifically for use on concrete and steel structures.
      b. Designed to be used in conjunction with specified spray applied waterproofing membrane, to form a continuous monolithic membrane and

joint system across the entire structure.

| Properties | Test Method | Typical Value |
|---|---|---|
| Shore Hardness | ASTM D2240 | <45D |
| Elongation | ASTM D638 | >250% |
| Tensile Strength, psi | ASTM D638 | >2,000 |
| Tear Strength, pli, Die C | ASTM D624 | >390 |
| Operating Temperature Range | | -40°F to 400°F |
| Movement Capability (of nominal joint size) | | +50% and -50% |

E. Coating and Joint Anchoring Materials:

1. Primer – bridge deck concrete primer.
   a. Plural component primer for porous substrates.

| Properties | Test Method | Typical Value |
|---|---|---|
| Color | | Amber/ White |
| Solids Content, % | | 89 |
| Elongation | | 6% |
| Shore D Hardness | ASTM D2240 | 71 |
| Tensile Strength, psi | ASTM D638 | 4,500 |
| Adhesion to Substrate, psi, concrete | ASTM D 4541 | >150 |
| Viscosity, cps, neat, 770 F | | 25 |
| VOC g/1 | ASTM D 4541 | 2.3 |
| Pot Life @ 770 F | | 5 min |
| Tack Free @ 770 F Final Cure @ 770 F | | 15 min |
| Tack Free @ 770 F Final Cure @ 770 F | | 20 min |

F. Joint Adhesive:

1. Bridge deck joint adhesive.
   a. A slow setting, 100 percent solids, two-component polymer product.

| Property, Cured Product | Test Method | Typical Value |
|---|---|---|
| Solids Content Shore | | 100% |
| Hardness | ASTM D 2240 | <50 D |
| Elongation | ASTM D 638 | >250% |
| Tensile Strength, psi | ASTM D 638 | >2,000 |
| Tear Strength, pli, Die C | ASTM D 624 | 390 |
| Gel Time | | >90 Seconds |
| Tack Free | | >2 Minutes |

G. Surface Activator:

1. Bridge deck membrane surface activator.
   a. Single component activating agent used to treat expansion joint surfaces prior to adhesive or over coating applications.
   b. May also be used with bridge deck membrane at coating overlap areas where coating has cured for more than 24 HRS.

| Typical Physical Properties | Typical Value |
|---|---|
| Viscosity @ 25ºC | N.D. |
| Appearance | Clear Liquid |
| Odor | Mild Sweet Odor |
| Specific Gravity @ 25ºC | 1.08 |
| Flash Point | >200 |

| | |
|---|---|
| Vapor Density (Air = 1) | N.D. |

H. Joint Sealant (OPTIONAL):

1. Bridge deck joint sealant.
   a. Single component, moisture-curing product which can be used as an optional double joint.

| **Typical Physical Properties** | | **Typical Value** |
|---|---|---|
| VOC Content | | 35.1 g/1 |
| Shore Hardness | ASTM C 661 | 25A |
| Elongation | ASTM D 412 | >600% |
| Tensile Strength, psi | ASTM D 412 | 400 |
| 100% Modulus, psi | ASTM D 412 | 44 |
| Service Temperature | | -22°F - 176°F |
| Specific Gravity | | 1.17 |
| Tack-Free Time @ 73°F and 50% RH | | 90 - 150 minutes |

**Equipment:**

A. Contractor shall utilize heated 1:1 plural component heated equipment capable of at least 100 DegF Delta T without recirculation and continuous discharge pressure of 2,500 psi.
   1. Pump shall have heated hose capable of maintaining 170 DegF Temperature at all times.
   2. Spray gun shall be impingement mix with either air or mechanical purge.
   3. Pump shall be capable of recording critical functions, including, product temperature of A component, B component, hose temperature, fluid pressure of A component, B component, number of pump cycles, and pump error codes.
   4. Contractor shall have a minimum of two spray guns in working order present at all times during the application.
   5. Backup parts for critical components such as feed pumps and proportioning cylinders shall be required.
   6. Contractor shall have pump, electrical generator, air compressor, supplies, spare parts and materials in a self-contained truck or trailer.

**Execution**

**Inspection:**

A. Assure all owner property construction requirements have been made and completed prior to commencement of primer and coatings installation.

B. Prior to application of primer inspect and approve substrate preparation.

**Preparation:**

A. Bridge Membrane and Integrated Ballast Mat:

1. Provide clean, sound and dry surfaces.
2. Sand blast metal surfaces to remove laitance and other contamination and provide suitable 3-5 mil blast profile.
3. Prepare metal surfaces to SSPS-SP 10 near White Blast or better.
4. Metal surfaces must be above dew point prior to application.
5. Repair spalls and other defects with Five Star Structural Concrete or other as acceptable to the Manufacturer.
6. Prepare concrete surfaces to SSPC SP 13/NACE No. 6 Surface Preparation of Concrete.
7. Concrete to have less than 5.0 percent moisture content prior to installation of primer.
8. Test prepared steel surface using Elcometer adhesion testing (ASTM D 4541).
   a. Minimum pull strength is 400 psi.
9. Test prepared concrete surface suing Elcometer adhesion testing (ASTM D 4541).
   a. Minimum pull strength is 150 psi or failure in the concrete substrate.
10. Mask protected surfaces prior to spray applications.
11. Erect spray curtains and partitions as required.

B. Expansion Joints: Joint fascia shall be of a uniform width and height.

**Installation:**

A. Bridge Membrane and Integrated Ballast Mat:
1. Mix all products in accordance with manufacturer's written instructions.
2. Steel Surfaces:
   a. Spray or roll primer at 600 – 800 SR/GAL over surfaces to receive coating system.
   b. Allow primer to go tack free before spraying Bridge Deck Membrane.
   c. Primer is not necessary provided steel surface is prepared to 5 mil profile or better and no rust present.
3. Concrete Surfaces:
   a. Spray, squeegee or roll concrete primer at 130-200 SQ FT/GAL over surfaces to receive coating system.
   b. Allow primer to go tack free before spraying Bridge Deck Membrane.
4. Concrete and masonry surfaces must have less than 5.0 percent moisture prior to installation.
5. Metal surfaces must be dry, rust-free, and have proper SSPC profile and preparation.
6. Reapply primer if set more than twenty four (24) HRS.
7. Spray base coat over primed deck surfaces at 20 SQ FT/GAL for a total thickness of 80 mils on all surfaces.
8. Retouch coat by filling low spots or areas with inadequate thickness.

9. Spray additional base coats to achieve specified system thickness.
    a. Retouch as required.
10. Spray membrane over primed surfaces at 20 SF/GAL (80 mils) by using a Graco Reactor pumping system or other approved by the manufacturer.
11. Apply a base coat of Bridge Deck Membrane at 80 mils, followed by SBR rubber aggregate broadcast into Bridge Deck Top Coat in two lifts applied at 40 mils per lift with rubber aggregate broadcast.
    a. Apply a third 40 mil lift to seal rubber aggregate particles.
12. Apply immediately broadcast rubber aggregate at 0.25 to 0.35 LBS/$FT^2$ to achieve 100 percent coverage rate.
    a. Remove excess aggregate after initial set and repeat process a second time, followed by a 40 mil seal coat to lock rubber aggregate.
13. Total thickness of Integrated Ballast Mat system is 1/4 IN (250 mils, 6.3 mm) on all surfaces.

B. Expansion Joints:

1. Concrete and steel structures to receive joint shall be free of surface defects such as air voids, fins, form-release agents and honeycombs, scaling, rust and shall be uniform in width.
2. Apply primer over concrete or masonry surfaces to receive joint system.
    a. Surfaces to receive adhesive membrane must be surface dry prior to application of primer and coating.
3. Reapply primer if set more than 24 HRS.
4. Assemble pre-molded joint sections, cutting joint sections to allow a minimum 4 in. overlap between sections.
5. Surfaces to be adhered and overlap sections must be treated with Bridge Preservation Activator 15 minutes prior to application.
6. Spray applied at 60 to 80 mils to adhere both the joint flanges and sealjoint overlaps.
7. Spray coating over primed surfaces at a rate of 60 to 80 mils, and immediately place joint flaps or overlap sections into the liquid material.
8. For coating and joint anchoring materials, apply uniform pressure to freshly sprayed areas to insure positive contact between joint sections and coating material.
9. For coating and joint anchoring materials, apply by brush, spray, or roller to clean, dry, properly prepared surfaces at 160-200 SF/GAL depending on substrate porosity.
    a. Allow primer to dry to the touch before overcoating.
10. Inspect joint flaps and overlap sections to insure that all areas are properly adhered and sealed.
    a. Retouch areas where additional coating is required to insure a watertight seal.
11. On ballasted decks, the joint system shall have a minimum 3/8 in. galvanized steel plate with a minimum 4 in. overlap on each side of the joint fascia, and shall be held in place by imbedding in a liquid mastic or anchored on one side of the joint header using mechanical fasteners.

C. Coating to Joint Overlap Installation:
   1. Apply primer over concrete or masonry surfaces to receive coating system.
      a. Surfaces must be surface dry prior to application of primer and coating.
   2. Reapply primer if set more than 24 HRS.
   3. Surfaces to be over coated must be treated with Bridge Deck Membrane Surface Activator 15 minutes prior to application.
   4. Spray coating over treated joint surfaces and primed concrete surfaces at authorized rate.
   5. Spray additional base coats to achieve specified base coat thickness.
      a. Retouch as required.

D. Double Joint:
   1. Install closed cell backer rod in joint opening (if not utilizing optional Double Joint).
   2. Install 3/8 in. galvanized steel plate over finished joint system.
      a. Steel plate provided by others.
      b. Secure to the substrate by mastic caulking or by securing one side using mechanical fasteners.
      c. Apply a sealant in the anchor holes prior to inserting mechanical fasteners to insure a proper seal.

**Field Quality Control:**

A. Perform dry film thickness tests in accordance with SSPC-PA 2 Measurement of Dry Coating Thickness or SSPC-PA 9, Measurement of Dry Coating Thickness on Cementitious Substrates Using Ultrasonic Gages.

B. Use magnetic or ultrasonic test equipment, destructive testing, or stroke per gallon method of assuring proper film thickness.
   1. Spray equipment is calibrated and tested to a stroke count per gallon of product sprayed.
      a. This is suitable for thickness assurance on most project.
   2. Ultrasonic testing is usually accurate to +/-5 percent.
   3. Repair destructive testing areas by respraying or filling with special two component gun grade material provided by manufacturer.

C. Other components of the system may be wet film tested for thickness.

D. Maintain spray and other installation equipment in proper operating condition throughout installation.
   1. Provide reserve equipment as required.

E. Ensure that joint overlaps are a minimum of 4 in. and are properly sealed revealing no pinholes of defects in the joint overlap.

**Cleaning:**

A. Clean spills and oversprays as they occur.

B. Consult manufacturer's literature and MSDS sheets for proper cleaning products and methods.

C. High pressure water clean any liner of covering material used to contain overspray and other debris.

D. Remove drums and waste material.

E. Clean site to Owner's satisfaction prior to final acceptance.

**Protection:**

A. Protect installed work prior to acceptance by owner.

B. Provide protective clothing, gloves, and respirators for use by installers as required.

**Method of Measurement and Basis of Payment:**

**Method of Measurement:**

A. The elastomeric cold spray applied waterproofing will be measured in square feet of a horizontal surface area of deck finished and in place. Measurement will be based on the horizontal distance between the face of curbs and the horizontal length of the membrane installed. Membrane waterproofing applied to the curb and backwall faces will not be measured for payment but shall be included in the unit price for MEMBRANE WATERPROOFING (SPECIAL).

**Basis of Payment:**

A. This work will be paid for at the contract unit price per square feet for MEMBRANE WATERPROOFING (SPECIAL) which price will be payment in full for completing the work according to these specifications.

## PRECAST PRESTRESSED CONCRETE FASCIA BEAM

**Description:** This work shall consist of furnishing all labor, material, and equipment for the fabrication and erection of a precast prestressed concrete fascia beam including the curb on top of the fascia beam.

**General:** Except as otherwise specified hereafter, the current Standard Specifications for Road

and Bridge Construction, Section 504 – Precast Concrete Structures and Section 1042 – Precast Concrete Products, shall apply to all work under this section.

**Construction Requirements:** Fly Ash, Slicafume and/or slag cement and any other admixtures, approved by the Engineer, shall be in addition to the minimum cement content listed in the Standard Specifications for Road and Bridge Construction, Section 1020-Portland Cement Concrete, not in lieu of cement.

Lifting loops shall be provided in the detailed locations on the design drawings. The area around all lifting loops shall be recessed so that the loops can be removed to a depth of ¾ in. and grouted.

**Method of Measurement:** This work will be measured for payment in units of lump sum.

**Basis of Payment:** This work will be paid at the contract unit lump sum price for PRECAST PRESTRESSED CONCRETE FASCIA BEAM, No. 1 or No. 3. Price shall be payment in full for all labor, materials, and equipment for fabrication and erection of the precast prestressed concrete fascia beam.

## SHOP DRAWING SUBMITTAL (STRUCTURAL ITEMS)

**Description:** This work shall consist of the submittal of shop drawings to the Engineer for review.

**General:** Shop drawing submittal shall be in accordance with this specification and Sections 105, 504, 505, 509, and 1042 of the Standard Specifications for Road and Bridge Construction.

**Construction Requirements:** The following items will require a shop drawing submittal to the Engineer for review.

- Mechanically Stabilized Earth Retaining Walls
- Structural Steel, Bearings and Anchor Bolts*
- Precast Prestressed Concrete Fascia Beam*
- Steel Railing (Special)
- Membrane Waterproofing (Special)*

* The Engineer will forward to the railroad agency for review.

**Basis of Payment:** This work will not be paid for separately but shall be included in the cost of the respective item.

## STEEL RAILING (SPECIAL)

**Description:** This work shall consist of furnishing all labor, materials, and equipment for the fabrication and erection of the steel railing.

**General:** The railing shall be fabricated to comply with the requirements indicated on the design drawings. The railing shall be in accordance with this specification and applicable sections of Section 509 of the Standard Specifications for Road and Bridge Construction.

**Construction Requirements:** The contractor shall provide all necessary equipment for the installation of the steel railing.

All members supplied shall comply with the applicable ASTM standards.

HSS – ASTM A500, Grade B (46 ksi) (cold formed)
Plate – ASTM A36/A36M
Stainless Steel Strand and Fittings – ASTM A316
Galvanized Steel Anchor Rods – ASTM F1554
Washers for Steel Anchor Rods – ASTM F844 (Standard) or F436 (Hardened)
Nuts for Steel Anchor Rods – ASTM A583 Grade A

All railing components, with the exception of the stainless steel parts, shall be galvanized according to Section 509.05 of the Standard Specifications for Road and Bridge Construction and general notes shown on the plans. Galvanizing will not be measured for payment but included in the unit cost of this pay item.

Stainless steel strands and fittings shall be isolated from the galvanized posts and plates to prevent galvanic corrosion due to dissimilar materials.

Welding procedures and personnel shall be qualified according to AWS D1.1/D1.1M, "Structural Welding Code – Steel."

Shop drawings shall include plans, elevations, sections, and detail views. Detail the posts, rails, strands and fittings. Indicate post and panel types, sizes, orientations and locations. Indicate critical dimensions from adjacent reveals, rustications and joints.

Indicate welded connections by AWS standard symbols. Detail loose and cast-in hardware, inserts, connections, and joints, including accessories.

Indicate locations and details of anchorage devices to be embedded in other construction. Coordinate with other trades to embed anchorages in other construction

Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 in. unless otherwise indicated. Remove sharp or rough areas on exposed surfaces. Provide a weep hole on the back face at the bottom of every HSS post.

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.

Intermediate tensioning posts shall be set at maximum of 70 ft spacing.

After threading strands through intermediate posts, hang a 20 pound weight at midpoint of the maximum post spacing on each strand prior to applying tension. Tension each strand to remove the sag to a maximum of 5/8 in.

Set railings accurately in location, alignment, and elevation. Set retaining wall posts plumb within a

tolerance of 1/16 in. in 3 ft. Use post-installed chemical anchors for fastening the base plates to the concrete.

**Method of Measurement:** This work will be measured for payment in place in feet. The length measured will be the overall length along the top longitudinal railing member through all posts and small gaps.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for STEEL RAILING (SPECIAL). Price shall be payment in full for all labor, materials, and equipment necessary to erect the steel railing.

## ELECTRICAL

## CONTRACT GUARANTEE

The Contractor shall guarantee all electrical equipment, apparatus, materials, and workmanship provided under the contract for a period of six (6) months after the date of final inspection according to Article 801.14.

All instruction sheets required to be furnished by the manufacturer for materials and supplies and for operations shall be delivered to the Engineer prior to the acceptance of the project, with the following warranties and guarantees:

1. The manufacturer's standard written warranty for each piece of electrical equipment or apparatus furnished under the contract.

2. The Contractor's written guarantee that, for a period of six (6) months after the date of final inspection of the project, all necessary repairs to or replacement of said warranted equipment, or apparatus shall be made by the Contractor at no cost to the Department.

3. The Contractor's written guarantee for satisfactory operation of all electrical systems furnished and constructed under the contract for a period of 6 months after final inspection of the project.

## HANDHOLE 18”x18”

**Description:** This work shall consist of furnishing and installing a precast composite concrete handhole in accordance with Sections 814 and 1088.05 of the Standard Specifications for Road and Bridge Construction and the following additions or exceptions.

**General:** The frame and cover shall be constructed of a polymer concrete and reinforced with a heavy-weave fiberglass cloth. The material shall be in accordance with Section 1088.05 of the Standard Specifications for Road and Bridge Construction. The nominal dimensions of the

handhole shall be a minimum of 18”(W) x 18”(L) x 18”(D).

The cover shall be held down by two stainless steel hex head bolts. The cover shall contain two recessed lift pins.

**Basis of Payment:** This work will be paid for at the contract unit price per each for HANDHOLE 18”x18”.

**HANDHOLE (SPECIAL)**

**Description:** This work shall consist of furnishing and installing a precast composite concrete handhole in accordance with Sections 814 and 1088.05 of the Standard Specifications for Road and Bridge Construction and the following additions or exceptions.

**General:** The frame and cover shall be constructed of a polymer concrete and reinforced with a heavy-weave fiberglass cloth. The material shall be in accordance with Section 1088.05 of the Standard Specifications for Road and Bridge Construction. The nominal dimensions of the handhole shall be a minimum of 17” (W) x 30” (L) x 36” (D).

The cover shall be held down by two stainless steel hex head bolts. The cover shall contain two recessed lift pins.

**Basis of Payment:** This work will be paid for at the contract unit price per each for HANDHOLE (SPECIAL).

**JUNCTION BOX EMBEDDED IN STRUCTURE, SPECIAL**

**Description:** This work shall consist of furnishing and installing a 6”x6”x4” stainless steel junction box or a stainless steel junction box of the size specified in the plans according to Section 813 of the of the SSRBC at locations as indicated on the plans.

**Materials/Installation:** The materials and installation shall be in accordance with Article 813 of the SSRBC.

**Basis of Payment:** The work will be paid for at the contract unit price per each for JUNCTION BOX EMBEDDED IN STRUCTURE, SPECIAL.

**LIGHT POLE, ALUMINUM**

**Description:** This work shall consist of furnishing and installing a light pole complete with an arm(s), when specified, and all hardware and accessories required for the intended permanent use of the pole according to Section 830 of the of the SSRBC at locations as indicated on the plans.

**Materials/Installation:** The materials and installation shall be in accordance with Article 830 of the SSRBC.

**Basis of Payment:** The work will be paid for at the contract unit price per each for LIGHT POLE, ALUMINUM, mounting height, and arm (quantity and length) type specified.

## LIGHT POLE, DECORATIVE, STREET LIGHT, 27 FT. M.H.

**Description:** This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations indicated on the plans.
**Materials:** The materials shall be in accordance with Article 821.02 of the "Standard Specifications", plan details, and the following:

Luminaires shall have a 250 watt HPS lamps. Luminaires will be mounted atop a 27' tall decorative pole in the drawings. The fixture shall be catalog number RN20-250HPS-THA3-ACDR-QTA/240-SMA-CR1-RC-BKTX lighting distribution as manufactured by Lumec.
The fixture shall have the following salient characteristics:

- Teardrop renaissance style housing
- High Pressure Sodium lamp
- HID ballast with a power factor > 90% and a THD of < 20%, 2.5kv surge rating
- UL listed for wet location
- IP-65 Rated
- Photoeye receptacle and controller
- Type 3 Distribution

**General:** The work shall be completed in accordance with Section 821 of the "Standard Specifications", plan details, and as modified herein.

**Basis of Payment:** The work will be paid for at the contract unit price per each for LIGHT POLE, DECORATIVE, STREET LIGHT, 27 FT. M.H. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires and light poles.

## LIGHT POLE, DECORATIVE, STREET LIGHT, 10.5 FT. M.H.

**Description:** This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations indicated on the plans.
**Materials:** The materials shall be in accordance with Article 821.02 of the "Standard Specifications", plan details, and the following:

Luminaires shall have a 150 watt HPS lamps. Luminaires will be mounted atop a 10.5' tall decorative pole in the drawings. The fixture shall be catalog number SCP-150HPS-240B-MT-V-BK lighting distribution as manufactured by Sentry Electric.

The fixture shall have the following salient characteristics:

- Central Park style, Tenon Mount

- High Pressure Sodium lamp
- HID ballast with a power factor > 90% and a THD of < 20%, 2.5kv surge rating
- UL listed for wet location
- IP-65 Rated
- Photoeye receptacle and controller
- GFI Receptacle

**General:** The work shall be completed in accordance with Section 821 of the "Standard Specifications", plan details, and as modified herein.

**Basis of Payment:** The work will be paid for at the contract unit price per each for LIGHT POLE, DECORATIVE, STREET LIGHT, 10.5 FT. M.H. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires and light poles.

## LIGHTING CONTROLLER, SPECIAL

**Description:** This work shall consist of furnishing all labor, materials, and equipment for the installation of the lighting controller as shown in the plans and in accordance with Section 825 of the Standard Specifications.
**Basis of Payment:** This will work will be paid for at the contract unit price per each for LIGHTING CONTROLLER, SPECIAL. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the lighting controller, special.

## LOCATION OF UNDERGROUND ELECTRICAL FACILITIES

**Description:** The Contractor shall be responsible for locating existing City of Springfield and CWLP facilities prior to performing any work. The Contractor shall also be liable for any damage to facilities resulting from inaccurate locating.

The Contractor may obtain, on request, plans for the existing electrical facilities from the agencies listed.

The Contractor shall also be responsible for locating and providing protection for facilities during all phases of construction. If at any time, the facilities are damaged, the Contractor shall immediately notify the Engineer and make all necessary arrangements for repair to the satisfaction of the Engineer.

**Basis of Payment:** This work will not be paid for separately but shall be included in the contract bid prices.

## LUMINAIRE, DECORATIVE ELECTROLUMINESCENT LIGHT TAPE

**Description:** This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations as indicated on the plans.

**Materials:** The materials shall be in accordance with Article 821.02 of the "Standard Specifications", plan details, and the following:

Luminaires shall have an Electroluminescent light engine. Luminaires will be mounted as detailed on the plans. The fixture shall be catalog number LT200-EXT-CLASSIC NATURAL BLUE-LENGTH as shown on the plans as manufactured by Electro- LuminiX Lighting Corp.

The fixture shall have the following salient characteristics:

- Dimming comes Standard
- Energy Efficient
- UV and Moisture Resistant
- Available in Lengths up to 300 ft
- Highly Visible through smoke and fog
- Thin profile
- Generates No Heat and is cool to the touch
- 0.25 in. clear barrier encapsulation envelops the light engine on all four (4) sides
- 40,000 hour expected life
- Three (3) brightness settings
- 2 in. minimum width of lit area

Included with this pay item provide the power supply and power connector. Provide stainless steel NEMA 4X junction boxes to protect the power supply and power connector. Provide conduit between the power supply and power connection as detailed in the plans.

**General:** The work shall be completed in accordance with Section 821 of the "Standard Specifications", plan details, and as modified herein.

**Basis of Payment:** The work will be paid for at the contract unit price per foot for LUMINAIRE, DECORATIVE ELECTROLUMINESCENT LIGHT TAPE. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires.

**LUMINAIRE, LED, SPECIAL**

**Description:** This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations as indicated on the plans.

**Materials:** The materials shall be in accordance with Article 821.02 of the "Standard Specifications", plan details, and the following:

Luminaires shall have a 95watt LED light engine. Luminaires on aluminum light poles with mast arms shall be catalog number LDRC-T2-E04-480-LCF as manufactured by LUMARK. The fixture shall have the following salient characteristics:

- Heavy duty die cast aluminum housing
- Removable door
- 3G vibration tested
- Tool-less entry for enhanced maintenance

- High efficiency LED optics with 4000K light color
- Designed to withstand a 10kV transient line surge
- Optimized thermal management and heavy duty die cast heat sink.
- Low temperature operation down to -30 Degree C.
- 90 percent Lumen maintenance at 60,000 hours per IESNA TM-21
- Mounting to be two bolt / one bracket slip fitter design
- 5 Stage super TGIC polyester powder paint finish, 2.5 mil nominal thickness
- 5 year limited warranty

**General:** The work shall be completed in accordance with Section 821 of the "Standard Specifications", plan details, and as modified herein.

**Basis of Payment:** The work will be paid for at the contract unit price per each for LUMINAIRE, LED, SPEICAL. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires.

## LUMINAIRE, LED, UNDERPASS, WALLMOUNT, OUTPUT DESIGNATION C

**Description:** This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations as indicated on the plans.

**Materials:** The materials shall be in accordance with Article 821.02 of the "Standard Specifications", plan details, and the following:

Luminaires shall have a 4 8 watt LED light engine. Luminaires will be wall mounted in the recessed notch as detailed on the drawings. The fixture shall be catalog number 24320 LED K4-4000K Color, W/85CRI, SLV as manufactured by Bega.

The fixture shall have the following salient characteristics:

- Housing shall have die-cast aluminum end caps welded to an aluminum extrusion
- The welds are continuous end ground flat to provide a water tight housing
- Die castings are marine grade, copper free A360.0 aluminum alloy
- Fully gasketed with a molded silicone gasket
- ¼ in. tempered white glass lens
- LED light source to meet LM-70 requirements for lumen maintenance and life
- UL listed for wet location and 85 PSI hosedown
- IP-65 Rated
- 25 Year Warranty

As part of this pay item provide the necessary junction boxes within structure to facilitate routing the raceway from the light fixtures to the new lighting controller.

**General:** The work shall be completed in accordance with Section 821 of the "Standard Specifications," plan details, and as modified herein.

**Basis of Payment:** The work will be paid for at the contract unit price per each for LUMINAIRE, LED, UNDERPASS, WALLMOUNT, OUTPUT DESIGNATION C. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires.

## LUMINAIRE, LED, UNDERPASS, SUSPENDED, OUTPUT DESIGNATION B

**Description:** This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations indicated on the plans.

**Materials:** The materials shall be in accordance with Article 821.02 of the "Standard Specifications", plan details, and the following:

Luminaires shall have a 25 watt LED light engine. Luminaires will be suspended from the bridge above as detailed in the drawings. The fixture shall be catalog number DSXPG LED, 20c 350, 40k T5W MVOH lighting distribution as manufactured by Lithonia Lighting.
The fixture shall have the following salient characteristics:

- Two piece die-cast aluminum housing
- Integral heat sink fins
- Fully gasketed with molded silicone gasket
- LED light source to meet LM-70 requirements for lumen maintenance and life
- Electronic driver with a power factor > 90% and a THD of < 20%, 2.5kv surge rating
- UL listed for wet location
- IP-65 Rated

Power supply to the underside of the bridge shall be provided under other items of work. The underpass luminaire shall include a stainless steel junction box on the power supply conduit located along the edge of the bridge and all conduit, fittings, attachment hardware, cable, and stainless steel junction boxes needed to complete the circuit to the luminaire.

**General:** The work shall be completed in accordance with Section 821 of the "Standard Specifications", plan details, and as modified herein.
**Basis of Payment:** The work will be paid for at the contract unit price per each for LUMINAIRE, LED, UNDERPASS, SUSPENED, OUTPUT DESIGNATION B. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires.

## MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION

The existing traffic signal equipment scheduled to remain in place, final or temporary, shall be

maintained while new signal or temporary signal is being installed. Any work necessary to temporarily change existing signal equipment including but not limited to cable or conduit runs to avoid proposed traffic signal equipment or foundations shall be included in this pay item.

**Method of Measurement**: This work will be measured as a lump sum for the project.

**Basis of Payment:** This work will be paid for at the contract unit price each for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION.

## RELOCATE EXISTING TRAFFIC SIGNAL EQUIPMENT

This work shall be in accordance with Section 895 of the Standard Specifications except as modified herein.

The Contractor shall relocate all traffic signal equipment as specified on the plans. This work shall be included in the bid price for this pay item.

**Method of Measurement:** All Traffic signal equipment including but not limited to vehicle signal heads, signs, and pedestrian signal heads for a particular intersection will be paid for as each (per intersection).

**Basis of Payment:** The above work will be paid for at the contract unit price each (per intersection) for RELOCATE EXISTING TRAFFIC SIGNAL EQUIPMENT and shall be payment in full for relocating the equipment described above, complete. No additional compensation will be allowed.

## REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT

This work shall be in accordance with Section 895 of the Standard Specifications except as modified herein.
The Contractor shall remove all traffic signal equipment as specified on the plans. This work shall be included in the bid price for this pay item.

**Method of Measurement:** All Traffic signal equipment including but not limited to handholes, signal posts, mast arms, concrete foundations, cable, and vehicle signal heads for a particular intersection will be paid for as each (per intersection).

**Basis of Payment:** The above work will be paid for at the contract unit price each (per intersection) for REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT and shall be payment in full for removing, disposing of, and transporting the equipment described above, complete. No additional compensation will be allowed.

## TEMPORARY TRAFFIC SIGNAL INSTALLATION

This work shall be in accordance with Section 890 of the Standard Specifications except as modified herein.

All work and material in relation to the installation, operation, and removal of the temporary traffic signals at the intersection of Jefferson with Ninth, Washington with Ninth, and Washington with Eleventh shall be included in this pay item.
**Method of Measurement**: All traffic signal equipment will be paid for as each (per intersection).

**Basis of Payment**: The above work will be paid for at the contract unit price each (per intersection) for TEMPORARY TRAFFIC SIGNAL INSTALLATION complete. No additional compensation will be allowed.

## TRAFFIC SIGNAL BACKPLATE

This work shall consist of furnishing and stalling a traffic signal backplate in accordance with Sections 882 and 1078.03 of the Standard Specifications for Road and Bridge Construction and the following exceptions.

The traffic signal backplate shall be of the same material as the traffic signal heads as specified on the plans.

A Three (3) inch wide strip of reflective sheeting shall be applied to the outside perimeter of the face of the backplates. The reflective tape shall be fluorescent yellow in color and shall consist of type ZZ sheeting.

**Basis of Payment:** This item will be paid for at the contract unit price each for TRAFFIC SIGNAL BACKPLATE, for supplying and installing the traffic signal backplate with reflective tape to the satisfaction of the Engineer.

## TRAFFIC SIGNAL LED MODULE SPECIFICATIONS

The material requirement shall be in accordance with Sections 880 and 1078 of the Standard Specifications except as modified herein.

The LED assemblies for the red, yellow, and green solid and arrow indications shall meet or exceed the following minimum specifications:
Solid Indication LED Module Specifications

| | |
|---|---|
| Compliance: | Fully compliant with ITE VTCSH LED Circular Signal Supplement specifications dated and adopted June 27, 2005 |
| Compliance Verification: | Intertek ETL verified compliance – Product must be listed on the "Directory of LED Modules Certified Products" list located on the ETL website at http://www.intertek.com/lighting/performance- |

| | |
|---|---|
| | testing/traffic-signals/ |
| Diameter: | 12” (300mm) |
| Lens: | UV stabilized scratch resistant polycarbonate, tinted red or yellow, clear for green, uniform non-pixelated illumination, Incandescent Appearance |
| LEDS: | Hi-Flux |
| Operating Temperature Range: | -40 to +74C (-40 to +165F) |
| Operating Voltage Range: | 80 to 135 V (60Hz AC) |
| Power Factor (PF): | > 90% |
| Total Harmonic Distortion (THD): | < 20% |
| Minimum Voltage Turn-Off: | 35V |
| Turn-On/Turn-Off Time: | <75 ms |
| Nominal Power: | 10.0 W (Red), 18.0W (Yellow), 12.5 W (Green) |
| Nominal Wavelength: | 625-626 nm (Red), 589-590 nm (Yellow), 500-502 nm (Green) |
| Minimum Maintained Intensity: | 365 Cd (Red), 910 Cd (Yellow), 475 Cd (Green) |
| Standard Conformance: | FCC compliant for electrical noise, MIL-STD-810F for moisture resistance, MIL-STD-883 for mechanical vibration, NEMA TS2 Transient Voltage Protection |
| Warranty: | 5 year replacement (materials, workmanship, and intensity) |

Arrow Indication LED Module Specifications (Red, Yellow, Green)

| | |
|---|---|
| Compliance: | Fully compliant with ITE VTCSH LED Vehicle Arrow Supplement specifications adopted July 1, 2007 |
| Compliance Verification: | Intertek ETL verified compliance – Product must be listed on the “Directory of LED Modules Certified Products” list located on the ETL website at http://www.intertek.com/lighting/performance-testing/traffic-signals/ |
| Diameter: | 12” (300mm) |

| | |
|---|---|
| Lens: | Clear Frosted, UV stabilized scratch resistant polycarbonate, tinted red or yellow, clear for green, uniform non-pixelated illumination, incandescent appearance, omni-directional |
| LEDS: | Hi-flux LEDs |
| Operating Temperature Range: | -40 to +74C (-40 to +165F) |
| Operating Voltage Range: | 80 to 135 V (60Hz AC) |
| Power Factor (PF): | > 90% |
| Total Harmonic Distortion (THD): | < 20% |
| Minimum Voltage Turn-Off: | 35V |
| Turn-On/Turn-Off Time: | <75 ms |
| Nominal Power: | 5.0-7.0 W (Red), 6.0-12.5W (Yellow), 5.0-7.0 W (Green) |
| Nominal Wavelength: | 625-628 nm (Red), 590 nm (Yellow), 500nm (Green) |
| Minimum Maintained Intensity: | 56.8-58.4 Cd (Red), 141.6-146.0 Cd (Yellow), 73.9-76.0 Cd (Green) |
| Standard Conformance: | FCC compliant for electrical noise, MIL-STD-810F for moisture resistance, MIL-STD-883 for mechanical vibration, NEMA TS2 Transient Voltage Protection |
| Warranty: | 5 year replacement (materials, workmanship, and intensity) |

Arrow Indication LED Module Specifications (Yellow/Green Dual Mode)

| | |
|---|---|
| Diameter: | 12” (300mm) |
| LEDS: | Interconnected to minimize the effect of single LED failures |
| Lens: | Clear UV stabilized scratch resistant polycarbonate, uniform non-pixelated illumination, incandescent appearance |
| Operating Temperature Range: | -40 to +74C (-40 to +165F) |
| Operating Voltage Range: | 80 to 135 V (60Hz AC) |

| | |
|---|---|
| Power Factor (PF): | > 90% |
| Total Harmonic Distortion (THD): | < 20% |
| Minimum Voltage Turn-Off: | 35V |
| Turn-On/Turn-Off Time: | <75 ms |
| Nominal Power: | 8.0-10.0 W (Yellow), 8.0-10.0 W (Green) |
| Nominal Wavelength: | 590-592 nm (Yellow), 505-508 nm (Green) |
| Minimum Maintained Intensity: | 141.6-146.0 Cd (Yellow), 73.9-76.0 Cd (Green) |
| Standard Conformance: | FCC compliant for electrical noise, MIL-STD-810F for moisture resistance, MIL-STD-883 for mechanical vibration, NEMA TS2 Transient Voltage Protection |
| Warranty: | 5 year replacement (materials, workmanship, and intensity) |

12" Pedestrian LED Module Specifications (Man/Hand, Countdown Timer)

| | |
|---|---|
| Compliance: | Fully compliant with ITE PTCSI Part-2 LED Pedestrian Traffic Signal Modules specification adopted August 4, 2010 |
| Compliance Verification: | Intertek ETL verified compliance – Product must be listed on the "Directory of LED Modules Certified Products" list located on the ETL website at http://www.intertek.com/lighting/performance-testing/traffic-signals/ |
| Size: | 12" x 12" |
| Configuration: | Full Man/Full Hand Overlay Module, Countdown Timer Module |
| Lens: | Clear Frosted, UV stabilized scratch resistant polycarbonate, uniform non-pixelated illumination, incandescent appearance |
| Operating Temperature Range: | -40 to +74C (-40 to +165F) |
| Operating Voltage Range: | 80 to 135 V (60Hz AC) |

| | |
|---|---|
| Power Factor (PF): | > 90% |
| Total Harmonic Distortion (THD): | < 20% |
| Minimum Voltage Turn-Off: | 35V |
| Turn-On/Turn-Off Time: | <75 ms |
| Nominal Power: | 5.0-9.0 W (Man), 5.0-11.0W (Hand), 5.0-8.0 W (Timer) |
| Minimum Maintained Intensity: | 1,400 Cd (Hand), 1,400 Cd (Timer), 2,200 Cd (Man) |
| Standard Conformance: | FCC compliant for electrical noise, MIL-STD-810F for moisture resistance, MIL-STD-883 for mechanical vibration, NEMA TS2 Transient Voltage Protection |
| Warranty: | 5 year replacement (materials, workmanship, and intensity) |

16" Pedestrian LED Module Specifications (Man/Hand with Countdown Timer)

| | |
|---|---|
| Compliance: | Fully compliant with ITE PTCSI Part-2 LED Pedestrian Traffic Signal Modules specification adopted August 4, 2010 |
| Compliance Verification: | Intertek ETL verified compliance – Product must be listed on the "Directory of LED Modules Certified Products" list located on the ETL website at http://www.intertek.com/lighting/performance-testing/traffic-signals/ |
| Size: | 16" x 18" |
| Configuration: | Man/Hand Overlay with Countdown Timer |
| Lens: | UV stabilized scratch resistant polycarbonate, uniform non-pixelated illumination, incandescent appearance |
| Operating Temperature Range: | -40 to +74C (-40 to +165F) |
| Operating Voltage Range: | 80 to 135 V (60Hz AC) |
| Power Factor (PF): | > 90% |
| Total Harmonic Distortion (THD): | < 20% |
| Minimum Voltage Turn-Off: | 35V |

| | |
|---|---|
| Turn-On/Turn-Off Time: | <75 ms |
| Nominal Power: | 6.0-9.0 W (Man), 7.0-9.0W (Hand), 5.0-8.0 W (Timer) |
| Minimum Maintained Intensity: | 1,400 Cd (Hand), 1,400 Cd (Timer), 2,200 Cd (Man) |
| Standard Conformance: | FCC compliant for electrical noise, MIL-STD-810F for moisture resistance, MIL-STD-883 for mechanical vibration, NEMA TS2 Transient Voltage Protection |
| Warranty: | 5 year replacement (materials, workmanship, and intensity) |

**600V, 4-1C No. 2, 1/C No. 8 Ground, (XLP-Type Use), 2" Dia Polyethylene**

**Description:** This work shall consist of furnishing and installing wire and conduit raceway in accordance with Sections 817, 1066, 1088.01 of the Standard Specifications for Road and Bridge Construction and the following additions or exceptions.

**General:** 600 volt XLP type wire to be provided, 4 copper conductors at #2 AWG, 1 copper ground conductor at #8 AWG, and in 2" 40 schedule polyethylene conduit.

**Basis of Payment:** This work will be paid for at the contract unit price per foot for 600V, 4-1C No. 2, 1/C No. 8 Ground, (XLP-Type Use), 2" Dia Polyethylene.

**REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (PROJECT SPECIFIC)**

**Description:** This work shall consist of the removal and disposal of regulated substances according to Section 669 of the Standard Specifications as revised below.

**Contract Specific Sites:** The excavation soil and groundwater within the areas listed below shall be managed as either "uncontaminated soil", hazardous waste, special waste, or non-special waste. For stationing, the lateral distance is measured from centerline and the farthest distance is the offset distance or construction limit, whichever is less.

**Site SR0107 – CWLP**

- Station 47731+50 to Station 47733+00 (10th Street Rail Corridor), 0 to 120 feet LT, 0-5 feet bgs. All excavation planned for Sewer and Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: lead, and TCLP/SPLP lead. See soil boring SR0107-B01 (Figure 2).

- Station 47733+00 to Station 47735+60 (10th Street Rail Corridor), 0 to 120 feet LT, 0-5 feet bgs. All excavation planned for Sewer and Ditch Excavation. The Engineer

has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil borings SR0107-B02 and –B03 (Figure 2).

**Site SR0110 – Warming Center**

- Station 47738+70 to Station 47739+70 (10th Street Rail Corridor), 0 to 120 feet LT, 0-6 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineerhas determined this material meets to criteria of and shall be managed in accordance withArticle 669.05(a)(2). Contaminants of concern sampling parameters: arsenic. See soil borings SR0110-B02, (Figure 3).

- Station 47738+70 to Station 47739+70 (10th Street Rail Corridor), 0 to 120 feet LT, 6-12 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineerhas determined this material meets to criteria of and shall be managed in accordance withArticle 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil borings SR0110-B02, (Figure 3).

**Site SR0113 – Horace Mann Parking**

- Station 296+30 to Station 297+30 (Madison Street), 0 to 60 feet RT, 0-5 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, Dibenzo(a,h)anthtracene, Ideno(1,2,3-cd)pyrene,arsenic, and TCLP/SPLP lead. See soil boring SR0113-B01 (Figure 3).

- Station 296+30 to Station 297+30 (Madison Street), 0 to 60 feet RT, 5-10 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameters: benzo(a)pyrene. See soil boring SR0113-B01 (Figure 3).
- Station 297+30 to Station 298+30 (Madison Street), 0 to 60 feet RT, 0-7 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameters: arsenic. See soil boring SR0113-B02 (Figure 3).

- Station 297+30 to Station 298+30 (Madison Street), 0 to 60 feet RT, 7-14 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0113-B02 (Figure 3).

- Station 298+30 to Station 299+90 (Madison Street), 0 to 60 feet RT; Station 47739+65 toStation 47740+30 (10th Street Rail Corridor), 0 to 60 RT, 0-7 bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminantsof concern sampling parameters: benzo(a)pyrene. See soil boring SR0113-B03 (Figure 3).

- Station 47740+30 to Station 47741+30 (10th Street Rail Corridor), 0 to 60 feet RT, 0-5 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineerhas determined this material meets to criteria of and shall be managed in accordance withArticle 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0113-B04 (Figure 3).

- Station 47796+40 to Station 47797+60 (10th Street Rail Corridor), 0 to 60 feet RT; StationStation 898+50 to 900+05 (Jefferson Street). 0 to 40 LT, 0-7 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determined this materialmeets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil borings SR0113-B06, -B07 (Figure 3).

**Site SR0114 – Salvation Army**

- Station 301+50 to Station 303+50 (Madison Street), 0 to 60 feet RT, 0-5 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0114-B01 (Figure 3).
- Station 300+50 to Station 301+50 (Madison Street), 0 to 60 feet RT, 0-7 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameters: arsenic. See soil boring SR0114-B02 (Figure 3).
- Station 300+50 to Station 301+50 (Madison Street), 0 to 60 feet RT, 7-15 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0114-B02 (Figure 3).

- Station 299+50 to Station 300+50 (Madison Street), 0 to 60 feet RT; Station 47739+70 toStation 47740+40 (10th Street Corridor), 0 to 140 LT, 0-6 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article

669.05(a)(2). Contaminantsof concern sampling parameters: benzo(a)pyrene. See soil boring SR0114-B03 (Figure 3).

- Station 299+50 to Station 300+50 (Madison Street), 0 to 60 feet RT; Station 47739+70 toStation 47740+40 (10th Street Corridor), 0 to 140 LT, 6-12 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminantsof concern sampling parameters: benzo(a)pyrene. See soil boring SR0114-B03 (Figure 3).

- Station 47741+85 to Station 47742+70 (10th Street Rail Corridor), 0 to 140 feet LT, 0-12 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, arsenic, and manganese. See soil boring SR0114-B05 (Figure 3).

- Station 47742+70 to Station 47743+80 (10th Street Rail Corridor), 0 to 80 feet LT,0-6 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineerhas determined this material meets to criteria of and shall be managed in accordance withArticle 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0114-B06 (Figure 3).

- Station 901+95 to Station 903+60 (Jefferson Street), 0 to 40 feet LT, 0-5 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic and pH. See soil boring SR0114-B08 (Figure 3).

**Site SR0115 – Parking Lot**

- Station 900+05 to Station 901+70 (Jefferson Street), 0 to 140 feet RT, 0-7 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0115-B01 (Figure 3).
- Station 47743+80 to Station 47745+70 (10th Street Rail Corridor), 0 to 140 feet LT, 0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameters: benzo(a)pyrene. See soil boring SR0115-B02 (Figure 3).

**Site SR0116 – Car-X**

- Station 901+70 to Station 902+70 (Jefferson Street), 0 to 50 feet RT, 0-7 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0116-B01 (Figure 3).

**Site SR0117 – Parking Lot**

- Station 47745+70 to Station 47746+60 (10th Street Rail Corridor), 0 to 140 feet LT, 7-15 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0117-B01 (Figure 3).

- Station 47746+60 to Station 47747+80 (10th Street Rail Corridor), 0 to 140 feet LT, 0-7 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluranthene, dibenzo(a,h)anthracene, ideno(1,2,3-cd)pyrene, lead, and TCLP/SPLP lead. See soil boring SR0117-B02 (Figure 3).

**Site SR0118 – Helping Hands**

- Station 1001+20 to Station 1002+30 (Washington Street), 0 to 60 feet LT, 0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0118-B01 (Figure 3).

**Site SR0119 – Parking Lot**

- Station 897+80 to Station 898+80 (Jefferson Street), 0 to 50 feet RT, 0-10 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0119-B02 (Figure 3).
- Station 898+80 to Station 900+05 (Jefferson Street), 0 to 80 feet RT, 0-14 feet bgs. All excavation planned for Underpass, Sewer, and Pump Station Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance withArticle 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0119-B03 (Figure 3).

- Station 898+80 to Station 900+05 (Jefferson Street), 0 to 80 feet RT, 35-40 feet bgs. All excavation planned for Underpass, Sewer, and Pump Station Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance withArticle 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0119-B03 (Figure 3).

**Site SR0120 – Parking Lot**

- Station 998+40 to Station 999+90 (Washington Street), 0 to 50 feet RT, 0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0120-B01 (Figure 3).

**Site SR0122 – Parking Lot**

- Station 1001+15 to Station 1002+15 (Washington Street), 0 to 50 feet RT, 0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0122-B02 (Figure 3).

- Station 47751+00 to Station 47752+00 (10th Street Rail Corridor), 0 to 120 feet LT, 0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluranthene, dibenzo(a,h)anthracene, antimony, arsenic, lead, TCLP/SPLP antimony, and TCLP/SPLP lead. See soil boring SR0122-B04 (Figure 4).

**Site SR0125 – Sangamon County Lot**

- Station 47752+00 to Station 47753+40 (10th Street Rail Corridor), 0 to 40 feet RT, 0-5 feet bgs. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: benzo(a)pyrene, arsenic, and pH. See soil boring SR0125-B01 (Figure 4).

- Station 47753+40 to Station 47754+40 (10th Street Rail Corridor), 0 to 40 feet RT, 0-5 feet bgs. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: methylene chloride,arsenic, and TCLP/SPLP antimony. See soil boring SR0125-B02 (Figure 4).

- Station 47754+40 to Station 47756+10 (10th Street Rail Corridor), 0 to 40 feet RT, 0-5 feet bgs. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, ideno(1,2,3-cd)pyrene, and arsenic. See soil boring SR0125-B03 (Figure 4).

**Site SR0126 – Family Video**

- Station 47752+00 to Station 47753+10 (10th Street Rail Corridor), 0 to 120 feet LT, 0-5 feet bgs. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: benzo(a)pyrene, antimony, lead, and TCLP/SPLP lead. See soil boring SR0126-B01 (Figure 4).

- Station 1001+50 to Station 1002+35 (Monroe Street), 0 to 70 feet LT, 0-7 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic and iron. See soil boring SR0126-B03 (Figure 4).

**Site SR0127 – Sherriff's Garage**

- Station 47754+10 to Station 47755+10 (10th Street Rail Corridor), 0 to 120 feet LT, 0-5 feet bgs. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic and iron. Seesoil boring SR0127-B01 (Figure 4).

- Station 1000+05 to Station 1001+50 (Monroe Street), 0 to 70 feet LT, 0-7 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0127-B02 (Figure 4).

**Site SR0129 – Family Video Warehouse**

- Station 47756+10 to Station 47757+10 (10th Street Rail Corridor), 0 to 120 feet LT, 0-7 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic and iron. See soil boring SR0129-B02 (Figure 4).

- Station 47757+10 to Station 47758+10 (10th Street Rail Corridor), 0 to 120 feet LT,

0-5 feet bgs. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0127-B03 (Figure 4).

**Site SR0130 – Unoccupied Building**

- Station 47758+10 to Station 47759+20 (10th Street Rail Corridor), 0 to 120 feet LT, 0-5 feet bgs. All excavation planned for Drainage Ditch and Sewer Excavation. The Engineerhas determined this material meets to criteria of and shall be managed in accordance withArticle 669.05(a)(5). Contaminants of concern sampling parameters: iron and TCLP/SPLPiron. See soil boring SR0130-B01 (Figure 4).

- Station 47759+20 to Station 47760+20 (10th Street Rail Corridor), 0 to 120 feet LT, 0-5 feet bgs. All excavation planned for Drainage Ditch and Sewer Excavation. The Engineerhas determined this material meets to criteria of and shall be managed in accordance withArticle 669.05(a)(1). Contaminants of concern sampling parameters: iron and TCLP/SPLPiron. See soil boring SR0130-B02 (Figure 4).

- Station 62+90 to Station 64+30 (Capitol Avenue), 0 to 70 feet LT, 0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: iron, manganese, and TCLP/SPLP iron. See soil boring SR0130-B03 (Figure 4).

**Site SR0306 – SJR Parking Lot**

- Station 998+15 to Station 1000+05 (Monroe Street), 0 to 70 feet RT, 0-7 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic, iron, and TCLP/SPLP iron. See soil boring SR0306-B01 (Figure 4).

- Station 47757+00 to Station 47757+80 (10th Street Rail Corridor), 0 to 50 feet RT, 0-5 feet bgs. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: iron and TCLP/SPLPiron. See soil boring SR0306-B02 (Figure 4).
- Station 47759+20 to Station 47760+20 (10th Street Rail Corridor), 0 to 50 feet RT; and Station 60+50 to Station 62+00 (Capitol Avenue), 0 to 50 feet LT, 0-5 feet bgs. All excavation planned for Drainage Ditch and Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters:

benzo(a)anthracene,benzo(a)pyrene, benzo(b) fluoranthene, dibenzo(a,h)anthracene, ideno(1,2,3-cd)pyrene, lead, and TCLP/SPLP lead. See soil boring SR0306-B05 (Figure 4).

**Site SR0308 – Gravel Lot**

- Station 47735+60 to Station 47736+60 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determined thismaterial meets to criteria of and shall be managed in accordance with Article 669.05(a)(5).Contaminants of concern sampling parameters: benzo(a)pyrene, arsenic, lead, and TCLP/SPLP lead. See soil boring SR0308-B01 (Figure 2).

- Station 47735+60 to Station 47736+60 (10th Street Rail Corridor), 0 to 170 feet LT, 5-10 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determined thismaterial meets to criteria of and shall be managed in accordance with Article 669.05(a)(2).Contaminants of concern sampling parameters: arsenic. See soil boring SR0308-B01 (Figure 2).

**Site SR0310 – Gravel Lot**

- Station 47736+60 to Station 47737+60 (10th Street Rail Corridor), 0 to 120 feet LT, 0-5 feet bgs. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: lead and TCLP/SPLP lead. See soil boring SR0310-B01 (Figure 3).

**Site SR0319 – Parking Lot**

- Station 47760+20 to Station 47763+00 (10th Street Rail Corridor), 0 to 60 feet RT, 0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5).Contaminants of concern sampling parameters: arsenic. See soil boring SR0319-B01 (Figure 4).

**Site SR0320 – St. John's Parking Lot**

- Station 47735+60 to Station 47736+60 (10th Street Rail Corridor), 0 to 200 feet RT,0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0320-B01 (Figure 2).
- Station 47736+60 to Station 47737+60 (10th Street Rail Corridor), 0 to 40 feet RT, 0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with

Article 669.05(a)(2). Contaminants of concern sampling parameters: arsenic. See soil boring SR0320-B02 (Figure 3).

- Station 47737+60 to Station 47738+60 (10th Street Rail Corridor), 0 to 40 feet RT, 0-5 feet bgs. All excavation planned for Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0320-B03 (Figure 3).

- Station 298+50 to Station 299+90 (Madison Street), 0 to 60 feet LT, 0-7 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameters: arsenic. See soil boring SR0320-B04 (Figure 3).

- Station 298+50 to Station 299+90 (Madison Street), 0 to 60 feet LT, 7-14 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: methylene chloride. See soilboring SR0320-B04 (Figure 3).

- Station 297+50 to Station 298+50 (Madison Street), 0 to 60 feet LT, 0-7 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0320-B05 (Figure 3).

- Station 296+30 to Station 297+50 (Madison Street), 0 to 60 feet LT, 0-10 feet bgs. All excavation planned for Underpass and Sewer Excavation. The Engineer has determinedthis material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic. See soil boring SR0320-B06 (Figure 3).

## STORM WATER POLLUTION PREVENTION PLAN

See following pages.

Illinois Department of Transportation

## Storm Water Pollution Prevention Plan

Print Form | Reset Form

| Route | Marked Route | Section Number |
|---|---|---|
| FAP 67, FAP 67A | Madison St, Jefferson St | 20-00491-00-BR |
| **Project Number** | **County** | **Contract Number** |
| 8UQF(680) | Sangamon | 93762 |

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No ILR10 (Permit ILR10), issued by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

| Signature | Date |
|---|---|
| Nathan Bottom | 10/4/21 |

| Print Name | Title | Agency |
|---|---|---|
| Nathan Bottom | Public Works Director | City of Springfield |

Note: Guidance on preparing each section of BDE 2342 can be found in Chapter 41 of the IDOT Bureau of Design and Environment (BDE) Manual. Chapter 41 and this form also reference the IDOT Drainage Manual which should be readily available.

**I. Site Description:**

A. Provide a description of the project location; include latitude and longitude, section, town, and range:
Springfield, IL, LAT 39 deg 48' 15", LONG 89 deg 38' 31",TWP. 16N, Range 5W

B. Provide a description of the construction activity which is the subject of this plan. Include the number of construction stages, drainage improvements, in-stream work, installation, maintenance, removal of erosion measures, and permanent stabilization:
Construction of 2 new underpasses, 2 at-grade crossings, 1 pedestrian crossing, and railroad corridor. There are 4 construction stages.

C. Provide the estimated duration of this project:
26 months

D. The total area of the construction site is estimated to be 26 acres.
The total area of the site estimated to be disturbed by excavation, grading or other activities is 26 acres.

E. The following are weighted averages of the runoff coefficient for this project before and after construction activities are completed; see Section 4-102 of the IDOT Drainage Manual:
Rational "C" =0.6

F. List all soils found within project boundaries; include map unit name, slope information, and erosivity:
Using the Web Soil Survey website (http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx) the soil types are identified in attachment A.

G. If wetlands were delineated for this project, provide an extent of wetland acreage at the site; see Phase I report:
Based on wetlands reconnaissance survey and the NWI mapping, this project does not affect any wetlands

regulated under the Clean Water Act of 1972.

H. Provide a description of potentially erosive areas associated with this project:

Areas of exposed dirt from excavation operations.

I. The following is a description of soil disturbing activities by stages, their locations, and their erosive factors (e.g., steepness of slopes, length of slopes, etc.):

Construction along NSRR
Preliminary grading stage: Soil disturbing activities will consist of trenching for utilities, embankment construction and placing sub-ballast east of the existing tracks.
Final Grading Stage: Same as for preliminary grading except on the west side of the proposed track.

J. See the erosion control plans and/or drainage plans for this contract for information regarding drainage patterns, approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent offsite sediment tracking (to be added after contractor identifies locations), areas of soil disturbance, the location of major structural and non-structural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands) , and locations where storm water is discharged to surface water including wetlands.

K. Identify who owns the drainage system (municipality or agency) this project will drain into:

City of Springfield

L. The following is a list of General NPDES ILR40 permittees within whose reporting jurisdiction this project is located:

City of Springfield
Sangamon County Water Reclamation District

M. The following is a list of receiving water(s) and the ultimate receiving water(s) for this site. In addition, include receiving waters that are listed as Biologically Significant Streams by the Illinois Department of Natural Resources (IDNR). The location of the receiving waters can be found on the erosion and sediment control plans:

The receiving waters for the project are Sugar Creek which outlets to the Sangamon River.

N. Describe areas of the site that are to be protected or remain undisturbed. These areas may include steep slopes (i.e., 1:3 or steeper), highly erodible soils, streams, stream buffers, specimen trees, natural vegetation, nature preserves, etc. Include any commitments or requirements to protect adjacent wetlands.

For any storm water discharges from construction activities within 50-feet of Waters of the U.S. (except for activities for water-dependent structures authorized by a Section 404 permit, describe: a) How a 50-foot undisturbed natural buffer will be provided between the construction activity and the Waters of the U.S. or b) How additional erosion and sediment controls will be provided within that area.

There are no protected areas within or adjacent to the job site.

O. Per the Phase I document, the following sensitive environmental resources are associated with this project and may have the potential to be impacted by the proposed development. Further guidance on these resources is available in Section 41-4 of the BDE Manual.

☐ 303(d) Listed receiving waters for suspended solids, turbidity, or siltation.
The name(s) of the listed water body, and identification of all pollutants causing impairment:

Provide a description of how erosion and sediment control practices will prevent a discharge of sediment resulting from a storm event equal to or greater than a twenty-five (25) year, twenty-four (24) hour rainfall event:

Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:

Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

☐ Applicable Federal, Tribal, State, or Local Programs

☐ Floodplain

☐ Historic Preservation

☐ Receiving waters with Total Maximum Daily Load (TMDL) for sediment, total suspended solids, turbidity or siltation

TMDL (fill out this section if checked above)

The name(s) of the listed water body:

Provide a description of the erosion and sediment control strategy that will be incorporated into the site design that is consistent with the assumptions and requirements of the TMDL:

If a specific numeric waste load allocation has been established that would apply to the project's discharges, provide a description of the necessary steps to meet that allocation:

☐ Threatened and Endangered Species/Illinois Natural Areas (INAI)/Nature Preserves

☐ Other

☐ Wetland

P. The following pollutants of concern will be associated with this construction project:

- ☒ Antifreeze / Coolants
- ☒ Concrete
- ☒ Concrete Curing Compounds
- ☒ Concrete Truck Waste
- ☒ Fertilizers / Pesticides
- ☒ Paints
- ☒ Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids)
- ☒ Soil Sediment
- ☒ Solid Waste Debris
- ☒ Solvents
- ☒ Waste water from cleaning construction equipments
- ☐ Other (Specify)
- ☐ Other (Specify)
- ☐ Other (Specify)
- ☐ Other (Specify)
- ☐ Other (Specify)

**II. Controls:**

This section of the plan addresses the controls that will be implemented for each of the major construction activities described in Section I.C above and for all use areas, borrow sites, and waste sites. For each measure discussed, the Contractor will be responsible for its implementation as indicated. The Contractor shall provide to the Resident Engineer a plan for the implementation of the measures indicated. The Contractor, and subcontractors, will notify the Resident Engineer of any proposed changes, maintenance, or modifications to keep construction activities compliant with the Permit ILR10. Each such Contractor has signed the required certification on forms which are attached to, and are a part of, this plan:

A. **Erosion and Sediment Controls:** At a minimum, controls must be coordinated, installed and maintained to:

1. Minimize the amount of soil exposed during construction activity;
2. Minimize the disturbance of steep slopes;
3. Maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible;
4. Minimize soil compaction and, unless infeasible, preserve topsoil.

B. **Stabilization Practices:** Provided below is a description of interim and permanent stabilization practices, including site- specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Stabilization practices may include but are not limited to: temporary seeding, permanent seeding, mulching, geotextiles, sodding, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Except as provided below in II.B.1 and II.B.2, stabilization measures shall be initiated **immediately** where construction activities have temporarily or permanently ceased, but in no case more than **one (1) day** after the construction activity in that portion of the site has temporarily or permanently ceases on all disturbed portions of the site where construction will not occur for a period of fourteen (14) or more calendar days.

1. Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.

2. On areas where construction activity has temporarily ceased and will resume after fourteen (14) days, a temporary stabilization method can be used.

The following stabilization practices will be used for this project:

- [x] Erosion Control Blanket / Mulching
- [ ] Geotextiles
- [x] Permanent Seeding
- [ ] Preservation of Mature Seeding
- [ ] Protection of Trees
- [ ] Sodding
- [x] Temporary Erosion Control Seeding
- [ ] Temporary Turf (Seeding, Class 7)
- [ ] Temporary Mulching
- [ ] Vegetated Buffer Strips
- [ ] Other (Specify)
- [ ] Other (Specify)
- [ ] Other (Specify)
- [ ] Other (Specify)

Describe how the stabilization practices listed above will be utilized during construction:

Permanent seeding will be placed on bare slopes to prevent erosion. Erosion control blankets will be placed after seeding on 2:1 slopes.

Describe how the stabilization practices listed above will be utilized after construction activities have been completed:

Erosion control blankets will help prevent erosion until vegetation established.

C. **Structural Practices:** Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include but are not limited to: perimeter erosion barrier, earth dikes, drainage swales, sediment traps, ditch checks, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. The installation of these devices may be subject to Section 404 of the Clean Water Act.

- [ ] Aggregate Ditch
- [ ] Concrete Revetment Mats
- [ ] Dust Suppression
- [ ] Dewatering Filtering
- [ ] Gabions
- [ ] In-Stream or Wetland Work
- [x] Stabilized Construction Exits
- [ ] Stabilized Trench Flow
- [ ] Slope Mattress
- [ ] Slope Walls
- [x] Temporary Ditch Check
- [ ] Temporary Pipe Slope Drain

| | | | |
|---|---|---|---|
| ☐ | Level Spreaders | ☐ | Temporary Sediment Basin |
| ☐ | Paved Ditch | ☐ | Temporary Stream Crossing |
| ☐ | Permanent Check Dams | ☐ | Turf Reinforcement Mats |
| ☒ | Perimeter Erosion Barrier | ☐ | Other (Specify) |
| ☐ | Permanent Sediment Basin | ☐ | Other (Specify) |
| ☐ | Retaining Walls | ☐ | Other (Specify) |
| ☐ | Riprap | ☐ | Other (Specify) |
| ☐ | Rock Outlet Protection | ☐ | Other (Specify) |
| ☐ | Sediment Trap | ☐ | Other (Specify) |
| ☒ | Storm Drain Inlet Protection | ☐ | Other (Specify) |

Describe how the structural practices listed above will be utilized during construction:

The storm drain inlet protection will be placed at all the inlets and manholes along the rail corridor with open grates to prevent sediment and silt from construction operations from entering the storm sewer system. The inlet protection will consist of inlets filters. These inlet filters should be checked on a regular basis and maintained as necessary to ensure the proper function of each filter.

Describe how the structural practices listed above will be utilized after construction activities have been completed:

Once construction operations are completed and vegetation is sufficiently established to prevent erosion, the storm drain inlet filters can be removed.
The perimeter erosion barrier can be removed after exposed surfaces have been constructed to their final condition and all vegetation is sufficiently established to prevent sediment from flowing into the adjacent parking lots and roadways.

D. **Treatment Chemicals**

Will polymer flocculants or treatment chemicals be utilized on this project: ☐ Yes ☐ No

If *yes* above, identify where and how polymer flocculants or treatment chemicals will be utilized on this project.

E. **Permanent (i.e., Post-Construction) Storm Water Management Controls:** Provided below is a description of measures that will be installed during the construction process to control volume and pollutants in storm water discharges that will occur after construction operations have been completed.The installation of these devices may be subject to Section 404 of the Clean Water Act.

1. Such practices may include but are not limited to: storm water detention structures (including wet ponds), storm water retention structures, flow attenuation by use of open vegetated swales and natural depressions, infiltration of runoff on site, and sequential systems (which combine several practices).

   The practices selected for implementation were determined based on the technical guidance in Chapter 41 (Construction Site Storm Water Pollution Control) of the IDOT BDE Manual. If practices other than those discussed in Chapter 41 are selected for implementation or if practices are applied to situations different from those covered in Chapter 41, the technical basis for such decisions will be explained below.

2. Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., maintenance of hydrologic conditions such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

Description of permanent storm water management controls:

F. **Approved State or Local Laws:** The management practices, controls and provisions contained in this plan will be in accordance with IDOT specifications, which are at least as protective as the requirements contained in the IEPA's Illinois Urban Manual. Procedures

and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials shall be described or incorporated by reference in the space provided below. Requirements specified in sediment and erosion site plans, site permits, storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI, to be authorized to discharge under the Permit ILR10 incorporated by reference and are enforceable under this permit even if they are not specifically included in the plan.
Description of procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials:

G. **Contractor Required Submittals:** Prior to conducting any professional services at the site covered by this plan, the Contractor and each subcontractor responsible for compliance with the permit shall submit to the Resident Engineer a Contractor Certification Statement, BDE 2342A.

1. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:
   - Approximate duration of the project, including each stage of the project
   - Rainy season, dry season, and winter shutdown dates
   - Temporary stabilization measures to be employed by contract phases
   - Mobilization time-frame
   - Mass clearing and grubbing/roadside clearing dates
   - Deployment of Erosion Control Practices
   - Deployment of Sediment Control Practices (including stabilized cons
   - Deployment of Construction Site Management Practices (including concrete washout facilities, chemical storage, refueling locations, etc.)
   - Paving, saw-cutting, and any other pavement related operations
   - Major planned stockpiling operation
   - Time frame for other significant long-term operations or activities that may plan non-storm water discharges as dewatering, grinding, etc
   - Permanent stabilization activities for each area of the project
2. During the pre-construction meeting, the Contractor and each subcontractor shall provide, as an attachment to their signed Contractor Certification Statement, a discussion of how they will comply with the requirements of the permit in regard to the following items and provide a graphical representation showing location and type of BMPs to be used when applicable:
   - Temporary Ditch Checks - Identify what type and the source of Temporary Ditch Checks that will be installed as part of the project. The installation details will then be included with the SWPPP.
   - Vehicle Entrances and Exits - Identify type and location of stabilized construction entrances and exits to be used and how they will be maintained.
   - Material Delivery, Storage and Use - Discuss where and how materials including chemicals, concrete curing compounds, petroleum products, etc. will be stored for this project.
   - Stockpile Management - Identify the location of both on-site and off-site stockpiles. Discuss what BMPs will be used to prevent pollution of storm water from stockpiles.
   - Waste Disposal - Discuss methods of waste disposal that will be used for this project.
   - Spill Prevention and Control - Discuss steps that will be taken in the event of a material spill (chemicals, concrete curing compounds, petroleum, etc.)
   - Concrete Residuals and Washout Wastes - Discuss the location and type of concrete washout facilities to be used on this project and how they will be signed and maintained.
   - Litter Management - Discuss how litter will be maintained for this project (education of employees, number of dumpsters, frequency of dumpster pick-up, etc.).
   - Vehicle and Equipment Fueling - Identify equipment fueling locations for this project and what BMPs will be used to ensure containment and spill prevention.
   - Vehicle and Equipment Cleaning and Maintenance - Identify where equipment cleaning and maintenance locations for this project and what BMPs will be used to ensure containment and spill prevention.
   - Dewatering Activities - Identify the controls which will be used during dewatering operations to ensure sediments will not leave the construction site.
   - Polymer Flocculants and Treatment Chemicals - Identify the use and dosage of treatment chemicals and provide the Resident Engineer with Material Safety Data Sheets. Describe procedures on how the chemicals will be used and identify who will be responsible for the use and application of these chemicals. The selected individual must be trained on the established procedures.
   - Additional measures indicated in the plan.

**III. Maintenance:**

When requested by the Contractor, the Resident Engineer will provide general maintenance guides (e.g., IDOT Erosion and Sediment Control Field Guide) to the Contractor for the practices associated with this project. Describe how all items will be checked for structural

integrity, sediment accumulation and functionality. Any damage or undermining shall be repaired immediately. Provide specifics on how repairs will be made. The following additional procedures will be used to maintain, in good and effective operating conditions, the vegetation, erosion and sediment control measures and other protective measures identified in this plan. It will be the Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

**IV. Inspections:**

Qualified personnel shall inspect disturbed areas of the construction site including Borrow, Waste, and Use Areas, which have not yet been finally stabilized, structural control measures, and locations where vehicles and equipment enter and exit the site using IDOT Storm Water Pollution Prevention Plan Erosion Control Inspection Report, BC 2259. Such inspections shall be conducted at least once every seven (7) calendar days and within twenty-four (24) hours of the end of a storm or by the end of the following business or work day that is 0.5 inch or greater or equivalent snowfall.

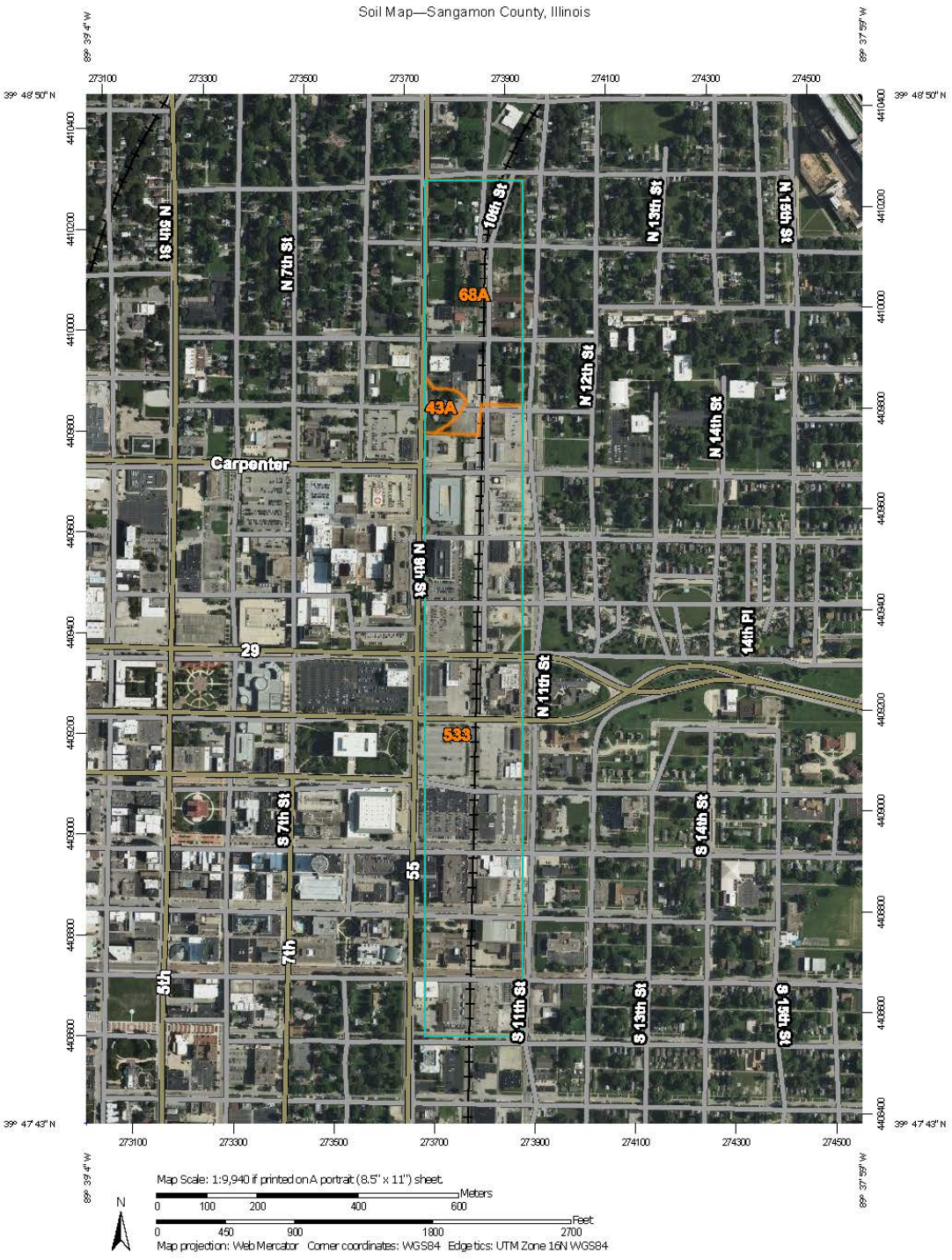
Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities are conducted, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.

If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer shall notify the appropriate IEPA Field Operations Section office by email at: epa.swnoncomp@illinois.gov, telephone or fax within twenty-four (24) hours of the incident. The Resident Engineer shall then complete and submit an "Incidence of Non-Compliance" (ION) report for the identified violation within five (5) days of the incident. The Resident Engineer shall use forms provided by IEPA and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of non-compliance shall be signed by a responsible authority in accordance with Part VI. G of the Permit ILR10.

The Incidence of Non-Compliance shall be mailed to the following address:
Illinois Environmental Protection Agency
Division of Water Pollution Control
Attn: Compliance Assurance Section
1021 North Grand East
Post Office Box 19276
Springfield, Illinois 62794-9276

**V. Failure to Comply:**

Failure to comply with any provisions of this Storm Water Pollution Prevention Plan will result in the implementation of a National Pollutant Discharge Elimination System/Erosion and Sediment Control Deficiency Deduction against the Contractor and/or penalties under the Permit ILR10 which could be passed on to the Contractor.


Soil Map—Sangamon County, Illinois
68A
43A
533
Carpenter
29
55
N 5th St
N 7th St
10th St
N 12th St
N 13th St
N 14th St
N 15th St
N 9th St
N 11th St
14th Pl
S 7th St
S 11th St
S 13th St
S 14th St
S 15th St
Map Scale: 1:9,940 if printed on A portrait (8.5" x 11") sheet.
Meters
Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84
Natural Resources Conservation Service
Web Soil Survey
National Cooperative Soil Survey
8/6/2021
Page 1 of 3

Soil Map—Sangamon County, Illinois

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

**Special Line Features**

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sangamon County, Illinois
Survey Area Data: Version 13, May 29, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 24, 2020—Jul 26, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 43A | Ipava silt loam, 0 to 2 percent slopes | 1.4 | 1.7% |
| 68A | Sable silty clay loam, 0 to 2 percent slopes | 21.5 | 26.5% |
| 533 | Urban land | 58.5 | 71.8% |
| **Totals for Area of Interest** | | **81.5** | **100.0%** |

**PROJECT LABOR AGREEMENT**

Effective: May 18, 2007 Revised: August 1, 2019

**Description.** The Illinois Project Labor Agreements Act, 30 ILCS 571, states that the State of Illinois has a compelling interest in awarding public works contracts so as to ensure the highest standards of quality and efficiency at the lowest responsible cost. A project labor agreement (PLA) is a form of pre-hire collective bargaining agreement covering all terms and conditions of employment on a specific project that is intended to support this compelling interest. It has been determined by the Department that a PLA is appropriate for the project that is the subject of this contract. The PLA document, provided below, only applies to the construction site for this contract. It is the policy of the Department on this contract, and all construction projects, to allow all contractors and subcontractors to compete for contracts and subcontracts without regard to whether they are otherwise parties to collective bargaining agreements.

**Execution of Letter of Assent.** A copy of the PLA applicable to this project is included as part of this special provision. As a condition of the award of the contract, the successful bidder and each of its subcontractors shall execute a "Contractor Letter of Assent", in the form attached to the PLA as Exhibit A. The successful bidder shall submit a Subcontractor's Contractor Letter of Assent to the Department prior to the subcontractor's performance of work on the project. Upon request, copies of the applicable collective bargaining agreements will be provided by the appropriate signatory labor organization at the pre-job conference.

**Quarterly Reporting.** Section 37 of the Illinois Project Labor Agreements Act requires the Department to submit quarterly reports regarding the number of minorities and females employed under PLAs. To assist in this reporting effort, the Contractor shall provide a quarterly workforce participation report for all minority and female employees working under the PLA of this contract. The data shall be reported on Construction Form BC 820, Project Labor Agreement (PLA) Workforce Participation Quarterly Reporting Form available on the Department's website http://www.idot.illinois.gov/Assets/uploads/files/IDOT-Forms/BC/BC%20820.docx.

The report shall be submitted no later than the 15th of the month following the end of each quarter (i.e., April 15 for the January – March reporting period). The form shall be emailed to DOT.PLA.Reporting@illinois.gov or faxed to (217) 524-4922.

Any costs associated with complying with this provision 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.

Illinois Department of Transportation
**PROJECT LABOR AGREEMENT**

This Project Labor Agreement ("PLA" or "Agreement") is entered into this_____ day of _____, 2019, by and between the Illinois Department of Transportation ("IDOT" or "Department") in its proprietary capacity, and each relevant Illinois AFL-CIO Building Trades signatory hereto as determined by the Illinois AFL-CIO Statewide Project Labor Agreement Committee on behalf of each of its affiliated members (individually and collectively, the "Unions"). This PLA shall apply to Construction Work (as defined herein) to be performed by IDOT's Prime Contractor and each of its subcontractors of whatever tier ("Subcontractor" or "Subcontractors") on Contract No. (hereinafter, the "Project").

## ARTICLE 1 - INTENT AND PURPOSES

1.1 This PLA is entered into in accordance with the Project Labor Agreement Act ("Act", 30 ILCS 571). It is mutually understood and agreed that the terms and conditions of this PLA are intended to promote the public interest in obtaining timely and economical completion of the Project by encouraging productive and efficient construction operations; by establishing a spirit of harmony and cooperation among the parties; and by providing for peaceful and prompt settlement of any and all labor grievances or jurisdictional disputes of any kind without strikes, lockouts, slowdowns, delays, or other disruptions to the prosecution of the work. The parties acknowledge the obligations of the Contractors and Subcontractors to comply with the provisions of the Act. The parties will work with the Contractors and Subcontractors within the parameters of other statutory and regulatory requirements to implement the Act's goals and objectives.

1.2 As a condition of the award of the contract for performance of work on the Project, IDOT's Prime Contractor and each of its Subcontractors shall execute a "Contractor Letter of Assent", in the form attached hereto as Exhibit A, prior to commencing Construction Work on the Project. The Contractor shall submit a Subcontractor's Contractor Letter of Assent to the Department prior to the Subcontractor's performance of Construction Work on the Project. Upon request copies of the applicable collective bargaining agreements will be provided by the appropriate signatory labor organization consistent with this Agreement and at the pre-job conference referenced in Article III, Section 3.1.

1.3 Each Union affiliate and separate local representing workers engaged in Construction Work on the Project in accordance with this PLA are bound to this agreement by the Illinois AFL-CIO Statewide Project Labor Agreement Committee which is the central committee established with full authority to negotiate and sign PLAs with the State on behalf of all respective crafts. Upon their signing the Contractor Letter of Assent, the Prime Contractor, each Subcontractor, and the individual Unions shall thereafter be deemed a party to this PLA. No party signatory to this PLA shall, contract or subcontract, nor permit any other person, firm, company, or entity to contract or subcontract for the performance of Construction Work for the Project to any person, firm, company, or entity that does not agree in writing to become bound for the term of this Project by the terms of this PLA prior to commencing such work and to the applicable area-wide collective bargaining agreement(s) with the Union(s) signatory hereto.

1.4 It is understood that the Prime Contractor(s) and each Subcontractor will be considered and accepted by the Unions as separate employers for the purposes of collective bargaining, and it is further agreed that the employees working under this PLA shall constitute a bargaining unit separate and distinct from all others. The parties hereto also agree that this PLA shall be applicable solely with respect to this Project, and shall have no bearing on the interpretation of any other collective bargaining agreement or as to the recognition of any bargaining unit other than for the specific purposes of this Project.

1.5 In the event of a variance or conflict, whether explicit or implicit, between the terms and conditions of this PLA and the provisions of any other applicable national, area, or local collective bargaining agreement, the terms and conditions of this PLA shall supersede and control. For any work performed under the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, the National Agreement of the International Union of Elevator Constructors, and for any instrument calibration work and loop checking performed under the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, the preceding sentence shall apply only with respect to Articles I, II, V, VI, and VII.

1.6 Subject to the provisions of paragraph 1.5 of this Article, it is the parties' intent to respect the provisions of any other collective bargaining agreements that may now or hereafter pertain, whether between the Prime Contractor and one or more of the Unions or between a Subcontractor and one or more of the Unions. Accordingly, except and to the extent of any contrary provision set forth in this PLA, the Prime Contractor and each of its Subcontractors agrees to be bound and abide by the terms of the following in order of precedence: (a) the applicable collective bargaining agreement between the Prime Contractor and one or more of the Unions made signatory hereto; (b) the applicable collective bargaining agreement between a Subcontractor and one or more of the Unions made signatory hereto; or (c) the current applicable area collective bargaining agreement for the relevant Union that is the agreement certified by the Illinois Department of Labor for purposes of establishing the Prevailing Wage applicable to the Project. The Union will provide copies of the applicable collective bargaining agreements pursuant to part (c) of the preceding sentence to the Prime Contractor. Assignments by the Contractors or Subcontractors amongst the trades shall be consistent with area practices; in the event of unresolved disagreements as to the propriety of such assignments, the provisions of Article VI shall apply.

1.7 Subject to the limitations of paragraphs 1.4 to 1.6 of this Article, the terms of each applicable collective bargaining agreement as determined in accordance with paragraph 1.6 are incorporated herein by reference, and the terms of this PLA shall be deemed incorporated into such other applicable collective bargaining agreements only for purposes of their application to the Project.

1.8 To the extent necessary to comply with the requirements of any fringe benefit fund to which the Prime Contractor or Subcontractor is required to contribute under the terms of an applicable collective bargaining agreement pursuant to the preceding paragraph, the Prime Contractor or Subcontractor shall execute all "Participation Agreements" as may be reasonably required by the Union to accomplish such purpose; provided, however, that such Participation Agreements shall, when applicable to the Prime Contractor or Subcontractor solely as a result of this PLA, be amended as reasonably necessary to reflect such fact. Upon written notice in the form of a lien of a Contractor's or Subcontractor's delinquency from any applicable fringe benefit fund, IDOT will withhold from the Contractor's periodic pay request an amount sufficient to extinguish any delinquency obligation of the Contractor or Subcontractor arising out of the Project.

1.9 In the event that the applicable collective bargaining agreement between a Prime Contractor and the Union or between the Subcontractor and the Union expires prior to the completion of this Project, the expired applicable contract's terms will be maintained until a new applicable collective bargaining agreement is ratified. The wages and fringe benefits included in any new applicable collective bargaining agreement will apply on and after the effective date of the newly negotiated collective bargaining agreement, except to the extent wage and fringe benefit retroactivity is specifically agreed upon by the relevant bargaining parties.

## ARTICLE II – APPLICABILITY, RECOGNITION, AND COMMITMENTS

2.1 The term Construction Work as used herein shall include all "construction, demolition, rehabilitation, renovation, or repair" work performed by a "laborer or mechanic" at the "site of the work" for the purpose of "building" the specific structures and improvements that constitute the Project. Terms appearing within quotation marks in the preceding sentence shall have the meaning ascribed to them pursuant to 29 CFR Part 5 and Illinois labor laws.

2.2 By executing the Letters of Assent, Prime Contractor and each of its Subcontractors recognizes the Unions signatory to this PLA as the sole and exclusive bargaining representatives for their craft employees employed on the jobsite for this Project. Unions who are signatory to this PLA will have recognition on the Project for their craft.

2.3 The Prime Contractor and each of its Subcontractors retains and shall be permitted to exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this PLA or by the terms and conditions of the applicable collective bargaining agreement.

2.4 Except to the extent contrary to an express provision of the relevant collective bargaining agreement, equipment or materials used in the Project may be pre-assembled or pre-fabricated, and there shall be no refusal by the Union to handle, transport, install, or connect such equipment or materials. Equipment or materials delivered to the job-site will be unloaded and handled promptly without regard to potential jurisdictional disputes; any such disputes shall be handled in accordance with the provisions of this PLA.

2.5 The parties are mutually committed to promoting a safe working environment for all personnel at the job-site. It shall be the responsibility of each employer to which this PLA applies to provide and maintain safe working conditions for its employees, and to comply with all applicable federal, state, and local health and safety laws and regulations.

2.6 The use or furnishing of alcohol or drugs and the conduct of any other illegal activity at the job-site is strictly prohibited. The parties shall take every practical measure consistent with the terms of applicable collective bargaining agreements to ensure that the job-site is free of alcohol and drugs.

2.7 All parties to this PLA agree that they will not discriminate against any employee based on race, creed, religion, color, national origin, union activity, age, gender or sexual orientation and shall comply with all applicable federal, state, and local laws.

2.8 In accordance with the Act and to promote diversity in employment, IDOT will establish, in cooperation with the other parties, the apprenticeship hours which are to be performed by minorities and females on the Project. IDOT shall consider the total hours to be performed by these underrepresented groups, as a percentage of the workforce, and create aspirational goals for each Project, based on the level of underutilization for the service area of the Project (together "Project Employment Objectives"). IDOT shall provide a quarterly report regarding the racial and gender composition of the workforce on the Project.

Persons currently lacking qualifications to enter apprenticeship programs will have the opportunity to obtain skills through basic training programs as have been established by the Department. The parties will endeavor to support such training programs to allow participants to obtain the requisite qualifications for the Project Employment Objectives.

The parties agree that all Contractors and Subcontractors working on the Project shall be encouraged to utilize the maximum number of apprentices as permitted under the terms of the applicable collective bargaining agreements to realize the Project Employment Objectives.

The Unions shall assist the Contractor and each Subcontractor in efforts to satisfy Project Employment Objectives. A Contractor or Subcontractor may request from a Union specific categories of workers necessary to satisfy Project Employment Objectives. The application of this section shall be consistent with all local Union collective bargaining agreements, and the hiring hall rules and regulations established for the hiring of personnel, as well as the apprenticeship standards set forth by each individual Union.

2.9 The parties hereto agree that engineering consultants and materials testing employees, to the extent subject to the terms of this PLA, shall be fully expected to objectively and responsibly perform their duties and obligations owed to the Department without regard to the potential union affiliation of such employees or of other employees on the Project.

2.10 This Agreement shall not apply to IDOT employees or employees of any other governmental entity.

## ARTICLE III - ADMINISTRATION OF AGREEMENT

3.1 In order to assure that all parties have a clear understanding of the PLA, and to promote harmony, at the request of the Unions a post-award pre-job conference will be held among the Prime Contractor, all Subcontractors and Union representatives prior to the start of any Construction Work on the Project. No later than the conclusion of such pre-job conference, the parties shall, among other matters, provide to one another contact information for their respective representatives (including name, address, phone number, facsimile number, e-mail). Nothing herein shall be construed to limit the right of the Department to discuss or explain the purpose and intent of this PLA with prospective bidders or other interested parties prior to or following its award of the job.

3.2 Representatives of the Prime Contractor and the Unions shall meet as often as reasonably necessary following award until completion of the Project to assure the effective implementation of this PLA.

3.3 Any notice contemplated under Article VI and VII of this Agreement to a signatory labor organization shall be made in writing to the Local Union with copies to the local union's International Representative.

## ARTICLE IV - HOURS OF WORK AND GENERAL CONDITIONS

4.1 The standard work day and work week for Construction Work on the Project shall be consistent with the respective collective bargaining agreements. In the event Project site or other job conditions dictate a change in the established starting time and/or a staggered lunch period for portions of the Project or for specific crafts, the Prime Contractor, relevant Subcontractors and business managers of the specific crafts involved shall confer and mutually agree to such changes as appropriate. If proposed work schedule changes cannot be mutually agreed upon between the parties, the hours fixed at the time of the pre-job meeting shall prevail.

4.2 Shift work may be established and directed by the Prime Contractor or relevant Subcontractor as reasonably necessary or appropriate to fulfill the terms of its contract with the Department. If used, shift hours, rates and conditions shall be as provided in the applicable collective bargaining agreement.

4.3 The parties agree that chronic and/or unexcused absenteeism is undesirable and must be controlled in accordance with procedures established by the applicable collective bargaining agreement. Any employee disciplined for absenteeism in accordance with such procedures shall be suspended from all work on the Project for not less than the maximum period permitted under the applicable collective bargaining agreement.

4.4 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, employment begins and ends at the Project site; employees shall be at their place of work at the starting time; and employees shall remain at their place of work until quitting time.

4.5 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, there shall be no limit on production by workmen, no restrictions on the full use of tools or equipment, and no restrictions on efficient use of manpower ortechniques of construction other than as may be required by safety regulations.

4.6 The parties recognize that specialized or unusual equipment may be installed on the Project. In such cases, the Union recognizes the right of the Prime Contractor or Subcontractor to involve the equipment supplier or vendor's personnel in supervising the setting up of the equipment, making modifications and final alignment, and performing similar activities that may be reasonably necessary prior to and during the start-up procedure in order to protect factory warranties. The Prime Contractor or Subcontractor shall notify the Union representatives in advance of any work at the job-site by such vendor personnel in order to promote a harmonious relationship between the equipment vendor's personnel and other Project employees.

4.7 For the purpose of promoting full and effective implementation of this PLA, authorized Union representatives shall have access to the Project job-site during scheduled work hours. Such access shall be conditioned upon adherence to all reasonable visitor and security rules of general applicability that may be established for the Project site at the pre-job conference or from time to time thereafter.

## ARTICLE V – GRIEVANCE PROCEDURES FOR DISPUTES ARISING UNDER A PARTICULAR COLLECTIVE BARGAINING AGREEMENT

5.1 In the event a dispute arises under a particular collective bargaining agreement specifically not including jurisdictional disputes referenced in Article VI below, said dispute shall be resolved by the Grievance/Arbitration procedure of the applicable collective bargaining agreement. The resulting determination from this process shall be final and binding on all parties bound to its process.

5.2 Employers covered under this Agreement shall have the right to discharge or discipline any employee who violates the provisions of this Agreement. Such discharge or discipline by a contractor or subcontractor shall be subject to Grievance/Arbitration procedure of the applicable collective bargaining agreement only as to the fact of such violation of this agreement. If such fact is established, the penalty imposed shall not be disturbed. Work at the Project site shall continue without disruption or hindrance of any kind as a result of a Grievance/Arbitration procedure under this Article.

5.3 In the event there is a deadlock in the foregoing procedure, the parties agree that the matter shall be submitted to arbitration for the selection and decision of an Arbitrator governed under paragraph 6.8.

## ARTICLE VI –DISPUTES: GENERAL PRINCIPLES

6.1 This Agreement is entered into to prevent strikes, lost time, lockouts and to facilitate the peaceful adjustment of jurisdictional disputes in the building and construction industry and to prevent waste and unnecessary avoidable delays and expense, and for the further purpose of at all times securing for the employer sufficient skilled workers.

6.2 A panel of Permanent Arbitrators are attached as addendum (A) to this agreement. By mutual agreement between IDOT and the Unions, the parties can open this section of the agreement as needed to make changes to the list of permanent arbitrators.

The arbitrator is not authorized to award back pay or any other damages for a miss assignment of work. Nor may any party bring an independent action for back pay or any other damages, based upon a decision of an arbitrator.

6.3 The PLA Jurisdictional Dispute Resolution Process ("Process") sets forth the procedures below to resolve jurisdictional disputes between and among Contractors, Subcontractors, and Unions engaged in the building and construction industry. Further, the Process will be followed for any grievance or dispute arising out of the interpretation or application of this PLA by the parties except for the prohibition on attorneys contained in 6.11. All decisions made through the Process are final and binding upon all parties.

## DISPUTE PROCESS

6.4 Administrative functions under the Process shall be performed through the offices of the President and/or Secretary-Treasurer of the Illinois State Federation of Labor, or their designated representative, called the Administrator. In no event shall any officer, employee, agent, attorney, or other representative of the Illinois Federation of Labor, AFL- CIO be subject to any subpoena to appear or testify at any jurisdictional dispute hearing.

6.5 There shall be no abandonment of work during any case participating in this Process or in violation of the arbitration decision. All parties to this Process release the Illinois State Federation of Labor ("Federation") from any liability arising from its action or inaction and covenant not to sue the Federation, nor its officers, employees, agents or attorneys.

6.6 In the event of a dispute relating to trade or work jurisdiction, all parties, including the employers, Contractors or Subcontractors, agree that a final and binding resolution of the dispute shall be resolved as follows:

(a) Representatives of the affected trades and the Contractor or Subcontractor shall meet on the job site within two (2) business days after receiving written notice in an effort to resolve the dispute. (In the event there is a dispute between local unions affiliated with the same International Union, the decision of the General President, or his/her designee, as the internal jurisdictional authority of that International Union, shall constitute a final and binding decision and determination as to the jurisdiction of work.)

(b) If no settlement is achieved subsequent to the preceding Paragraph, the matter shall be referred to the local area Building & Construction Trades Council, which shall meet with the affected trades within two (2) business days subsequent to receiving written notice. In the event the parties do not wish to avail themselves of the local Building & Construction Trades Council, the parties may elect to invoke the services of their respective International Representatives with no extension of the time limitations. An agreement reached at this Step shall be final and binding upon all parties.

(c) If no settlement agreement is reached during the proceedings contemplated by Paragraphs “a” or “b” above, the matter shall be immediately referred to the Illinois Jurisdictional Dispute Process for final and binding resolution of said dispute. Said referral submission shall be in writing and served upon the Illinois State Federation of Labor, or the Administrator, pursuant to paragraph 6.4 of this agreement. The Administrator shall, within three (3) days, provide for the selection of an available Arbitrator to hear said dispute within this time period. Upon good cause shown and determined by the Administrator, an additional three (3) day extension for said hearing shall be granted at the sole discretion of the Administrator. Only upon mutual agreement of all parties may the Administrator extend the hearing for a period in excess of the time frames contemplated under this Paragraph. Business days are defined as Monday through Friday, excluding contract holidays.

6.7 The primary concern of the Process shall be the adjustment of jurisdictional disputes arising out of the Project. A sufficient number of Arbitrators shall be selected from list of approved Arbitrators as referenced Sec. 6.2 and shall be assigned per Sec. 6.8. Decisions shall be only for the Project and shall become effective immediately upon issuance and complied with by all parties. The authority of the Arbitrator shall be restricted and limited specifically to the terms and provisions of Article VI and generally to this Agreement as a whole.

6.8 Arbitrator chosen shall be randomly selected based on the list of Arbitrators in Sec. 6.2 and geographical location of the jurisdictional dispute and upon his/her availability, and ability to conduct a Hearing within two (2) business days of said notice. The Arbitrator may issue a "bench" decision immediately following the Hearing or he/she may elect to only issue a written decision, said decision must be issued within two (2) business days subsequent to the completion of the Hearing. Copies of all notices, pleadings, supporting memoranda, decisions, etc. shall be provided to all disputing parties and the Illinois State Federation of Labor.

Any written decision shall be in accordance with this Process and shall be final and binding upon all parties to the dispute and may be a "short form" decision. Fees and costs of the arbitrator shall be divided evenly between the contesting parties except that any party wishing a full opinion and decision beyond the short form decision shall bear the reasonable fees and costs of such full opinion. The decision of the Arbitrator shall be final and binding upon the parties hereto, their members, and affiliates.

In cases of jurisdictional disputes or other disputes between a signatory labor organization and another labor organization, both of which is an affiliate or member of the same International Union, the matter or dispute shall be settled in the manner set forth by their International Constitution and/or as determined by the International Union's General President whose decision shall be final and binding upon all parties. In no event shall there be an abandonment of work.

6.9 In rendering a decision, the Arbitrator shall determine:

(a) First, whether a previous agreement of record or applicable agreement, including a disclaimer agreement, between National or International Unions to the dispute or agreements between local unions involved in the dispute, governs;

(b) Only if the Arbitrator finds that the dispute is not covered by an appropriate or applicable agreement of record or agreement between the crafts to the dispute, he shall then consider the established trade practice in the industry and prevailing practice in the locality. Where there is a previous decision of record governingthe case, the Arbitrator shall give equal weight to such decision of record, unless the prevailing practice in the locality in the past ten years favors one craft. In that case, the Arbitrator shall base his decision on the prevailing practice in the locality. Except, that if the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wages or by the use of vertical agreements, the Arbitrator shall rely on the decision of record and established trade practice in the industry rather than the prevailing practice in the locality; and,

(c) Only if none of the above criteria is found to exist, the Arbitrator shall then consider that because efficiency, cost or continuity and good management are essential to the well being of the industry, the interests of the consumer or the past practices of the employer shall not be ignored.

(d) The arbitrator is not authorized to award back pay or any other damages for a mis-assignment of work. Nor may any party bring an independent action for back pay or any other damages, based upon a decision of an arbitrator.

6.10 The Arbitrator shall set forth the basis for his/her decision and shall explain his/her findings regarding the applicability of the above criteria. If lower ranked criteria are relied upon, the Arbitrator shall explain why the higher-ranked criteria were not deemed applicable. The Arbitrator's decision shall only apply to the Project. Agreements of Record, for other PLA projects, are applicable only to those parties signatory to such agreements. Decisions of Record are those that were either attested to by the former Impartial Jurisdictional Disputes Board or adopted by the National Arbitration Panel.

6.11 All interested parties, as determined by the Arbitrator, shall be entitled to make presentations to the Arbitrator. Any interested labor organization affiliated to the PLA Committee and party present at the Hearing, whether making a presentation or not, by such presence shall be deemed to accept the jurisdiction of the Arbitrator and to agreeto be bound by its decision. In addition to the representative of the local labor organization, a representative of the labor organization's International Union may appear on behalf of the parties. Each party is responsible for arranging for its witnesses. In the event an Arbitrator's subpoena is required, the party requiring said subpoena shall prepare the subpoena for the Arbitrator to execute. Service of the subpoena upon any witness shall be the responsibility of the issuing party.

Attorneys shall not be permitted to attend or participate in any portion of a Hearing.

The parties are encouraged to determine, prior to Hearing, documentary evidence which may be presented to the Arbitrator on a joint basis.

6.12 The Order of Presentation in all Hearings before an Arbitrator shall be

I. Identification and Stipulation of the Parties
II. Unions(s) claiming the disputed work presents its case
III. Union(s) assigned the disputed work presents its case
IV. Employer assigning the disputed work presents its case
V. Evidence from other interested parties (i.e., general contractor, project manager, owner)
VI. Rebuttal by union(s) claiming the disputed work
VII. Additional submissions permitted and requested by Arbitrator
VIII. Closing arguments by the parties

6.13 All parties bound to the provisions of this Process hereby release the Illinois State Federation of Labor and IDOT, their respective officers, agents, employees or designated representatives, specifically including any Arbitrator participating in said Process, from any and all liability or claim, of whatsoever nature, and specifically incorporating the protections provided in the Illinois Arbitration Act, as amended from time to time.

6.14 The Process, as an arbitration panel, nor its Administrator, shall have any authority to undertake any action to enforce its decision(s). Rather, it shall be the responsibility of the prevailing party to seek appropriate enforcement of a decision, including findings, orders or awards of the Arbitrator or Administrator determining non-compliance with a prior award or decision.

6.15 If at any time there is a question as to the jurisdiction of the Illinois Jurisdictional Dispute Resolution Process, the primary responsibility for any determination of the arbitrability of a dispute and the jurisdiction of the Arbitrator shall be borne by the party requesting the Arbitrator to hear the underlying jurisdictional dispute. The affected party or parties may proceed before the Arbitrator even in the absence or one or more stipulated parties with the issue of jurisdiction as an additional item to be decided by the Arbitrator. The Administrator may participate in proceedings seeking a declaration or determination that the underlying dispute is subject to the jurisdiction and process of the Illinois Jurisdictional Dispute Resolution Process. In any such proceedings, the non-prevailing party and/or the party challenging the jurisdiction of the Illinois Jurisdictional Dispute Resolution Process shall bear all the costs, expenses and attorneys' fees incurred by the Illinois Jurisdictional Dispute Resolution Process and/or its Administrator in establishing its jurisdiction.

## ARTICLE VII - WORK STOPPAGES AND LOCKOUTS

7.1 During the term of this PLA, no Union or any of its members, officers, stewards, employees, agents or representatives shall instigate, support, sanction, maintain, or participate in any strike, picketing, walkout, work stoppage, slow down or other activity that interferes with the routine and timely prosecution of work at the Project site or at any other contractor's or supplier's facility that is necessary to performance of work at the Project site. Hand billing at the Project site during the designated lunch period and before commencement or following conclusion of the established standard workday shall not, in itself, be deemed an activity that interferes with the routine and timely prosecution of work on the Project.

7.2 Should any activity prohibited by paragraph 7.1 of this Article occur, the Union shall undertake all steps reasonably necessary to promptly end such prohibited activities.

7.2.A No Union complying with its obligations under this Article shall be liable for acts of employees for which it has no responsibility or for the unauthorized acts of employees it represents. Any employee who participates or encourages any activity prohibited by paragraph 7.1 shall be immediately suspended from all work on the Project for a period equal to the greater of (a) 60 days; or (b) the maximum disciplinary period allowed under the applicable collective bargaining agreement for engaging in comparable unauthorized or prohibited activity.

7.2.B Neither the PLA Committee nor its affiliates shall be liable for acts of employees for which it has no responsibility. The principal officer or officers of the PLA Committee will immediately instruct, order and use the best efforts of his office to cause the affiliated union or unions to cease any violations of this Article. The PLA Committee in its compliance with this obligation shall not liable for acts of its affiliates. The principal officer or officers of any involved affiliate will immediately instruct, order or use the best effort of his office to cause the employees the union represents to cease any violations of this Article. A union complying with this obligation shall not be liable for unauthorized acts of employees it represents. The failure of the Contractor to exercise its rights in any instance shall not be deemed a waiver of its rights in any other instance.

During the term of this PLA, the Prime Contractor and its Subcontractors shall not engage in any lockout at the Project site of employees covered by this Agreement.

7.3 Upon notification of violations of this Article, the principal officer or officers of the local area Building and Construction Trades Council, and the Illinois AFL-CIO Statewide Project Labor Agreement Committee as appropriate, will immediately instruct, order and use their best efforts to cause the affiliated union or unions to cease any violations of this Article. A Trades Council and the Committee otherwise in compliance with the obligations under this paragraph shall not be liable for unauthorized acts of its affiliates.

7.4 In the event that activities in violation of this Article are not immediately halted through the efforts of the parties, any aggrieved party may invoke the special arbitration provisions set forth in paragraph 7.5 of this Article.

7.5 Upon written notice to the other involved parties by the most expeditious means available, any aggrieved party may institute the following special arbitration procedure when a breech of this Article is alleged:

7.5.A The party invoking this procedure shall notify the individual designated as the Permanent Arbitrator pursuant to paragraph 6.8 of the nature of the alleged violation; such notice shall be by the most expeditious means possible. The initiating party may also furnish such additional factual information as may be reasonably necessary for the Permanent Arbitrator to understand the relevant circumstances. Copies of any written materials provided to the arbitrator shall also be contemporaneously provided by the most expeditious means possible to the party alleged to be in violation and to all other involved parties.

7.5.B Upon receipt of said notice the Permanent Arbitrator shall set and hold a hearing within twenty-four (24) hours if it is contended the violation is ongoing, but not before twenty-four (24) hours after the written notice to all parties involved as required above.

7.5.C The Permanent Arbitrator shall notify the parties by facsimile or any other effective written means, of the place and time chosen by the Permanent Arbitrator for this hearing. Said hearing shall be completed in one session. A failure of any party or parties to attend said hearing shall not delay the hearing of evidence or issuance of an Award by the Permanent Arbitrator.

7.5.D The sole issue at the hearing shall be whether a violation of this Article has, in fact, occurred. An Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without a written opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The Permanent Arbitrator may order cessation of the violation of this Article, and such Award shall be served on all parties by hand or registered mail upon issuance.

7.5.E Such Award may be enforced by any court of competent jurisdiction upon the filing of the Award and such other relevant documents as may be required. Facsimile or other hardcopy written notice of the filing of such enforcement proceedings shall be given to the other relevant parties. In a proceeding to obtain a temporary order enforcing the Permanent Arbitrator's Award as issued under this Article, all parties waive the right to a hearing and agree that such proceedings may be ex parte. Such agreement does not waive any party's right to participate in a hearing for a final order of enforcement. The Court's order or orders enforcing the Permanent Arbitrator's Award shall be served on all parties by hand or by delivery to their last known address or by registered mail.

7.6 Individuals found to have violated the provisions of this Article are subject to immediate termination. In addition, IDOT reserves the right to terminate this PLA as to any party found to have violated the provisions of this Article.

7.7 Any rights created by statue or law governing arbitration proceedings inconsistent with the above procedure or which interfere with compliance therewith are hereby waived by parties to whom they accrue.

7.8 The fees and expenses of the Permanent Arbitrator shall be borne by the party or parties found in violation, or in the event no violation is found, such fees and expenses shall be borne by the moving party.

## ARTICLE VIII – TERMS OF AGREEMENT

8.1 If any Article or provision of this Agreement shall be declared invalid, inoperative or unenforceable by operation of law or by any of the above mentioned tribunals of competent jurisdiction, the remainder of this Agreement or the application of such Article or provision to persons or circumstances other than those as to which it has been held invalid, inoperative or unenforceable shall not be affected thereby.

8.2 This Agreement shall be in full force as of and from the date of the Notice of Award until the Project contract is closed.

8.3 This PLA may not be changed or modified except by the subsequent written agreement of the parties. All parties represent that they have the full legal authority to enter into this PLA. This PLA may be executed by the parties in one or more counterparts.

8.4 Any liability arising out of this PLA shall be several and not joint. IDOT shall not be liable to any person or other party for any violation of this PLA by any other party, and no Contractor or Union shall be liable for any violation of this PLA by any other Contractor or Union.

8.5 The failure or refusal of a party to exercise its rights hereunder in one or more instances shall not be deemed a waiver of any such rights in respect of a separate instance of the same or similar nature.

[The Balance of This Page Intentionally Left Blank]

Addendum A

IDOT Slate of Permanent Arbitrators

1. Bruce Feldacker
2. Thomas F. Gibbons
3. Edward J. Harrick
4. Brent L. Motchan
5. Robert Perkovich
6. Byron Yaffee
7. Glenn A. Zipp

**Execution Page**

***Illinois Department of Transportation***

**VACANT**
Director of Highways Project Implementation

Director of Finance & Administration

Philip Kaufmann, Chief Counsel

Omer Osman, Acting Secretary (Date)

***Illinois AFL-CIO Statewide Project Labor Agreement Committee, representing the Unions listed below:***

(Date)

List Unions:

Exhibit A - Contractor Letter of Assent

(Date)

To All Parties:

In accordance with the terms and conditions of the contract for Construction Work on [Contract No. ], this Letter of Assent hereby confirms that the undersigned Prime Contractor or Subcontractor agrees to be bound by the terms and conditions of the Project Labor Agreement established and entered into by the Illinois Department of Transportation in connection with said Project.

It is the understanding and intent of the undersigned party that this Project Labor Agreement shall pertain only to the identified Project. In the event it is necessary for the undersigned party to become signatory to a collective bargaining agreement to which it is not otherwise a party in order that it may lawfully make certain required contributions to applicable fringe benefit funds, the undersigned party hereby expressly conditions its acceptance of and limits its participation in such collective bargaining agreement to its work on the Project.

(Authorized Company Officer)

(Company)

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

# SPECIAL PROVISION FOR INSURANCE

Effective: February 1, 2007
Revised: August 1, 2007

All references to Sections or Articles in this specification shall be construed to mean specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

The Contractor shall name the following entities as additional insured under the Contractor's general liability insurance policy in accordance with Article 107.27:

City of Springfield

The entities listed above and their officers, employees, and agents shall be indemnified and held harmless in accordance with Article 107.26.

LR1030-2

State of Illinois
DEPARTMENT OF TRANSPORTATION
Bureau of Local Roads & Streets
SPECIAL PROVISION
FOR
LOCAL QUALITY ASSURANCE/ QUALITY MANAGEMENT QC/QA
Effective: January 1, 2022

Replace the first five paragraphs of Article 1030.06 of the Standard Specifications with the following:

"**1030.06 Quality Management Program.** The Quality Management Program (QMP) will be Quality Control / Quality Assurance (QC/QA) according to the following."

Delete Article 1030.06(d)(1) of the Standard Specifications.

Revise Article 1030.09(g)(3) of the Standard Specifications to read:

"(3) If core testing is the density verification method, the Contractor shall provide personnel and equipment to collect density verification cores for the Engineer. Core locations will be determined by the Engineer following the document "Hot-Mix Asphalt QC/QA Procedure for Determining Random Density Locations" at density verification intervals defined in Article 1030.09(b). After the Engineer identifies a density verification location and prior to opening to traffic, the Contractor shall cut a 4 in. (100 mm) diameter core. With the approval of the Engineer, the cores may be cut at a later time."

Revise Article 1030.09(h)(2) of the Standard Specifications to read:

"(2) After final rolling and prior to paving subsequent lifts, the Engineer will identify the random density verification test locations. Cores or nuclear density gauge testing will be used for density verification. The method used for density verification will be as selected below.

| Density Verification Method | |
|---|---|
| ☐ | Cores |
| ☒ | Nuclear Density Gauge (Correlated when paving ≥ 3,000 tons per mixture) |

Density verification test locations will be determined according to the document "Hot-Mix Asphalt QC/QA Procedure for Determining Random Density Locations". The density testing interval for paving wider than or equal to 3 ft (1 m) will be 0.5 miles (800 m) for lift thicknesses of 3 in. (75 mm) or less and 0.2 miles (320 m) for lift thicknesses greater than 3 in. (75 mm). The density testing interval for paving less than 3 ft (1 m) wide will be 1 mile (1,600 m). If a day's paving will be less than the prescribed density testing interval, the length of the day's paving will be the interval for that day. The density testing interval for mixtures used for patching will be 50 patches with a minimum of one test per mixture per project.

If core testing is the density verification method, the Engineer will witness the Contractor coring, and secure and take possession of all density samples at the

LR1030-2

density verification locations. The Engineer will test the cores collected by the Contractor for density according to Illinois Modified AASHTO T 166 or AASHTO T 275.

If nuclear density gauge testing is the density verification method, the Engineer will conduct nuclear density gauge tests. The Engineer will follow the density testing procedure detailed in the document "Illinois Modified ASTM D 2950, Standard Test Method for Density of Bituminous Concrete In-Place by Nuclear Method".

A density verification test will be the result of a single core or the average of the nuclear density tests at one location. The results of each density test must be within acceptable limits. The Engineer will promptly notify the Contractor of observed deficiencies."

Revise the seventh paragraph and all subsequent paragraphs in Section D. of the document "Hot-Mix Asphalt QC/QA Initial Daily Plant and Random Samples" to read:

"Mixtures shall be sampled from the truck at the plant by the Contractor following the same procedure used to collect QC mixture samples (Section A). This process will be witnessed by the Engineer who will take custody of the verification sample. Each sample bag with a verification mixture sample will be secured by the Engineer using a locking ID tag. Sample boxes containing the verification mixture sample will be sealed/taped by the Engineer using a security ID label."

## AGGREGATE SUBGRADE IMPROVEMENT (BDE)

Effective: April 1, 2012
Revised: April 1, 2016

Add the following Section to the Standard Specifications:

### "SECTION 303. AGGREGATE SUBGRADE IMPROVEMENT

**303.01 Description.** This work shall consist of constructing an aggregate subgrade improvement.

**303.02 Materials.** Materials shall be according to the following.

| Item | Article/Section |
|---|---|
| (a) Coarse Aggregate | 1004.07 |
| (b) Reclaimed Asphalt Pavement (RAP) (Notes 1, 2, and 3) | 1031 |

Note 1. Crushed RAP, from either full depth or single lift removal, may be mechanically blended with aggregate gradations CS 01, CS 02, and RR 01 but shall not exceed 40 percent of the total product. The top size of the RAP shall be less than 4 in. (100 mm) and well graded.

Note 2. RAP having 100 percent passing the 1 1/2 in. (37.5 mm) sieve and being well graded, may be used as capping aggregate in the top 3 in. (75 mm) when aggregate gradations CS 01, CS 02, or RR 01 are used in lower lifts.

Note 3. The RAP used for aggregate subgrade improvement shall be according to the current Bureau of Materials and Physical Research Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications".

**303.03 Equipment.** The vibratory machine shall be according to Article 1101.01, or as approved by the Engineer.

**303.04 Soil Preparation.** The stability of the soil shall be according to the Department's Subgrade Stability Manual for the aggregate thickness specified.

**303.05 Placing Aggregate.** The maximum nominal lift thickness of aggregate gradations CA 02, CA 06, or CA 10 shall be 12 in. (300 mm). The maximum nominal lift thickness of aggregate gradations CS 01, CS 02, and RR 01 shall be 24 in. (600 mm).

**303.06 Capping Aggregate.** The top surface of the aggregate subgrade shall consist of a minimum 3 in. (75 mm) of aggregate gradations CA 06 or CA 10. When the contract specifies that a granular subbase is to be placed on the aggregate subgrade improvement, the 3 in. (75 mm) of capping aggregate shall be the same gradation and may be placed with the underlying aggregate subgrade improvement material.

**303.07 Compaction.** All aggregate lifts shall be compacted to the satisfaction of the Engineer. If the moisture content of the material is such that compaction cannot be obtained, sufficient water shall be added so that satisfactory compaction can be obtained.

**303.08 Finishing and Maintenance of Aggregate Subgrade Improvement.** The aggregate subgrade improvement shall be finished to the lines, grades, and cross sections shown on the plans, or as directed by the Engineer. The aggregate subgrade improvement shall be maintained in a smooth and compacted condition.

**303.09 Method of Measurement.** This work will be measured for payment according to Article 311.08.

**303.10 Basis of Payment.** This work will be paid for at the contract unit price per cubic yard (cubic meter) or ton (metric ton) for AGGREGATE SUBGRADE IMPROVEMENT or at the contract unit price per square yard (square meter) for AGGREGATE SUBGRADE IMPROVEMENT, of the thickness specified."

Add the following to Section 1004 of the Standard Specifications:

"**1004.07 Coarse Aggregate for Aggregate Subgrade Improvement.** The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate shall be crushed gravel, crushed stone, or crushed concrete. In applications where greater than 24 in. (600 mm) of subgrade material is required, gravel may be used below the first 12 in (300 mm) of subgrade.

(b) Quality. The coarse aggregate shall consist of sound durable particles reasonably free of deleterious materials.

(c) Gradation.

(1) The coarse aggregate gradation for total subgrade thickness less than or equal to 12 in. (300 mm) shall be CA 2, CA 6, CA 10, or CS 01.

The coarse aggregate gradation for total subgrade thickness more than 12 in. (300 mm) shall be CS 01 or CS 02 as shown below or RR 01 according to Article 1005.01(c).

| | COARSE AGGREGATE SUBGRADE GRADATIONS | | | | |
|---|---|---|---|---|---|
| Grad No. | Sieve Size and Percent Passing | | | | |
| | 8" | 6" | 4" | 2" | #4 |
| CS 01 | 100 | 97 ± 3 | 90 ± 10 | 45 ± 25 | 20 ± 20 |
| CS 02 | | 100 | 80 ± 10 | 25 ± 15 | |

| | COARSE AGGREGATE SUBGRADE GRADATIONS (Metric) |
|---|---|

| Grad No. | Sieve Size and Percent Passing | | | | |
|---|---|---|---|---|---|
| | 200 mm | 150 mm | 100 mm | 50 mm | 4.75 mm |
| CS 01 | 100 | 97 ± 3 | 90 ± 10 | 45 ± 25 | 20 ± 20 |
| CS 02 | | 100 | 80 ± 10 | 25 ± 15 | |

(2) The 3 in. (75 mm) capping aggregate shall be gradation CA 6 or CA 10."

80274

**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."

80436

**BUILDING REMOVAL - CASE II (NON-FRIABLE ASBESTOS ABATEMENT) (BDE)**

Effective: September 1, 1990
Revised: April 1, 2010

BUILDING REMOVAL: This work shall consist of the removal and disposal of 3 building(s), together with all foundations, retaining walls, and piers, down to a plane 1 ft (300 mm) below the ultimate or existing grade in the area and also all incidental and collateral work necessary to complete the removal of the building(s) in a manner approved by the Engineer. Any holes, such as basements, shall be filled with a suitable granular material. The building(s) are identified as follows:

| Bldg. No. | Parcel No. | Location | Description |
|---|---|---|---|
| 1 | SR0114 | 221 N 11th Street | One-story CMU and steel framed commercial building with CMU and brick exterior, ballasted roof over steel deck and steel framing, and concrete floor/foundation. |
| 3 | SR0127 | 1001 E Monroe Street | One-story brick/block building with flat roof. |
| 4 | SR0306 | 915 E Capitol Avenue | CMU building with concrete footings and floor slab, concrete ramp, and metal roof. |

Discontinuance of Utilities: The Contractor shall arrange for the discontinuance of all utility services and the removal of the metering devices that serve the building(s) according to the respective requirements and regulations of the City, County, or utility companies involved. The Contractor shall disconnect and seal, in an approved manner, all service outlets that serve any building(s) he/she is to remove.

Signs: Immediately upon execution of the contract and prior to the wrecking of any structures, the Contractor shall be required to paint or stencil, in contrasting colors of an oil base paint, on all four sides of each residence and two opposite sides of other structures, the following sign:

PROPERTY ACQUIRED FOR
HIGHWAY CONSTRUCTION
TO BE DEMOLISHED BY THE

VANDALS WILL BE PROSECUTED

The signs shall be positioned in a prominent location on the structure so that they can be easily seen and read and at a sufficient height to prevent defacing. The Contractor shall not paint signs nor start demolition of any building(s) prior to the time that the State becomes the owner of the respective building(s).

The Contractor has the option of removing the non-friable asbestos prior to demolition or demolishing the building(s) with the non-friable asbestos in place. Refer to the Special Provisions titled “Asbestos Abatement (General Conditions)” and “Removal and Disposal of Non-Friable Asbestos Building No. _____“ contained herein.

Basis of Payment: This work will be paid for at the contract lump sum unit price for BUILDING REMOVAL, numbers as listed above, which price shall be payment in full for complete removal of the buildings and structures, including any necessary backfilling material as specified herein. The lump sum unit price(s) for this work shall represent the cost of demolition and disposal assuming all non-friable asbestos is removed prior to demolition. Any salvage value shall be reflected in the contract unit price for this item.

EXPLANATION OF BIDDING TERMS: Two separate contract unit price items have been established for the removal of each building. They are:

1. BUILDING REMOVAL NO. _____

2. REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. _____

The Contractor shall have two options available for the removal and disposal of the non-friable asbestos.

The pay item for removal and disposal of non-friable asbestos will not be deleted regardless of the option chosen by the Contractor.

ASBESTOS ABATEMENT (GENERAL CONDITIONS): This work consists of the removal and disposal of non-friable asbestos from the building(s) to be demolished. All work shall be done according to the requirements of the U.S. Environmental Protection Agency (USEPA), the Illinois Environmental Protection Agency (IEPA), the Occupational Safety and Health Administration (OSHA), the Special Provision for "Removal and Disposal of Non-Friable Asbestos, Building No. _____," and as outlined herein.

Sketches indicating the location of Asbestos Containing Material (ACM) are included in the proposal on pages _____ thru _____. Also refer to the Materials Description Table on page _____ for a brief description and location of the various materials. Also included is a Materials Quantities Table on page _____. This table states the ACM is non-friable and gives the approximate quantity. The quantities are given only for information and it shall be the Contractor's responsibility to determine the exact quantities prior to submitting his/her bid.

The work involved in the removal and disposal of non-friable asbestos if done prior to demolition, shall be performed by a Contractor or Sub-Contractor prequalified with the Illinois Capital Development Board.

The Contractor shall provide a shipping manifest, similar to the one shown on page _____, to the Engineer for the disposal of all ACM wastes.

Permits: The Contractor shall apply for permit(s) in compliance with applicable regulations of the Illinois Environmental Protection Agency. Any and all other permits required by other federal, state, or local agencies for carrying on the work shall be the responsibility of the Contractor. Copies of the permit(s) shall be sent to the district office and the Engineer.

Notifications: The "Demolition/Renovation Notice" form, which can be obtained from the IEPA office, shall be completed and submitted to the address listed below at least ten days prior to commencement of any asbestos removal or demolition activity. Separate notices shall be sent for the asbestos removal work and the building demolition if they are done as separate operations.

Asbestos Demolition/Renovation Coordinator
Illinois Environmental Protection Agency
Division of Air Pollution Control
P. O. Box 19276
Springfield, Illinois 62794-9276
(217) 785-1743

Notices shall be updated if there is a change in the starting date or the amount of asbestos changes by more than 20 percent.

Submittals:

A. All submittals and notices shall be made to the Engineer except where otherwise specified herein.

B. Submittals that shall be made prior to start of work:

1. Submittals required under Asbestos Abatement Experience.

2. Submit documentation indicating that all employees have had medical examinations and instruction on the hazards of asbestos exposure, on use and fitting of respirators, on protective dress, on use of showers, on entry and exit from work areas, and on all aspects of work procedures and protective measures as specified in Worker Protection Procedures.

3. Submit manufacturer's certification stating that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to ANSI 29.2.

4. Submit to the Engineer the brand name, manufacturer, and specification of all sealants or surfactants to be used. Testing under existing conditions will be required at the direction of the Engineer.

5. Submit proof that all required permits, site locations, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials, supplies, and the like have been obtained (i.e., a letter of authorization to utilize designated landfill).

6. Submit a list of penalties, including liquidated damages, incurred through non-compliance with asbestos abatement project specifications.

7. Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination units, the sequencing of work, the respiratory protection plan to be used during this work, a site safety plan, a disposal plan including the location of an approved disposal site, and a detailed description of the methods to be used to control pollution. The plan shall be submitted to the Engineer prior to the start of work.

8. Submit proof of written notification and compliance with the “Notifications” paragraph.

C. Submittals that shall be made upon completion of abatement work:

1. Submit copies of all waste chain-of-custodies, trip tickets, and disposal receipts for all asbestos waste materials removed from the work area;

2. Submit daily copies of work site entry logbooks with information on worker and visitor access;

3. Submit logs documenting filter changes on respirators, HEPA vacuums, negative pressure ventilation units, and other engineering controls; and

4. Submit results of any bulk material analysis and air sampling data collected during the course of the abatement including results of any on-site testing by any federal, state, or local agency.

Certificate of Insurance:

A. The Contractor shall document general liability insurance for personal injury, occupational disease and sickness or death, and property damage.

B. The Contractor shall document current Workmen's Compensation Insurance coverage.

C. The Contractor shall supply insurance certificates as specified by the Department.

Asbestos Abatement Experience:

A. Company Experience. Prior to starting work, the Contractor shall supply evidence that he/she has been prequalified with the Illinois Capital Development Board and that he/she has been included on the Illinois Department of Public Health's list of approved Contractors.

B. Personnel Experience:

1. For Superintendent, the Contractor shall supply:

    a. Evidence of knowledge of applicable regulations in safety and environmental protection is required as well as training in asbestos abatement as evidenced by the successful completion of a training course in supervision of asbestos abatement as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to the Engineer prior to the start of work.

    b. Documentation of experience with abatement work in a supervisory position as evidenced through supervising at least two asbestos abatement projects; provide names, contact, phone number, and locations of two projects in which the individual(s) has worked in a supervisory capacity.

2. For workers involved in the removal of asbestos, the Contractor shall provide training as evidenced by the participation and successful completion of an accredited training course for asbestos abatement workers as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to all employees who will be working on this project.

ABATEMENT AIR MONITORING: The Contractor shall comply with the following:

A. Personal Monitoring. All personal monitoring shall be conducted per specifications listed in OSHA regulation, Title 29, Code of Federal Regulation 1926.58. All area sampling shall be conducted according to 40 CFR Part 763.90. All air monitoring equipment shall be calibrated and maintained in proper operating condition. Excursion limits shall be monitored daily. Personal monitoring is the responsibility of the Contractor. Additional personal samples may be required by the Engineer at any time during the project.

B. Interior Non-Friable Asbestos-Containing Materials. The Contractor shall perform personal air monitoring during removal of all non-friable Transite and floor tile removal operations. The Engineer will also have the option to require additional personal samples and/or clearance samples during this type of work.

C. Exterior Non-Friable Asbestos-Containing Materials. The Contractor shall perform personal air monitoring during removal of all non-friable cementitious panels, piping, roofing felts, and built up roofing materials that contain asbestos.

    The Contractor shall conduct down wind area sampling to monitor airborne fiber levels at a frequency of no less than three per day.

D. Air Monitoring Professional

    1. All air sampling shall be conducted by a qualified Air Sampling Professional supplied by the Contractor. The Air Sampling Professional shall submit

documentation of successful completion of the National Institute for Occupational Safety and Health (NIOSH) course #582 - "Sampling and Evaluating Airborne Asbestos Dust".

2. Air sampling shall be conducted according to NIOSH Method 7400. The results of these tests shall be provided to the Engineer within 24 hours of the collection of air samples.

REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. _____: The Contractor has the option of removing and disposing of the non-friable asbestos prior to demolition of the building(s) or demolishing the building(s) with the non-friable asbestos in place.

Option #1 - If the Contractor chooses to remove all non-friable asbestos prior to demolition, the work shall be done according to the Special Provision titled "Asbestos Abatement (General Conditions)".

Option #2 - If the Contractor chooses to demolish the building(s) with the non-friable asbestos in place, the following provisions shall apply:

1. Continuously wet all non-friable ACM and other building debris with water during demolition.

2. Dispose of all demolition debris as asbestos containing material by placing it in lined, covered transport haulers and placing it in an approved landfill.

This work will be paid for at the contract unit price per lump sum for REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. _____, as shown.

The cost for this work shall be determined as follows:

Option #1 - Actual cost of removal and disposal of non-friable asbestos.

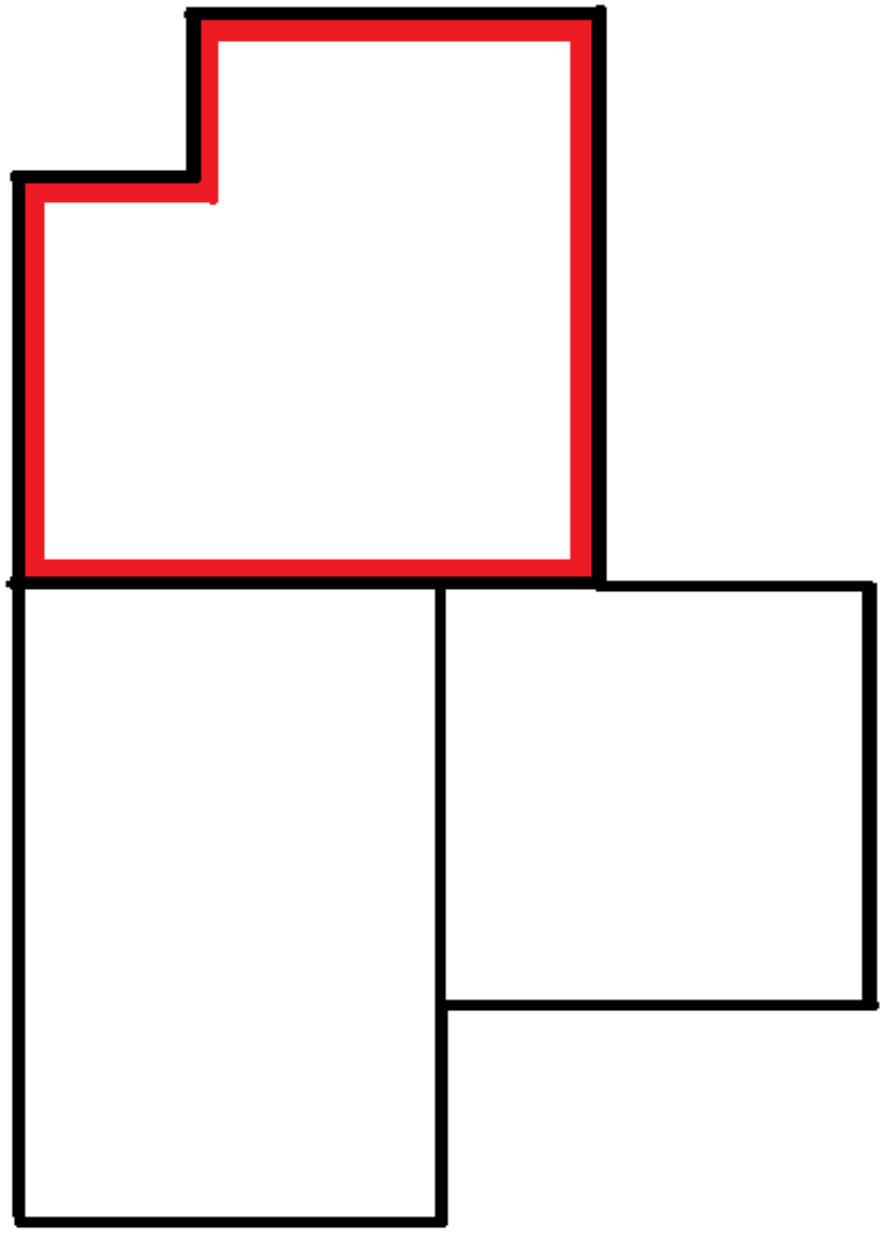
Option #2 - The difference in cost between removing and disposing of the building if all non-friable asbestos is left in place and removing and disposing of the building assuming all non-friable asbestos is removed prior to demolition.

The cost of removing and disposing of the building(s), assuming all non-friable asbestos is removed first, shall be represented by the pay item "BUILDING REMOVAL NO. _".

Regardless of the option chosen by the Contractor, this pay item will not be deleted, nor will the pay item BUILDING REMOVAL NO. _____ be deleted.

5048I

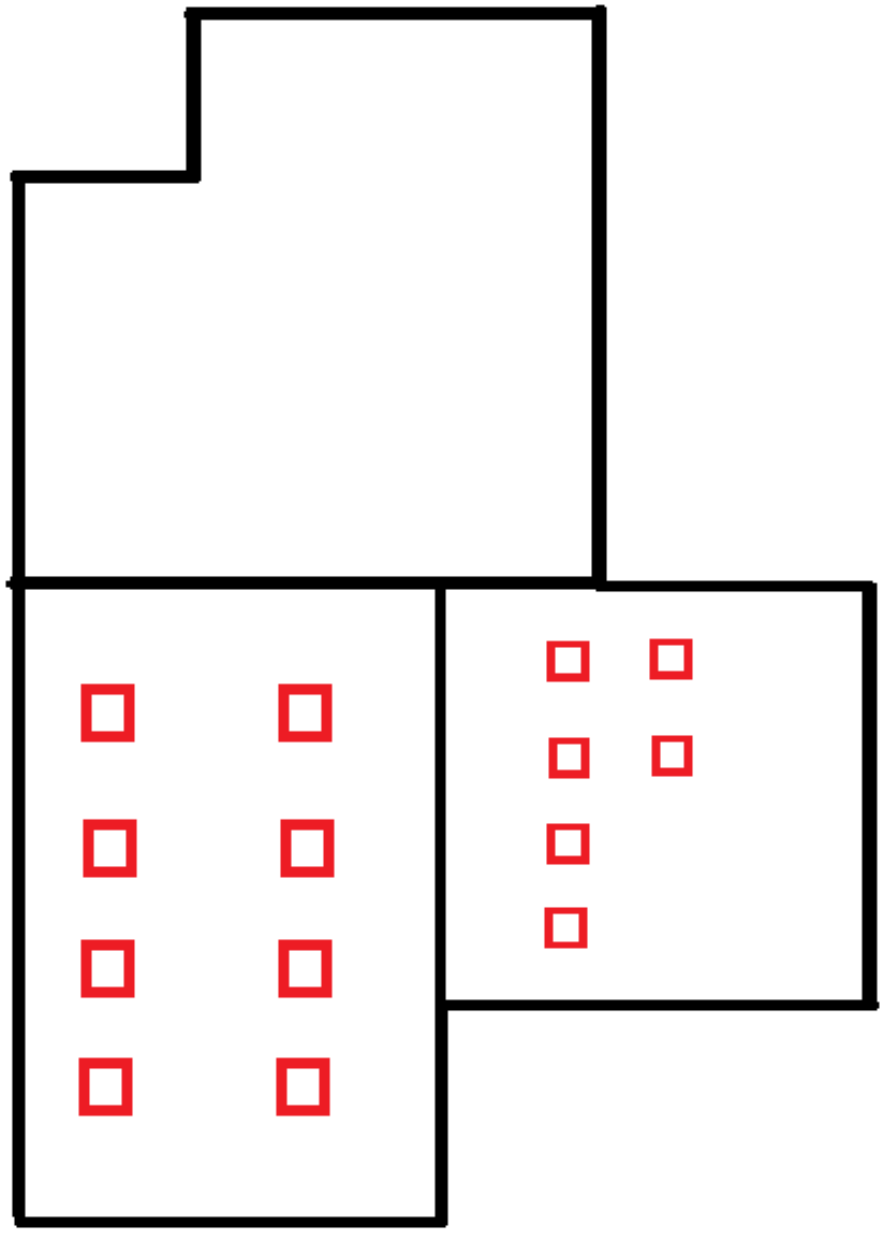
**SPRINGFIELD RAILROAD IMPROVEMENT PROJECT**
**SR0114**
**221 NORTH 11TH STREET, SPRINGFIELD, IL**



**HOMOGENEOUS AREA: MRA N. ROOF FLASHING**

**JEFFERSON STREET**

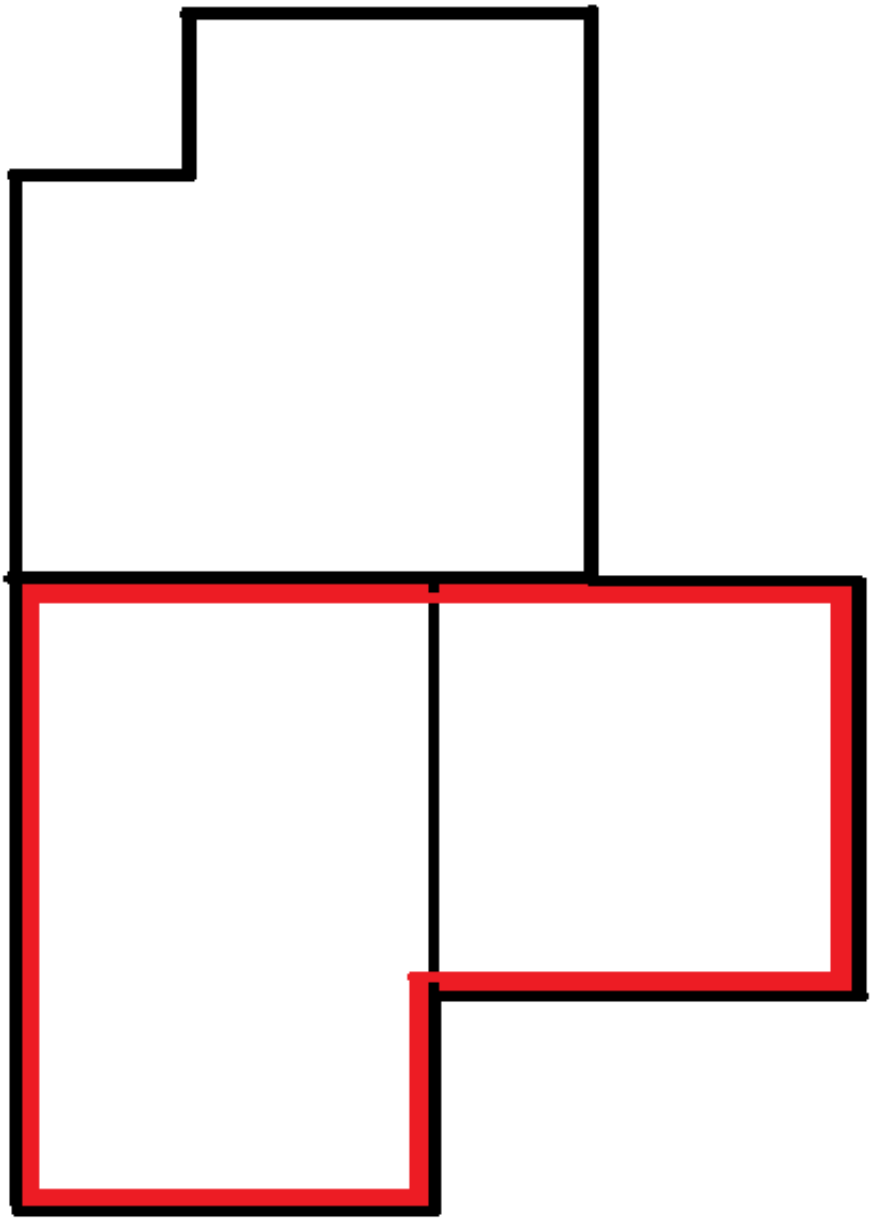
**SPRINGFIELD RAILROAD IMPROVEMENT PROJECT**
**SR0114**
**221 NORTH 11TH STREET, SPRINGFIELD, IL**



**HOMOGENEOUS AREA: MRD - S. ROOF VENT FLASHING**

**JEFFERSON STREET**

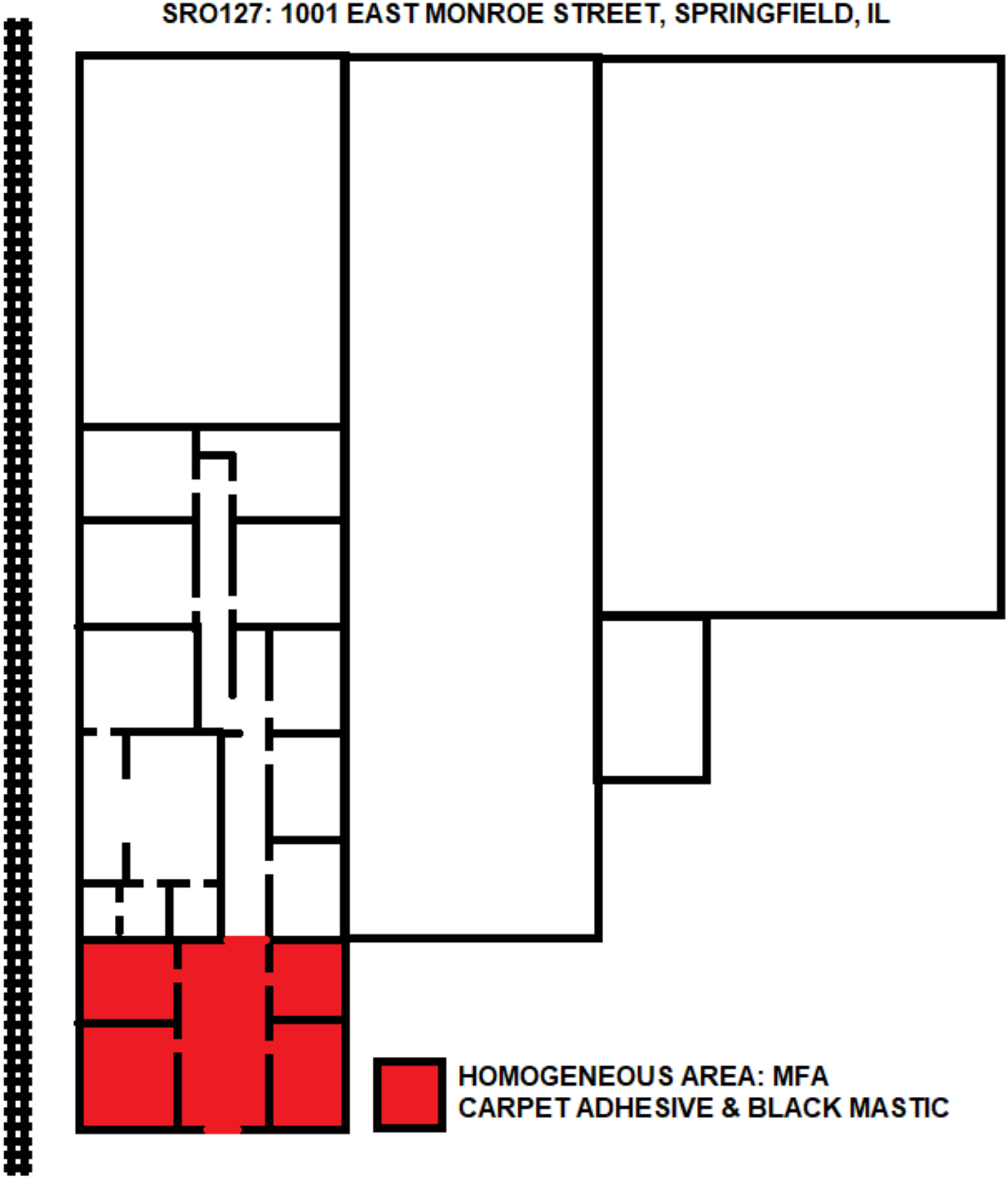
**SPRINGFIELD RAILROAD IMPROVEMENT PROJECT**
**SR0114**
**221 NORTH 11TH STREET, SPRINGFIELD, IL**



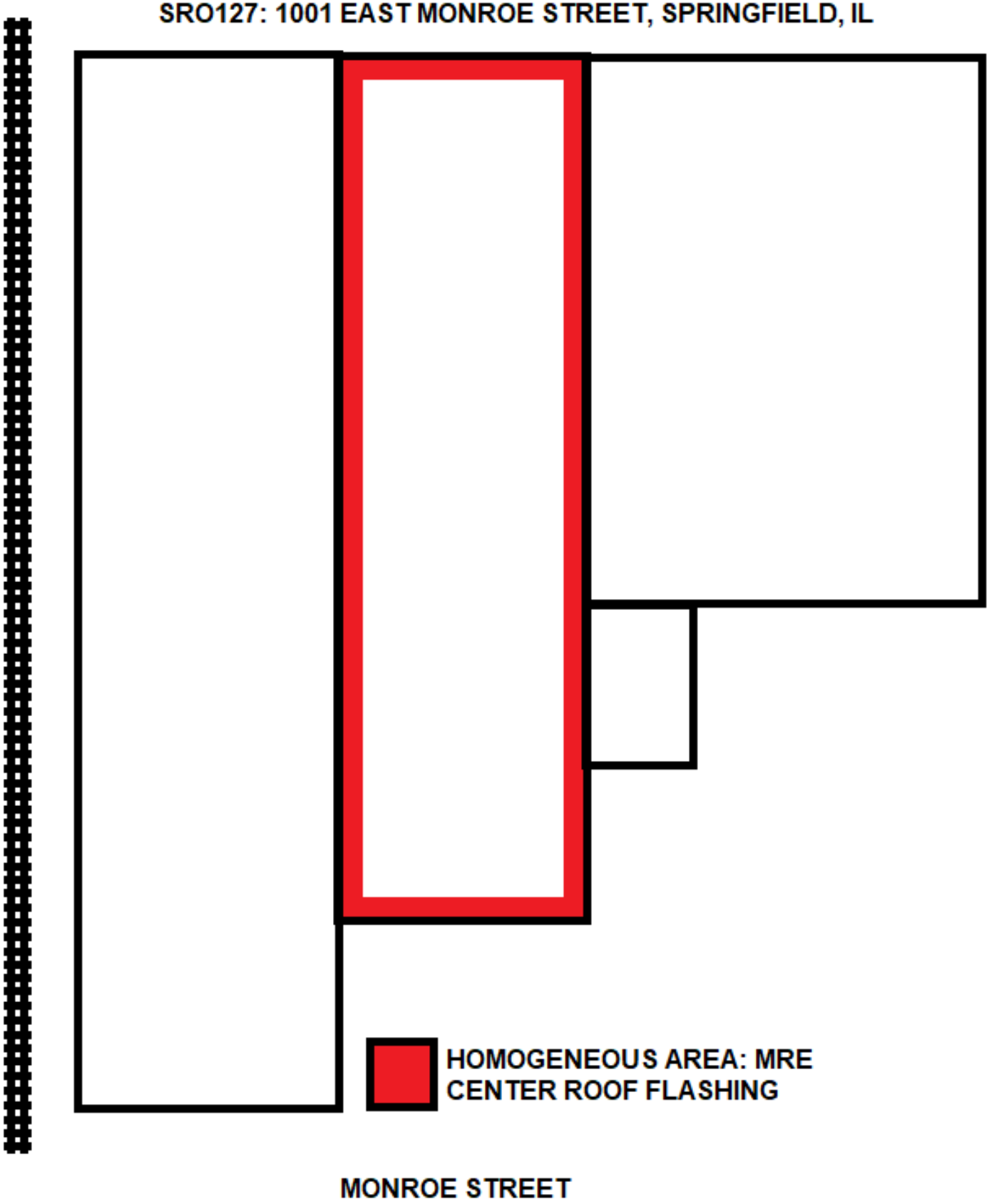
**HOMOGENEOUS AREA: MRE - S. ROOF PERIMETER FLASHING**

**JEFFERSON STREET**

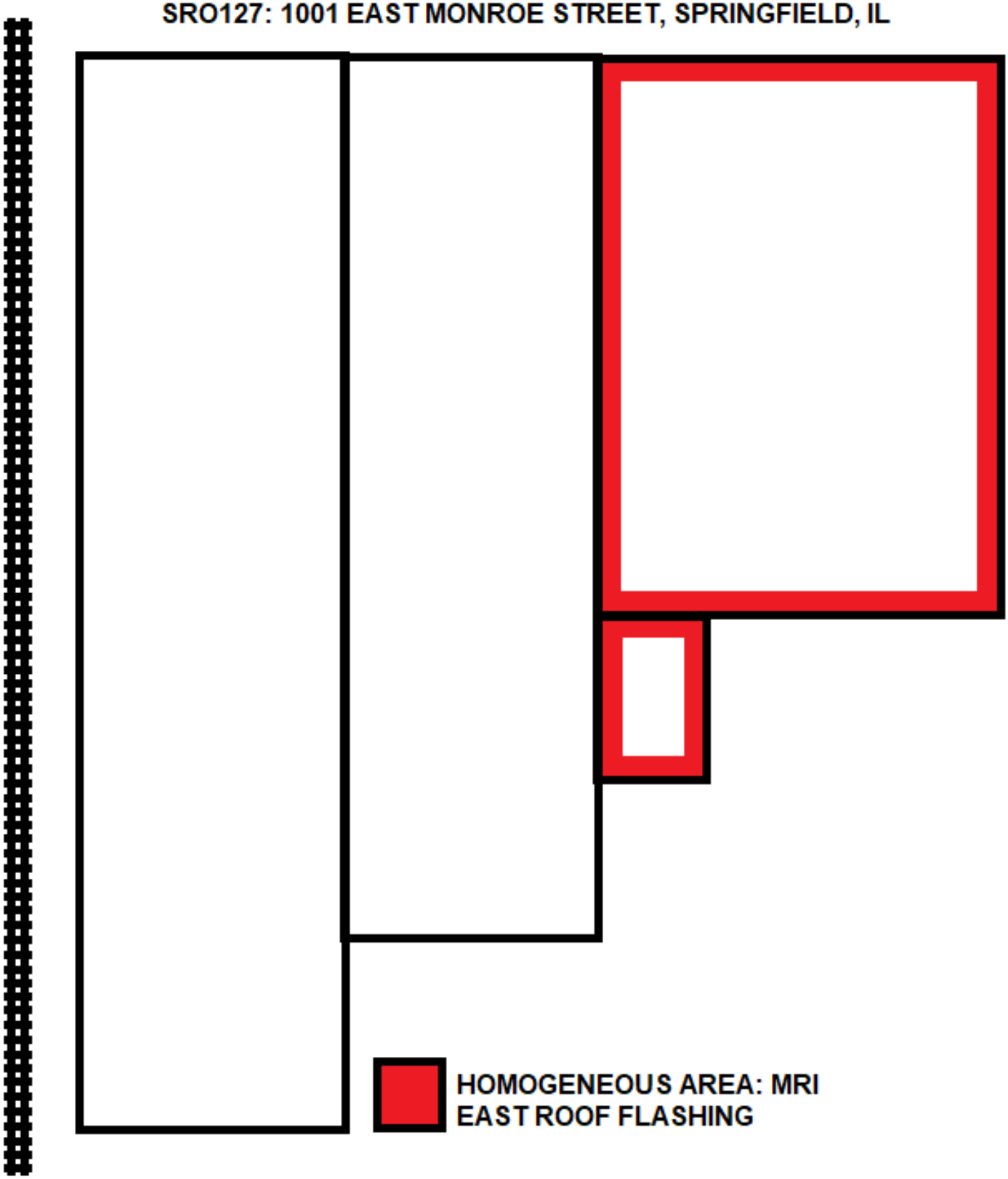
SPRINGFIELD RAIL IMPROVEMENT PROJECT
SRO127: 1001 EAST MONROE STREET, SPRINGFIELD, IL



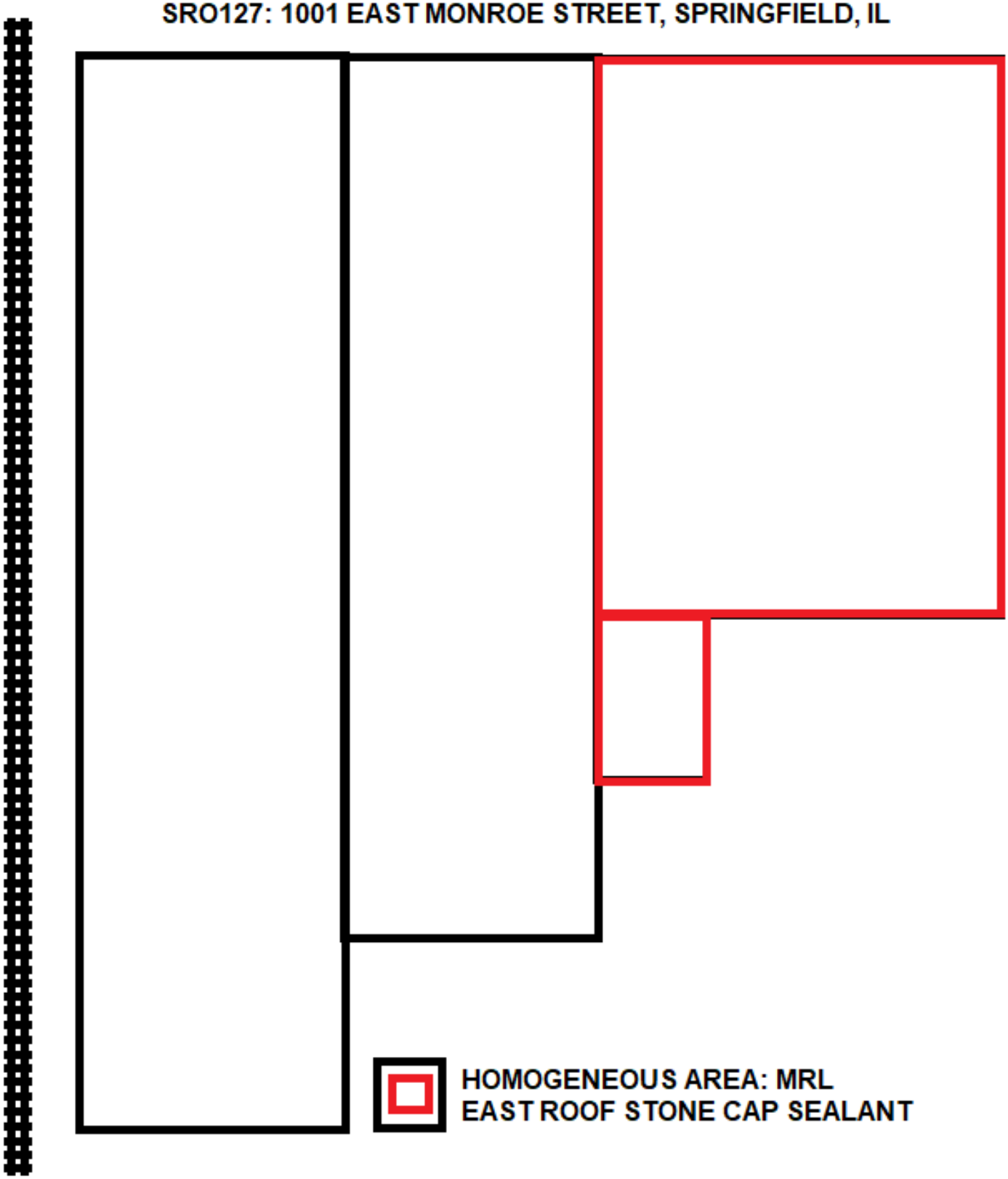
SPRINGFIELD RAIL IMPROVEMENT PROJECT
SRO127: 1001 EAST MONROE STREET, SPRINGFIELD, IL



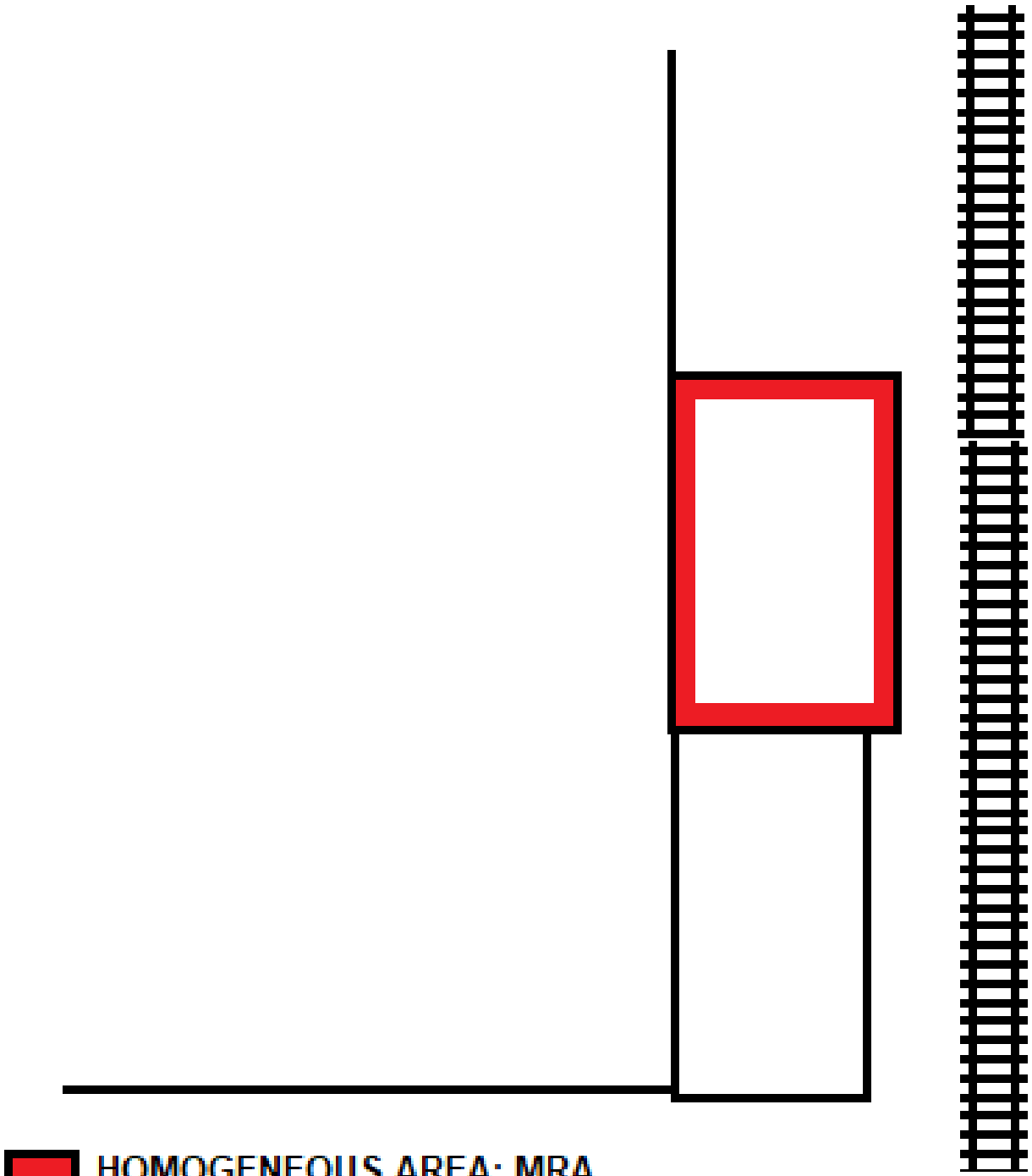
SPRINGFIELD RAIL IMPROVEMENT PROJECT
SRO127: 1001 EAST MONROE STREET, SPRINGFIELD, IL



SPRINGFIELD RAIL IMPROVEMENT PROJECT
SRO127: 1001 EAST MONROE STREET, SPRINGFIELD, IL



# SPRINGFIELD RAIL IMPROVEMENT PROJECT
## SR0306
## CORNER OF CAPITOL AVE. & TRACKS, SPRINGFIELD, IL



HOMOGENEOUS AREA: MRA
ROOF FLASHING

**CAPITOL AVENUE**

**APPENDIX B**

**MATERIAL DESCRIPTION TABLE**

| Material Description | % and Type of Asbestos | Location, Description, Sample Number (If Applicable) |
|---|---|---|
| **I. BUILDING REMOVAL - CASE I (NON-FRIABLE AND FRIABLE ASBESTOS ABATEMENT)** | | |
| **II. BUILDING REMOVAL - CASE II (NON-FRIABLE ASBESTOS ABATEMENT)** | | |
| **A. Building No. 1** | **Parcel No. SR0114** | **221 N. 11TH ST** |
| North Roof Flashing | 3% chrysotile | Roof flashing coating on north roof. Category I Non-friable. Samples MRA/1, MRA/2, MRA/3 |
| South Roof Vent Flashing | 10% chrysotile | Roof flashing coating around south roof vents. Category I Non-friable. Samples MRD/1, MRD/2, MRD/3 |
| South Roof Permimeter Flashing | 10% chrysotile | Roof flashing coating around perimeter of south roof. Category I Non-friable. Samples MRE/1, MRE/2, MRE/3 |
| **B. Building No. 3** | **Parcel No. SR0127** | **1001 E. MONROE ST** |
| Carpet Adhesive and Black Mastic | <1% chrysotile | Carpet adhesive with black mastic. Category I Non-friable. Samples MFA/1, MFA/2, MFA/3 |
| Center Roof Flashing | 3%-5% chrysotile | Roof flashing coating on center roof. Category I Non-friable. Samples MRE/1, MRE/2, MRE/3 |
| East Roof Flashing | 5%-10% chrysotile | Roof flashing coating on east roof. Category I Non-friable. Samples MRI/1, MRI/2, MRI/3 |
| East Roof Stone Cap Sealant | 1%-7% chrysotile | Stone cap sealant on east roof. Category II Non-friable. Samples MRL/1, MRL/2, MRL/3 (Sealant) |
| **C. Building No. 4** | **Parcel No. SR0306** | **915 E. CAPITOL AVENUE** |
| Roof Flashing | 15%-18% chrysotile | Roof flashing. Category I Non-friable. Samples MRA/1, MRA/2, MRA/3 |

## APPENDIX C

### MATERIAL QUANTITIES TABLE

The following are approximate quantities of ACM to be removed from the building indicated. These material quantities do not indicate the cleaning required to remove asbestos debris and resulting contamination from the work areas.

**I. BUILDING REMOVAL - CASE I (NON-FRIABLE AND FRIABLE ASBESTOS ABATEMENT)**

**II. BUILDING REMOVAL - CASE II (NON-FRIABLE ASBESTOS ABATEMENT)**

**A. Building No. 1** **Parcel No.** **SR0114** **221 N. 11TH ST**

| Material | Floor | Quantity Present | | Friable |
|---|---|---|---|---|
| North Roof Flashing | | 1050 | S.F. | No |
| South Roof Vent Flashing | | 150 | S.F. | No |
| South Roof Permimeter Flashing | | 1050 | S.F. | No |

**B. Building No. 3** **Parcel No.** **SR0127** **1001 E. MONROE ST**

| Material | Floor | Quantity Present | | Friable |
|---|---|---|---|---|
| Carpet Adhesive and Black Mastic | | 1200 | S.F. | No (Removal Required) |
| Center Roof Flashing | | 1050 | S.F. | No |
| East Roof Flashing | | 1155 | S.F. | No |
| East Roof Stone Cap Sealant | | 385 | L.F. | No (Removal Required) |

**C. Building No. 4** **Parcel No.** **SR0306** **915 E. CAPITOL AVENUE**

| Material | Floor | Quantity Present | | Friable |
|---|---|---|---|---|
| Roof Flashing | | 250 | S.F. | No |

**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,<br>One Project Superintendent or Engineer, and<br>One Clerk |
| Over $25,000,000 - up to $50,000,000 | One Project Manager,<br>One Project Superintendent,<br>One Engineer, and |

| | |
|---|---|
| | One Clerk |
| Over $50,000,000 | One Project Manager,<br>Two Project Superintendents,<br>One Engineer, and<br>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."

80384

**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 6.00 % 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.

80029

## 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.

80229

**LUMINAIRES, LED (BDE)**

Effective: April 1, 2019
Revised: January 1, 2022

**Description.** This work shall consist of furnishing and installing light emitting diode (LED) luminaires. Work shall be according to Sections 801, 821, and 1067 of the Standard Specifications, except as modified herein.

**Submittals.** In addition to the requirements listed in Article 801.05(a), submittals for LED luminaires shall include the following.

- Completed manufacturer's luminaire ordering form with the full catalog number provided.
- Descriptive literature and catalog cuts for the luminaire, driver, and surge protective device.
- Lighting calculations generated with AGi32 software demonstrating compliance with the Luminaire Performance Table(s) shown in the contract. These calculations shall be performed to the following criteria: photopic units shall be used; calculations shall be performed to an accuracy matching the number of significant digits given in the Luminaire Performance Table(s); point-by-point illuminance, luminance, and veiling luminance ratios demonstrating the submitted luminaire meets the lighting metrics specified in the Luminaire Performance Table(s) using IES RP-8 methods.

Upon request by the Engineer, submittals for LED Luminaires shall also include any or all the following.

- IES file associated with each submitted luminaire in IES LM-63 format.
- TM-21 calculator spreadsheet (XLSX or PDF format) and if available, TM-28 report for the specified luminaire or luminaire family. Both reports shall be for 50,000 hours at an ambient temperature of 77 °F (25 °C).
- LM-79 report with National Voluntary Laboratory Accreditation Program (NVLAP) current at the time of testing in PDF format inclusive of the following: isofootcandle diagram with half candela contour and maximum candela point; polar plots through maximum plane and maximum cone; coefficient of utilization graph; candela table; and spectral distribution graph and chromaticity diagram.
- LM-80 report for the specified LED package in PDF format and if available, LM-84 report for the specified luminaire or luminaire family in PDF format. Both reports shall be conducted by a laboratory with NVLAP certification current at the time of testing.
- In Situ Temperature Measurement Test (ISTMT) report for the specified luminaire or luminaire family in PDF format.

- Vibration test report in accordance with ANSI C136.31 in PDF format.

- ASTM B117/ASTM D1654 (neutral salt spray) test and sample evaluation report in PDF format.

- ASTM G154 (ASTM D523) gloss test report in PDF format.

- LED drive current, total luminaire input wattage, and current over the operating voltage range at an ambient temperature of 77 °F (25 °C).

- Power factor (pf) and total harmonic distortion (THD) at maximum and minimum supply and at nominal voltage for the dimmed states of 70%, 50%, and 30% full power.

- Ingress protection (IP) test reports, conducted according to ANSI C136.25 requirements, for the driver and optical assembly in PDF format.

- Installation, maintenance, and cleaning instructions in PDF format, including recommendations on periodic cleaning methods.

- Documentation in PDF format that the reporting laboratory is certified to perform the required tests.

**Roadway Luminaires.** Revise Article 821.02(d) to read.

"(d) Light Source .....1067.06"

Revise the third paragraph of Article 821.03 to read.

"Each luminaire driver and/or driver arrangement shall be checked to ensure compatibility with the project power supply."

Replace the fifth paragraph of Article 821.03 with the following.

"No luminaire shall be installed before it is approved. When independent luminaire testing is required, full approval will not be given until complete test results which demonstrate compliance with the contract documents have been reviewed and accepted by the Engineer. Independent luminaire testing will be required, and shall be conducted, according to Article 1067.01(k)".

Revise the last paragraph of Article 821.03 to read.

"When installing or adjusting the luminaire, care shall be taken to avoid touching the lenses or allowing contaminants to be deposited on any part of the optical assembly. Each lens shall be free of all dirt, smudges, etc. Should the luminaire require cleaning, the luminaire manufacturer's cleaning instructions shall be strictly followed."

Revise Article 821.08 to read.

"**821.08 Basis of Payment.** This work will be paid for at the contract unit price per each for LUMINAIRE, LED, ROADWAY, of the output designation specified; LUMINAIRE, LED, HIGHMAST, of the output designation specified; LUMINAIRE, LED, UNDERPASS, WALLMOUNT, of the output designation specified; LUMINAIRE, LED, UNDERPASS, SUSPENDED, of the output designation specified; LUMINAIRE, LED, SIGN LIGHTING, of the output designation specified.

**Luminaires.** Revise Articles 1067.01 through 1067.06 to read.

"**1067.01 General.** The size, weight, and shape of the luminaire shall be designed so as not to incite detrimental vibrations in its respective pole and it shall be compatible with the pole and arm. All electrical and electronic components of the luminaire shall comply with the requirements of Restriction of Hazardous Materials (RoHS) regulations. The luminaire shall be listed for wet locations by an NRTL and shall meet the requirements of UL 1598 and UL 8750.

(a) Labels. An internal label shall be provided indicating the luminaire is suitable for wet locations and indicating the luminaire is an NRTL listed product to UL1598 and UL8750. The internal label shall also comply with the requirements of ANSI C136.22.

An external label consisting of two black characters on a white background with the dimensions of the label and the characters as specified in ANSI C136.15 for HPS luminaires. The first character shall be the alphabetical character representing the initial lumen output as specified in Table 1 of Article 1067.06(c). The second character shall be the numerical character representing the transverse light distribution type as specified in IES RP-8 (i.e. Types 1, 2, 3, 4, or 5).

(b) Surge Protection. The luminaire shall comply the requirements of ANSI C136.2 for electrical transient immunity at the "Extreme" level (20KV/10KA) and shall be equipped with a surge protective device (SPD) that is UL1449 compliant with indicator light. An SPD failure shall open the circuit to protect the driver.

(c) Optical Assembly. The optical assembly shall have an IP66 or higher rating in accordance with ANSI C136.25. The circuiting of the LED array shall be designed to minimize the effect of individual LED failures on the operation of other LEDs. All optical components shall be made of glass or a UV stabilized, non-yellowing material.

(d) Housing. All external surfaces shall be cleaned in accordance with the manufacturer's recommendations and be constructed in such a way as to discourage the accumulation of water, ice, and debris.

(e) Driver. The driver shall be integral to the luminaire and shall be capable of receiving indefinite open and short circuit output conditions without damage.

The driver shall incorporate the use of thermal foldback circuitry to reduce output current under abnormal driver case temperature conditions and shall be rated for a lifetime of 100,000 hours at an ambient temperature exposure of 77 °F (25 °C) to the luminaire. If the driver has a thermal shut down feature, it shall not turn off the LEDs when operated at 104 °F (40 °C) or less.

The driver shall have an input voltage range of 120 to 277 volts (± 10%) or 347 to 480 volts (± 10%) according to the contract documents. When the driver is operating within the rated input voltage range and in an un-dimmed state, the power factor measurement shall be not less than 0.9 and the THD measurement shall be no greater than 20%.

The driver shall meet the requirements of the FCC Rules and Regulations, Title 47, Part 15 for Class A devices with regard to electromagnetic compatibility. This shall be confirmed through the testing methods in accordance with ANSI C63.4 for electromagnetic interference.

The driver shall be dimmable using the protocol listed in the Luminaire Performance Table shown in the contract.

(f) Photometric Performance. The luminaire shall be IES LM-79 tested by a laboratory holding accreditation from the NVLAP for IES LM-79 testing procedures. At a minimum the LM-79 report shall include a backlight/uplight/glare (BUG) rating and a luminaire classification system (LCS) graph showing lumen values and percent lumens by zone as described in IES RP-8. The uplight of the BUG rating shall be U=0.

The luminaire shall also meet the requirements of the Luminaire Performance Table shown in the contract.

(g) Finish. The luminaire shall have a baked acrylic enamel finish. The color of the finish shall be gray, bronze, or black to match the pole or tower on which the luminaire is mounted.

The finish shall have a rating of six or greater according to ASTM D1654, Section 8.0 Procedure A – Evaluation of Rust Creepage for Scribed Samples after exposure to 1000 hours of testing according to ASTM B117 for painted or finished surfaces under environmental exposure.

The luminaire finish shall have less than or equal to 30% reduction of gloss according to ASTM D523 after exposure of 500 hours to ASTM G154 Cycle 6 QUV® accelerated weathering testing.

(h) Hardware. All hardware shall be stainless steel or of other corrosion resistant material approved by the Engineer.

(i) Vibration Testing. All luminaires, with the exception of underpass and sign lighting luminaires, shall be subjected to and pass vibration testing requirements at “3G” minimum

zero to peak acceleration in accordance with ANSI C136.31 requirements using the same luminaire. To be accepted, the luminaire housing, hardware, and each individual component shall pass this test with no noticeable damage and the luminaire must remain fully operational after testing.

(j) Wiring. All wiring in the luminaire shall be rated for operation at 600V, 221 °F (105 °C).

(k) Independent Luminaire Testing. When a contract has 30 or more luminaires of the same manufacturer's catalog number, that luminaire shall be independently tested to verify it will meet the contract requirements. The quantity of luminaires requiring testing shall be one luminaire for the first 30 plus one additional luminaire for each additional 50 luminaires of that catalog number. Testing is not required for temporary lighting luminaires.

Prior to testing the Contractor shall propose a properly accredited laboratory and a qualified independent witness, submitting their qualifications to the Engineer for approval. After approval, the Contractor shall coordinate the testing and pay all associated costs, including travel expenses, for the independent witness.

(1) Independent Witness. The independent witness shall select from the project luminaires at the manufacturer's facility the luminaires for testing. In all cases, the selection of luminaires shall be a random selection from the entire completed lot of luminaires required for the contract. Selections from partial lots will not be allowed. The independent witness shall mark each sample luminaire's shipping carton with the IDOT contract number and a unique sample identifier.

At the time of random selection, the independent witness shall inspect the luminaire(s) for compliance with all physical, mechanical, and labeling requirements for luminaires according to Sections 821 and 1067. If deficiencies are found during the physical inspection, the Contractor shall have all luminaires of that manufacturer's catalog number inspected for the identified deficiencies and shall correct the problem(s) where found. Random luminaire selection and physical inspection must then be repeated. When the physical inspection is successfully completed, the independent witness shall mark the project number and sample identifier on the interior housing and driver of the luminaires and have them shipped to the laboratory.

The independent witness shall be present when testing is approved to be performed by the luminaire manufacturer. If the tests are performed by a laboratory independent of the luminaire manufacturer, distributor, and Contractor, the independent witness need not be present during the testing.

(2) Laboratory Testing. Luminaires shall be tested at an NVLAP accredited laboratory approved for each of the required tests. The testing shall include photometric, colorimetric, and electrical testing according to IES LM-79. Colorimetric values shall be determined from total spectral radiant flux measurements using a spectroradiometer. Photometric testing shall be according to IES recommendations and as a minimum, shall yield an isofootcandle chart, with max candela point and half

candela trace indicated, an isocandela diagram, maximum plane and maximum cone plots of candela, a candlepower table (house and street side), a coefficient of utilization chart, a luminous flux distribution table, BUG rating report, and complete calculations based on specified requirements and test results.

All testing shall cover the full spherical light output at a maximum of 5 degree intervals at the vertical angles. The vertical angles shall run from 0 to 180 degrees. There shall be a minimum of 40 lateral test planes listed in Fig. 1 of IES LM-31 plus the two planes containing the maximum candela on the left and right sides of the luminaire axis. Before testing, the luminaire when mounted on the goniometer shall be scanned for vertical and horizontal angles of maximum candela and these planes included in the test. The luminaire shall be checked for a bi-symmetric light distribution. Individual tests must be conducted for each hemisphere, quadrant, and left/right sides.

The results for each photometric and colorimetric test performed shall be presented in a standard IES LM-79 report that includes the contract number, sample identifier, and the outputs listed above. The calculated results for each sample luminaire shall meet or exceed the contract specified levels in the luminaire performance table(s). The laboratory shall mark its test identification number on the interior of each sample luminaire.

Electrical testing shall be in according to IES LM-79 as well as NEMA and ANSI standards. The report shall list luminaire characteristics including input amperes, watts, power factor, total harmonic distortion, and LED driver current for full and partial power.

(3) Summary Test Report. The summary test report shall consist of a narrative documenting the test process, highlight any deficiencies and corrective actions, and clearly state which luminaires have met or exceeded the test requirements and may be released for delivery to the jobsite. Photographs shall also be used as applicable to document luminaire deficiencies and shall be included in the test report. The summary test report shall include the Luminaire Physical Inspection Checklist (form BDE 5650), photometric and electrical test reports, and point-by-point photometric calculations performed in AGi32 sorted by luminaire manufacturers catalog number. All test reports shall be certified by the independent test laboratory's authorized representative or the independent witness, as applicable, by a dated signature on the first page of each report. The summary test reports shall be delivered to the Engineer and the Contractor as an electronic submittal. Hard copy reports shall be delivered to the Engineer for record retention.

(4) Approval of Independent Testing Results. Should any of the tested luminaires fail to satisfy the specifications and perform according to approved submittal information, all luminaires of that manufacturers catalog number shall be deemed unacceptable and shall be replaced by alternate equipment meeting the specifications. The submittal and testing process shall then be repeated in its entirety. The Contractor may request in writing that unacceptable luminaires be corrected in lieu of replacement. The

request shall identify the corrections to be made and upon approval of the request, the Contractor shall apply the corrections to the entire lot of unacceptable luminaires. Once the corrections are completed, the testing process shall be repeated, including selection of a new set of sample luminaires. The number of luminaires to be tested shall be the same quantity as originally tested.

The process of retesting, correcting, or replacing luminaires shall be repeated until luminaires for each manufacturers catalog number are approved for the project. Corrections and re-testing shall not be grounds for additional compensation or extension of time. No luminaires shall be shipped from the manufacturer to the jobsite until all luminaire testing is completed and approved in writing.

Submittal information shall include a statement of intent to provide the testing as well as a request for approval of the chosen independent witness and laboratory. All summary test reports, written reports, and the qualifications of the independent witness and laboratory shall be submitted for approval to the Engineer with a copy to the Bureau of Design and Environment, 2300 S Dirksen Parkway, Room 330 Springfield, IL 62764.

**1067.02 Roadway Luminaires.** Roadway luminaires shall be according to Article 1067.01 and the following.

The luminaire shall be horizontally mounted and shall be designed to slip-fit on a 2-3/8 in. (60 mm) outside diameter pipe arm with a stop to limit the amount of insertion to 7 in. (180 mm). It shall not be necessary to remove or open more than the access door to mount the luminaire.

The effective projected area (EPA) of the luminaire shall not exceed 1.6 sq ft (0.149 sq m) and the weight, including accessories, shall not exceed 40 lb (18.14 kg). If the weight of the luminaire is less than 20 lb (9.07 kg), weight shall be added to the mounting arm or a supplemental vibration damper installed as approved by the Engineer.

The luminaire shall be equipped with both internal and external leveling indicators. The external leveling indicator shall be clearly visible in daylight to an observer directly under the luminaire at a mounting height of 50 ft (15.2 m).

The luminaire shall be fully prewired to accept a seven-pin, twist-lock receptacle that is compliant with ANSI C136.41. All receptacle pins shall be connected according to TALQ Consortium protocol.

The luminaire shall be provided with an installed shorting cap that is compliant with ANSI C136.10.

**1067.03 Highmast Luminaires.** Highmast luminaires shall be according to Article 1067.01 and the following.

The luminaire shall be horizontally mounted and shall be designed and manufactured for highmast tower use. The EPA of the luminaire shall not exceed 3.0 sq ft (0.279 sq m) and the weight, including accessories, shall not exceed 85 lb (38.6 kg).

The optical assembly shall be capable of being rotated 360 degrees. A vernier scale shall be furnished on the axis of rotation for aiming the luminaire in relation to its mounting tenon arm. The scale shall be graduated in 5 degree increments or less. The luminaire shall be clearly marked at the vernier as to 'house-side' and 'street-side' to allow proper luminaire orientation.

**1067.04 Underpass Luminaires.** Underpass luminaries shall be according to Article 1067.01 and the following.

The underpass luminaire shall be complete with all supports, hardware, and appurtenant mounting accessories. The underpass luminaire shall be suitable for lighting a roadway underpass at an approximate mounting height of 15 ft (4.5 m) from a position suspended directly above the roadway edge of pavement or attached to a wall or pier. The underpass luminaire shall meet the requirements of ANSI C136.27.

It shall not be necessary to remove more than the cover, reflector and lens to mount the luminaire. The unit shall be suitable for highway use and shall have no indentations or crevices in which dirt, salt, or other corrosives may collect.

(a) Housing. The housing and lens frame shall be made of die cast aluminum or 16 gauge (1.5 mm) minimum thickness Type 304 stainless steel. All seams in the housing enclosure shall be welded by continuous welds.

The housing shall have an opening for installation of a 3/4 in. (19 mm) diameter conduit.

(b) Lens and Lens Frame. The frame shall not overlap the housing when closed. The luminaire shall have a flat glass lens to protect the LEDs from dirt accumulation or be designed to prevent dirt accumulation. The optic assembly shall be rated IP 66 or higher.

**1067.05 Sign Lighting Luminaires.** Sign lighting luminaries shall be suitable for lighting overhead freeway and expressway guide signs; and shall be according to Article 1067.01.

**1067.06 Light Sources.** The light sources in all luminaires shall be LED according to Article 1067.01 and the following.

(a) The light source shall be according to ANSI C136.37 for solid state light sources used in roadway and area lighting.

(b) The light source shall have a minimum color rendering index (CRI) of 70 and a nominal correlated color temperature (CCT) of 4000 K.

(c) The rated initial luminous flux (lumen output) of the light source, as installed in the luminaire, shall be according to the following table for each specified output designation.

| **Output Designations and Initial Luminous Flux** | | | *(for information only)* |
|---|---|---|---|
| **Output Designation** | **Initial Luminous Flux (lm)** | | Approximate High Pressure Sodium (HPS) Equivalent Wattage |
| A | 2,200 | | 35 (Low Output) |
| B | 3,150 | | 50 (Low Output) |
| C | 4,400 | | 70 (Low Output) |
| D | 6,300 | | 100 (Low Output) |
| E | 9,450 | | 150 (Low Output) |
| F | 12,500 | | 200 (Med Output) |
| G | 15,500 | | 250 (Med Output) |
| H | 25,200 | | 400 (Med Output) |
| I | 47,250 | | 750 (High Output) |
| J | 63,300 | | 1,000 (High Output) |
| K | 80,000+ | | 1,000+ (High Output) |

Luminaires with an initial luminous flux less than or greater than the values listed in the above table may be acceptable if they meet the requirements given in the Luminaire Performance Table shown in the contract and approved by the Engineer."

80411

**MECHANICALLY STABILIZED EARTH RETAINING WALLS (BDE)**

Effective: November 1, 2019
Revised: November 1, 2020

Revise Articles 1003.07(f)(2) and 1004.06(f)(2) of the Standard Specifications to read:

"(2) The chlorides shall be a maximum of 100 parts per million according to Illinois Modified AASHTO T 291."

Revise Articles 1003.07(f)(3) and 1004.06(f)(3) of the Standard Specifications to read:

"(3) The sulfates shall be a maximum of 200 parts per million according to Illinois Modified AASHTO T 290."

Revise Articles 1003.07(g) and 1004.06(g) of the Standard Specifications to read:

"(g) Testing Protocol. Prior to the start of and during construction, the internal friction angle and pH shall be determined in order to demonstrate the select fill material meets the specification requirements. Resistivity, chlorides, sulfates, and organic content test results shall also be determined if steel reinforcement is used. Testing shall be according to the current Bureau of Materials Policy Memorandum "Fine and Coarse Aggregates Used as Select Fill in MSE Walls Acceptance Procedures for Approved/Qualified Aggregate Sources"."

80418

**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."

80430

**RAILROAD PROTECTIVE LIABILITY INSURANCE (BDE)**

Effective: December 1, 1986
Revised: January 1, 2022

Description. Railroad Protective Liability and Property Damage Liability Insurance shall be carried according to Article 107.11 of the Standard Specifications. A separate policy is required for each railroad unless otherwise noted.

| NAMED INSURED & ADDRESS | NUMBER & SPEED OF PASSENGER TRAINS | NUMBER & SPEED OF FREIGHT TRAINS |
|---|---|---|
| Norfolk Southern Railway Co.<br>3 Commercial Place<br>Norfolk, VA 25310-2191 | None | 16 Trains/Day<br>60 mph |

Class 1 RR (Y or N): Y
DOT/AAR No.: 479327Y and 479328F
RR Mile Post: DH 414.09 and DH 414.17
RR Division: Western
RR Sub-Division: Decatur

For Freight/Passenger Information Contact: George Taylor
Phone: (678) 333-4274
For Insurance Information Contact: Scott Dickerson
Phone: (757) 629-2364

Class 1 RR (Y or N):
DOT/AAR No.:
RR Mile Post:
RR Division:
RR Sub-Division:

For Freight/Passenger Information Contact:
Phone:
For Insurance Information Contact:
Phone:

Basis of Payment. Providing Railroad Protective Liability and Property Damage Liability Insurance will be paid for at the contract unit price per Lump Sum for RAILROAD PROTECTIVE LIABILITY INSURANCE.

3426I

**STEEL COST ADJUSTMENT (BDE)**

Effective: April 2, 2004
Revised: January 1, 2022

Description. Steel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in steel 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 item of work will make that item of steel exempt from steel cost adjustment.

Types of Steel Products. An adjustment will be made for fluctuations in the cost of steel used in the manufacture of the following items:

Metal Piling (excluding temporary sheet piling)
Structural Steel
Reinforcing Steel

Other steel materials such as dowel bars, tie bars, welded reinforcement, guardrail, steel traffic signal and light poles, towers and mast arms, metal railings (excluding wire fence), and frames and grates will be subject to a steel cost adjustment when the pay items they are used in have a contract value of $10,000 or greater.

The adjustments shall apply to the above items when they are part of the original proposed construction, or added as extra work and paid for by agreed unit prices. The adjustments shall not apply when the item is added as extra work and paid for at a lump sum price or by force account.

Documentation. Sufficient documentation shall be furnished to the Engineer to verify the following:

(a) The dates and quantity of steel, in lb (kg), shipped from the mill to the fabricator.

(b) The quantity of steel, in lb (kg), incorporated into the various items of work covered by this special provision. The Department reserves the right to verify submitted quantities.

Method of Adjustment. Steel cost adjustments will be computed as follows:

$SCA = Q \times D$

Where: SCA = steel cost adjustment, in dollars
Q = quantity of steel incorporated into the work, in lb (kg)
D = price factor, in dollars per lb (kg)

$D = MPI_M - MPI_L$

Where: $MPI_M$ = The Materials Cost Index for steel as published by the Engineering News-Record for the month the steel is shipped from the mill. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

$MPI_L$ = The Materials Cost Index for steel as published by the Engineering News-Record 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,. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

The unit weights (masses) of steel that will be used to calculate the steel cost adjustment for the various items are shown in the attached table.

No steel cost adjustment will be made for any products manufactured from steel having a mill shipping date prior to the letting date.

If the Contractor fails to provide the required documentation, the method of adjustment will be calculated as described above; however, the $MPI_M$ will be based on the date the steel arrives at the job site. In this case, an adjustment will only be made when there is a decrease in steel costs.

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

$$\text{Percent Difference} = \{(MPI_L - MPI_M) \div MPI_L\} \times 100$$

Steel cost adjustments will be calculated by the Engineer and will be paid or deducted when all other contract requirements for the items of work are satisfied. Adjustments will only be made for fluctuations in the cost of the steel as described herein. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, storage, etc.

The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

**Attachment**

| Item | Unit Mass (Weight) |
|---|---|
| Metal Piling (excluding temporary sheet piling) | |
| Furnishing Metal Pile Shells 12 in. (305 mm), 0.179 in. (3.80 mm) wall thickness) | 23 lb/ft (34 kg/m) |
| Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness) | 32 lb/ft (48 kg/m) |
| Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness) | 37 lb/ft (55 kg/m) |
| Other piling | See plans |
| Structural Steel | See plans for weights (masses) |
| Reinforcing Steel | See plans for weights (masses) |
| Dowel Bars and Tie Bars | 6 lb (3 kg) each |
| Welded Reinforcement | 63 lb/100 sq ft (310 kg/sq m) |
| Guardrail | |
| Steel Plate Beam Guardrail, Type A w/steel posts | 20 lb/ft (30 kg/m) |
| Steel Plate Beam Guardrail, Type B w/steel posts | 30 lb/ft (45 kg/m) |
| Steel Plate Beam Guardrail, Types A and B w/wood posts | 8 lb/ft (12 kg/m) |
| Steel Plate Beam Guardrail, Type 2 | 305 lb (140 kg) each |
| Steel Plate Beam Guardrail, Type 6 | 1260 lb (570 kg) each |
| Traffic Barrier Terminal, Type 1 Special (Tangent) | 730 lb (330 kg) each |
| Traffic Barrier Terminal, Type 1 Special (Flared) | 410 lb (185 kg) each |
| Steel Traffic Signal and Light Poles, Towers and Mast Arms | |
| Traffic Signal Post | 11 lb/ft (16 kg/m) |
| Light Pole, Tenon Mount and Twin Mount, 30 - 40 ft (9 – 12 m) | 14 lb/ft (21 kg/m) |
| Light Pole, Tenon Mount and Twin Mount, 45 - 55 ft (13.5 – 16.5 m) | 21 lb/ft (31 kg/m) |
| Light Pole w/Mast Arm, 30 - 50 ft (9 – 15.2 m ) | 13 lb/ft (19 kg/m) |
| Light Pole w/Mast Arm, 55 - 60 ft (16.5 – 18 m) | 19 lb/ft (28 kg/m) |
| Light Tower w/Luminaire Mount, 80 - 110 ft (24 – 33.5 m) | 31 lb/ft (46 kg/m) |
| Light Tower w/Luminaire Mount, 120 - 140 ft (36.5 – 42.5 m) | 65 lb/ft (97 kg/m) |
| Light Tower w/Luminaire Mount, 150 - 160 ft (45.5 – 48.5 m) | 80 lb/ft (119 kg/m) |
| Metal Railings (excluding wire fence) | |
| Steel Railing, Type SM | 64 lb/ft (95 kg/m) |
| Steel Railing, Type S-1 | 39 lb/ft (58 kg/m) |
| Steel Railing, Type T-1 | 53 lb/ft (79 kg/m) |
| Steel Bridge Rail | 52 lb/ft (77 kg/m) |
| Frames and Grates | |
| Frame | 250 lb (115 kg) |
| Lids and Grates | 150 lb (70 kg) |

80127

**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."

80397

**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%" |

80391

## SURFACE TESTING OF PAVEMENTS – IRI (BDE)

Effective: January 1, 2021
Revised: January 1, 2022

Description. This work shall consist of testing the ride quality of the finished surface of pavements, according to Illinois Test Procedure 701, "Ride Quality Testing Using the International Roughness Index (IRI)". Work shall be according to Sections 406, 407, or 420 of the Standard Specifications, except as modified herein.

### Hot-Mix Asphalt (HMA) Overlays

Add Article 406.03(n) to the Standard Specifications:

"(n) Pavement Surface Grinding Equipment.....1101.04"

Revise Article 406.11 of the Standard Specifications to read:

"**406.11 Surface Tests.** Prior to pavement improvements, the Engineer will measure the smoothness of the existing high-speed mainline pavement. The Contractor shall measure the smoothness of the finished high-speed mainline, low-speed mainline, and miscellaneous pavements within seven days of paving. Testing shall be performed in the presence of the Engineer and according to Illinois Test Procedure 701. The pavement will be identified as high-speed mainline, low-speed mainline, or miscellaneous as follows.

(a) Test Sections

(1) High-Speed Mainline Pavement. High-speed mainline pavement shall consist of pavements, ramps, and loops with a posted speed limit greater than 45 mph. These sections shall be tested with an inertial profiling system (IPS).

(2) Low-Speed Mainline Pavement. Low-speed mainline pavement shall consist of pavements, ramps, and loops with a posted speed limit of 45 mph or less. These sections shall be tested with an IPS and will be analyzed using the rolling 16 ft (5 m) straightedge simulation in ProVAL.

(3) Miscellaneous Pavement. Miscellaneous pavement includes segments that either cannot readily be tested by an IPS or conditions beyond the control of the contractor preclude the achievement of smoothness levels typically achievable with mainline pavement construction. This may include the following examples or as determined by the Engineer.

(a) Pavement on horizontal curves with a centerline radius of curvature of less than or equal to 1,000 ft (300 m) and the pavement within the superelevation transition of such curves;

(b) Pavement on vertical curves having a length less than or equal to 200 ft (60 m) in combination with an algebraic change in tangent grade greater than or equal to 3 percent as may occur on urban ramps or other constricted-space facilities;

(c) The first and last 50 ft (15 m) of a pavement section where the Contractor is not responsible for the adjoining surface;

(d) Intersections and the 25 ft (7.6 m) before and after an intersection or end of radius return;

(e) Variable width pavements;

(f) Side street returns, to the end of radius return;

(g) Crossovers;

(h) Connector pavement from the mainline pavement expansion joint to the bridge approach slab;

(i) Bridge approach slab;

(j) Pavement that must be constructed in multiple short segments, typically defined as 600 ft (180 m) or less;

(k) Pavement within 25 ft (7.6 m) of manholes, utility structures, or other appurtenances;

(l) Turn lanes; and

(m) Pavement within 5 ft (1.5 m) of jobsite sampling locations for HMA volumetric testing that fall within the wheel path.

Miscellaneous pavement shall be tested using a 16 ft (5 m) straightedge.

(4) International Roughness Index (IRI). An index computed from a longitudinal profile measurement using a quarter-car simulation at a simulation speed of 50 mph (80 km/h).

(5) Mean Roughness Index (MRI). The average of the IRI values for the right and left wheel tracks.

(6) Areas of Localized Roughness (ALR). Isolated areas of roughness, which can cause significant increase in the calculated MRI for a given sublot.

(7) Lot. A lot will be defined as a continuous strip of pavement 1 mile (1,600 m) long and one lane wide. When the length of a continuous strip of pavement is less than 1 mile (1,600 m), that pavement will be included in an adjacent lot. Structures will be omitted when measuring pavement length, but will not be considered as a discontinuity and the numbering of sublots will not restart. The limits of the structure shall include the entire length between the outside ends of both connector pavements.

(8) Sublot. Lots will be divided into 0.1 mile (160 m) sublots. A partial sublot greater than or equal to 264 ft (80 m) resulting from an interruption in the pavement will be subject to the same evaluation as a whole sublot. Partial sublots less than 264 ft (80 m) shall be included with the previous sublot for evaluation purposes.

(b) Corrective Work. Corrective work shall be completed according to the following.

(1) High-Speed Mainline Pavement. For high-speed mainline pavement, any 25 ft (7.6 m) interval with an ALR in excess of 150 in./mile (2,400 mm/km) will be identified by the Engineer and shall be corrected by the Contractor. Any sublot having a MRI greater than $MRI_D$, including ALR, shall be corrected to reduce the MRI to the $MRI_F$, or replaced at the Contractor's option.

(2) Low-Speed Mainline Pavement. Bumps in low-speed mainline pavement which exceed the 5/16 in. (8 mm) tolerance using a simulated 16 ft (5 m) straightedge will be identified by the Engineer and shall be corrected by the Contractor.

(3) Miscellaneous Pavements. Bumps in miscellaneous pavement which exceed the 5/16 in. (8 mm) tolerance on a 16 ft (5 m) straightedge will be identified by the Engineer and shall be corrected by the Contractor.

Corrective work shall be completed with pavement surface grinding equipment or by removing and replacing the pavement. Corrective work shall be applied to the full lane width. When completed, the corrected area shall have uniform texture and appearance, with the beginning and ending of the corrected area normal to the centerline of the paved surface.

Upon completion of the corrective work, the surface of the sublot(s) shall be retested. The Contractor shall furnish the data and reports to the Engineer within 2 working days after corrections are made. If the MRI and/or ALR still do not meet the requirements, additional corrective work shall be performed.

Corrective work shall be at no additional cost to the Department.

(c) Smoothness Assessments. Assessments will be paid to or deducted from the Contractor for each sublot of high-speed mainline pavement per the Smoothness Assessment Schedule. Assessments will be based on the MRI of each sublot prior to performing any corrective work unless the Contractor has chosen to remove and replace the sublot. For

sublots that are replaced, assessments will be based on the MRI determined after replacement.

The upper MRI thresholds for high-speed mainline pavement are dependent on the MRI of the existing pavement before construction ($MRI_0$) and shall be determined as follows.

| Upper MRI Thresholds [1/] | MRI Thresholds (High-Speed, HMA Overlay) | |
|---|---|---|
| | $MRI_0 \leq 125.0$ in./mile (≤ 1,975 mm/km) | $MRI_0 > 125.0$ in./mile [1/] (> 1,975 mm/km) |
| Incentive ($MRI_I$) | 45.0 in./mile (710 mm/km) | $0.2 \times MRI_0 + 20$ |
| Full Pay ($MRI_F$) | 75.0 in./mile (1,190 mm/km) | $0.2 \times MRI_0 + 50$ |
| Disincentive ($MRI_D$) | 100.0 in./mile (1,975 mm/km) | $0.2 \times MRI_0 + 75$ |

1/ $MRI_0$, $MRI_I$, $MRI_F$, and $MRI_D$ shall be in in./mile for calculation.

Smoothness assessments for high-speed mainline pavement shall be determined as follows.

| SMOOTHNESS ASSESSMENT SCHEDULE (High-Speed, HMA Overlay) | |
|---|---|
| Mainline Pavement MRI Range | Assessment Per Sublot [1/] |
| $MRI \leq MRI_I$ | $+ (MRI_I - MRI) \times \$33.00$ [2/] |
| $MRI_I < MRI \leq MRI_F$ | + \$0.00 |
| $MRI_F < MRI \leq MRI_D$ | $- (MRI - MRI_F) \times \$20.00$ |
| $MRI > MRI_D$ | – \$500.00 |

1/ MRI, $MRI_I$, $MRI_F$, and $MRI_D$ shall be in in./mile for calculation.

2/ The maximum incentive amount shall not exceed \$500.00.

Smoothness assessments will not be paid or deducted until all other contract requirements for the pavement are satisfied. Pavement that is corrected or replaced for reasons other than smoothness, shall be retested as stated herein."

**Hot-Mix Asphalt (HMA) Pavement (Full-Depth)**

Revise the first paragraph of Article 407.03 of the Standard Specifications to read:

"**407.03 Equipment.** Equipment shall be according to Article 406.03."

Revise Article 407.09 of the Standard Specifications to read:

"**407.09 Surface Tests.** The finished surface of the pavement shall be tested for smoothness

according to Article 406.11, except as follows:

The testing of the existing pavement prior to improvements shall not apply and the smoothness assessment for high-speed mainline pavement shall be determined according to the following table.

| SMOOTHNESS ASSESSMENT SCHEDULE (High-Speed, Full-Depth HMA) | |
|---|---|
| Mainline Pavement MRI, in./mile (mm/km) | Assessment Per Sublot [1/] |
| ≤ 45.0 (710) | + (45 – MRI) × $80.00 [2/] |
| > 45.0 (710) to 75.0 (1,190) | + $0.00 |
| > 75.0 (1,190) to 100.0 (1,580) | – (MRI – 75) × $30.00 |
| > 100.0 (1,580) | – $750.00 |

1/ MRI shall be in in./mile for calculation.

2/ The maximum incentive amount shall not exceed $1,200.00."

**Portland Cement Concrete Pavement**

Delete Article 420.03(i) of the Standard Specifications.

Revise Article 420.03(j) of the Standard Specifications to read:

"(i) Coring Machine (Note 1)"

Revise Article 420.10 of the Standard Specifications to read:

"**420.10 Surface Tests.** The finished surface of the pavement shall be tested for smoothness according to Article 406.11, except as follows.

The testing of the existing pavement prior to improvements shall not apply. The Contractor shall measure the smoothness of the finished surface of the pavement after the pavement has attained a flexural strength of 250 psi (3,800 kPa) or a compressive strength of 1,600 psi (20,700 kPa).

Membrane curing damaged during testing shall be repaired as directed by the Engineer at no additional cost to the Department.

(a) Corrective Work. No further texturing for skid resistance will be required for areas corrected by grinding. Protective coat shall be reapplied to ground areas according to Article 420.18 at no additional cost to the Department.

Pavement corrected by removal and replacement, shall be corrected in full panel sizes.

(b) Smoothness Assessments. Smoothness assessment for high-speed mainline pavement shall be determined as follows.

| SMOOTHNESS ASSESSMENT SCHEDULE (High-Speed, PCC) | |
|---|---|
| Mainline Pavement MRI, in./mile (mm/km) [3/] | Assessment Per Sublot [1/] |
| ≤ 45.0 (710) | + (45 – MRI) × $120.00 [2/] |
| > 45.0 (710) to 75.0 (1,190) | + $0.00 |
| > 75.0 (1,190) to 100.0 (1,580) | – (MRI – 75) × $45.00 |
| > 100.0 (1,580) | – $1,125.00 |

1/ MRI shall be in in./mile for calculation.

2/ The maximum incentive amount shall not exceed $1,800.00.

3/ If pavement is constructed with traffic in the lane next to it, then an additional 10 in./mile will be added to the upper thresholds."

**Removal of Existing Pavement and Appurtenances**

Revise the first paragraph of Article 440.04 of the Standard Specifications to read:

"**440.04 HMA Surface Removal for Subsequent Resurfacing.** The existing HMA surface shall be removed to the depth specified on the plans with a self-propelled milling machine. The removal depth may be varied slightly at the discretion of the Engineer to satisfy the smoothness requirements of the finished pavement. The temperature at which the work is performed, the nature and condition of the equipment, and the manner of performing the work shall be such that the milled surface is not torn, gouged, shoved or otherwise damaged by the milling operation. Sufficient cutting passes shall be made so that all irregularities or high spots are eliminated to the satisfaction of the Engineer. When tested with a 16 ft (5 m) straightedge, the milled surface shall have no surface variations in excess of 3/16 in. (5 mm)."

80435

**TRAINING SPECIAL PROVISIONS (BDE)**

Effective: October 15, 1975
Revised: September 2, 2021

This Training Special Provision supersedes Section 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," and is in implementation of 23 U.S.C. 140(a).

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved. The number of trainees to be trained under this contract will be 8. In the event the Contractor subcontracts a portion of the contract work, it shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also ensure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within the reasonable area of recruitment. Prior to commencing construction, the Contractor shall submit to the Illinois Department of Transportation for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee it employs on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g. by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps it has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he or she has successfully completed a training course leading to journeyman status or in which he or she has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used, the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by the Illinois Department of Transportation and the Federal Highway Administration. The Illinois Department of Transportation and the Federal Highway Administration shall approve a program, if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved by not necessarily sponsored by the U.S. Department of Labor Employment Training Administration shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Illinois Department of Transportation and the Federal Highway Administration. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirement of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program.

It is not required that all trainees be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The Contractor shall furnish the trainee a copy of the program he will follow in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily complete.

The Contractor shall provide for the maintenance of records and furnish periodic reports documenting its performance under this Training Special Provision.

For contracts with an awarded contract value of $500,000 or more, the Contractor is required to comply with the Illinois Works Apprenticeship Initiative (30 ILCS 559/20-20 to 20-25) and all applicable administrative rules to the extent permitted by Section 20-20(g). For federally funded projects, the number of trainees to be trained under this contract, as stated in the Training Special Provisions, will be the established goal for the Illinois Works Apprenticeship Initiative 30 ILCS 559/20-20(g). The Contractor shall make a good faith effort to meet this goal. For federally funded projects, the Illinois Works Apprenticeship Initiative will be implemented using the FHWA approved OJT procedures. The Contractor must comply with the recordkeeping and reporting obligations of the Illinois Works Apprenticeship Initiative for the life of the project, including the certification as to whether the trainee/apprentice labor hour goals were met.

Method of Measurement. The unit of measurement is in hours.

Basis of Payment. This work will be paid for at the contract unit price of 80 cents per hour for TRAINEES. The estimated total number of hours, unit price, and total price have been included in the schedule of prices.

20338

**VEHICLE AND EQUIPMENT WARNING LIGHTS (BDE)**

Effective: November 1, 2021

Add the following paragraph after the first paragraph of Article 701.08 of the Standard Specifications:

"The Contractor shall equip all vehicles and equipment with high-intensity oscillating, rotating, or flashing, amber or amber-and-white, warning lights which are visible from all directions. The lights shall be in operation while the vehicle or equipment is engaged in construction operations."

80439

**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.

80302

**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."

80427

**WORKING DAYS (BDE)**

Effective: January 1, 2002

The Contractor shall complete the work within 200 working days.

80071

**DRILLED SHAFTS**
Effective: October 5, 2015
Revised: October 4, 2016

Revise Section 516 of the Standard Specifications to read:

## "SECTION 516. DRILLED SHAFTS

**516.01 Description.** This work shall consist of constructing drilled shaft foundations.

**516.02 Materials.** Materials shall be according to the following.

| Item | Article/Section |
|---|---|
| (a) Portland Cement Concrete (Note 1) | 1020 |
| (b) Reinforcement Bars | 1006.10 |
| (c) Grout (Note 2) | 1024.01 |
| (d) Permanent Steel Casing | 1006.05(d) |
| (e) Slurry (Note 3) | |

Note 1. When the soil contains sulfate contaminates, ASTM C 1580 testing will be performed to assess the severity of sulfate exposure to the concrete. If the sulfate contaminate is >0.10 to < 0.20 percent by mass, a Type II (MH) cement shall be used. If the sulfate contaminate is >0.20 to < 2.0 percent by mass, a Type V cement shall be used. If the sulfate contaminate is ≥ 2.0 percent by mass, refer to ACI 201.2R for guidance.

Note 2. The sand-cement grout mix shall be according to Section 1020 and shall be two to five parts sand and one part Type I or II cement. The maximum water cement ratio shall be sufficient to provide a flowable mixture with a typical slump of 10 in. (250 mm).

Note 3. Slurry shall be bentonite, emulsified polymer, or dry polymer, and shall be approved by the Engineer.

**516.03 Equipment.** Equipment shall be according to the following.

| Item | Article/Section |
|---|---|
| (a) Concrete Equipment | 1020.03 |
| (b) Drilling Equipment (Note 1) | |
| (c) Hand Vibrator | 1103.17(a) |
| (d) Underwater Concrete Placement Equipment | 1103.18 |

Note 1. The drilling equipment shall have adequate capacity, including power, torque and down thrust, to create a shaft excavation of the maximum diameter specified to a depth of 20 percent beyond the depths shown on the plans.

**516.04 Submittals.** The following information shall be submitted on form BBS 133.

(a) Qualifications. At the time of the preconstruction conference, the Contractor shall provide the following documentation.

(1) References. A list containing at least three projects completed within the three years prior to this project's bid date which the Contractor performing this work has installed drilled shafts of similar diameter, length, and site conditions to those shown in the plans. The list of projects shall contain names and phone numbers of owner's representatives who can verify the Contractor's participation on those projects.

(2) Experience. Name and experience record of the drilled shaft supervisor, responsible for all facets of the shaft installation, and the drill operator(s) who will be assigned to this project. The supervisor and operator(s) shall each have a minimum of three years experience in the construction of drilled shafts.

(b) Installation Procedure. A detailed installation procedure shall be submitted to the Engineer for acceptance at least 28 days prior to drilled shaft construction and shall address each of the following items unless otherwise directed by the Engineer in writing.

(1) Equipment List. List of proposed equipment to be used including cranes, drill rigs, augers, belling tools, casing, vibratory hammers, core barrels, bailing buckets, final cleaning equipment, slurry equipment, tremies, or concrete pumps, etc.

(2) General Sequence. Details of the overall construction operation sequence, equipment access, and the sequence of individual shaft construction within each substructure bent or footing group. The submittal shall address the Contractor's proposed time delay and/or the minimum concrete strength necessary before initiating a shaft excavation adjacent to a recently installed drilled shaft.

(3) Shaft Excavation. A site specific step by step description of how the Contractor anticipates the shaft excavation to be advanced based on their evaluation of the subsurface data and conditions expected to be encountered. This sequence shall note the method of casing advancement, anticipated casing lengths, tip elevations and diameters, the excavation tools used and drilled diameters created. The Contractor shall indicate whether wet or dry drilling conditions are expected and if groundwater will be sealed from the excavation.

(4) Slurry. When the use of slurry is proposed, details on the types of additives to be used and their manufacturers shall be provided. In addition, details covering the measurement and control of the hardness of the mixing water, agitation, circulation, de-sanding, sampling, testing, and chemical properties of the slurry shall be submitted.

(5) Shaft Cleaning. Method(s) and sequence proposed for the shaft cleaning operation.

(6) Reinforcement Cage and Permanent Casing. Details of reinforcement placement including rolling spacers to be used and method to maintain proper elevation and location of the reinforcement cage within the shaft excavation during concrete placement. The method(s) of adjusting the reinforcement cage length and permanent casing if rock is encountered at an elevation other than as shown on the plans. As an option, the Contractor may perform soil borings and rock cores at the drilled shaft locations to determine the required reinforcement cage and permanent casing lengths.

(7) Concrete Placement. Details of concrete placement including proposed operational procedures for free fall, tremie or pumping methods. The sequence and method of casing removal shall also be stated along with the top of pour elevation, and method of forming through water above streambed.

(8) Mix Design. The proposed concrete mix design(s).

(9) Disposal Plan. Containment and disposal plan for slurry and displaced water. Containment and disposal plan for contaminated concrete pushed out of the top of the shaft by uncontaminated concrete during concrete placement.

(10) Access and Site Protection Plan. Details of access to the drilled shafts and safety measures proposed. This shall include a list of casing, scaffolding, work platforms, temporary walkways, railings, and other items needed to provide safe access to the drilled shafts. Provisions to protect open excavations during non-working hours shall be included.

The Engineer will evaluate the drilled shaft installation procedure and notify the Contractor of acceptance, need for additional information, or concerns with the installation’s effect on the existing or proposed structure(s).

## CONSTRUCTION REQUIREMENTS

**516.05 General.** Excavation for drilled shaft(s) shall not proceed until written authorization is received from the Engineer. The Contractor shall be responsible for verification of the dimensions and alignment of each shaft excavation as directed by the Engineer.

Unless otherwise approved in the Contractor's installation procedure, no shaft excavation, casing installation, or casing removal with a vibratory hammer shall be made within four shaft diameters center to center of a shaft with concrete that has a compressive strength less than 1500 psi (10,300 kPa). The site-specific soil strengths and installation methods selected will determine the actual required minimum spacing, if any, to address vibration and blow out concerns.

Lost tools shall not remain in the shaft excavation without the approval of the Engineer.

Blasting shall not be used as a method of shaft excavation.

**516.06 Shaft Excavation Protection Methods.** The construction of drilled shafts may involve the use of one or more of the following methods to support the excavation during the various phases of shaft excavation, cleaning, and concrete placement dependent on the site conditions encountered. Surface water shall not flow uncontrolled into the shaft excavation, however water may be placed into the shaft excavation in order to meet head pressure requirements according to Articles 516.06(c) and 516.13.

The following are general descriptions indicating the conditions when these methods may be used.

(a) Dry Method. The dry construction method shall only be used at sites where the groundwater and soil conditions are suitable to permit the drilling and dewatering of the excavation without causing subsidence of adjacent ground, boiling of the base soils, squeezing, or caving of the shaft side walls. The dry method shall consist of drilling the shaft excavation, removing accumulated water, cleaning the shaft base, and placing the reinforcement cage and concrete in a predominately dry excavation.

(b) Slurry Method. The slurry construction method may be used at sites where dewatering the excavation would cause collapse of the shaft sidewalls or when the volume and head of water flowing into the shaft is likely to contaminate the concrete during placement resulting in a shaft defect. This method uses slurry, or in rare cases water, to maintain stability of the shaft sidewall while advancing the shaft excavation. After the shaft excavation is completed, the slurry level in the shaft shall be kept at an elevation to

maintain stability of the shaft sidewall, maintain stability of the shaft base, and prevent additional groundwater from entering the shaft. The shaft base shall be cleaned, the reinforcement cage shall be set, and the concrete shall be discharged at the bottom of the shaft excavation, displacing the slurry upwards.

(c) Temporary Casing Method. Temporary casing shall be used when either the dry or slurry methods provide inadequate support to prevent sidewall caving or excessive deformation of the shaft excavation. Temporary casing may be used with slurry or be used to reduce the flow of water into the excavation to allow dewatering and concrete placement in a dry shaft excavation. Temporary casing shall not be allowed to remain permanently without the approval of the Engineer.

During removal of the temporary casing, the level of concrete in the casing shall be maintained at a level such that the head pressure inside the casing is a minimum of 1.25 times the head pressure outside the casing, but in no case is less than 5 ft (1.5 m) above the bottom of the casing. Casing removal shall be at a slow, uniform rate with the pull in line with the shaft axis. Excessive rotation of the casing shall be avoided to limit deformation of the reinforcement cage. In addition, the slump requirements during casing removal shall be according to Article 516.12.

When called for on the plans, the Contractor shall install a permanent casing as specified. Permanent casing may be used as a shaft excavation support method or may be installed after shaft excavation is completed using one of the above methods. After construction, if voids are present between the permanent casing and the drilled excavation, the voids shall be filled with grout. Permanent casing shall not remain in place beyond the limits shown on the plans without the specific approval of the Engineer.

When the shaft extends above the streambed through a body of water and permanent casing is not shown, the portion above the streambed shall be formed with removable casings, column forms, or other forming systems as approved by the Engineer. The forming system shall not scar or spall the finished concrete or leave in place any forms or casing within the removable form limits as shown on the plans unless approved as part of the installation procedure. The forming system shall not be removed until the concrete has attained a minimum compressive strength of 2500 psi (17,200 kPa) and cured for a minimum of 72 hours. For shafts extending through water, the concrete shall be protected from water action after placement for a minimum of seven days.

**516.07 Slurry.** When slurry is used, the Contractor shall provide a technical representative of the slurry additive manufacturer at the site prior to introduction of the slurry into the first shaft where slurry will be used, and during drilling and completion of a minimum of one shaft to adjust the slurry mix to the specific site conditions. During construction, the level of the slurry shall be maintained a minimum of 5 feet (1.5 m) above the height required to prevent

caving of the shaft excavation. In the event of a sudden or significant loss of slurry in the shaft excavation, the construction of that foundation shall be stopped and the shaft excavation backfilled or supported by temporary casing, until a method to stop slurry loss, or an alternate construction procedure, has been approved by the Engineer.

(a) General Properties. The material used to make the slurry shall not be detrimental to the concrete or surrounding ground. Mineral slurries shall have both a mineral grain size that remains in suspension and sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. Polymer slurries shall have sufficient viscosity and gel characteristics to transport excavated material to suitable screening systems or settling tanks. The percentage and specific gravity of the material used to make the slurry shall be sufficient to maintain the stability of the excavation and to allow proper concrete placement.

If approved by the Engineer, the Contractor may use water and excavated soils as drilling slurry. In this case, the range of acceptable values for density, viscosity and pH, as shown in the following table for bentonite slurry shall be met.

When water is used as the slurry to construct rock sockets in limestone, dolomite, sandstone or other formations that are not erodible, the requirements for slurry testing shall not apply if the entire fluid column is replaced with fresh water after drilling. To do so, fresh water shall be introduced at the top of the shaft excavation and existing water used during drilling shall be pumped out of the shaft excavation from the bottom of the shaft excavation until the entire volume of fluid has been replaced.

(b) Preparation. Prior to introduction into the shaft excavation, the manufactured slurry admixture shall be pre-mixed thoroughly with clean, fresh water and for adequate time in accordance with the slurry admixture manufacturer's recommendations. Slurry tanks of adequate capacity shall be used for slurry mixing, circulation, storage and treatment. No excavated slurry pits will be allowed in lieu of slurry tanks without approval from the Engineer. Adequate desanding equipment shall be provided to control slurry properties during the drilled shaft excavation in accordance with the values provided in Table 1.

(c) Quality Control. Quality control tests shall be performed on the slurry to determine density, viscosity, sand content and pH of freshly mixed slurry, recycled slurry and slurry in the shaft excavation. Tests of slurry samples from within two feet of the bottom and at mid-height of the shaft excavation shall be conducted in each shaft excavation during the excavation process to measure the consistency of the slurry. A minimum of four sets of tests shall be conducted during the first eight hours of slurry use on the project. When a series of four test results do not change more than 1% from the initial test, the testing frequency may be decreased to one set every four hours of slurry use. Reports of all tests, signed by an authorized representative of the Contractor, shall be furnished to the

Engineer upon completion of each drilled shaft. The physical properties of the slurry shall be as shown in Table 1.

The slurry shall be sampled and tested less than 1 hour before concrete placement. Any heavily contaminated slurry that has accumulated at the bottom of the shaft shall be removed. The contractor shall perform final shaft bottom cleaning after suspended solids have settled from the slurry. Concrete shall not be placed if the slurry does not have the required physical properties.

| Table 1 – SLURRY PROPERTIES | | | | |
|---|---|---|---|---|
| | Bentonite | Emulsified Polymer | Dry Polymer | Test Method |
| Density, lb/cu ft (kg/cu m) (at introduction) | 65.2 ± 1.6[1] (1043.5 ± 25.6) | 63 (1009.0) max. | 63 (1009.0) max. | ASTM D 4380 |
| Density, lb/cu ft (kg/cu m) (prior to concrete placement) | 67.0 ± 3.5[1] (1073.0 ± 56.0) | 63 (1009.0) max. | 63 (1009.0) max. | ASTM D 4380 |
| Viscosity[2], sec/qt (sec/L) | 46 ± 14 (48 ± 14) | 38 ± 5 (40 ± 5) | 65 ± 15 (69 ± 16) | ASTM D 6910 |
| pH | 9.0 ± 1.0 | 9.5 ± 1.5 | 9.0 ± 2.0 | ASTM D 4972 |
| Sand Content, percent by volume (at introduction) | 4 max. | 1 max. | 1 max. | ASTM D 4381 |
| Sand Content, percent by volume (prior to concrete placement) | 10 max. | 1 max. | 1 max. | ASTM D 4381 |
| Contact Time[3], hours | 4 max. | 72 max. | 72 max | |

Note 1. When the slurry consists of only water and excavated soils, the density shall not exceed 70 lb/cu ft (1121 kg/cu m).
Note 2. Higher viscosities may be required in loose or gravelly sand deposits.
Note 3. Contact time is the time without agitation and sidewall cleaning.

**516.08 Obstructions.** An obstruction is an unknown isolated object that causes the shaft excavation method to experience a significant decrease in the actual production rate and requires the Contractor to core, break up, push aside, or use other means to mitigate the obstruction. Subsurface conditions such as boulders, cobbles, or logs and buried infrastructure such as footings, piling, or abandoned utilities, when shown on the plans, shall not constitute an obstruction. When an obstruction is encountered, the Contractor shall notify the Engineer immediately and upon concurrence of the Engineer, the Contractor shall mitigate the obstruction with an approved method.

**516.09 Top of Rock.** The top of rock will be considered as the point where rock, defined as bedded deposits and conglomerate deposits exhibiting the physical characteristics and difficulty of rock removal as determined by the Engineer, is encountered which cannot be drilled with augers and/or underreaming tools configured to be effective in the soils indicated in the contract documents.

**516.10 Design Modifications.** If the top of rock elevation differs from that shown on the plans by more than 10 percent of the length of the drilled shaft above the rock, the Engineer shall be contacted to determine if any drilled shaft design changes may be required. In addition, if the type of soil or rock encountered is not similar to that shown in the subsurface exploration data, the Contractor may be required to extend the drilled shaft length(s) beyond those specified in the plans. In either case, the Engineer will determine if revisions are necessary and the extent of the modifications required.

**516.11 Excavation Cleaning and Inspection.** Materials removed or generated from the shaft excavations shall be disposed of according to Article 202.03.

After excavation, each shaft shall be cleaned. For a drilled shaft terminating in soil, the depth of sediment or debris shall be a maximum of 1 1/2 in. (38 mm). For a drilled shaft terminating in rock, the depth of sediment or debris shall be a maximum of 1/2 in. (13 mm).

A shaft excavation shall be overreamed when, in the opinion of the Engineer, the sidewall has softened, swelled, or has a buildup of slurry cake. Overreaming may also be required to correct a shaft excavation which has been drilled out of tolerance. Overreaming may be accomplished with a grooving tool, overreaming bucket, or other approved equipment. Overreaming thickness shall be a minimum of 1/2 in. (13 mm) and a maximum of 3 in. (75 mm).

**516.12 Reinforcement.** This work shall be according to Section 508 and the following.

The shaft excavation shall be cleaned and inspected prior to placing the reinforcement cage. The reinforcement cage shall be completely assembled prior to drilling and be ready for adjustment in length as required by the conditions encountered. The reinforcement cage shall be lifted using multiple point sling straps or other approved methods to avoid reinforcement

cage distortion or stress. Cross frame stiffeners may be required for lifting or to keep the reinforcement cage in proper position during lifting and concrete placement.

The Contractor shall attach rolling spacers to keep the reinforcement cage centered within the shaft excavation during concrete placement and to ensure that at no point will the finished shaft have less than the minimum concrete cover(s) shown on the plans. The rolling spacers or other approved non-corrosive spacing devices shall be installed within 2 ft (0.6 m) of both the top and bottom of the drilled shaft and at intervals not exceeding 10 ft (3 m) throughout the length of the shaft to ensure proper reinforcement cage alignment and clearance for the entire shaft. The number of rolling spacers at each level shall be one for each 1.0 ft (300 mm) of shaft diameter, with a minimum of four rolling spacers at each level. For shafts with different shaft diameters throughout the length of the excavation, different sized rolling spacers shall be provided to ensure the reinforcement cage is properly positioned throughout the entire length of the shaft.

When a specific concrete cover between the base of the drilled shaft and the reinforcement cage is shown on the plans, the bottom of the reinforcement cage shall be supported so that the proper concrete cover is maintained.

If the conditions differ such that the length of the shaft is increased, additional longitudinal bars shall be either mechanically spliced or lap spliced to the lower end of the reinforcement cage and confined with either hoop ties or spirals. The Contractor shall have additional reinforcement available or fabricate the reinforcement cages with additional length as necessary to make the required adjustments in a timely manner as dictated by the encountered conditions. The additional reinforcement may be non-epoxy coated.

**516.13 Concrete Placement.** Concrete work shall be performed according to the following.

Throughout concrete placement the head pressure inside the drilled shaft shall be at least 1.1 times the head pressure outside the drilled shaft.

Concrete placement shall begin within 1 hour of shaft cleaning and inspection. The pour shall be made in a continuous manner from the bottom to the top elevation of the shaft as shown on the contract plan or as approved in the Contractor's installation procedure. Concrete placement shall continue after the shaft excavation is full and until 18 in. (450 mm) of good quality, uncontaminated concrete is expelled at the top of shaft. Vibration of the concrete will not be allowed when the concrete is displacing slurry or water. In dry excavations, the concrete in the top 10 ft (3 m) of the shaft shall be vibrated.

When using temporary casing or placing concrete under water or slurry, a minimum of seven days prior to concrete placement, a 4 cu yd (3 cu m) trial batch of the concrete mixture shall be

performed to evaluate slump retention. Temporary casing shall be withdrawn before the slump of the concrete drops below 6 in. (150 mm). For concrete placed using the slurry method of construction, the slump of all concrete placed shall be a minimum of 6 in. (150 mm) at the end of concrete placement.

Devices used to place concrete shall have no aluminum parts in contact with concrete.

When the top of the shaft is at the finished elevation and no further concrete placement above the finished elevation is specified, the top of the shaft shall be level and finished according to Article 503.15(a).

Concrete shall be placed by free fall, tremie, or concrete pump subject to the following conditions.

(a) Free Fall Placement. Concrete shall only be placed by free fall when the rate of water infiltration into the shaft excavation is less than 12 in. (300 mm) per hour and the depth of water in the shaft excavation is less than 3 in. (75 mm) at the time of concrete placement.

Concrete placed by free fall shall fall directly to the base without contacting the reinforcement cage, cross frame stiffeners, or shaft sidewall. Drop chutes may be used to direct concrete to the base during free fall placement.

Drop chutes used to direct placement of free fall concrete shall consist of a smooth tube. Concrete may be placed through either a hopper at the top of the tube or side openings as the drop chute is retrieved during concrete placement. The drop chute shall be supported so that free fall does not exceed 60 ft (18.3 m) for conventional concrete or 30 ft (9.1 m) for self-consolidating concrete. If placement cannot be satisfactorily accomplished by free fall in the opinion of the Engineer, either a tremie or pump shall be used to accomplish the pour.

(b) Tremie and Concrete Pump Placement. Concrete placement shall be according to Article 503.08, except the discharge end of the steel pipe shall remain embedded in the concrete a minimum of 10 ft (3.0 m) throughout concrete placement when displacing slurry or water.

**516.14 Construction Tolerances.** The following construction tolerances shall apply to all drilled shafts.

(a) Center of Shaft. The center of the drilled shaft shall be within 3 in. (75 mm) of the plan station and offset at the top of the shaft.

(b) Center of Reinforcement Cage. The center of the reinforcement cage shall be within 1 1/2 in. (40 mm) of plan station and offset at the top of the shaft.

(c) Vertical Plumbness of Shaft. The out of vertical plumbness of the shaft shall not exceed 1.5 percent.

(d) Vertical Plumbness of Reinforcement Cage. The out of vertical plumbness of the shaft reinforcement cage shall not exceed 0.83 percent.

(e) Top of Shaft. The top of the shaft shall be no more than 1 in. (25 mm) above and no more than 3 in. (75 mm) below the plan elevation.

(f) Top of Reinforcement Cage. The top of the reinforcement cage shall be no more than 1 in. (25 mm) above and no more than 3 in. (75 mm) below the plan elevation.

(g) Bottom of shaft. Excavation equipment and methods used to complete the shaft excavation shall have a nearly planar bottom. The cutting edges of excavation equipment used to create the bottom of shafts in rock shall be normal to the vertical axis of the shaft within a tolerance of 6.25 percent.

**516.15 Method of Measurement.** This work will be measured for payment in place and the volume computed in cubic yards (cubic meters). The volume will be computed using the plan diameter of the shaft multiplied by the measured length of the shaft. The length of shaft in soil will be computed as the difference in elevation between the top of the drilled shaft shown on the plans, or as installed as part of the Contractor's installation procedure, and the bottom of the shaft or the top of rock (when present) whichever is higher. The length of shaft in rock will be computed as the difference in elevation between the measured top of rock and the bottom of the shaft.

When permanent casing is specified, it will be measured for payment in place, in feet (meters). Permanent casing installed at the Contractor's option will not be measured for payment.

Reinforcement furnished and installed will be measured for payment according to Article 508.07.

**516.16 Basis of Payment.** This work will be paid for at the contract unit price per cubic yard (cubic meter) for DRILLED SHAFT IN SOIL, and/or DRILLED SHAFT IN ROCK.

Permanent casing will be paid for at the contract unit price per foot (meter) for PERMANENT CASING.

Reinforcement furnished and installed will be paid for according to Article 508.08.

Obstruction mitigation will be paid for according to Article 109.04.”

**CROSSHOLE SONIC LOGGING TESTING OF DRILLED SHAFTS**
Effective: April 20, 2016
Revised: August 9, 2019

Description. This work shall consist of furnishing and installing materials and equipment necessary to install access ducts in all drilled shafts of structures identified on the plans, and to perform Crosshole Sonic Logging (CSL) testing of selected drilled shafts on these structures. This work shall be according to Illinois Modified ASTM D6760. This work also includes analysis of the CSL data, preparation of reports summarizing the CSL data, and investigating anomalies identified in the CSL data. This work shall also include grouting of all access ducts after testing and approval by the Engineer.

Materials. Materials shall be according to the following.

(a) Nonshrink Grout (Note 1)…….1024.02
Note 1. Grout shall attain a minimum strength equal to the required strength of the drilled shaft concrete at 14 days.

Qualifications. A consulting firm experienced in CSL testing shall conduct this work. The CSL consulting firm shall be a company independent from the Contractor with a minimum of 3 years of experience in performing CSL testing of drilled shafts. The individual employee of the CSL consulting firm performing analysis of the CSL data and preparing the report shall be an Illinois Licensed Professional Engineer and have experience on a minimum of 5 projects performing CSL testing of drilled shafts.

The name, contact information, and qualifications of the CSL consulting firm, including the names and experience of the individual employees performing and analyzing the test results and preparing the report, shall be submitted to the Engineer at least 30 days prior to drilled shaft construction.

Construction. Access ducts shall be placed in all drilled shafts for the structures indicated on the plans, attached to the reinforcement cage and situated symmetrically around the diameter of the shaft according to the Illinois Modified ASTM D6760. The Engineer will determine which drilled shafts shall have CSL testing performed after the concrete has been placed in the drilled shafts, and may direct additional tests, if necessary, due to problems encountered or observed during drilled shaft construction.

After permission is given by the Engineer, the access ducts shall be grouted. The grout shall be placed with a pump, starting at the bottom of each access duct.

Superimposed loads, either dead or live, shall not be applied to a drilled shaft until CSL testing is completed, CSL reports have been submitted, any necessary repairs have been completed, access ducts have been grouted, and permission has been granted by the Engineer.

Reports. Reports shall be according to Illinois Modified ASTM D6760. Each anomalous zone detected by the CSL testing shall be identified and discussed in the report. An anomalous zone shall be defined as areas where velocity reduction exceeds 20 percent of the average velocity of properly placed and cured shaft concrete at the time of testing.

Anomalies. If anomalies are identified, they shall be investigated by coring or other methods approved by the Engineer.

Correction of Drilled Shaft Defects. When testing determines that a defect is present, the Engineer will direct the Contractor to submit remedial measures for approval. No compensation will be made for remedial work, or losses, or damage, due to remedial work of drilled shafts found defective or not in accordance with the drilled shaft specifications or plans. Modifications to the drilled shaft design, or any load transfer mechanisms required by the remedial action, must be designed, detailed, and sealed by an Illinois Licensed Structural Engineer, and submitted for approval.

Method of Measurement. Installation and grouting of access ducts will be measured for payment per shaft by the linear foot of drilled shaft(s) with access ducts.

CSL testing, analysis, and reporting will be measured for payment by each drilled shaft foundation tested.

Investigation of anomalies will not be measured for payment.

Basis of Payment. Installation and grouting of access ducts will be paid for at the contract unit price per foot for CROSSHOLE SONIC LOGGING ACCESS DUCTS. CSL testing, analysis, and reporting will be paid for at the contract unit price per each for CROSSHOLE SONIC LOGGING TESTING.

ILLINOIS MODIFIED ASTM D6760

Effective Date: August 9, 2019

Standard Test Method for

**Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing**

Reference ASTM D6760-14

<table>
<tr><th>ASTM SECTION</th><th>Illinois Modification</th></tr>
<tr><td>3.1.1</td><td>Revise this section as follows:<br>access ducts, n – preformed steel tubes or drilled boreholes, placed in the concrete to allow probe entry in pairs to measure pulse transmission in the concrete between the probes.</td></tr>
<tr><td>6.1</td><td>Revise the second sentence of this section as follows:<br>The tubes shall be mild steel.<br>Delete the third, fourth, and fifth sentences of this section.</td></tr>
<tr><td>7.1.1</td><td>Revise this section as follows:<br>The access ducts shall be installed during construction of the drilled shaft.<br><br>For drilled shafts foundations, access ducts shall be provided according to the following table.
<table>
<tr><th>Reinforcing Cage Diameter (feet)</th><th>Number of access ducts</th></tr>
<tr><td>≤ 4.0</td><td>3</td></tr>
<tr><td>4.1 to 5.0</td><td>4</td></tr>
<tr><td>5.1 to 7.0</td><td>6</td></tr>
<tr><td>> 7.0</td><td>8</td></tr>
</table>
Access ducts shall be spread equally around the perimeter and spaced at an equal distance from the axis.<br><br>Delete Fig. 4.</td></tr>
<tr><td>7.1.2</td><td>Revise the second sentence of this section as follows:<br>The exterior tube surface shall be free from contamination (for example, oil, dirt, loose rust, mill scale, etc.) to ensure a good bond between the tube surface and the surrounding concrete.</td></tr>
<tr><td>7.1.3</td><td>Delete the third sentence of this section.</td></tr>
</table>

ILLINOIS MODIFIED ASTM D6760

Effective Date: August 9, 2019

Standard Test Method for

**Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing**

Reference ASTM D6760-14

| | |
|---|---|
| 7.2 | Revise the first sentence of this section as follows:<br>The access tubes shall be installed such that their bottom is within 4 inches of the bottom of the concrete deep foundation element so that<br>the bottom condition can be tested.<br><br>Revise the sixth sentence of this section as follows:<br>Access tubes shall be filled with water prior to concrete placement to assure good bonding of the concrete to the tube after the concrete cools. The access tubes shall be kept full of water until the tubes are grouted. |
| 7.3 | Revise the first sentence of this section as follows:<br>In cases where drilled shafts to be tested have access ducts that do not permit passage of the probes, do not retain water, are not plumb, are debonded from the concrete, or cannot be used for testing for other reasons, drilled boreholes shall be used to provide probe access. |
| 7.4.2 | Revise the second sentence of this section as follows:<br>The tests shall be performed no later than 21 days after concrete casting. |
| 7.6 | Delete this section. |
| 7.8.1 | Revise the first sentence of this section as follows:<br>If the ultrasonic profile indicates an anomaly, then the suspect anomaly zone shall be further investigated by special test procedures such as fan shaped tests, tests with the probes raised at a fixed offset distance, or other tomographical techniques (1, 2). |
| 7.8.2 | Delete Note 5 of this section. |

**ERECTION OF BRIDGE GIRDERS OVER OR ADJACENT TO RAILROADS**
Effective: August 9, 2019

**Description:** In addition to the requirements of Article 504.06(d) and 505.08(e), the following shall apply.

The Contractor or sub-Contractor performing the erection of steel or concrete beams or girders over, or adjacent to (within 25 ft. of), active railroad tracks shall submit an erection plan to the Engineer for approval prior to starting the work.

Erection Plan: The Erection Contractor shall retain the services of an Illinois Licensed Structural Engineer for the completion of a project-specific erection plan. The structural engineer, herein referred to as the Erection Engineer, shall sign and seal the erection plan, drawings, and calculations for the proposed erection of the structural beams or girders.

The erection plan shall be complete in detail for all phases, stages, and conditions anticipated during erection. The erection plan shall include structural calculations and supporting documentation necessary to completely describe and document the means, methods, temporary support positions, and loads necessary to safely erect the structural members in conformance with the contract documents and as outlined herein. The erection plans shall address and account for all items pertinent to the erection including such items as sequencing, falsework, temporary shoring and/or bracing, girder stability, crane positioning and movement, means of access, pick points, girder shape, permissible deformations and roll, interim/final plumbness, cross frame/diaphragm placement and connections, bolting and anchor bolt installation sequences and procedures, and blocking and anchoring of bearings. The Erection Contractor shall be responsible for the stability of the partially erected structure during all phases of erection.

The erection plans and procedures shall be submitted to the Engineer for review and acceptance prior to starting the work. Review, acceptance and/or comments by the Department shall not be construed to guarantee the safety or final acceptability of the work or compliance with all applicable specifications, codes, or contract requirements, and shall neither relieve the Contractor of the responsibility and liability to comply with these requirements, nor create liability for the Department. Significant changes to the erection plan in the field must be approved by the Erection Engineer and accepted by the Engineer for the Department.

**Basis of Payment:** This work shall not be paid for separately but shall be included in the applicable pay items according to Article 504.08 or 505.13 of the Standard Specifications.

**REQUIRED CONTRACT PROVISIONS**
**FEDERAL-AID CONSTRUCTION CONTRACTS**



## I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

## II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

**1. Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection

for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

**2. EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

**3. Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

**4. Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

**5. Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

**6. Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

**7. Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

**8. Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

**9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

**10. Assurance Required by 49 CFR 26.13(b):**

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor 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 DOT-assisted contracts. 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 contracting agency deems appropriate.

**11. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

**III. NONSEGREGATED FACILITIES**

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

**IV. DAVIS-BACON AND RELATED ACT PROVISIONS**

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

**1. Minimum wages**

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each

classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

**2. Withholding**

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

**3. Payrolls and basic records**

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee ( e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

**4. Apprentices and trainees**

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

**5. Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

**6. Subcontracts.** The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

**7. Contract termination: debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8. Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

**9. Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

**10. Certification of eligibility.**

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

## V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

**1. Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

**2. Violation; liability for unpaid wages; liquidated damages**. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

**3. Withholding for unpaid wages and liquidated damages.** The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

**4. Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

## VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

**VII. SAFETY: ACCIDENT PREVENTION**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

**VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

**IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

**X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

**2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:**

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of

Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

**XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

## Contract Provision - Cargo Preference Requirements

In accordance with Title 46 CFR § 381.7 (b), the contractor agrees—

"(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract."

Provisions (1) and (2) apply to materials or equipment that are acquired solely for the project. The two provisions do not apply to goods or materials that come into inventories independent of the project, such as shipments of Portland cement, asphalt cement, or aggregates, when industry suppliers and contractors use these materials to replenish existing inventories.