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Letting September 20, 2019

Notice to Bidders, Specifications and Proposal



**Contract No. 87695
GRUNDY County
Section 11-00134-02-WR
Route FAU 384 (Ridge Road)
Project ZX7F-566 ()
District 3 Construction Funds**

Prepared by	
Checked by	F

(Printed by authority of the State of Illinois)



- 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 10:00 a.m. September 20, 2019 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. 87695
GRUNDY County
Section 11-00134-02-WR
Project ZX7F-566 ()
Route FAU 384 (Ridge Road)
District 3 Construction Funds**

Pavement widening and reconstruction of Ridge Road from a two-lane to a four-lane with bi-directional turn lane, includes bridge rehabilitation and the construction of a new bridge span to carry the Wisconsin Central Ltd. Railway over Ridge Road. Project runs from south of McEvelly Road to Minooka Road in the village of Minooka.

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

(b) State law, and, if the work is to be paid wholly or in part with Federal-aid funds, Federal law requires the bidder to make various certifications as a part of the proposal and contract. By execution and submission of the proposal, the bidder makes the certification contained therein. A false or fraudulent certification shall, in addition to all other remedies provided by law, be a breach of contract and may result in termination of the contract.
- 4. AWARD CRITERIA AND REJECTION OF BIDS.** This contract will be awarded to the lowest responsive and responsible bidder considering conformity with the terms and conditions established by the Department in the rules, Invitation for Bids and contract documents. The issuance of plans and proposal forms for bidding based upon a prequalification rating shall not be the sole determinant of responsibility. The Department reserves the right to determine responsibility at the time of award, to reject any or all proposals, to readvertise the proposed improvement, and to waive technicalities.

By Order of the
Illinois Department of Transportation

Omer Osman,
Acting Secretary

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2019

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

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 4-1-16) (Revised 1-1-19)

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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.

<u>File Name</u>	<u>Pg.</u>	<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80099		Accessible Pedestrian Signals (APS)	April 1, 2003	Jan. 1, 2014
80274		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
80241		Bridge Demolition Debris	July 1, 2009	
50261		Building Removal-Case I (Non-Friable and Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50481		Building Removal-Case II (Non-Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50491		Building Removal-Case III (Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50531		Building Removal-Case IV (No Asbestos)	Sept. 1, 1990	April 1, 2010
80404		Coarse Aggregate Quality for Micro-Surfacing and Cape Seals	Jan. 1, 2019	
80384	173	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
80277		Concrete Mix Design – Department Provided	Jan. 1, 2012	April 1, 2016
80261		Construction Air Quality – Diesel Retrofit	June 1, 2010	Nov. 1, 2014
80387		Contrast Preformed Plastic Pavement Marking	Nov. 1, 2017	
80029	177	X Disadvantaged Business Enterprise Participation	Sept. 1, 2000	Mar. 2, 2019
80402	187	X Disposal Fees	Nov. 1, 2018	
80378	189	X Dowel Bar Inserter	Jan. 1, 2017	Jan. 1, 2018
80405		Elastomeric Bearings	Jan. 1, 2019	
* 80415	196	X Emulsified Asphalts	Aug. 1, 2019	
80388	199	X Equipment Parking and Storage	Nov. 1, 2017	
80229		Fuel Cost Adjustment	April 1, 2009	Aug. 1, 2017
80304		Grooving for Recessed Pavement Markings	Nov. 1, 2012	Nov. 1, 2017
80246	200	X Hot-Mix Asphalt – Density Testing of Longitudinal Joints	Jan. 1, 2010	Aug. 1, 2018
80398		Hot-Mix Asphalt – Longitudinal Joint Sealant	Aug. 1, 2018	Jan. 1, 2019
80406		Hot-Mix Asphalt – Mixture Design Verification and Production (Modified for I-FIT Projects)	Jan. 1, 2019	
80399	202	X Hot-Mix Asphalt – Oscillatory Roller	Aug. 1, 2018	Nov. 1, 2018
80347		Hot-Mix Asphalt – Pay for Performance Using Percent Within Limits – Jobsite Sampling	Nov. 1, 2014	Aug. 1, 2018
80383		Hot-Mix Asphalt – Quality Control for Performance	April 1, 2017	Jan. 1, 2019
80392	204	X Lights on Barricades	Jan. 1, 2018	
80336		Longitudinal Joint and Crack Patching	April 1, 2014	April 1, 2016
80411	206	X Luminaires, LED	April 1, 2019	
80393	215	X Manholes, Valve Vaults, and Flat Slab Tops	Jan. 1, 2018	Mar. 1, 2019
80400	217	X Mast Arm Assembly and Pole	Aug. 1, 2018	
80045		Material Transfer Device	June 15, 1999	Aug. 1, 2014
80394		Metal Flared End Section for Pipe Culverts	Jan. 1, 2018	April 1, 2018
80165		Moisture Cured Urethane Paint System	Nov. 1, 2006	Jan. 1, 2010
* 80412		Obstruction Warning Luminaires, LED	Aug. 1, 2019	
80349		Pavement Marking Blackout Tape	Nov. 1, 2014	April 1, 2016
80371	218	X Pavement Marking Removal	July 1, 2016	
80390	219	X Payments to Subcontractors	Nov. 2, 2017	
80389	220	X Portland Cement Concrete	Nov. 1, 2017	
80359		Portland Cement Concrete Bridge Deck Curing	April 1, 2015	Nov. 1, 2017

<u>File Name</u>	<u>Pg.</u>	<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80300		Preformed Plastic Pavement Marking Type D - Inlaid	April 1, 2012	April 1, 2016
80328	221	X Progress Payments	Nov. 2, 2013	
34261		Railroad Protective Liability Insurance	Dec. 1, 1986	Jan. 1, 2006
80157	222	X Railroad Protective Liability Insurance (5 and 10)	Jan. 1, 2006	
80306	224	X Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS)	Nov. 1, 2012	Jan. 1, 2019
80407	234	X Removal and Disposal of Regulated Substances	Jan. 1, 2019	
80395		Sloped Metal End Section for Pipe Culverts	Jan. 1, 2018	
80340		Speed Display Trailer	April 2, 2014	Jan. 1, 2017
80127		Steel Cost Adjustment	April 2, 2014	Aug. 1, 2017
80408		Steel Plate Beam Guardrail Manufacturing	Jan. 1, 2019	
* 80413		Structural Timber	Aug. 1, 2019	
80397	246	X Subcontractor and DBE Payment Reporting	April 2, 2018	
80391	247	X Subcontractor Mobilization Payments	Nov. 2, 2017	April 1, 2019
* 80317		Surface Testing of Hot-Mix Asphalt Overlays	Jan. 1, 2013	Aug. 1, 2019
80298		Temporary Pavement Marking	April 1, 2012	April 1, 2017
20338	248	X Training Special Provision	Oct. 15, 1975	
80403		Traffic Barrier Terminal, Type 1 Special	Nov. 1, 2018	
80409	251	X Traffic Control Devices – Cones	Jan. 1, 2019	
80410		Traffic Spotters	Jan. 1, 2019	
80318	252	X Traversable Pipe Grate for Concrete End Sections	Jan. 1, 2013	Jan. 1, 2018
80288	254	X Warm Mix Asphalt	Jan. 1, 2012	April 1, 2016
80302	256	X Weekly DBE Trucking Reports	June 2, 2012	April 2, 2015
* 80414		Wood Fence Sight Screen	Aug. 1, 2019	
80071		Working Days	Jan. 1, 2002	

The following special provisions are in the 2019 Supplemental Specifications and Recurring Special Provisions.

<u>File Name</u>	<u>Special Provision Title</u>	<u>New Location(s)</u>	<u>Effective</u>	<u>Revised</u>
80382	Adjusting Frames and Grates	Articles 602.02(s) and (t), 1043.04, and 1043.05	April 1, 2017	
80366	Butt Joints	Article 406.08(c)	July 1, 2016	
80386	Calcium Aluminate Cement for Class PP-5 Concrete Patching	Article 1001.01(e)	Nov. 1, 2017	
80396	Class A and B Patching	Articles 442.06(a)(1) and (2)	Jan. 1, 2018	Nov. 1, 2018
80377	Portable Changeable Message Signs	Articles 701.20(h) and 1106.02(i)	Nov. 1, 2016	April 1, 2017
80385	Portland Cement Concrete Sidewalk	Article 424.12	Aug. 1, 2017	

The following special provision has been deleted from use.

<u>File Name</u>	<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80376	Hot-Mix Asphalt – Tack	Nov. 1, 2016	
80401	Portland Cement Concrete Pavement Connector for Bridge Approach Slab	Aug. 1, 2018	

GUIDE BRIDGE SPECIAL PROVISION INDEX/CHECK SHEET

Effective as of the: April 26, 2019 Letting

Pg #	√	File Name	Title	Effective	Revised
		GBSP 4	Polymer Modified Portland Cement Mortar	June 7, 1994	Apr 1, 2016
257	X	GBSP 12	Drainage System	June 10, 1994	Jun 24, 2015
		GBSP 13	High-Load Multi-Rotational Bearings	Oct 13, 1988	Apr 1, 2016
		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 17	Bonded Preformed Joint Seal	July 12, 1994	Jan 1, 2007
		GBSP 18	Modular Expansion Joint	May 19, 1994	Dec 29, 2014
		GBSP 21	Cleaning and Painting Contact Surface Areas of Existing Steel Structures	June 30, 2003	April 13, 2018
259	X	GBSP 25	Cleaning and Painting Existing Steel Structures	Oct 2, 2001	Apr 22, 2016
283	X	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	March 1, 2019
		GBSP 30	Bridge Deck Latex Concrete Overlay	May 15, 1995	Oct 20, 2017
		GBSP 31	Bridge Deck High-Reactivity Metakaolin (HRM) Conc Overlay	Jan 21, 2000	March 1, 2019
		GBSP 33	Pedestrian Truss Superstructure	Jan 13, 1998	Dec 29, 2014
		GBSP 34	Concrete Wearing Surface	June 23, 1994	Oct 4, 2016
		GBSP 35	Silicone Bridge Joint Sealer	Aug 1, 1995	Oct 15, 2011
		GBSP 45	Bridge Deck Thin Polymer Overlay	May 7, 1997	Feb 6, 2013
307	X	GBSP 51	Pipe Underdrain for Structures	May 17, 2000	Jan 22, 2010
308	X	GBSP 53	Structural Repair of Concrete	Mar 15, 2006	Apr 1, 2016
		GBSP 55	Erection of Curved Steel Structures	June 1, 2007	
		GBSP 56	Setting Piles in Rock	Nov 14, 1996	Apr 1, 2016
		GBSP 59	Diamond Grinding and Surface Testing Bridge Sections	Dec 6, 2004	Mar 29, 2017
		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	March 1, 2019
		GBSP 75	Bond Breaker for Prestressed Concrete Bulb-T Beams	April 19, 2012	
		GBSP 77	Weep Hole Drains for Abutments, Wingwalls, Retaining Walls And Culverts	April 19, 2012	Oct 22, 2013
		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 5, 2015
		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	March 1, 2019
		GBSP 90	Three Sided Precast Concrete Structure (Special)	Dec 21, 2016	April 13, 2018
		GBSP 91	Crosshole Sonic Logging Testing of Drilled Shafts	Apr 20, 2016	
		GBSP 92	Thermal Integrity Profile Testing of Drilled Shafts	Apr 20, 2016	

Pg #	√	File Name	Title	Effective	Revised
		GBSP 93	Preformed Bridge Joint Seal	Dec 21, 2016	March 1, 2019
		GBSP 94	Warranty for Cleaning and Painting Steel Structures	Mar 3, 2000	Nov 24, 2004
		GBSP 95	Bituminous Coated Aggregate Slopewall	Mar 21, 1997	Mar 19, 2018

LIST ANY ADDITIONAL SPECIAL PROVISIONS BELOW

The following Guide Bridge Special Provisions have been incorporated into the 2016 Standard Specifications:

File Name	Title	Std Spec Location
GBSP32	Temporary Sheet Piling	522
GBSP38	Mechanically Stabilized Earth Retaining Walls	522
GBSP42	Drilled Soldier Pile Retaining Wall	522
GBSP43	Driven Soldier Pile Retaining Wall	522
GBSP44	Temporary Soil Retention System	522
GBSP46	Geotextile Retaining Walls	522
GBSP57	Temporary Mechanically Stabilized Earth Retaining Walls	522
GBSP62	Concrete Deck Beams	504
GBSP64	Segmental Concrete Block Wall	522
GBSP65	Precast Modular Retaining Wall	522
GBSP73	Cofferdams	2017 Supp
GBSP74	Permanent Steel Sheet Piling (LRFD)	522
GBSP76	Granular Backfill for Structures	2017 Supp
GBSP80	Fabric Reinforced Elastomeric	1028
GBSP84	Precast, Prestressed Concrete Beams	2017 Supp

The following Guide Bridge Special Provisions have been discontinued or have been superseded:

File Name	Title	Disposition:
GBSP70	Braced Excavation	Use TSRS per Sec 522
GBSP95	Bridge Deck Concrete Sealer	Use July 1, 2012 version for Repair projects only

STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the “Standard Specifications for Road and Bridge Construction, Adopted April 1, 2016”, the latest edition of the “Manual on Uniform Traffic Control Devices for Streets and Highways”, and the “Manual of Test Procedures of Materials” in effect on the date of invitation of bids, and the “Supplemental Specifications and Recurring Special Provisions” indicated on the Check Sheet included herein, which apply to and govern the construction of FAP Route 384 (Ridge Road / C.H. V37), Project ZX7F(566), Section 11-00134-02-WR, Grundy County, Contract 87695, and in case of conflict with any part, or parts, of said Specifications, the said Special Provisions shall take precedence and shall govern.

LOCATION OF PROJECT

This project is located on Ridge Road (County Highway V37) and begins South of McEvelly Road and Ends at Minooka Road in the Village of Minooka.

DESCRIPTION OF PROJECT

This project consists of widening and reconstructing Ridge Road from a two-lane typical section to a four-lane with a bi-directional center turn lane typical section. The work to be performed under this contract includes earthwork, pipe culvert removal and storm sewer installation, water main installation, force main installation, concrete curb and gutter, Portland cement concrete pavement, pavement marking, construction staging, landscaping, traffic signal modernization, lighting installation, signing, structure rehabilitation, construction of a new bridge span, construction of a multi-use path, and roadway resurfacing.

WORKING DAYS

The Contractor shall complete the work within 190 working days.

TEMPORARY PAVEMENT

This work shall be in accordance with the applicable portions of Section 355 of the Standard Specifications, as shown in the plans, or as directed by the Engineer and as modified herein.

This item shall consist of installation and maintenance of nine inches of temporary HMA pavement, as shown on the staging plans.

The bottom 7” material used shall meet the requirements in the plans for HMA Base Course (IL 19.0, N50). The top 2” shall meet the gradation requirements in the plans for HMA surface course (IL 9.5, Mixture D,N50).

All labor, equipment, and material necessary to complete this work as specified herein shall be paid for at the contract unit price per square yard for TEMPORARY PAVEMENT. Subsequent removal of the temporary pavement shall be paid for at the contract unit price per square yard for PAVEMENT REMOVAL.

TRAFFIC CONTROL AND PROTECTION (SPECIAL)

Traffic Control shall be according to the applicable sections of the Standard Specifications, the Supplemental Specifications, the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways", any special details and Highway Standards contained in the plans, the TRAFFIC CONTROL PLAN (SPECIAL) included in the Special Provisions contained herein.

Special attention is called to Article 107.09 of the Standard Specifications and the following Highway Standards, Details, Quality Standard for Work Zone Traffic Control Devices, Recurring Special Provisions and Special Provisions contained herein, relating to traffic control.

The Contractor shall contact the Grundy County Highway Department at least 72 hours in advance of beginning the work.

Construction signs referring to daytime conditions (daily lane closures, presence of workers, presence of flaggers, etc.) shall be covered or turned away from the view of motorists during non-working hours.

The contractor shall maintain at least one lane of traffic in each direction at all times, except for allowable closures with a detour as shown in the plans, or night-time single lane closures as approved by the Engineer.

All signs except those referring to daily lane closures shall be post mounted in accordance with Standards 720001 and 720006.

Traffic Control standards 701006, 701301, 701306, 701311, 701501, 701601, 701602, 701701, and 701901 required to complete pre-stage and stage 3 work will not be measured for payment separately but shall be included in the cost of Traffic Control and Protection (Special).

Article 701.10 "Surveillance" shall be modified by replacing the last two sentences with the following:

The contractor shall furnish and install a mailbox at a location within the project limits as determined by the Engineer. The inspection form furnished by the Engineer shall remain inside the mailbox and shall only be removed by the Engineer on the first working day following the inspection. The person responsible for surveillance shall complete the inspection form at the required intervals at the mailbox location only. This work shall be included in the contract unit price for Traffic Control Surveillance.

Article 701.20 "Basis of Payment" shall be modified by replacing the first paragraph with the following:

Basis of Payment. This work will be paid at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (SPECIAL).

The salvage value of the materials removed shall be reflected in the bid price for this item.

Any delays or inconveniences incurred by the Contractor while complying with these requirements shall be considered included in the cost of TRAFFIC CONTROL AND PROTECTION (SPECIAL) and no additional compensation will be allowed.

Any traffic control devices, including Portable Changeable Message Signs, required by the Engineer to implement the Traffic Control Plan as shown in the plans and specifications of the contract shall be considered as included in the cost of the pay item TRAFFIC CONTROL AND PROTECTION (SPECIAL).

Supplemental Portable Changeable Message Signs (not shown in the plans but requested by the Engineer), shall be paid per each per month for PORTABLE CHANGEABLE MESSAGE SIGN.

If the Engineer requires additional work involving a substantial change of location and/or work which differs in design and/or work requiring a change in the type of construction, as stated in Article 104.02(d) of the "Standard Specifications" the standards and/or the designs, other than those required in the plans, will be made available to the Contractor at least one week in advance of the change in traffic control. Payment for additional traffic control required for the reasons listed above will be in accordance with Article 109.04 of the "Standard Specifications."

Revisions in the phasing of construction or maintenance operations, requested by the Contractor, may require traffic control to be installed in accordance with standards and/or designs other than those included in the plans. The Contractor shall submit revisions or modifications to the traffic control plan shown in the contract to the Engineer for approval. No additional payment will be made for a Contractor requested modification.

ATTENUATOR (SPECIAL)

Description. This work shall consist of furnishing and installing impact attenuators of the category and test level specified which will meet the geometry of the proposed WCL center pier.

Materials. Materials shall meet the requirements of article 631.02 of the Standard Specifications.

Construction Requirements

General. Attenuators shall be furnished and erected as shown on the plans.

Attenuator shall be Ingal Civil Products "WIDETRACC" which meets the requirements of NCHRP 350 Test Level 3 or MASH.

Attenuator shall be installed according to the manufacturer's specifications and shall include all necessary transitions between the terminal and the item to which it is attached.

The end of the attenuator facing traffic shall be delineated with a terminal marker direct applied. No other guardrail delineation shall be attached to the terminal.

Method of Measurement. This work will be measured for payment, complete in place, in units of each.

Basis of Payment. This work will be paid for at the contract unit price per each for ATTENUATOR (SPECIAL).

PRECAST MODULAR RETAINING WALL, SPECIAL

Description: This work shall consist of constructing an interlocking block PRECAST MODULAR RETAINING WALL, SPECIAL as specified herein as shown in the plans and as directed by the Engineer.

Materials: The concrete wall units shall have a minimum 28-day compressive strength of 4000 psi in accordance with AASHTO T22. The exterior dimensions may vary but units are required to have a minimum of 0.3 square feet of face each. Fill, which is contained within the dimensions of the unit,

may be considered as 80% effective weight. The face shall be straight with a split (or rock face) and capable of attaining concave and convex alignment curves with a minimum radius of 6.5 feet. The units shall be installed per the manufacturer's recommended interlocking system.

The color/pattern of the blocks and pre-cast caps will be submitted for approval prior to ordering.

The walls shall be backfilled (per manufacturer's recommendation) with a coarse aggregate material (CA7, CA11, or approved equivalent.)

Construction Requirements: The Contractor shall excavate to the lines and grades shown on the plans, being careful to not disturb embankment materials beyond lines shown in the plans. Over excavation shall not be paid for and replacement with compacted fill and/or wall system component will be required at the Contractor's expense.

The wall shall be constructed starting at the lowest footing elevation.

Each unit of the first course to be in full contact with the concrete base. Native soil shall be used for the areas to be backfilled unless otherwise specified. Where additional fill is required, the Contractor shall submit samples to the Engineer to determine if acceptable. After each course, the manufacturer's interlocking system shall be installed before filling and tamping.

Prior to ordering the Modular Retaining Wall units, the contractor shall submit either shop drawings or manufacturer catalog cuts (including manufacturer's recommended backfill and drainage requirements) to the Engineer for approval. The Engineer retains the sole right of approval of the type and color of the units to be utilized.

Method of Measurement: The PRECAST MODULAR RETAINING WALL, SPECIAL shall be measured for payment on a "frontal" square foot basis of installed wall, starting from the top of the concrete leveling pad, measured to the top of the cap block.

Basis of Payment: This work shall be paid for at the contract unit price per frontal square foot for PRECAST MODULAR RETAINING WALL, SPECIAL, which price shall include the concrete foundation, wall drainage system, any required tiebacks as recommended by the wall manufacturer, excavation, backfill, and all other labor and materials needed to complete the wall in accordance with manufacturer's installation instructions and details provided in the plans and specifications.

TEMPORARY SIDEWALK

Description: This work shall consist of constructing, maintaining, and removing temporary portland cement concrete sidewalks, 4" and sidewalk accessibility ramps on a prepared subgrade.

Construction Requirements: Installation of temporary sidewalk shall be performed in accordance with article 424 of the Standard Specifications. Removal of temporary sidewalk shall be performed in accordance with article 440 of the Standard Specifications.

Method of Measurement: This work will be measured for payment in place and the area computed in square feet.

Basis of Payment: This work will be paid for at the contract unit price per square foot for TEMPORARY SIDEWALK.

Partial payment of the measured area will be paid according to the following schedule:

(a) Upon construction of the temporary sidewalk, sixty percent of the measured area will be paid.

(b) Subject to the approval of the Engineer for the adequate maintenance and removal of the temporary access, the remaining forty percent of the measured area will be paid upon the permanent removal of the temporary sidewalk.

STORM SEWER JACKED IN PLACE, 48”

Replace section 552.02 with the following:

“Materials: Materials shall be according to the following:

- (a) Reinforced Concrete culvert, Storm Drain, and Sewer Pipe (Note 1) Article 1042
Note 1. Tongue and Groove Type Joint. Not Less than a Class V Pipe.”

REMOVE AND DISPOSE OF REGULATED SUBSTANCES

This work shall be according to article 669 of the Standard Specifications and the following:

General. Implementation of this Special Provision will likely require the Contractor to subcontract for the execution of certain activities. It will be the Contractor’s responsibility to assess the working conditions and adjust anticipated production rates accordingly.

All contaminated materials shall be managed as non-special waste. This work shall include monitoring and potential sampling, analytical testing, and management of contaminated material.

During the PSI, the following contaminants were discovered:

1. Station 101+60 to Station 102+90, 0 to 70 Feet Right (Midwest Valve Services, Inc., Site 1882-17, 850 South Ridge Road, Minooka) – Non-special waste.
Contaminants of concern sampling parameters: Arsenic.
2. Station 105+50 to Station 112+00, 0 to 70 Feet Right (Site 19, Boring 18-4) – Non-special waste.
Contaminants of concern sampling parameters: Mercury.

Any soil classified as a non-special waste or groundwater classified as a special waste shall be excavated and disposed of as directed by this project or the Engineer.

Any excavation or disposal beyond what is required by this project of the Engineer will be at no additional cost to the Department. The preliminary site investigation (PSI) report, available through the Department’s Environmental Studies Unit, estimated the excavation quantity or non-special waste at the following locations. The information available at the time of plan preparation determined the limits of the contamination and quantities estimated were based on soil or groundwater excavation for construction purposes only. The lateral distance is measured from centerline and the farthest distance is the offset distance or construction limit, whichever is less. Any soil samples or analysis without approval of the Engineer will be at no additional cost to the Department.

A) The Environmental Firm shall continuously monitor for worker protection and the Contractor shall manage and dispose of all soils excavated within the following areas as classified below:

1. Station 101+60 to Station 102+90, 0 to 70 Feet Right (Midwest Valve Services, Inc., Site 1882-17, 850 South Ridge Road, Minooka) – Non-special waste.
Contaminants of concern sampling parameters: Arsenic.
2. Station 105+50 to Station 112+00, 0 to 70 Feet Right (Site 19, Boring 18-4) – Non-special waste.
Contaminants of concern sampling parameters: Mercury.

STORM SEWER TO BE FILLED

Description: This work consists of filling storm sewer pipes and associated manholes, junction boxes, and junction chambers to be abandoned, as designated on the plans or as directed by the Engineer with Controlled Low-Strength Material (CLSM). The ends of the pipe shall be securely sealed as described in Section 605.

One pipe is designated to be filled on the plans, the existing 48” steel culvert beneath the CSX tracks.

Materials: The CLSM shall meet the requirements of Sections 593 and 1019 of the Standard Specifications. Materials used to plug pipe shall meet the requirements of Article 605.02.

Construction Requirements: The storm sewer shall be plugged on both ends 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 the filling operation, the Contractor shall be responsible for the cost of repairing the plugs, any wasted CLSM, and filling the remainder of the storm sewer.

The CLSM may be placed directly from the chute or may be pumped into the space to be filled. Other placement methods may be used, subject to the Engineer's approval. Temporary vent/riser pipes shall be installed at the ends of each pipe sections to be filled to allow for venting of displaced water and air and to allow for visual verification that the pipe has been completely filled.

Method of Measurement: This work will be measured for payment in place based on the length of pipe filled and inside dimensions of any associated manholes, junction box or junction chamber filled. Additional CLSM required due to plug blowouts/failures or waste will not be measured for payment.

Basis of Payment: This work will be paid for at the contract unit price per foot for STORM SEWER TO BE FILLED which price shall include all labor, equipment, and materials necessary to complete the work. The cost of plugging the pipe ends will not be paid for separately but will be considered as included in the contract unit price for STORM SEWER TO BE FILLED.

AGGREGATE SURFACE COURSE FOR TEMPORARY ACCESS

Revise Article 402.10 of the Standard Specifications to read:

“402.10 For Temporary Access. The contractor shall construct and maintain aggregate surface course for temporary access to private entrances, commercial entrances and roads according to Article 402.07 and as directed by the Engineer.

The aggregate surface course shall be constructed to the dimensions and grades specified below, except as modified by the plans or as directed by the Engineer.

(a) Commercial Entrance. The minimum width shall be 24 ft (7.2 m). The minimum compacted thickness shall be 9 in. (230 mm). The maximum grade shall be six percent, except as required to match the existing grade.

Maintaining the temporary access shall include relocating and/or regrading the aggregate surface course for any operation that may disturb or remove the temporary access. The same type and gradation of material used to construct the temporary access shall be used to maintain it.

When use of the temporary access is discontinued, the aggregate shall be removed and utilized in the permanent construction or disposed of according to Article 202.03.”

Add the following to Article 402.12 of the Standard Specifications:

“Aggregate surface course for temporary access will be measured for payment in units of each for every private entrance, commercial entrance, field entrance, or road constructed for the purpose of temporary access. If a residential drive, commercial entrance, field entrance, or road is to be constructed under multiple stages, the aggregate needed to construct the second or subsequent stages will not be measured for payment but shall be included in the cost per each of the type specified.”

Revise the second paragraph of Article 402.13 of the Standard Specifications to read:

“Aggregate surface course for temporary access will be paid for at the contract unit price per each for TEMPORARY ACCESS (COMMERCIAL ENTRANCE)

Partial payment of the each amount bid for temporary access, of the type specified, will be paid according to the following schedule:

(a) Upon construction of the temporary access, sixty percent of the contract unit price per each, of the type constructed, will be paid.

(b) Subject to the approval of the Engineer for the adequate maintenance and removal of the temporary access, the remaining forty percent of the pay item will be paid upon the permanent removal of the temporary access.”

RAILROAD INTERCONNECT CABLE

The cable shall meet the requirements of Section 873 of the Standard Specifications, except for the following:

Add to Article 873.02 of the Standard Specifications:

The railroad interconnect cable shall be three conductor stranded #14 copper cable in a clear polyester binder, shielded with #36 AWG tinned copper braid with 85% coverage, and insulated with .016" polyethylene (black, blue, red). The jacket shall be black 0.045 PVC or polyethylene.

Add the following to Article 873.05 of the Standard Specifications:

Basis of Payment.

This work shall be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, RAILROAD, NO. 14 3C, which price shall be payment in full for furnishing, installing, and making all electrical connections in the traffic signal controller cabinet. Connections in the railroad controller cabinet shall be performed by railroad personnel.

LUMINAIRE, LED, SPECIAL

Description.

This work shall consist of furnishing and installing LED luminaires with photocell and shall conform to the applicable sections of Article 1067.02 of the Standard Specifications, except as modified herein and as indicated in the plans:

Photocells shall conform to section of Article 1068.01 of the Standard Specifications.

Luminaires shall be cobra head style, black finish, Leotek Catalog No.GCL1-80G-MV-NW-2R-XX-700. **No alternates will be accepted.** Contractor shall coordinate color selection of luminaire and pole to ensure they match in color. Contractor shall submit color samples of luminaire and pole for review by Village of Minooka.

Method of Measurement. This work shall be measured in units of each.

Basis of Payment.

This work will be paid for at the contract unit price per each for **LUMINAIRE, LED, SPECIAL**

COMBINATION LIGHTING CONTROLLER

Description

This item shall consist of furnishing and installing a combination lighting controller complete with the enclosure indicated on the drawings and wiring for the control of highway lighting as specified herein, shown on the Contract Drawings and as directed by the Engineer.

Materials

Photo control. The photocell shall be in accordance with Article 1068.01(e)(2) except that the size of the photocell shall allow mounting under the cabinet roof overhang.

Overcurrent Protection. Circuit breakers shall be 30A unless otherwise indicated. Circuit breakers shall be standard listed molded case, thermal-magnetic bolt-on type circuit breakers with trip free indicating handles. 120 V circuit breakers shall have a listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated circuit voltage for which the breaker is applied.

Contactor. The contactor shall be a 30A, 2-Pole, 120VAC@60Hz electrically held contactor.

Hand-Off-Auto switch. 30mm. 3 position selector switch.

Enclosure. A molded fiberglass polyester NEMA 4X enclosure with matching cover shall utilized. A molded hinge with stainless steel pin shall be used with a stainless steel draw type "snap latch" door fastener. Threaded brass inserts shall be provided for the non-conductive inner mounting panel.

CONSTRUCTION REQUIREMENTS

General This item shall be constructed in full accord with Section 825 of the Standard Specifications and the details as indicated in the Contract Drawings.

Basis of Payment

This work shall be paid for at the contract unit price each for **COMBINATION LIGHTING CONTROLLER** which price shall be payment in full for furnishing, installing, shipping, handling, tools and appurtenances necessary for a complete and operational unit as indicated on the drawings and as approved by the Engineer

MAST ARM, ALUMINUM, 15 FT

Description. This work shall consist of the installation of an aluminum truss mast arm on temporary traffic signal poles and shall be removed after permanent lighting system is placed in approved operation.

Materials. Materials shall be according to the following:

Arm. The mast arm shall be a truss style arm with upper and lower chord and reinforcing (bracing) members. The top chord of the arms shall have raceway openings extending through the bracket. Raceway openings shall be free of burrs and rough edges that may be injurious to the wires.

Exterior surfaces of the truss arms shall be free of all protuberances, dents, cracks, or other imperfections. The truss arm shall be made of aluminum alloy tube, round, seamless, according to ASTM B 221, 6063 T6.

The truss arms shall be supplied with fabricated aluminum brackets welded to the arms. All shall be heat treated after welding.

CONSTRUCTION REQUIREMENTS

Installation.

The arm shall be set at right angles to the centerline of pavement.

Basis of Payment.

This work will be paid for at the contract unit price each for MAST ARM, ALUMINUM, 15FT. which shall be payment in full for the work specified herein.

REMOVAL OF TEMPORARY LUMINAIRE

Description. This item shall consist of removing temporary luminaire as shown on the plans and disposed of off the site.

CONSTRUCTION REQUIREMENTS

General. No removal work will be permitted without approval from the Engineer. Temporary luminaire shall be removed after completion of construction stage 2 and the traffic is for final configuration. The existing luminaire shall be reinstalled the same day temporary luminaire will be removed and lighting system shall be made operational before dusk. The existing luminaire reinstallation will be paid under Relocate Existing Luminaire pay item.

Basis of Payment.

This work will be paid for at the contract unit price each for REMOVAL OF TEMPORARY LUMINAIRE which shall be payment in full for the work specified herein.

FULL-ACTUATED CONTROLLER IN EXISTING CABINET

Description.

This work shall consist of furnishing and installing a traffic actuated solid state digital controller in the existing controller cabinet of the type specified, meeting the requirements of Section 857 of the Standard Specifications as modified herein and including conflict monitor, load switches and flasher relays, with monitoring and/or providing redundancy to the railroad preemptor and all necessary connections for proper operation.

If the intersection is part of an existing system and/or when specified in the plans, this work shall consist of furnishing and installing a(n) "Econolite" brand traffic actuated solid state controller.

Controller and cabinet shall be assembled only by an approved Grundy County/Village of Minooka traffic signal equipment supplier. The equipment shall be tested and approved in the equipment supplier's facility prior to field installation.

Materials.

Add the following to Article 857.02 of the Standard Specifications:

For installation as a stand-alone traffic signal, connected to a closed loop system or integrated into an advance traffic management system (ATMS), controllers shall be Econolite Cobalt C-1000. Only controllers supplied by one of the Grundy County/Village of Minooka approved closed loop equipment supplier will be allowed. The controller shall be the most recent model and software version approved by Grundy County/Village of Minooka for use with railroad intersections supplied by the equipment supplier at the time of the traffic signal TURN-ON unless specified otherwise on plans or this specification, and include a removable data key. Individual load switches shall be provided for each vehicle, pedestrian, and right turn over lap phase. The controller shall prevent phases from being omitted during program changes and after all preemption events and shall inhibit simultaneous display of circular yellow and yellow arrow indications.

For integration into an ATMS such as Centracs, Tactics, or TransSuite, the controller shall have the latest version of NTCIP software installed. For operation prior to integration into an ATMS, the controller shall maintain existing communications.

Controller shall comply with Article 1073.01 as amended herein.

Controller Cabinet and Peripheral Equipment shall comply with Article 1074.03 as amended in these Traffic Signal Special Provisions.

Add the following to Articles 1073.01 (c) (2) of the Standard Specifications:

Railroad interconnected controllers and cabinets shall be assembled only by an approved traffic signal equipment supplier. All railroad interconnected (including temporary railroad interconnect) controllers and cabinets shall be new, built, tested and approved by the controller equipment vendor, in the vendor's facility, prior to field installation. The vendor shall provide the technical equipment and assistance as required by the Engineer to fully test this equipment.

Installation.

Installation shall be per section 857.03 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER IN EXISTING CABINET.

TEMPORARY TRAFFIC SIGNAL TIMING

Description.

This work shall consist of developing and maintaining appropriate traffic signal timings for the specified intersection for the duration of the temporary signalized condition, as well as impact to existing traffic signal timings caused by detours or other temporary conditions.

All timings and adjustments necessary for this work shall be performed by an approved Consultant who has previous experience in optimizing Closed Loop Traffic signal Systems for IDOT District 3. The Contractor shall contact the Traffic Signal Engineer for a listing of approved Consultants.

The following tasks are associated with TEMPORARY TRAFFIC SIGNAL TIMING.

- (a) Consultant shall attend temporary traffic signal inspection (turn-on) and/or detour meeting and conduct on-site implementation of the traffic signal timings.
- (b) Consultant shall be responsible for making fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.
- (c) Consultant shall provide monthly observation of traffic signal operations in the field.

- (d) Consultant shall provide on-site consultation and adjust timings as necessary for construction stage changes, temporary traffic signal phase changes, and any other conditions affecting timing and phasing, including lane closures, detours, and other construction activities.

- (e) Consultant shall make timing adjustments and prepare comment responses as directed by the Area Traffic Signal Operations Engineer.

- (f) Return original timing plan once construction is complete.

Basis of Payment.

The work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL TIMING, which price shall be payment in full for performing all work described herein per intersection. When the temporary traffic signal installation is turned on and/or detour implemented, 50 percent of the bid price will be paid. The remaining 50 percent of the bid price will be paid following the removal of the temporary traffic signal installation and/or detour.

EXPLORATION TRENCH, SPECIAL

Description: This work shall be performed according to Article 611.03 and Section 213 of the Standard Specifications except as modified herein. This item shall consist of excavating a trench at the locations directed by the Engineer for the purpose of locating existing TELEPHONE LINES, GAS LINES, and other UTILITIES (Including TILE LINES) within the construction limits of the proposed improvement.

General: The trench shall be deep enough to expose the utility, and the width of the trench shall be sufficient to allow proper investigation to determine if the utility needs to be replaced. The exploration trench shall be backfilled with trench backfill at the direction of the Engineer meeting the requirements of the Standard Specifications. This shall be paid for at the contract unit price for trench backfill.

Method of Measurement: An estimated length of exploration trench has been shown in the summary of quantities to establish a unit price only, and payment shall be based on the actual length of trench explored without a change in unit price because of adjustment in plan quantities.

Basis of Payment: This work shall be paid for at the contract unit price per foot (regardless of depth) for EXPLORATION TRENCH, SPECIAL, and no extra compensation will be allowed for any delays, inconveniences or damage sustained by the Contractor in performing the work.

**VILLAGE OF MINOOKA UTILITY RELOCATIONS AND LIGHTING
RIDGE ROAD**

PUBLIC AND RESIDENT NOTIFICATION

If the Contractor is required to shutoff existing utility service (i.e., water and sanitary) for any reason during the course of this project, the Contractor shall provide 24-hour advance written notice to: 1) the Village of Minooka of the scheduled work, 2) those residents or businesses with connections to the water sections affected by the work and 3) any other residents that may potentially be adversely affected by the construction operations. The notification shall be of a form and method as approved by the Village of Minooka

GUARANTEE

All materials and equipment shall be guaranteed for a period of one (1) year from the date of written acceptance by the Owner. Upon receipt of notice from the Owner of failure of any part of the system during the guarantee period, new replacement parts shall be furnished and installed by the Contractor at no additional cost to the Village of Minooka.

SUBMITTALS

The Contractor shall provide five (5) identical hard copy sets or digital copy in Adobe PDF format of submittal information, to the Engineer for review and approval prior to commencement of construction activities. Submittal information generally includes product information, catalog pages, manufacturer's instructions, product warranties, specifications, samples, shop drawings, and proposed substitutions. At a minimum, the following items shall require submittal to the Engineer:

Major Components – Specifications for all major components such as hydrants, valves, piping, fittings, bedding material, fasteners, seals and coatings.

DUCTILE IRON WATER MAIN

This work shall consist of the construction of various sized ductile iron water main at locations indicated on the plans or as directed by the Engineer. The water main shall be cement-lined, bituminous coated with polyethylene encasement and shall be completed in accordance with Section 561 of the Standard Specifications and as described below.

The water main shall be "Ductile Iron," ANSI thickness Class 52, Clow "Super Bell-Tite", "Push-On" Joint, or appand must meet all applicable requirements of ANSI A21.51, AWWA C151 (AWWA Standard for Ductile-Iron Pipe, Centrifugally Cast for Water), ANSI A21.10, AWWA C110 (AWWA Standard for Ductile Iron and Grey Iron fittings for Water), AWWA C153 (AWWA Standard for Ductile-Iron Compact Fittings For Water Service), ANSI A21.11, AWWA C111 (AWWA Standard for Ductile-Iron and Grey-Iron Fittings For Water), ANSI A21.4, AWWA C104 (AWWA Standard for Cement Water Lining for Ductile Iron Pipe and Fitting for Water) specifications. All water mains shall be wrapped in 8-mil thick polyethylene encasement (V-Bio Polywrap) in accordance with ANSI A21.5 and AWWA C105 (AWWA Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems) Method B, with pipe and joints wrapped separately.

Measurement shall be made along the centerline of water main installed. The cost for furnishing all labor, materials and equipment necessary for excavation, construction of the new water main, backfilling, all materials and labor required for wrapping the water main will be paid for at the contract unit price per FOOT for DUCTILE IRON WATER MAIN (SPECIFIED SIZE). Fittings will be paid for separately as DUCTILE IRON FITTINGS.

PRESSURE TEST, STERILIZATION, AND FLUSHING OF WATER MAIN

All water main shall be pressure tested in accordance with the Standard Specifications for Water and Sewer main Construction in Illinois, latest Edition. Water main shall be pressure tested at 150 psi for a minimum of two (2) hours with no pressure loss.

All piping used in the transmission of water to the distribution system shall be properly pressure tested and sterilized. The dosage shall be such as to produce a minimum of fifty (50) parts per million concentration. The heavily chlorinated water shall be retained in the water pumping system for a period of at least twenty-four (24) hours, after which time it shall be flushed out.

Sections of pipe to be disinfected shall first be flushed to remove any solids or contaminated material that may have become lodged in the pipe. If no hydrant is installed at the end of the main, then a tap should be provided large enough to develop a velocity of at least two and five-tenths (2.5) feet per second in the main. A two and one-half (2-1/2) inch hydrant opening will, under normal pressures, provide this velocity in pipe sizes up to and including twelve (12) inches. Flushing shall meet AWWA C651. All taps two (2) inch in size and smaller required for chlorination or flushing purposes, or for temporary or permanent release of air, shall be provided by the Contractor as a part of the construction of water mains with no additional compensation.

When the complete system has been thoroughly flushed, samples shall be collected at the discharge main to be delivered to the lab for bacteriological examination. Should the results prove satisfactory, the system shall be placed in service; otherwise, it shall be cause for re-sterilization. This work will not be paid for separately but will be considered included in the cost of Ductile Iron Water Main (Specified Size).

MECHANICAL JOINT RESTRAINTS

All mechanical joint restraints shall be incorporated in the design of a follower gland. The gland shall be manufactured of ductile iron conforming to ASTM A 536. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to AWWA C111 and C153.

The restraint mechanism shall consist of numerous individually activated gripping surfaces to maximize restraint capability. The gripping surfaces shall be sedges designed to spread the bearing surfaces on the pipe. Twist-off nuts, sized same as tee-head bolts, shall be used to insure proper actuating of restraining devices. When the nut is sheared off, a standard hex nut shall remain. The mechanical joint restraint device for ductile iron pipe shall have a working pressure of at least 250 psi with a minimum safety factor of 2. Gasket material identical to that described above shall be utilized at all joints and fittings.

The mechanical joint restraint devices shall be EBAA Iron, Inc. MegaLug 1100 series, Uni-Flange Series 1400.

Joint restraint for ductile iron pipe within the steel sleeve shall be Field Lok 350, for Tyton Joint pipe and fittings, TR Flex pipe and fittings, or other Engineer-approved equal. Restrained ductile iron pipe shall be rated for 350 psi in accordance with ANSI/AWWA C111/A21.11 *Rubber-Gasket Joints for Ductile Iron Pipe and Fittings*. The difference in price for the restrained joint pipe versus the push on joint pipe shall not be paid for separately but shall be included in the unit price for the steel sleeve.

All design associated with mechanical joint restraints shall be completed by the Contractor and his supplier. Design calculations shall be submitted to the Engineer for review and approval prior to the ordering of materials. The cost for designing, materials, and labor for furnishing, installing, adjusting, and testing of mechanical joint restraints will not be compensated for separately but shall be considered incidental to the contract. No additional compensation will be given for the weights of the mechanical joint restraint. The Contractor shall not include the weights of the mechanical joint restraints in the fitting weights when submitting invoices.

STAINLESS STEEL WATER MAIN T-HEAD BOLTS AND NUTS

Stainless steel T-head bolts and nuts shall be series S30400 AISI 304 meeting ASTM A193. To prevent galling the entire surface of the bolt shall be spray coated with burgundy colored 1010

Xylan as manufactured by Whitford Worldwide. This item shall be incidental to the per foot cost of the water main.

DUCTILE IRON WATERMAIN FITTINGS

All fittings shall be made from ductile iron, cement lined and furnished with mechanical joint ends. All fittings shall have a pressure rating of 250 psi and shall be wrapped with an 8-mil thick polyethylene material per AWWA Standard C105. At locations indicated on the plans or as directed by the Engineer, the water main shall be constructed around existing utility structures or other obstacles by use of tees, bends or other appropriate fittings. Gasket material identical to that described above shall be utilized at all joints and fittings. Xylan coated stainless steel "tee" bolts shall be used to prevent corrosion. All fittings shall be wrapped in 8-mil thick polyethylene encasement (V-Bio Polywrap) in accordance with (ANSI/AWWA C105/A21.5) Method B, with pipe and joints wrapped separately

The cost for all fittings, excluding that incidental to the hydrants, cut & cap, and tapping sleeves will be paid at the contract unit price per POUND for DUCTILE IRON WATERMAIN FITTINGS.

STEEL CASINGS

This work shall consist of furnishing spiral welded, steel casing of the thickness listed in the table below and of the outer diameter specified on the plans or as directed by the Engineer. The sleeve shall meet ASTM A139 and ANSI/AWWA C200 (AWWA Standard for Steel Water Pipe—6 in. (150 mm) and Larger), Grade B, minimum yield strength of 35,000 psi. Sleeves shall extend at least ten feet (10') beyond the outer edge of the existing pavement or sewer pipe, as indicated in the detail drawings, unless otherwise approved by the Engineer. All work shall be done in accordance with Section 552 of the Standard Specifications.

After installation of the steel sleeve is completed, the proposed water main shall be constructed in place within the sleeve. The water main shall be inserted and centered by use of model CCS stainless steel casing spacers as manufactured by Cascade Waterworks Mfg. Co. of Yorkville, IL at a maximum spacing of 10 feet. Casing spacers shall be bolt on style with a two-piece shell made from T-304 stainless steel of a minimum 14-gauge thickness. Each shell section shall have bolt flanges formed with ribs for added strength. Each connecting flange shall have a minimum of three 5/16" T-304 bolts. The shell shall be lined with a ribbed PVC extrusion with a retaining section that overlaps the edge of the shell and prevents slippage. Bearing surfaces (runners) made from UHMW polymer with a static coefficient of friction of 0.11-0.13 shall be attached to support structures (risers) at appropriate positions to properly support the carrier within the casing and to ease installation. The runners shall be attached mechanically by T-304 threaded fasteners inserted through the punched riser section and TIG welded for strength. Risers shall be made of T-304 14-gauge stainless steel. All risers over two inches (2") in height shall be reinforced. Risers shall be MIG welded to the shell. All metal surfaces shall be fully passivated. The ends of the sleeve shall be sealed using a method approved by the Engineer.

The cost for casing spacers, filling of the annular space (if required), and furnishing and installing the steel sleeve shall be incidental to the contract unit price for the steel sleeve. Unless otherwise shown on the plans, steel sleeves [casings] shall be of the size and thickness shown in the table below:

Standard Sizes of Steel Sleeves Used As Casings*

Carrier Pipe ID in Inches	Casing Wall Thickness in Inches	Casing Outside Diameter in Inches
6	0.344	20
8	0.344	20
10	0.344	20
12	0.375	24
16	0.469	30
20	0.563	36
24	0.625	42
30	0.719	48
36	0.781	54
42	0.875, 0.938	60, 66
48	1.000	72

The cost of furnishing and installation of the steel sleeve, and all incidental work necessary for its installation, including casing spacers, will be paid for at the contract unit price per FOOT for STEEL CASINGS [SPECIFIED SIZE]. The cost for water main constructed within the sleeves will be paid for at its unit price.

10-INCH VALVE AND VALVE VAULTS

Valve vaults shall be installed at the locations indicated in the plans or as directed by the Engineer. This work shall be completed in accordance with section 602 of the standard Specifications. All valves 12 inches and smaller valves shall be American Flow Control, Clow, Mueller, resilient wedge, cast iron, bronze-mounted, O-ring seal, bronze non-rising stems meeting the requirements of AWWA C509 and AWWA C550. Valves shall be centered directly under the vault lid opening unless otherwise approved by the Engineer.

Valve vaults shall conform to ASTM C478. For valves up to 12 inches in diameter, valve vaults shall have a forty-eight (48) inch inside diameter; for valves 12 inches and larger in diameter, valve-

vaults shall have a sixty (60) inch inside diameter, for pressure connections and valves larger than 12 inches in diameter, valve vaults shall have a sixty (60) inch inside diameter.

No more than two (2) adjusting rings with four (4) inch minimum and twelve (12) inch maximum height adjustment shall be allowed. One (1) inch rubber adjusting rings are required for all valve vaults in paved areas. No one (1) inch precast concrete rings are allowed. All castings shall be set on bituminous mastic material. All joints between vaults sections shall be sealed with bituminous mastic material and McWrap shall be used around the outside wall of the vault at the joints.

All vaults shall be provided with a heavy-duty Type 1 frame and closed lid. The manhole frame and cover shall be a Neenah R-1550-A or East Jordan Iron Works 1050 embossed with "MINOOKA WATER".

Measurement for payment shall be per EACH for VALVE VAULTS, TYPE A 4' DIAMETER, TYPE 1 FRAME, CLOSED LID, as called out in the plans and per EACH for WATER VALVES 10".

CONNECTION TO EXISTING WATER MAIN

This work shall consist of all labor, equipment and materials required to connect the proposed water main to the existing water main at locations indicated on the plans in accordance with the Standard Specifications for Sewer and Water Main Construction in Illinois.

Tyler/Union long fitting MJ solid sleeves meeting the requirements of C153 shall be used for connecting proposed water main to the existing water main.

This work shall be paid for at the contract unit price per each for CONNECTION TO EXISTING WATER MAIN [SPECIFIED SIZE] which shall be payment in full for all labor, equipment, materials, and all other work required to complete the installation of the water main connection including pipe, reducer, fittings, solid sleeve, excavation, backfill and legal disposal of all excess materials.

CONNECTION TO EXISTING FORCE MAIN

This work shall consist of all labor, equipment and materials required to connect the proposed sanitary force main to the existing force main at locations indicated on the plans in accordance with the Standard Specifications for Sewer and Water Main Construction in Illinois.

Tyler/Union long fitting MJ solid sleeves meeting the requirements of C153 shall be used for connecting proposed sanitary force main to the existing force main.

This work shall be paid for at the contract unit price per each for CONNECTION TO EXISTING FORCE MAIN [SPECIFIED SIZE] which shall be payment in full for all labor, equipment, materials, and all other work required to complete the installation of the force main connection including pipe, reducer, fittings, solid sleeve, excavation, backfill and legal disposal of all excess materials.

CONNECTION TO EXISTING STRUCTURE

This work involves connection of the proposed water main to existing valve vault at the locations shown on the plans, or as directed by the Engineer. The Contractor shall provide sheeting, scaffolding or bracing to ensure that no movement of the exposed valve vault will take place while core drilling the exposed wall to allow the pipe installation. Should the structure be found to deflect, displace or fall out of plumb, the Contractor shall be responsible for correcting the movement.

In the process of core drilling the wall, extreme care shall be taken so that minimal structural damage is done to the valve vault. All debris falling into the valve vault must be entirely removed. The area between the outside of the pipe and the wall of the valve vault shall be filled with hydraulic cement.

The cost for all equipment, labor and materials, including core drilling the valve vault wall opening, excavation, furnishing, erecting, and removing shoring, scaffolding and/or bracing, and backfilling will be paid for at the contract unit price per EACH for CONNECTION TO EXISTING STRUCTURE.

WATER MAIN TO BE ABANDONED

CUT AND CAP EXISTING WATER MAIN

This work shall consist of abandonment of the existing 8-inch water main only after all requirements for testing and disinfection have been satisfied on the new main. The Contractor shall abandon the existing water main in place by installing blind flange caps blocked and mechanically restrained at the locations indicated in the plans or as directed by the Engineer.

Upon completion of the proposed water main installation, the Contractor shall abandon the existing water main by filling it with Controlled Low-Strength Material (CLSM) in accordance with Sections 593 and 1019 of the Standard Specifications at the locations indicated on the plans or as directed by the Engineer. The plugging of the ends of the pipe shall be done in accordance with Section 31 of the "Standard Specifications for Water and Sewer Main Construction in Illinois", latest edition.

The work will be measured for payment in place for each abandoned 8-inch water main and each cut and cap provided. This work will be paid for at the contract unit price per EACH for CUT AND CAP EXISTING [SPECIFIED SIZE] WATER MAIN and per FOOT for WATER MAIN TO BE ABANDONED [SPECIFIED SIZE] which price shall include all materials, labor and equipment necessary to perform the work as here in specified.

ABANDON FORCE MAIN

CUT AND CAP EXISTING FORCE MAIN

This work shall consist of abandonment of the existing twelve-inch force main only after all requirements for testing have been satisfied on the new force main. All exposed ends of the existing 12" force main to be abandoned and filled with Controlled Low-Strength Material (CLSM) at the limits of trench excavation and shall be plugged with mortar to the satisfaction of the Engineer or Village.

Provide twelve-inch ductile iron plugs, caps, or other fittings and thrust blocking on ends of the portions of existing mains that are to remain in service.

The CLSM shall conform to the Section 1019 of the Standard Specifications for Road and Bridge Construction, latest edition. The plugging of the ends of the pipe shall be done in accordance with Section 31 of the "Standard Specifications for Water and Sewer Main Construction in Illinois", latest edition.

The work will be measured for payment in place for each abandoned 12" force main and each cut and cap provided. This work will be paid for at the contract unit price per EACH for CUT AND CAP EXISTING [SPECIFIED SIZE] FORCE MAIN and per FOOT for ABANDON FORCE MAIN [SPECIFIED SIZE], which price shall include all materials, labor and equipment necessary to perform the work as here in specified.

12" LINE STOP

Under this item Contractor shall furnish all materials, labor and equipment to properly install and set a line stop into the existing force main, in parkway or pavement locations, where determined by the Engineer as being necessary to facilitate the capping of existing force main.

Description of procedure

The line stopping procedure is a means of temporarily plugging a sewer force main to block existing effluent flow until the connection to the existing force main is completed. A pressure tap is first made into the main, allowing insertion of the line stop-plugging device into the main. By using a special line stop fitting, the tapping valve can be recovered after the line stop-plugging head has been removed from the main. The suggested procedure consists of the following fourteen steps.

Excavate, expose, and clean the exterior of the main.

Assemble split line stop fitting around the main.

Mount temporary tapping valve to nozzle of fitting.

Mount tapping machine; open valve; tap; retract cutter; close temporary valve; remove tapping machine.

Mount line stop machine; open temporary valve; insert line stop plugging head into main.

Test for shutdown.

Cut downstream force main. Perform required work.

Retract line stop plugging head. Close temporary valve. Remove line stop machine.

Install completion machine; open valve.

Insert completion plug into nozzle of line stop fitting.

Remove completion machine and temporary valve.

Install screwed pipe cap or blind flange onto nozzle of line stop fitting.

Interruption of flow

The existing force main, upstream of the line stop will be taken out of service. The Village will allow the lift station to be shut down for a period of four (4) hours. The line stop will be installed to eliminate the need for by-pass pumping. If the contractor feels that bypass pumping will still be necessary, he shall include that in the cost of his unit process as all of this work will be incidental.

Line stop fittings

The line stop fitting shall consist of a two (2) part, full encirclement stainless steel saddle with a stainless-steel nozzle MIG welded to the upper saddle half. Accessories shall include all fasteners and gaskets noted below.

The stainless steel used in the saddle halves shall be Type 304, a minimum of 16 gauge (.0598") thick.

The line stop nozzle shall be machined from seamless pipe or tubing and shall have an external pipe thread to receive a screwed pipe cap at the end of the work. The interior shall be threaded to receive the completion plug.

The full encirclement saddle gasket shall be molded from an elastomer compound that will resist compression set and is compatible with drinking water in the temperature range of -40 to 150 degrees F.

The gasket shall have molded grid pattern on the surface that seals against the main. The longitudinal ends of the gasket shall be tapered to allow sealing at the lap joint.

Materials for bolts and nuts shall be Type 304 stainless steel.

If applicable, the line stop fittings shall be compatible with the end users existing Hydra-Stop equipment.

Material drawings

At request of the Engineer, the Contractor shall submit three (3) sets of drawings, furnished by the manufacturers, fully and distinctly illustrating and describing the line stop fitting proposed to be furnished.

Installation of line stop fitting

Contractor shall first wire brush the exterior of the main to remove any debris, corrosion, or other surface irregularities that might interfere with the proper sealing of the line stop-fitting gasket.

Under no circumstances shall the Contractor attempt to reshape or bend a line stop saddle in order to obtain greater gasket compression.

All gasket-sealing surfaces shall be thoroughly coated with Permatex No. 2 sealing compound, prior to assembly around the main. Fasteners shall be tightened in accordance with manufacturer's instructions.

Pressure test

The assembled line stop fitting, and valve assembly shall be pressure tested to verify a tight seal.

Cutting operation

Drilling equipment shall be in good condition and equipped with a power drive to insure smooth cutting and to minimize shock and vibration.

The shell cutter shall have carbide teeth to insure adequate performance if the existing main contains chill spots, sand inclusions or has cement lining.

Cutting equipment is to be chlorinated prior to starting the pressure tap.

Line stop operation

The resilient plugging (sealing) elements shall be free from cuts, nick or other surface defects that could prevent a satisfactory shutdown. The sealing elements shall be inserted into the main by self-contained hydraulic or jackscrew actuators.

Line stop Units are to be lightweight, so they can be handled by manpower alone (no crane necessary).

The units furnished will be able to shut down heavily tuberculated lines through the expansion of the Stopper Rubber itself. Stationary (nonexpendable) stoppers needing a brushing technique are not acceptable.

Basis of payment

This work will be paid for at the contract unit price EACH for [SPECIFIED SIZE] LINE STOP, which price shall include all materials, equipment and labor necessary to perform the work as herein specified.

FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX

This work shall consist of the installation of new hydrants, auxiliary valves, valve boxes, tees and associated pipe and fittings at the locations indicated in the plans or as directed by the Engineer. Hydrants shall be Mueller Super Centurion 250 or, Clow Medallion as approved by the Minooka Superintendent of Public Works. The cost for pipe, if any, needed for offsetting the hydrant from the water main shall be considered as incidental to the hydrant construction.

All hydrants shall be painted as directed by the Village of Minooka Water Department. The cost for this work will be paid for at the contract unit price bid per EACH for FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX.

FIRE HYDRANTS TO BE REMOVED

This item of work shall consist of the removal of existing fire hydrants as indicated on the plans or as directed by the engineer and shall be in accordance with Article 564 of the Standard Specifications.

Once the new main is in service, including satisfactorily pressure tested, chlorinated and all service lines installed, existing hydrants and auxiliary valves shall be carefully disconnected from the existing water main, install cap, install thrust block, delivered to the Water Department, and remain

the property of the Village of Minooka. The cost for the materials, excavation and trench backfill material shall be paid for at the contract unit price per EACH for FIRE HYDRANTS TO BE REMOVED.

VALVE BOXES TO BE REMOVED

Valves in valve boxes specified on the plans to be abandoned shall be closed. The valve box shall then be cut a minimum of twelve inches (12") below the existing ground surface and be filled with concrete, sand or other appropriate material. This work will be paid for at the unit price per EACH for VALVE BOXES TO BE REMOVED.

12-INCH C-900 FORCE MAIN, DR-18

This work shall consist of the installation of restrained joint C-900 PVC DR-18 force main at locations indicated on the plans or as directed by the Engineer. Polyvinyl Chloride Solid Wall Pipe (Pressure Class 235, DR 18, green in color, conforming to AWWA C900 (AWWA Standard for Polyvinyl Chloride [PVC] Pressure Pipe and Fabricated Fittings, 4 in. Through 12 in. [100 mm through 300 mm], for Water Distribution) with elastomeric gasketed joints meeting the requirements of AWWA C900 (Injection-Molded Polyvinyl Chloride [PVC] Pressure Fittings, 4 in. through 12 in. [100 mm through 300 mm], for Water Distribution), ASTM F477 and ASTM D3139, unless otherwise directed by the Engineer. All pipe must be certified to CSA B137.3 "Rigid Poly (Vinyl Chloride) (PVC) Pipe for Pressure Applications".

Each PVC pipe length and fitting shall be clearly marked with the following:

- a. Manufacturer's Name
- b. Nominal Pipe Size
- c. Cell Classification
- d. Minimum Pipe Stiffness

PVC pipe and fittings shall be manufactured in accordance with the requirements of ASTM F 679. PVC pipe shall be made from a compound meeting the requirements of cell classification 12454B.

PVC pipe joints shall be the bell and spigot type. Gaskets shall meet the requirements of ASTM F 477 and be molded into a circular form or extruded to the proper section, then spliced into circular form, and shall be made of a properly cured high grade elastomeric compound. Gaskets shall be factory installed and chemically bonded to the bell end of the pipe. Field installed gaskets and field cut beveled lengths of pipe shall be done in accordance with the manufacturer's instructions and recommended equipment and materials. All pipe gaskets and spigots shall be thoroughly cleaned and lubricated prior to assembly.

Detectable Warning Tape and Pipe Tracer Wire:

Detectable Warning Tape: Acid- and alkali-resistant, PE film warning tape of a type approved by the Engineer shall also be installed. This work shall consist of burying of metallic tape in the trench running along the centerline of the sanitary force main. The tape shall be laid in the trench two feet above the buried sanitary force main. The tape shall be 6" wide and 4 mils thick and read "CAUTION – BURIED SEWER MAIN BELOW. with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30-inches deep; colored yellow.

Pipe Tracer Wire: Place Pipe tracer wire on top of pipe and secure to pipe with tape at maximum intervals of 8-feet and shall be installed prior to any backfill being placed. The tracer wire shall be 12-gauge coated Copperhead Part # (1230B-HS-**) [** is the spool size]. The tracer wire shall be tied to and/or wrapped around the bolts of fittings, vaults, structures, or as deemed necessary by the Engineer. Where tracer wire terminates, make hard-wire connections with DryConn Direct Bury Lugs, acceptable to the Engineer, to ductile iron or other traceable pipe, or to tracer wire on pipe installed by other methods.

Testing Sewers

Buried or Concealed piping: Testing of buried or concealed piping shall be conducted as follows:

1. Completely backfill all harnessed sections of buried piping before such sections are tested.
2. Pressure test buried or concealed pipelines for leakage by maintaining the fluid in the pipe at a hydrostatic pressure of at least 1.5 times the working pressure for a minimum period of 4 hours. 12-inch force main maximum operating pressure is xx psi.
3. Pressure test the piping for leakage as a whole or in sections, valved or bulkheaded at the ends.
4. Apply the specified pressure to the piping through a tap in the pipe by means of a hand pump or other approved method.
5. Do not use air for testing. Stop all visible leakage.
6. Retest, if necessary, until pipe passes testing requirement.

This work will be paid for at the contract unit price per FOOT for [SPECIFIED SIZE] C-900 FORCE MAIN, DR-18, which price shall include the installation of the sewer, excavation and spoil disposal, bedding, testing of the force main and all work as mentioned above. Trench Backfill will be provided in accordance with Section 208 and paid for under TRENCH BACKFILL.

AS-BUILT DRAWINGS

The Contractor will be responsible for providing one copy of red-lined drawings showing field lengths, rim and invert elevations and locations for all sanitary sewer and water system appurtenances installed as part of this contract including manholes, service risers, hydrants, tees, reducers, valves, valve vaults, stubs, and crossing locations. Distances should be given to each

utility item from existing visible landmarks (surface) identified on the design plans for this project. This work shall not be paid for separately but shall be incidental to the contract.

Village of Minooka Minimum Chlorination Standards

The Village of Minooka requires all contractors disinfecting water system components using gas chlorine to abide with the following requirements:

Procedure

1. Minimum 24-hour notice before chlorinating. Call the Department of Public Works to schedule chlorination.
2. Only authorized Village of Minooka employees shall operate all water system valves and turn on/off sampling whips while samples are being collected.

Equipment

1. All chlorination and safety equipment must meet or exceed the standards and recommendations set by The Chlorine Institute, Inc.

Requirements for Chlorinating Contractors

1. Chlorinator must be licensed plumber or certified Illinois water operator with a minimum of 5 years experience, and a minimum of 5 years experience working with chlorine disinfection of water supply systems.
2. Two people must be present to chlorinate: One to monitor cylinder and the other to monitor in the field.
3. Chlorination contractor must be bonded and insured and have proof of both on file with the Village.
4. Chlorination contractor must have updated emergency phone numbers on file with the Village.
5. Chlorination contractor must comply with state and federal regulations regarding transportation and handling of chlorine cylinders.
 - a. Shipping and emergency papers for every job location
 - b. Proof of insurance for hauling and handling chlorine gas
 - c. Commercial Drivers License with Hazmat endorsement and medical card
 - d. Copy of Emergency Response Guidebook in vehicle
 - e. Hazmat certificate of registration
 - f. Hazardous material placards displayed on vehicle

- g. Cylinder strapped upright in truck

Under no circumstances will chlorine contractors be allowed to apply heat to the chlorine cylinder (i.e. hot baths, propane torches, etc.). While the cylinder is being used it must be in a vertical position, as well as being affixed to a solid object.

Prior to work, the Chlorinator must provide a detailed written chlorination and flushing plan to the Village for review and approval.

GENERAL ELECTRICAL REQUIREMENTS

This special provision replaces Articles 801.01 – 801.07, 801.09 – 801-16 of the Standard Specifications.

Definition. Codes, standards, and industry specifications cited for electrical work shall be by definition the latest adopted version thereof, unless indicated otherwise.

Materials by definition shall include electrical equipment, fittings, devices, motors, appliances, fixtures, apparatus, all hardware and appurtenances, and the like, used as part of, or in connection with, electrical installation.

Standards of Installation. Materials shall be installed according to the manufacturer's recommendations, the NEC, OSHA, the NESC, and AASHTO's Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

All like materials shall be from the same manufacturer. Listed and labeled materials shall be used whenever possible. The listing shall be according to UL.

Safety and Protection. Safety and protection requirements shall be as follows.

Safety. Electrical systems shall not be left in an exposed or otherwise hazardous condition. All electrical boxes, cabinets, pole handholes, etc. which contain wiring, either energized or non-energized, shall be closed or shall have covers in place and be locked when possible, during nonworking hours.

Protection. Electrical raceway or duct openings shall be capped or otherwise sealed from the entrance of water and dirt. Wiring shall be protected from mechanical injury.

Equipment Grounding Conductor. All electrical systems, materials, and appurtenances shall be grounded. Good ground continuity throughout the electrical system shall be assured, even though every detail of the requirements is not specified or shown. Electrical circuits shall have a continuous insulated equipment grounding conductor. When metallic conduit is used, it shall be

bonded to the equipment grounding conductor, but shall not be used as the equipment grounding conductor.

Detector loop lead-in circuits, circuits under 50 volts, and runs of fiber optic cable will not require an equipment grounding conductor.

Where connections are made to painted surfaces, the paint shall be scraped to fully expose metal at the connection point. After the connection is completed, the paint system shall be repaired to the satisfaction of the Engineer.

Bonding of all boxes and other metallic enclosures throughout the wiring system to the equipment grounding conductor shall be made using a splice and pigtail connection. Mechanical connectors shall have a serrated washer at the contact surface.

All connections to structural steel or fencing shall be made with exothermic welds. Care shall be taken not to weaken load carrying members. Where connections are made to epoxy coated reinforcing steel, the epoxy coating shall be sufficiently removed to facilitate a mechanical connection. The epoxy coating shall be repaired to the satisfaction of the Engineer. Where connections are made to insulated conductors, the connection shall be wrapped with at least four layers of electrical tape extended 6 in. (150 mm) onto the conductor insulation.

Submittals. At the preconstruction meeting, the Contractor shall submit a written listing of manufacturers for all major electrical and mechanical items. The list of manufacturers shall be binding, except by written request from the Contractor and approval by the Engineer. The request shall include acceptable reasons and documentation for the change.

Major items shall include, but not limited to the following:

Type of Work (discipline)	Item
All Electrical Work	Electric Service Metering Emergency Standby System Transformers Cable

	Unit Duct Splices Conduit Surge Suppression System
Lighting	Tower Pole Luminaire Foundation Breakaway Device Controllers Control Cabinet and Peripherals

The Engineer will review the submittals for conformance with the design concept of the project according to Article 105.04 and the following. The Engineer will stamp the drawings indicating their status as “Approved”, “Approved as Noted”, “Disapproved”, or “Information Only”. Since the Engineer’s review is for conformance with the design concept only, it shall be the Contractor’s responsibility to coordinate the various items into a working system as specified. The Contractor shall not be relieved from responsibility for errors or omissions in the shop, working, or layout drawings by the Engineer’s approval thereof. The Contractor shall still be in full compliance with contract and specification requirements.

All submitted items reviewed and marked “Disapproved” or “Approved as Noted” shall be resubmitted by the Contractor in their entirety, unless otherwise indicated within the submittal comments.

Work shall not begin until the Engineer has approved the submittal. Material installed prior to approval by the Engineer, will be subject to removal and replacement at no additional cost to the municipality.

Unless otherwise approved by the Engineer, all the above items shall be submitted to the Engineer at the same time. Each item shall be properly identified by route, and project number.

Certifications. When certifications are specified and are available prior to material manufacture, the certification shall be included in the submittal information. When specified and only available after manufacture, the submittal shall include a statement of intent to furnish certification. All certificates shall be complete with all appropriate test dates and data.

Authorized Project Delay. See Article 801.08

Maintenance transfer and Preconstruction Inspection:

General. Before performing any excavation, removal, or installation work (electrical or otherwise) at the site, the Contractor shall request a maintenance transfer and preconstruction site inspection, to be held in the presence of the Engineer and a representative of the party or parties responsible for maintenance of any lighting and/or traffic control systems which may be affected by the work. The request for the maintenance transfer and preconstruction inspection shall be made no less than seven (7) calendar days prior to the desired inspection date. The maintenance transfer and preconstruction inspection shall:

Establish the procedures for formal transfer of maintenance responsibility required for the construction period.

Establish the approximate location and operating condition of lighting and/or traffic control systems which may be affected by the work

Marking of Existing Cable Systems. The party responsible for maintenance of any existing lighting and/or traffic control systems at the project site will, at the Contractor's request, mark and/or stake, once per location, all underground cable routes owned or maintained by the State. A project may involve multiple "locations" where separated electrical systems are involved (i.e. different controllers). The markings shall be taken to have a horizontal tolerance of at least 304.8 mm (one (1) foot) to either side. The request for the cable locations and marking shall be made at the same time the request for the maintenance transfer and preconstruction inspection is made. The Contractor shall exercise extreme caution where existing buried cable runs are involved. The markings of existing systems are made strictly for assistance to the Contractor and this does not relieve the Contractor of responsibility for the repair or replacement of any cable run damaged in the course of his work, as specified elsewhere herein. Note that the contractor shall be entitled to only one request for location marking of existing systems and that multiple requests may only be honored at the contractor's expense. No locates will be made after maintenance is transferred, unless it is at the contractor's expense.

Condition of Existing Systems. The Contractor shall conduct an inventory of all existing electrical system equipment within the project limits, which may be affected by the work, making note of any parts which are found broken or missing, defective or malfunctioning. Megger and load readings shall be taken for all existing circuits which will remain in place or be modified. If a circuit is to be taken out in its entirety, then readings do not have to be taken. The inventory and test data shall be reviewed with and approved by the Engineer and a record of the inventory shall be submitted to the Engineer for the record. Without such a record, all systems transferred to the Contractor for maintenance during construction shall be returned at the end of construction in complete, fully operating condition.”

Marking Proposed Locations for Highway Lighting System. The Contractor shall, with the assistance of the Engineer, mark or stake the proposed locations of all poles, cabinets, junction boxes, pull boxes, handholes, cable routes, pavement crossings, and other items pertinent to the work. A proposed location inspection by the Engineer shall be requested prior to any excavation, construction, or installation work after all proposed installation locations are marked. Any work installed without location approval is subject to corrective action at no additional cost to the municipality.

Inspection of electrical work. Inspection of electrical work shall be according to Article 105.12 and the following.

Before any splice, tap, or electrical connection is covered in handholes, junction boxes, light poles, or other enclosures, the Contractor shall notify and make available such wiring for the Engineer’s inspection.

Maintenance and Responsibility During Construction.

Lighting Operation and Maintenance Responsibility. The scope of work shall include the assumption of responsibility for the continuing operation and maintenance of the existing, proposed, temporary, sign and navigation lighting, or other lighting systems and all appurtenances affected by the work as specified elsewhere herein. Maintenance of lighting systems is specified elsewhere and will be paid for separately

The proposed lighting system must be operational prior to opening the roadway to traffic unless temporary lighting exists which is designed and installed to properly illuminate the roadway.

Energy and Demand Charges. The payment of basic energy and demand charges by the electric utility for existing lighting which remains in service will continue as a responsibility of the Owner, unless otherwise indicated. Unless otherwise indicated or required by the Engineer

duplicate lighting systems (such as temporary lighting and proposed new lighting) shall not be operated simultaneously at the Owner's expense and lighting systems shall not be kept in operation during long daytime periods at the Owner's expense. Upon written authorization from the Engineer to place a proposed new lighting system in service, whether the system has passed final acceptance or not, (such as to allow temporary lighting to be removed), the Owner will accept responsibility for energy and demand charges for such lighting, effective the date of authorization. All other energy and demand payments to the utility shall be the responsibility of the Contractor until final acceptance.

Damage to Electrical Systems. Should damage occur to any existing electrical systems through the Contractor's operations, the Engineer will designate the repairs as emergency or non-emergency in nature.

Emergency repairs shall be made by the Contractor, or as determined by the Engineer, the municipality, or its agent. Non-emergency repairs shall be performed by the Contractor within six working days following discovery or notification. All repairs shall be performed in an expeditious manner to assure all electrical systems are operational as soon as possible. The repairs shall be performed at no additional cost to the municipality.

Lighting. An outage will be considered an emergency when three or more lights on a circuit or three successive lights are not operational. Knocked down materials, which result in a danger to the motoring public, will be considered an emergency repair.

Temporary aerial multi-conductor cable, with grounded messenger cable, will be permitted if it does not interfere with traffic or other operations, and if the Engineer determines it does not require unacceptable modification to existing installations.

Testing. Before final inspection, the electrical work shall be tested. Tests may be made progressively as parts of the work are completed, or may be made when the work is complete. Tests shall be made in the presence of the Engineer. Items which fail to test satisfactorily shall be repaired or replaced. Tests shall include checks of control operation, system voltages, cable insulation, and ground resistance and continuity.

The forms for recording test readings will be available from the Engineer in electronic format. The Contractor shall provide the Engineer with a written report of all test data including the following:

- Voltage Tests

- Amperage Tests
- Insulation Resistance Tests
- Continuity tests
- Detector Loop Tests

Lighting systems. The following tests shall be made.

(1) Voltage Measurements. Voltages in the cabinet from phase to phase and phase to neutral, at no load and at full load, shall be measured and recorded. Voltage readings at the last termination of each circuit shall be measured and recorded.

(2) Insulation Resistance. Insulation resistance to ground of each circuit at the cabinet, with all loads connected, shall be measured and recorded.

On tests of new cable runs, the readings shall exceed 50 megohms for phase and neutral conductors with a connected load over 20 A, and shall exceed 100 megohms for conductors with a connected load of 20 A or less.

On tests of cable runs which include cables which were existing in service prior to this contract, the resistance readings shall be the same or better than the readings recorded at the maintenance transfer at the beginning of the contract. Measurements shall be taken with a megohm meter approved by the Engineer.

(3) Loads. The current of each circuit, phase main, and neutral shall be measured and recorded. The Engineer may direct reasonable circuit rearrangement. The current readings shall be within ten percent of the connected load based on material ratings.

(4) Ground Continuity. Resistance of the system ground as taken from the farthest extension of each circuit run from the controller (i.e. check of equipment ground continuity for each circuit) shall be measured and recorded. Readings shall not exceed 2.0 ohms, regardless of the length of the circuit.

(5) Resistance of Grounding Electrodes. Resistance to ground of all grounding electrodes shall be measured and recorded. Measurements shall be made with a ground tester during dry soil conditions as approved by the Engineer. Resistance to ground shall not exceed 10 ohms.

All test results shall be furnished to the Engineer seven working days before the date the inspection is scheduled.

Record Drawings. Alterations and additions to the electrical installation made during the execution of the work shall be neatly and plainly marked in red by the Contractor on the full-size set of record drawings kept at the Engineer's on site. These drawings shall be updated on a daily basis and shall be available for inspection by the Engineer during the course of the work. The record drawings shall include the following:

- Cover Sheet
- Summary of Quantities, electrical items only
- Legends, Schedules and Notes
- Plan Sheet
- Pertinent Details
- Single Line Diagram
- Other useful information useful to locate and maintain the systems.

Any modifications to the details shall be indicated. Final quantities used shall be indicated on the Summary of Quantities. Foundation depths used shall also be listed.

As part of the record drawings, the Contractor shall inventory all materials, new or existing, on the project and record information on inventory sheets provided by the Engineer.

The inventory shall include:

- Location of Equipment, including rack, chassis, slot as applicable.
- Designation of Equipment
- Equipment manufacturer
- Equipment model number
- Equipment Version Number

- Equipment Configuration
 - Addressing, IP or other
 - Settings, hardware or programmed
- Equipment Serial Number

The following electronic inventory forms are available from the Engineer:

- Lighting Controller Inventory
- Lighting Inventory
- Light Tower Inspection Checklist
- ITS Location Inventory

The information shall be entered in the forms; handwritten entries will not be acceptable; except for signatures. Electronic file shall also be included in the documentation.

When the work is complete, and seven days before the request for a final inspection, the set of contract drawings, stamped "**RECORD DRAWINGS**", shall be submitted to the Engineer for review and approval and shall be stamped with the date and the signature of the Contractor's supervising Engineer or electrician. The record drawings shall be submitted in PDF format on CDROM as well as hardcopy's for review and approval.

In addition to the record drawings, PDF copies of the final catalog cuts which have been Approved and Approved as Noted with applicable follow-up shall be submitted along with the record drawings. The PDF files shall clearly indicate either by filename or PDF table of contents the respective pay item number. Specific part or model numbers of items which have been selected shall be clearly visible. Hard copies of the catalog are not required with this submittal.

The Contractor shall provide two sets of electronically produced drawings in a moisture proof pouch to be kept on the inside door of the controller cabinet or other location approved by the Engineer. These drawings shall show the final as-built circuit orientation(s) of the project in the form of a single line diagram with all luminaires numbered and clearly identified for each circuit.

Final documentation shall be submitted as a complete submittal package, i.e. record drawings, test results, inventory, etc. shall be submitted at the same time. Partial piecemeal submittals

will be rejected without review. A total of two hardcopies and CDROMs of the final documentation shall be submitted.\

Acceptance. Acceptance of electrical work will be given at the time when the municipality assumes the responsibility to protect and maintain the work according to Article 107.30 or at the time of final inspection.

When the electrical work is complete, tested, and fully operational, the Contractor shall schedule an inspection for acceptance with the Engineer no less than seven working days prior to the desired inspection date. The Contractor shall furnish the necessary labor and equipment to make the inspection.

A written record of the test readings taken by the Contractor according to Article 801.13 shall be furnished to the Engineer seven working days before the date the inspection is scheduled. Inspection will not be made until after the delivery of acceptable record drawings, specified certifications, and the required guarantees.

Final Acceptance Documentation Checklist

LOCATION	
Route	Common Name
Limits	Section
Contract #	County
Controller Designation(s)	EMC Database Location Number(s)

ITEM	Contractor (Verify)	Resident Engineer (Verify)
Record Drawings -Four hardcopies (11" x 17") -Scanned to two CD-ROMs	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
Field Inspection Tests -Voltage -Amperage -Cable Insulation Resistance -Continuity -Controller Ground Rod Resistance (Four Hardcopies & scanned to two CD's)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
GPS Coordinates -Excel file (Check Special Provisions, Excel file scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
Job Warranty Letter (Four Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>

Catalog Cut Submittals -Approved & Approved as Noted (Scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
Lighting Inventory Form (Four Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
Lighting Controller Inventory Form (Four Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
Light Tower Inspection Form (If applicable, Four Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>

Four Hardcopies & scanned to two CD's shall be submitted for all items above. The CD ROM shall be labeled as shown in the example contained herein.

General Notes:

Record Drawings – The record drawings should contain contract cover sheet, summary of quantities showing all lighting pay item sheets, proposed lighting plans and lighting detail sheets. Submit hardcopies 11 x 17 size. Include the original “red-ink” copy. The red-ink markup should be neatly drawn. Record drawings copies should be legible. Blurred copies will not be acceptable. Temporary lighting plans and removal lighting plans should not be part of the set.

Field Inspection Tests – Testing should be done for proposed cables. Testing shall be per standard specifications. Forms shall be neatly filled out.

Job Warranty Letter – See standard specifications.

Cutsheet Submittal – See special provisions “General Electrical Requirements”. Scan Approved and Approved as Noted cutsheets.

Lighting Inventory Form – Inventory form should include only proposed light poles, proposed light towers, proposed combination (traffic/light pole) lighting and proposed underpass luminaires.

Lighting Controller Inventory Form – Form should be filled out for only proposed lighting controllers.

Light Tower Safety Inspection Form – Form should be filled out for each proposed light tower.

CD LABEL FORMAT TEMPLATE.

Label must be printed; hand written labels are unacceptable and will be rejected.



UNDERGROUND RACEWAYS

Effective: March 1, 2015

Revise Article 810.04 of the Standard Specifications to read:

“Installation. All underground conduits shall have a minimum depth of 30-inches (700 mm) below the finished grade.”

Add the following to Article 810.04 of the Standard Specifications:

“All metal conduit installed underground shall be Rigid Steel Conduit unless otherwise indicated on the plans.”

Add the following to Article 810.04 of the Standard Specifications:

“All raceways which extend outside of a structure or duct bank but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum of 300 mm (12”) or the length shown on the plans beyond the structure or duct bank. The end of this extension shall be capped and sealed with a cap designed for the conduit to be capped.

The ends of rigid metal conduit to be capped shall be threaded, the threads protected with full galvanizing, and capped with a threaded galvanized steel cap.

The ends of rigid nonmetallic conduit and coilable nonmetallic conduit shall be capped with a rigid PVC cap of not less than 3 mm (0.125”) thick. The cap shall be sealed to the conduit using a room-temperature-vulcanizing (RTV) sealant compatible with the material of both the cap and the conduit. A washer or similar metal ring shall be glued to the inside center of the cap with epoxy, and the pull cord shall be tied to this ring.”

UNIT DUCT

Effective: January 1, 2012

Revise the first paragraph of Article 810.04 to read:

“The unit duct shall be installed at a minimum depth of 30-inches (760 mm) unless otherwise directed by the Engineer.”

Revise Article 1088.01(c) to read:

“(c) Coilable Nonmetallic Conduit.

General:

The duct shall be a plastic duct which is intended for underground use and which can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance. The duct shall be a plastic duct which is intended for underground use and can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance.

The duct shall be made of high density polyethylene which shall meet the requirements of ASTM D 2447, for schedule 40. The duct shall be composed of black high density polyethylene meeting the requirements of ASTM D 3350, Class C, Grade P33. The wall thickness shall be in accordance with Table 2 for ASTM D 2447.

The duct shall be UL Listed per 651-B for continuous length HDPE coiled conduit. The duct shall also comply with NEC Article 354.100 and 354.120.

Submittal information shall demonstrate compliance with the details of these requirements.

Dimensions:

Duct dimensions shall conform to the standards listed in ASTM D2447. Submittal information shall demonstrate compliance with these requirements.

Nominal Size		Nominal I.D.		Nominal O.D.		Minimum Wall	
mm	in	mm	in	mm	in	mm	in
31.75	1.25	35.05	1.380	42.16	1.660	3.556 +0.51	0.140 +0.020
38.1	1.50	40.89	1.610	48.26	1.900	3.683 +0.51	0.145 +0.020

Nominal Size		Pulled Tensile	
mm	in	N	lbs
31.75	1.25	3322	747
38.1	1.50	3972	893

Marking:

As specified in NEMA Standard Publication No. TC-7, the duct shall be clearly and durably marked at least every 3.05 meters (10 feet) with the material designation (HDPE for high density polyethylene), nominal size of the duct and the name and/or trademark of the manufacturer.

Performance Tests:

Polyethylene Duct testing procedures and test results shall meet the requirements of UL 651. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the duct. Duct crush test results shall meet or exceed the following requirements:

Duct Diameter		Min. force required to deform sample 50%	
mm	in	N	lbs
35	1.25	4937	1110
41	1.5	4559	1025

WIRE AND CABLE

Effective: January 1, 2012

Add the following to the first paragraph of Article 1066.02(a):

“The cable shall be rated at a minimum of 90°C dry and 75°C wet and shall be suitable for installation in wet and dry locations, and shall be resistant to oils and chemicals.”

Revise the Aerial Electric Cable Properties table of Article 1066.03(a)(3) to read:

Aerial Electric Cable Properties

Phase Conductor		Messenger wire			
Size AWG	Stranding	Average Insulation Thickness		Minimum Size AWG	Stranding
		mm	mils		
6	7	1.1	(45)	6	6/1
4	7	1.1	(45)	4	6/1
2	7	1.1	(45)	2	6/1
1/0	19	1.5	(60)	1/0	6/1
2/0	19	1.5	(60)	2/0	6/1
3/0	19	1.5	(60)	3/0	6/1
4/0	19	1.5	(60)	4/0	6/1

Add the following to Article 1066.03(b) of the Standard Specifications:

“Cable sized No. 2 AWG and smaller shall be U.L. listed Type RHH/RHW and may be Type RHH/RHW/USE. Cable sized larger than No. 2 AWG shall be U.L. listed Type RHH/RHW/USE.”

Revise Article 1066.04 to read:

“Aerial Cable Assembly. The aerial cable shall be an assembly of insulated aluminum conductors according to Section 1066.02 and 1066.03. Unless otherwise indicated, the cable assembly shall be composed of three insulated conductors and a steel reinforced bare aluminum conductor (ACSR) to be used as the ground conductor. Unless otherwise indicated, the code word designation of this cable assembly is “Palomino”. The steel reinforced aluminum conductor shall conform to ASTM B-232. The cable shall be assembled according to ANSI/ICEA S-76-474.”

Revise the second paragraph of Article 1066.05 to read:

“The tape shall have reinforced metallic detection capabilities consisting of a woven reinforced polyethylene tape with a metallic core or backing.”

LIGHT POLE FOUNDATION, 24" DIAMETER, OFFSET

1. DESCRIPTION:

This work shall consist of the construction of a steel reinforced concrete offset light pole foundations, 24 inches in diameter, with offset construction as indicated, complete with raceways, all as indicated in the Contract Drawings, and in accordance with Section 836 of the Standard Specifications.

2. BASIS OF PAYMENT:

Offset foundations will be paid for at the contract unit price per **FOOT** for **LIGHT POLE FOUNDATION, 24" DIAMETER, OFFSET**.

MAINTENANCE OF LIGHTING SYSTEMS

Replace Article 801.11 and 801.12 of the Standard Specifications with the following:

Effective the date the Contractor's activities (electrical or otherwise) at the job site begin, the Contractor shall be responsible for the proper operation and maintenance of all proposed or existing lighting systems which are part of, or which may be affected by the work until final acceptance or as otherwise determined by the Engineer.

Maintenance of Proposed Lighting Systems

Proposed Lighting Systems. Proposed lighting systems shall be defined as any lighting system or part of a lighting system, temporary or permanent, which is to be constructed under this contract.

The Contractor shall be fully responsible for maintenance of all items installed under this contract. Maintenance shall include, but not be limited to, any equipment failures or malfunctions as well as equipment damage either by the motoring public, Contractor operations, vandalism, or other means. The potential cost of replacing or repairing any malfunctioning, damaged, or vandalized equipment shall be included in the bid price of this item and will not be paid for separately.

Maintenance of Existing Lighting Systems

Existing Lighting Systems. Existing lighting systems shall be defined as any lighting system or part of a lighting system, temporary or permanent, which is to be modified under this contract.

The Contractor shall be fully responsible for maintenance of all items in the systems affected by the removal operations to be performed under this contract. Maintenance shall include, but not be limited to, any equipment failures or malfunctions as well as equipment damage either by the motoring public, Contractor operations, vandalism, or other means. The potential cost of replacing or repairing any malfunctioning, damaged, or vandalized equipment shall be included in the bid price of this item and will not be paid for separately.

Lighting System Maintenance Operations

The Contractor's responsibility shall include all applicable responsibilities of the Village of Minooka. These responsibilities shall include the maintenance of existing and proposed lighting units, cable runs and lighting controls affected by this project. In the case of a pole knockdown or sign light damage, the Contractor shall promptly clear the lighting unit and circuit discontinuity and restore the system to service.

If the equipment damaged by normal vehicular traffic, not contractor operations, is beyond repair and cannot be re-set, the contractor shall replace the equipment in kind with payment made for such equipment under Article 109.04. If the equipment damaged by any construction operations, not normal vehicular traffic, is beyond repair and cannot be re-set, the contractor shall replace the equipment in kind and the cost of the equipment shall be included in the cost of this pay item and shall not be paid for separately.

Basis of Payment. Maintenance of proposed lighting and existing lighting systems affected by the work included in this contract shall be paid for at the unit price bid per **CALENDAR MONTH** for **MAINTENANCE OF LIGHTING SYSTEM** which shall be payment in full for the work specified herein.

HANDHOLE (SPECIAL)

This work shall consist of installing handholes at locations as shown on the plans, or as directed by the engineer, in accordance with section 814 of the standard specifications.

The handholes shall be QUAZITE PG covers and boxes. Size shall be 12" x 12" Handholes should be of the gasketed Heavy-Duty type w/ 2 bolts, ANSI TIER 15. The handholes shall be of the open bottom type. The label should read ELECTRICAL. This item shall include any splices or connections required in the handhole.

A French drain shall be constructed 18" deep in accordance with Section 601.06 of the Standard Specifications. All labor and materials required to construct the French drain shall be considered included in the cost of the handhole.

This work shall be paid for at the contract unit price per each for **HANDHOLE (SPECIAL)**, of the size specified, which shall include all material and work described herein.

LUMINAIRE, LED, ROADWAY, OUTPUT DESIGNATION H

This work shall consist of the furnishing and installation of luminaires as on the plans and in accordance with Section 821 and LUMINAIRES, LED (BDE Special Provision 80411) except as modified herein. This work shall include all labor, materials and equipment necessary for the proper installation.

The luminaires specified for this installation is as follows:

Intersection Light: The luminaire shall be rated 22,900 Lumens at 240 Volts, shall have a black powder coat finish and shall include a shorting cap.

This item shall be paid at the contract unit price **EACH** for **LUMINAIRE, LED, ROADWAY, OUTPUT DESIGNATION H** which shall be payment in full for the material and work described herein.

LUMINAIRE, LED, ROADWAY, OUTPUT DESIGNATION G

This work shall consist of the furnishing and installation of luminaires as on the plans and in accordance with Section 821 and LUMINAIRES, LED (BDE Special Provision 80411) except as modified herein. This work shall include all labor, materials and equipment necessary for the proper installation.

The luminaires specified for this installation is as follows:

Roadway Light: The luminaire shall be rated 16,400 Lumens at 240 Volts, shall have a black powder coat finish and shall include a shorting cap. The performance shall meet the following table(s):

STATE OF ILLINOIS

ILLINOIS DEPARTMENT OF TRANSPORTATION

LUMINAIRE PERFORMANCE TABLE FOR ROADWAY LUMINAIRE

Given Conditions

Roadway Data	Pavement Width (in one direction only)	38 ft.
	Pavement Width (in opposite direction)	38 ft.
	Number of Lanes (in one direction only)	3
	Number of Lanes (in opposite direction)	3
	Median width	0 ft.

	I.E.S. Surface Classification	R3
	Q-Zero Value	.07
Light Pole Data	Mounting Height	40 ft.
	Mast Arm Length	10 ft.
	Pole Set-Back From Edge of Pavement	3 ft.
Luminaire Data	Luminaire Type	LED
	Luminaire Lumens	16,749
	I.E.S. Vertical Distribution	
	I.E.S. Control Of Distribution	
	I.E.S. Lateral Distribution	Type III
	Lamp Lumen Depreciation Factor	.70
	Dirt Depreciation Factor	1.0
	Equipment Factor	1.0
	Total Light Loss Factor	.70 min
Layout Data	Spacing	225 ft.
	Configuration	Opposite
	Luminaire Overhang over edge of pavement	7 ft.

NOTE: Variations from the above specified I.E.S. distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

Performance Requirements

NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above. TM-21 and LM-80 reports must be attached and must support the Lamp Lumen Depreciation Factor given above.

Illumination	Average Horizontal Illumination, E_{AVE}	13 Lux
	Uniformity Ratio, E_{AVE}/E_{MIN}	3.0:1
Luminance	Average Luminance, L_{AVE}	0.90 Cd/m ²
	Uniformity Ratio, L_{AVE}/L_{MIN}	3.0 :1
	Uniformity Ratio, L_{MAX}/L_{MIN}	5.0 :1
	Max. Veiling Luminance Ratio, L_V/L_{AVE}	0.30 :1

This item shall be paid at the contract unit price **EACH** for **LUMINAIRE, LED, ROADWAY, OUTPUT DESIGNATION G** which shall be payment in full for the material and work described herein.

LUMINAIRE, LED, UNDERPASS, WALLMOUNT, OUTPUT DESIGNATION F

This work shall consist of the furnishing and installation of luminaires as on the plans and in accordance with Article 821.068 and LUMINAIRES, LED (BDE Special Provision 80411) except as modified herein. This work shall include all labor, materials and equipment necessary for the proper installation.

The luminaires specified for this installation is as follows:

The luminaire shall have the following features:

1. 12,963 Initial Lumens at 240 Volts
2. Includes fuse and fuse holder
3. Marine-grade, die cast aluminum construction
4. TGIC polyester powder coat finish with five-step pre-treatment to withstand 1,000 hour salt spray test per ASTM B117

5. Stainless Steel safety cables
6. 4 304 grade stainless steel latches
7. One-piece closed cell silicone gasket
8. Serviceable LED module array.
9. Replaceable surge protector rated to 20kA/kV
10. Clear polycarbonate lens

This item shall be paid at the contract unit price **EACH** for **LUMINAIRE, LED, UNDERPASS, WALLMOUNT, OUTPUT DESIGNATION F** which shall be payment in full for the material and work described herein.

LIGHT POLE, SPECIAL

This work shall consist of the furnishing and installation of light poles as shown on the plans and in accordance with Section 830 except as modified herein. This work shall include all labor, materials and equipment necessary for the proper installation.

The light poles shall be as manufactured by Hapco and shall include all accessories as shown on the plans including spring loaded banner saver arms. The entire assembly, including the banner arms, banner arm brackets, outlet cover, breakaway device, arm, bracketry, and exposed hardware shall be black.

The pole shall include a duplex outlet, UL listed, of the GFCI type, with weatherproof in-use covers in compliance with NEC article 406.8(B)(2)(a). Outlets shall be rated at 20a, 125 VAC, NEMA 50-20R and constructed as shown on the detail drawings. This work shall include all pole wiring, fuses, and other associated equipment needed to connect the outlets as shown.

This item shall be paid at the contract unit price **EACH** for **LIGHT POLE, SPECIAL** which shall be payment in full for the material and work described herein.

RELOCATE EXISTING LIGHTING UNIT

This work shall consist of the relocation of lighting units (pole, mast arm, luminaire, breakaway device all wiring and hardware, and all appurtenances including signage) at locations shown on the plans or as directed by the engineer. This work shall be in accordance with the details in the contract drawings and Section 844 of the Standard Specifications, except as modified herein.

An on-site meeting shall be held with the Village, Contractor, and Engineer before any work is done on the lighting system. Each pole to be relocated shall be inventoried, photographed, and noted of any structural, electrical, or cosmetic damage. The contractor shall take all responsibility for new damage during removal, transportation, storage, and re-installation. The materials shall be properly protected and stored at a secure location provided by the Contractor.

Poles shall be relocated onto new foundations as shown in the detail drawings. Foundations will be paid for separately.

The proposed location for the relocated poles are noted as such on the plans.

All work as described (except new wire and unit duct) will be paid for at the contract unit price per each for **RELOCATE EXISTING LIGHTING UNIT** which price shall be full compensation for all equipment, labor and materials as described herein.

REMOVAL OF POLE FOUNDATION

Existing foundations shall be removed in accordance with Article 842.04 of the Standard Specifications. The foundation materials shall be disposed of off-site. The holes shall be backfilled with trench backfill material. The foundations shall be removed in their entirety. Underground conduits and cables shall be separated from the foundation at 2.5 feet below grade and shall be abandoned.

All work as described (except new wire and unit duct) will be paid for at the contract unit price per each for **REMOVAL OF POLE FOUNDATION** which price shall be full compensation for all equipment, labor and materials as described herein.

RELOCATE EXISTING LIGHTING CONTROLLER

1. DESCRIPTION:

This work shall consist of removing and relocating the existing lighting controller and reconnecting all wiring and conduit as needed, including the work necessary to connect the proposed lighting to the existing controller at the relocated position. This work shall be performed in accordance with Section 825 of the Standard Specifications except as modified herein.

All splices shall be accomplished in the light pole handhole, in-ground handhole, or at the controller. No underground splices will be allowed. Where new cable or conduit is required, it will be paid according to the unit prices bid for the corresponding cable, duct, conduit etc.

This work shall include the removal and disposal of existing lighting controller foundation, and the backfilling of the excavated areas. This work shall be done in accordance with Article 842.04 of the Standard Specifications, except as modified herein. Concrete foundations shall be removed to at least 3 feet below grade with removed material disposed of off-site. The cost of removing the controller foundation will not be paid for separately but shall be considered incidental to the cost of the controller relocation.

The removal shall extend deeper where required to facilitate multi-use path construction at no additional cost. Underground conduits and cables shall be separated from the foundation at 2.5 feet below grade and shall be abandoned or re-used as indicated. The space caused by the removal of the foundations shall be backfilled with trench backfill in accordance with Section 208 of the Standard Specifications. The cost of backfilling will not be paid for separately but shall be considered incidental to the cost of the controller relocation.

Labor and materials required to relocate the existing electric service to a new power pole shall be included in this item. This includes coordination with the electric utility. Bushings, weatherheads, u-guards, straps, brackets, straps, hardware, and couplings may be re-used as necessary.

Rigid conduit and service conductors shall be new. Conduit and conductors will be paid for separately under their respective pay items.

As part of the relocation of the existing controller, the existing incandescent internal bulb shall be replaced with an LED equivalent bulb meeting the approval of the engineer. The cost of replacing the existing bulb will not be paid for separately but shall be considered incidental to the cost of the controller relocation.

The installation of the new foundation and work pad shall be in accordance with the plan details provided and shall be considered included in the cost of the controller relocation.

2. BASIS OF PAYMENT:

This work shall be paid for at the contract unit price per EACH for RELOCATE EXISTING LIGHTING CONTROLLER, which shall be payment in full for the relocation, removal and disposal of foundations and all work as specified herein.

POROUS GRANULAR EMBANKMENT, SPECIAL

PART 1 - GENERAL:

- 1.01 Description of Work:** This Section specifies the requirements for porous granular embankment, special. The work under this Section includes furnishing all labor, materials, tools and equipment necessary to furnish, place and compact porous granular embankment to be used as backfill behind abutments, behind retaining walls and as required in connection with Structure Excavation.
- 1.02** Except as modified herein, the work will be in accordance with the applicable portions of Section 207 of the Standard Specifications and as shown on the Plans.

PART 2 - PRODUCTS:

- 2.01 Material:** The material must consist of granular limestone backfill CA 11, or as approved by the Engineer, conforming to the requirements of Section 1004 of the Standard Specifications.
- 2.02 Construction:** The use of chats, wet bottom boiler slag, slag sand or crushed concrete will not be allowed for this item.

PART 3 – EXECUTION:

- 3.01** Before the material is deposited, it must contain the amount of moisture required for compaction. The amount of moisture required will be determined by the Engineer, for the material and compaction methods being used.
- 3.02** The porous granular embankment must be placed in lifts not exceeding 6 inches and compacted to 95% Standard Proctor maximum dry density as determined by ASTM D - 1557 Method C. The granular material must be placed in the full width of the excavation with equipment as approved by the Engineer and in such a manner which will not cause segregation and which will require minimum blading or manipulation. The equipment and the method used must be approved by the Engineer.

Backfilling must proceed immediately after installation of the geocomposite wall drains and underdrain pipes, where applicable, but not prior to 14 days after placement of concrete of the wall to be backfilled.

- 3.03** Each layer must be compacted immediately after placing.
- 3.04** If the moisture is insufficient to maintain satisfactory compaction or to prevent segregation, water must be added as directed by the Engineer.

3.05 Compaction tests must be made at the direction of the Engineer.

PART 4 – MEASUREMENT AND PAYMENT

3.01 Method of Measurement: This work shall be measured in place and the volume computed in cubic yards as shown on the plans.

3.02 Payment: This work will be paid for at the contract unit price per Cubic Yard for POROUS GRANULAR EMBANKMENT, SPECIAL.

ANTI-GRAFFITI PROTECTION SYSTEM

PART 1 – GENERAL:

Description

This work shall consist of furnishing and applying an anti-graffiti coating to the exposed vertical surfaces and top surfaces of the Retaining Wall, Special, new abutment, modified pier, existing abutment, existing steel span and new steel bridge span. All work discussed herein shall be executed in coordination with the plans and special provisions for FORM LINER TEXTURED SURFACE.

General Requirements. The anti-graffiti protection system shall consist of a permanent, color stable, UV, stain, chemical and abrasion resistant coating. The removal of graffiti from the protected surfaces shall be accomplished by applying a separate removal agent as recommended by the manufacturer of the permanent coating. The removal agent shall have the capability of completely removing all types of paints and stains. After graffiti removal there shall be no damage to the anti-graffiti coating or the surface to which it is applied. Additionally, there shall be no evidence of ghosting, shadowing, or staining of the protected surface.

Installer / Product Qualifications. The Contractor shall submit written evidence that the installer for the work of this section has completed at least 5 projects of similar complexity within the past five years. The anti-graffiti protection system shall be a product that has been commercially available for a period of at least five (5) years. Samples of the proposed material shall be supplied to the Engineer for testing. The Contractor shall apply the material per the manufacturer's recommendations to a color-stained form liner mockup as required in the Form Liner Textured Surface special provision. After the manufacturer's recommended curing period, the Engineer will apply various types of graffiti materials to the coating. After three (3) days the removal agent shall be used to remove the graffiti. If after graffiti removal the anti-graffiti coating is clean and undamaged, with no evidence of ghosting, shadowing or staining, then the anti-graffiti coating may be approved for use.

Surface Preparation. Prior to application of the anti-graffiti coating, all designated surfaces shall be cleaned by a method as recommended by the coating manufacturer and approved by the Engineer. All surfaces shall be thoroughly clean, dry and free of dust that might prevent penetration of the coating. New concrete should be thoroughly cured before application of the coating. Concrete surfaces shall be properly sealed according to the manufacturer's recommendations so the application of the system does not produce any noticeable long-term change in the color of the surfaces being treated. A technical representative of the manufacturer shall be present to approve surface preparation and application of the anti-graffiti protection system. The Contractor shall coordinate with the various suppliers to ensure all products used in the form lining, color staining and anti-graffiti protection of concrete surfaces are compatible with the other products.

Weather Conditions. Coatings shall not be applied in the rain, snow, fog or mist, nor shall they be applied if these conditions are expected within twelve (12) hours of application. Coatings shall not be applied when surface or air temperatures are less than 40° F nor greater than 100° F, or are expected to exceed these temperatures within twelve (12) hours of application.

Application. The manufacturer's product data sheets and application guides shall be submitted to the Engineer prior to coating application. All information contained in the data sheets and application guides shall be strictly followed. All coatings shall be applied in the presence of the Engineer. The wet film thickness will be measured by the Engineer and shall be according to the manufacturer's recommendation. Application of the clear protective coating shall take place after the application and curing of any color staining compounds as required within the Staining Concrete Structures special provision and as appropriate for the surface to be treated.

Cleaning Agent. The Contractor shall supply the Engineer with an initial quantity of the removal agent and written instructions for its use, as recommended by the manufacturer for graffiti removal. The amount shall be furnished at the rate of 1 quart per 200 square foot of treated surface area.

Samples. Contractor shall apply proposed coating system to the form liner mockup and provide demonstration of the product.

PART 2 – MEASUREMENT AND PAYMENT

2.01 Method of Measurement

This work will be measured for payment in place per square foot of exposed surface area upon which the anti-graffiti protection system has been applied and approved by the Engineer. No surface area will be measured for payment for areas below final grade.

2.02 Basis of Payment

This work will be paid for at the contract unit price per square foot for ANTI- GRAFFITI PROTECTION SYSTEM which price shall be payment in full for the cleaning of

designated surfaces, the application of the anti-graffiti coating, supplying the manufacturer's technical representative, the product qualification on the stained mockup and supplying the initial quantity of cleaning agent.

FORM LINER TEXTURED SURFACE

PART 1 – GENERAL:

1.01 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 various concrete treatments as shown in the drawings and specifications for exposed cast-in-place and precast concrete surfaces. Work shall be performed in accordance with applicable portions of Section 503 of the IDOT Standard Specifications and as specified herein.

Work this section with the special provision for ANTI-GRAFFITI PROTECTION SYSTEM.

General. Concrete facing patterns shall consist of a STACKED STONE finish as shown below:



The following three form liner manufacturers have been approved to provide STACKED STONE patterned form liners.

Manufacturer	Pattern Number	Pattern Name
ARCHITECTURAL POLYMERS 1220 Little Gap Rd Palmerton, PA 18071 (610) 824-3322 www.apformliner.com	911A	Large Stone Drystack
CUSTOM ROCK INTERNATIONAL 1156 Homer Street St. Paul, Minnesota 55116	1208	Drystack

(800) 637-2447 www.custom-rock.com		
DAYTON SUPERIOR 402 S. First Street Oregon, IL 61061 (800) 800-7966 www.daytonsuperior.com	F3170578, F3170503	Standard Dry Stack

Form liner finish shall include 3" to 42" stones and a maximum relief of 1-1/2". All manufacturers of form liners shall adhere to the provisions listed herein and in the plans.

Concrete facing patterns shall be of consistent source, pattern, and size between the Retaining Wall, Special and the cast-in-place abutment and precast abutment cap. The Contractor shall take appropriate measures to ensure the horizontal and vertical pattern joints in the cast-in-place abutment, precast abutment is consistent with the Retaining Wall, Special wall face sizes.

1.02 Submittals

Shop drawings of the concrete facing patterns shall be submitted to the Engineer for each area of textured concrete. Shop drawing submittals shall include:

1. Individual form liner pattern descriptions, dimensions, and sequencing of form liner sections. Include details showing typical cross sections, joints, corners, step footings, stone relief, stone size, pitch/working line, mortar joint and bed depths, joint locations, edge treatments, and any other special conditions.
2. Elevation views of the form liner panel layouts for the STACKED STONE texture showing the full length and height of the structures including the footings with each form liner panel outlined. The arrangement of the form liner panels shall provide a continuous pattern of desired textures and colors with no interruption of the pattern made at the panel joints.

PART 2 - MATERIALS

Form liners shall be of 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 stone texture shall be made from high-strength elastomeric urethane material which shall not compress more than 0.02 feet when poured at a rate of 10 vertical feet 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.

Forms for smooth faced surfaces shall be plastic coated or metal to provide a smooth surface free of any impression or pattern.

Cast Concrete Mockup. The Contractor shall provide to the Engineer a cast concrete mockup containing the STACKED STONE form liner surface. The form liner

manufacturer's technical representative shall be on-site for technical supervision during the installation and removal operations.

The purpose of the mockup is to select and verify the masonry pattern and different color concrete stains to be used for the STACKED STONE pattern.

1. Locate mockup on site as directed by the Engineer.
2. The mockup shall be a minimum 5 ft. x 5 ft. x 6 in. thick.
3. Include examples of each condition required for construction i.e. liner joints, construction joints, expansion joints, steps, corners, and special conditions due to topography or manmade elements, etc.
4. Upon receipt of comments from inspection of the mockup, adjustments or corrections shall be made to the molds where imperfections are found. If required, additional mockups shall be prepared when the initial mockup is found to be unsatisfactory.

Installation. Form liners shall be installed in accordance with the manufacturers' 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 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. Cold joints shall not occur within continuous form liner pattern fields. Wall ties shall be coordinated with the liner and form to achieve the least visible results. Liners shall be stripped between 12 and 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. Concrete slump requirements shall meet the form liner

manufacturer's recommendations for optimizing the concrete finish, as well as IDOT's material specifications.

With the use of standard Portland cement concrete mixtures, the Contractor shall employ proper consolidation methods to ensure the highest quality finish. Internal vibration shall be achieved with a vibrator of appropriate size, the highest frequency and low to moderate amplitude.

Concrete placement shall be in lifts not to exceed 1.5 feet. Internal vibrator operation shall be at appropriate intervals and depths and withdrawn slowly enough to assure a minimal amount of surface air voids and the best possible finish without causing segregation.

External form vibrators may be required to assure the proper results. Any use of external form vibrators must be approved by the form liner manufacturer and the Engineer as coordinated with the County. The use of internal or external vibratory action shall not be allowed with the use of self-consolidating concrete mixtures. It is the intention of this specification that no rubbing of flat areas or other repairs shall be required after form removal. 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.

Guidelines for the use of Form Liners. Form liners are being used on this project to achieve very specific architectural results. The Contractor shall not deviate from the guidelines contained - herein unless authorized by the Engineer in writing.

PART 3 – MEASUREMENT AND PAYMENT

3.01 Method of Measurement: This work shall be measured and paid for in place and the area computed in square feet of actual concrete surface area formed with concrete form liners as specified herein.

Cast concrete form liner mockups with finished stain surfaces will not be measured for payment but included in the square foot price for this item. 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 the square foot price for this item.

3.02 Basis of Payment: STACKED STONE form lined surfaces will be paid for at the contract unit price per square foot for FORM LINER TEXTURED SURFACE. The unit price bid for these items shall include all labor and material costs associated with forming, pouring, and disposal of forms, including satisfactory cast concrete mockup panels to the requirements included herein.

CONSTRUCTION VIBRATION MONITORING

PART 1 – GENERAL:

Description. This work consists of monitoring buildings, and structures susceptible to movement. Additional monitoring of facilities may be required and will be determined by the Engineer during the work. Additional monitoring, as determined by the Engineer, is included in the cost of this item.

The Contractor shall monitor adjacent building for both vibration and displacement. The Contractor shall designate a minimum of three monitoring point locations for the structure located at 112 Ridge Road, Minooka, IL.

The monitoring point locations shall be spaced as evenly as possible along the building edge. The monitoring points for vibration and displacement do not have to be at the same location. The Contractor shall coordinate with the Engineer and building owner to ensure the proposed monitoring locations are acceptable to the building and accessible to both the Contractor and the Engineer. Proposed locations of building vibration and displacement monitoring points are to be submitted to the Engineer for approval prior to construction.

Vibration Monitoring: The Contractor shall employ the services of a seismic monitoring consultant as approved by the Engineer. Monitoring point locations and frequency of data collection shall be as determined by the Contractor's Consultant and are subject to the approval of the Engineer. All vibration monitoring devices (seismographs) shall be attached to the floor of the buildings they are monitoring. The limit of acceptable vibration (Limiting Value) at structure shall be 0.5 in/s (inches per second) peak particle velocity. The Contractor's consultant may propose a Threshold Value of vibration for Engineer's review. When the Threshold Value is reached, the Contractor must stop the work and meet with the Engineer to determine the best course of action to reduce the vibrations (or minimize further displacement). Once the Limiting Value is reached, the work is stopped and a more formal response plan is submitted for approval before work can proceed. All seismographs on the project shall be programmed to actuate an alarm when the Threshold Value is exceeded. The alarm notification protocol shall consist of immediate dialing of mobile telephone numbers of the Engineer and the Contractor.

If the Limiting Value is exceeded, all vibration inducing work within 100 feet of the existing building shall be stopped. Work may resume at the direction of the Engineer with the Contractor continuing to closely monitor vibration in the area of the alarm. If the work is stopped because the Limiting Value is exceeded there will be no additional compensation nor any additional time extensions granted. Any change in construction methods to avoid exceeding Limiting Value will not be grounds for additional compensation.

Displacement Monitoring: The Contractor shall provide the exact horizontal and vertical location of the displacement monitoring points to the Engineer prior to the commencement of any construction activities. The data shall be presented in a tabular format and shall

include horizontal positions (stations and offsets or Northing and Easting) as well as vertical elevation to a minimum of one hundredth of a foot (0.01').

Monitoring Frequency: During the beginning phase of each stage of demolition and construction, displacement monitoring shall be performed at the beginning and end of each work day at a minimum. These surveying intervals are the minimum required, and more frequent monitoring may be required by the Engineer as field conditions warrant.

If after a period of time resulting in movements that are small in magnitude, monitoring frequency can be reduced to a frequency as established by the Engineer. If resulting movements become random in nature and/or large in magnitude, the frequency shall be increased as directed by the Engineer. The frequency of readings will be dictated by the phase of current construction but must be sufficient to detect serious movements so that corrective measures can be initiated immediately.

Monitoring readings for displacement shall be dated, recorded, and reported to the Engineer the same day the readings are taken.

Vibration monitoring shall be a continuous and uninterrupted process. During demolition within 50 feet of a vibration monitoring point location, the Contractor shall report the results of the largest amplitude of vibration to the Engineer on the same day. At all other times the vibration report shall be submitted weekly.

PART 2 Execution:

Construction Requirements. Before the start of construction, the Contractor will complete a preconstruction inspection of the following address: 112 Ridge Road, Minooka, IL.

Before the start of construction, the Contractor will complete a preconstruction inspection of the existing building listed above. Readily visible conditions and distress such as unusual cracks in concrete or masonry, obvious signs of leakage, settlement, etc. will be photographically recorded and documented. The Contractor will also make a DVD survey to provide a more complete general record of conditions in those areas. The interior survey shall include the first floor and basement (if existing) within 30 feet of the exterior wall closest to the project site. The exterior survey will include the exterior wall closest to the project site and the two adjacent walls. The survey will be performed from grade without the use of magnification devices. At the conclusion of the pre-construction field work, a report shall be prepared by the Contractor presenting the observed existing conditions and shall include written, videotaped and photographic documentation. This record shall then be used by the Contractor as a basis for comparison to distresses that may occur after the survey. The locations of the displacement monitoring points shall be included in the Report.

The Contractor will use the preconstruction report to aid in the selection of the displacement monitoring points. The Contractor must devise means and methods of construction that will not exceed the specified vibration limits. The Contractor is advised

that particularly careful demolition requirements will be required at the edges of the retaining wall where the property line is immediately adjacent to the area of construction.

Corrective Measures. If at any time resulting movements are serious in nature or cause damage to facilities or property, the Contractor shall stop work immediately and the necessary corrective measures shall be initiated as directed by the Engineer. Damage as a result of the work activity of the Contractor will be corrected by the Contractor as determined by the Engineer. No additional compensation will be due the Contractor for repairing these facilities. The Contractor will not be entitled to any claim of delay for stopping of working to make correct measures.

Submittals. The Contractor must submit a Vibration and Displacement Control Plan to the Engineer for Approval. The Plan must be approved prior to the commencement of work. The plan must include, but is not limited to the following:

- Locations of all monitoring points (Vibration and displacement).
- Procedure and outline for how the data will be provided to the Engineer.
- Type of seismograph to be used (Submit to Engineer for Approval).
- List of pneumatic equipment to be used during demolition operations.
- Contact information for the Seismic Monitoring consultant.
- Timetable that outlines the duration that each monitoring point will be maintained and checked.
- A "Response Plan" to detail how the Contractor will address any concerns with vibration or displacement.

Additional Submittals include:

- Daily reports of all displacement monitoring
- Weekly reports of all vibration monitoring

PART 3 – MEASUREMENT AND PAYMENT

3.01 Method of Measurement: The work under this item as described herein will not be measured separately. It will be paid for as lump sum.

3.02 Basis of Payment: This work will be paid at the contract unit price per lump sum for CONSTRUCTION VIBRATION MONITORING which payment shall be full compensation for the work described herein and as directed by the Engineer.

TEMPORARY SOIL RETENTION SYSTEM (SPECIAL)

PART 1 – GENERAL

1.01 Description: The temporary soil retention system, special shall be designed by the Contractor as a minimum, to retain the exposed surface area specified on the plans or the exposed surfaces needed by the Contractor to complete the work.

This work shall also include furnishing and installing sheeting, ground anchors, deadmen anchors, wales, sheet piling railing and miscellaneous steel shapes, plates, timber blocking and connecting hardware when required to attach the sheeting to an existing substructure unit and/or to facilitate stage construction. It also includes removal of sheeting, ground anchors, deadmen anchors, wales, sheet piling railing and miscellaneous steel shapes. It shall also include any excavation performed in conjunction with this work beyond the limits specified for Structure Excavation (Special) to allow for the installation of ground anchors, deadmen anchors, wales and other connecting hardware, as well as backfilling the excavated areas. The proposed temporary soil retention system must stay on CN property.

- 1.01 General:** Design computations and shop drawings shall be submitted according to Article 522.05, and meet the requirements AREMA and CN Railroad. The Contractor is responsible to check with IDOT to determine their review and approval time. The Contractor is responsible to check with the Railroad to determine their review and approval time. The calculations shall be prepared and sealed by an Illinois Licensed Structural Engineer. The calculations must meet AREMA, CN and IDOT Standards when applicable. This approval will not relieve the Contractor of responsibility for the safety of the excavation. Approval shall be contingent upon acceptance by all involved utilities and/or railroads.

Ground anchor design and construction for Temporary Soil Retention System (Special) is the Contractors responsibility. All ground anchor calculations must be submitted to the Engineer and IDOT Bridge Office for review and comment. The Contractor is responsible to check with IDOT to determine their review and approval time. All ground anchor calculations must be submitted to the Engineer and Railroad for review and comment. The Contractor is responsible to check with Railroad to determine their review and approval time.

PART 2 – PRODUCTS

- 2.01 Material:** The sheet piling shall be made of steel and may be new or used material, at the option of the Contractor. The sheeting shall be ASTM A572, Grade 50. The sheeting, used by the Contractor, shall be identifiable and in good condition free of bends and other structural defects. The Contractor shall furnish a copy of the published sheet pile section properties to the Engineer for verification purposes. The Engineer's approval will be required prior to driving any sheeting. All driven sheeting not approved by the Engineer shall be removed at the Contractor's expense.
- 2.02 Construction:** The Contractor shall verify locations of all underground utilities before driving any sheet piling. Any disturbance or damage to existing structures, utilities or other property, caused by the Contractor's operation, shall be repaired by the Contractor in a manner satisfactory to the Engineer at no additional cost to

the Grundy County. The Contractor shall be responsible for determining the appropriate equipment necessary to drive the sheeting according to the Contractor's approved design. The sheet piling shall be driven, as a minimum, to the tip elevation(s) specified, prior to commencing any related excavation. If unable to reach the minimum tip elevation, the adequacy of the sheet piling design will require re-evaluation by the Grundy County prior to allowing excavation adjacent to the sheet piling in question. The Contractor shall not excavate below the maximum excavation line shown in the approved design without the prior permission of the Engineer. The sheet piling shall remain in place until the Engineer determines it is no longer required.

The sheet piling shall be removed and disposed of by the Contractor when directed by the Engineer. When allowed, the Contractor may elect to cut off a portion of the sheet piling leaving the remainder in place. The remaining sheet piling shall be a minimum of 12 in. below the finished grade or as directed by the Engineer. Removed sheet piling shall become the property of the Contractor.

PART 3 – EXECUTION

3.01 Excavation: Any excavation performed in conjunction with this work shall be according to Section 502 of the Standard Specifications. Subsequent backfilling shall be according to Section 502.10 of the Standard Specifications.

PART 4 – MEASUREMENT AND PAYMENT

4.01 Method of Measurement: The TEMPORARY SOIL RETENTION SYSTEM (SPECIAL) will be measured for payment in place in square feet. The area measured shall be the minimum of the vertical exposed surface area envelope of the excavation supported by temporary soil retention system.

4.02 Basis of Payment: This work will be paid for at the contract unit price per square foot for TEMPORARY SOIL RETENTION SYSTEM (SPECIAL). This includes the cost of ground anchors, deadmen rods, wales, sheet piling railing, miscellaneous steel shapes, timber blocking and connecting hardware, as well as any excavation and subsequent backfilling performed in conjunction with this work beyond the limits of Structure Excavation (Special).

Obstruction mitigation shall be paid for according to Article 109.04 of the Standard Specifications.

TRACK MONITORING

PART 1 – GENERAL

1.01 Description. This work shall consist of developing and implementing a Track Monitoring Program to provide pre-construction and post-construction track surveys, existing east abutment, existing span, and Temporary Bridge and daily monitoring of the Canadian National Railroad (CNRR) tracks for vertical and horizontal movements during all operations that may impact the existing railroad embankment. These operations shall include, but not be limited to:

1. Installation and removal of all TEMPORARY SOIL RETENTION SYSTEM (SPECIAL);
2. Installation and removal of TEMPORARY BRIDGE
3. Installation on piles
4. All backfilling operations

The Track Monitoring Program shall adhere to all guidelines and restrictions as set forth by the CNRR. No construction activities impacting the existing CNRR embankment shall be permitted prior to approval of the Track Monitoring Program by the Engineer and CNRR.

1.02 Submittals. A Track Monitoring Program to be implemented by the Contractor shall be prepared and sealed by a Professional Engineer licensed in the state of Illinois who is experienced in this type of construction and shall be submitted to the CNRR and the Engineer for approval prior to the start of any survey work.

As part of the Track Monitoring Program, the following submittals, at a minimum, shall be provided to the Engineer and CNRR:

1. Pre-Construction survey report
2. Post-Construction survey report
3. Weekly track condition reports
4. Contingency Plan

The Track Monitoring Program must be submitted for review at least 30 days before commencement of construction activities impacting the existing railroad embankment.

1.03 Construction. Prior to the start of any work on the CNRR's right-of-way, the Contractor shall meet with the CNRR Representative to determine his/her requirements for flaggers and all other necessary items related to the work activities on, over and next to the CNRR facilities.

A pre-construction track survey and inspection shall be performed prior to any construction operations taking place which shall consist of the Contractor establishing a horizontal baseline and track elevations. The following track monitoring criteria, at a minimum, shall be met:

1. Each rail shall be monitored from the west end of the existing bridge to 100' east of Temporary Bridge.
2. Establish at least two (2) monitoring points on the existing east abutment, four (4) points on the existing steel span, four (4) points on the Temporary Bridge steel spans, two (2) monitoring points on the new pier bent and abutment bent and four (4) monitoring points on the Temporary Soil Retention System, Special.

3. Baseline values shall be set a week prior to the construction of the TEMPORARY SOIL RETENTION SYSTEM (SPECIAL), or any alternate construction activity impacting the railroad embankment that may proceed earth retention elements.
4. Monitor horizontal and vertical ground and track displacements at least three (3) times daily for the first week and at least once daily thereafter. During Temporary Soil Retention System installation ground displacements shall be monitored on a near continuous basis using a remote monitoring system capable of providing real-time data. Continue monitoring for a least two weeks after the completion of the construction operation.
5. The CNRR shall be notified of any movement noticed during track monitoring, even when below the 1/8" threshold value. The Contractor's Contingency Plan shall be enacted when movements reach the 1/8" threshold value.
6. If ground surface displacements are still occurring after two weeks, continue monitoring up to another four weeks until the displacement stabilizes, or as directed by CNRR or the Engineer.

The Contingency Plan shall be implemented in the event that the track displacements exceed the threshold (1/8") movement value. Construction activities must be discontinued if track movements exceed the ¼" shutdown value as established by the pre-construction track survey. Permissible mitigation measures to correct excessive movement of the tracks may include, but are not limited to:

1. Compaction grouting through the embankment to raise the grade
2. Coordination with the CNRR to re-level the tracks affected. Track re-leveling would be done by CNRR forces at their earliest convenience.

Any mitigation measures shall be the responsibility of the Contractor, performed at the Contractor's expense prior to resuming construction operations. Construction shall not resume until mitigation measures are satisfactory to the CNRR.

The Track Monitoring Program shall utilize a remote monitoring system that does not require fouling of the tracks to take the survey readings; fouling the tracks to survey movement is not acceptable other than to place any track monitoring targets. Monitoring targets should be placed such that monitoring is possible when a train is present. However, monitoring during the passing of a train is not required. The same targets should be maintained throughout the duration of the Track Monitoring Program. Targets should be removed once the monitoring phase is completed.

Track conditions shall be documented and tabulated for weekly submittal to the CNRR and the Engineer.

The Contractor shall complete a post-construction track survey and inspection after completion of the operation. The post-construction track survey shall consist of the Contractor surveying the same points taken during the pre-construction track survey, taking horizontal and vertical measurements, for a period of fourteen (14) consecutive calendar days and as accepted by CNRR and the Engineer. If multiple operations are on-going concurrently, the post-construction track survey shall be performed based off the operation that is completed last. All pre-construction and post-construction track survey work shall be included in the cost of the daily track monitoring.

PART 2 – MEASUREMENT AND PAYMENT

2.01 Method of Measurement. The track monitoring will be measured for payment per calendar day until the post-construction track survey is completed. Additional track monitoring that extends beyond the post-construction track survey due to continued ground surface displacements will not be measured for payment.

2.02 Basis of Payment. This work will be paid for at the contract unit price per calendar day for TRACK MONITORING.

RETAINING WALL, SPECIAL

PART 1 – GENERAL:

Description. This work shall consist of the design, manufacture and construction of a precast modular retaining wall structure in accordance with Section 522 of the Standard Specifications and as modified or supplemented herein. Work shall be done in close conformity with the lines, grades, and dimensions shown in the plans.

General. The County and Canadian Railroad (CNRR) have approved the use of a Reinforced Earth Company T-WALL ® retaining wall system on this project. The Contractor may propose to use an alternate precast modular retaining wall system. Any proposed alternative wall systems shall be subject to review and approval from the Engineer and CNRR. Additional submittals not listed herein may be required at the discretion of the CNRR in support of an alternate system.

Design of the precast modular retaining wall shall meet the current requirements of AREMA – Manual for Railway Engineering.

Top of precast modular retaining wall stems shall be set at an elevation at least 1'-0" above the proposed ground line at the back face of the wall. Design of the precast modular retaining wall shall consider track loading.

Submittals. The Contractor or their supplier shall submit complete design calculations and shop drawings to the CNRR and Engineer no later than 45 days prior to beginning wall construction. All submittals shall be signed and sealed by a licensed Illinois Structural Engineer and shall include all details, dimensions, quantities and cross sections necessary to construct the wall. No work or ordering of materials shall be done by the Contractor until the submittal has been approved in writing by the CNRR and Engineer.

PART 2 MATERIALS:

Precast Wall Modules.

The material shall be in accordance with Section 522.10 of the Standard Specifications and unless the manufacturer requirements govern.

PART 3 Execution:

Construction.

Repairs. Repairs to the units in the field are possible only with a preapproved repair procedure and prior permission of the Owner and manufacturer.

Cleaning. After completion of wall installation, remove construction debris and restore any adjacent finished areas affected by wall construction to their pre-construction state. Wash the wall face to remove soiling and stains. Do not use acid or detergents that may “burn” or discolor the face.

Staining, Sealing or Coatings. Field apply color stain and anti-graffiti protection coating in accordance with manufacturer’s recommended procedures and as specified elsewhere within these special provisions.

Remove existing deck waterproofing on the existing bridge as shown on the plans. This includes labor, equipment, material and any temporary support of the ballast.

PART 4 – MEASUREMENT AND PAYMENT

4.01 Method of Measurement: RETAINING WALL, SPECIAL will be measured for payment in square feet. The precast modular wall will be measured from the top of wall units to the theoretical top of leveling pad line for the length of the wall as shown on the plans.

4.02 Basis of Payment: This work will be paid for at the contract unit price per square foot for RETAINING WALL, SPECIAL. The unit price includes the precast units, joint material, excavation, leveling pads, select backfill within the limits of the precast modular wall stems, drainage materials for the wall, and all materials, labor, equipment, and incidentals necessary to complete the installation.

TEMPORARY BRIDGE

PART 1: DESCRIPTION

1.01 General

- A. This Section includes all the work required to construct the Temporary Bridge as indicated in the Plans. Construction includes but is not limited to driving piling, furnishing steel bent caps, furnishing and erecting structural steel, installing a new open timber deck, placing track, and installing the walk and handrail. It also includes removal of temporary bridge.
- B. In addition, this Section includes the work required on the east end of the existing span to accommodate the temporary and permanent bridge. This work includes but is not limited to the installation of a temporary ballast retainer across the width of the ballast pan, installation of timber blocking to support ties between the retainer and the temporary span. Removal of these temporary works is also included.
- C. The removal of existing waterproofing and installation of replacement waterproofing on the existing span is not covered by this Section. Refer to Deck Waterproofing specifications.

1.02 References

- A. Canadian National Railroad Safety Rules
- B. AREMA: Manual for Railway Engineering, latest edition

1.03 Quality Assurance

- A. CONSTRUCTION SUPERVISION - The bridge construction shall be progressed with skilled supervision and labor and the Contractor shall construct the structure in such a manner as may be required by the Engineer. Any supervisor or laborer not satisfactory to the Canadian National Railroad or the Engineer shall be removed from the Project on request of the Engineer.

1.04 SUBMITTALS

- A. Shop Drawings: The Contractor shall prepare Shop Drawings for submittal in accordance with the General Specifications showing details for all elements.

PART 2: MATERIALS

2.02 Steel Piles HP14x89

- A. HP14x89 piles shall conform to Standard Specifications.

2.04 Reinforcement Bars

A. Reinforcement Bars (plain) shall conform to Article 508 of the Standard Specifications.

2.05 Structural Steel

A. Structural steel shall conform to the applicable requirements of FURNISHING AND ERECTING STRUCTURAL STEEL, SPECIAL in the Detailed Specifications. A shim pack consisting of 2 -1/8", 2-1/4" and 2-1/2" adjusting shim plates shall be provided for each bearing in addition to all other plates or shims and they shall be placed between the Bed Plate and the Neoprene Pad if required. The steel shall be A709 Grade 50W2 and bracing A588, Grade 50.

2.06 Anchor Bolts

A. Anchor bolts shall conform to the applicable requirements of FURNISHING AND ERECTING STRUCTURAL STEEL, SPECIAL in the Detailed Specifications.

2.08 Handrail

A. Handrail shall be designed by the contractor and it shall meet AREMA requirements and CN standards. Stamped calculations and plans must be submitted for approval. Handrail shall conform to the applicable requirements of FURNISHING AND ERECTING STRUCTURAL STEEL, SPECIAL in the Detailed Specifications.

2.09 Walkway Grating

A. Walkway grating shall be designed by the contractor and it shall meet AREMA requirements and CN standards. Stamped calculations and plans must be submitted for approval.

2.10 Trackwork

A. Ties, rail, inner guard rail, and other track material shall conform to the Specification for Trackwork Construction.

B. The Contractor shall use timber for the temporary ballast retainer and for blocking up track at the end of the span.

PART 3: EXECUTION

3.01 Driving Piles

A. Driving of piles shall conform to Section 512 of the Detailed Specifications.

3.02 Erecting Structural Steel

A. Erection of Structural Steel shall conform to the applicable requirements of FURNISHING AND ERECTING STRUCTURAL STEEL, SPECIAL in the Detailed Specifications.

3.03 Trackwork

A. Placement of ties, rail, inner guard rail, and other track material shall be according to the Canadian National Standards and AREMA.

B. Timber use for support of ties and the ballast retainer shall be sound and meet requirements of AREMA and Canadian National. The Contractor shall submit for approval drawings of the proposed work to the Engineer prior to undertaking any work.

3.04 Handrail

A. Placement of handrail shall be according to the applicable requirements of FURNISHING AND ERECTING STRUCTURAL STEEL, SPECIAL in the Detailed Specifications.

3.05 Stud Shear Connectors

A. Welding and workmanship shall be according to the requirements of the AWS-Bridge Welding Code.

3.06 Walkway Grating

A. Walkway grating shall be installed in accordance with the manufacturer's instructions or as directed by the Engineer.

PART 4: METHOD OF MEASUREMENT AND PAYMENT

4.01 Measurement

- A. Construction of the temporary bridge will be measured for payment in units of a lump sum at the location designated on the Plans. Individual components of the temporary bridge as described and shown on the Plans will not be measured for payment.

4.02 Payment

- A. This work will be paid for at the Contract unit lump sum price for TEMPORARY BRIDGE completely installed and accepted in the location designated on the Plans. This payment shall be considered to be full compensation for all work, including all labor, furnishing and shipping materials, and equipment necessary to construct the structure.

DECK WATERPROOFING

PART 1: GENERAL

1.01 DESCRIPTION OF WORK

The work under this section shall include, but not be limited to, furnishing all labor, materials, tools, equipment and incidentals necessary to complete the placement of waterproofing and deck drainage systems. This work includes removal of existing deck water proofing and installation of water proofing on the existing bridge as shown on the plans.

1.02 SUBMITTALS

A. Certificates of compliance attesting that the materials meet specification requirements shall be submitted.

B. Instructions:

1. Manufacturer's instructions for installation of the deck waterproofing shall be submitted for approval. Instructions shall stress safety precautions required in handling.
2. Manufacturer's instructions for installation of the asphalt panels and the deck drainage system shall be submitted for approval.

C. Samples: The following samples shall be submitted for approval:

Seamless Spray Applied System	3-inch square section
Asphalt Panels	1-foot square section

D. Shop Drawings: Shop Drawings shall be submitted for approval and shall show size of sheets, position of sheets and splices, termination details and the deck drainage system layout and details.

PART 2: PRODUCTS

2.01 SEAMLESS SPRAY APPLIED SYSTEM

Seamless Spray Applied System shall be one of the following:

1. Two-component elastomer membrane such as bridge deck membrane as manufactured by Bridge Preservation.

2. Two-component methyl methacrylate resin membrane as manufactured by GCP- Stirling Lloyd.

2.02 ASPHALTIC PANELS

The protective cover over the Seamless Spray Applied System shall be two layers of asphaltic panels. The asphaltic panels shall be in accordance with the requirements for Asphaltic Panels, as specified in Part 29, Chapter 8, of the AREMA Specifications. The thickness of each sheet shall be as specified on the plans and the width not less than four feet. The portion of the asphaltic panels which is exposed above the ballast shall be coated with Fibred Aluminum Roof Coating in accordance with Paragraph 14.4.4(b) of Part 29, Chapter 8, of the AREMA Specifications.

2.03 SEALING COMPOUND

The sealing compound for sealing unavoidable gaps between asphaltic panels shall be compatible with materials containing bitumens and any other materials in contact with it. The type of sealing compound, with evidence of compatibility, shall be submitted to the Engineer for approval before it may be furnished.

2.04 DECK DRAINAGE SYSTEM

The material for the deck drain half-round corrugated steel pipes, bottom pans, end plates, outlet drops, reducer sections and relevant fittings and anchors shall conform to the requirements of ASTM A760.

A. The holes in the half-round steel pipes and bottom pans shall be punched to the pattern shown on the Plans. The half-round corrugated steel pipes, bottom pans, end plates, outlet drops and reducer sections shall be given a two-ounce galvanized protective coating after all fabrication has been completed. All parts of the drainage system shall be coated uniformly with asphalt, inside and outside as specified in AASHTO M 190, Type A. Holes in the perforated pipe and bottom pans shall be blown open after coating with asphalt.

2.05 Bolts, nuts and washers shall be fabricated from steel, meeting the requirements of ASTM F3125 Grade A325, and be galvanized in accordance with ASTM A163.

2.06 The downspouts shall be plain bituminous-coated corrugated steel pipe conforming to the requirements of Article 1006.01 of the Standard Specifications. The top end of the downspouts shall be protected with a temporary wood cover.

2.07 PRODUCT DELIVERY AND STORAGE

Materials shall be delivered to the job site in the manufacturer's original, unopened packages, clearly marked with the manufacturer's name, brand name and description of contents. Membrane and adhesives shall be stored in clean, dry areas. Storage temperature for adhesives shall be between 60 degrees F and 80 degrees F.

PART 3: EXECUTION

3.01 PREPARATION OF SURFACES

Immediately prior to the application of the waterproofing, all areas of the floor plates and ballast stop plates to be covered with the waterproofing shall be carried out in accordance to the waterproofing manufacturer's requirement. Surfaces to be waterproofed shall be clean, smooth, dry and free of fins, sharp edges, oil, grease and loose or foreign materials. Projections or depressions on the surface on which the waterproofing is to be applied, that may cause injury to the waterproofing, shall be filled or removed as directed by the Engineer.

3.02 INSTALLATION OF DECK WATERPROOFING SYSTEM

The deck waterproofing materials shall be installed in accordance with the applicable requirements of Part 29, Chapter 8, of the AREMA Specifications and according to the manufacturer's specifications except as modified herein.

A. The component parts of the system shall be applied on the deck in the following order:

1. Seamless Spray Applied System

- i. Seamless apply waterproofing should be applied in accordance to the manufacturer's specifications.
- ii. During the process of the work, care shall be exercised to prevent injury to the waterproofing membrane by the passage of men and equipment. As soon as practicable after the membrane waterproofing has been placed, it shall be protected from damage by the installation of the asphaltic panels.

2. Placing of Asphaltic Panels:

- i. The asphalt protection boards shall be placed over the horizontal and the vertically inclined waterproofed surface of the deck, as shown on the Plans and as specified herein. The asphaltic panels shall be laid in accordance with Part 29, Chapter 8, of the AREMA Specifications except as modified herein. The panels placed on the horizontal

surfaces of the deck shall be placed dry. Those placed on the vertical surfaces shall be laid in a coating of bonding approved adhesive. Asphaltic panels shall be installed in two layers with joints staggered on the half-sheet module, and shall be carefully placed to ensure tight proximity to adjacent members.

- ii. Immediately prior to placing the protection course, the surface of the waterproofing membrane shall be cleaned of all dirt and loose material. Unless the air temperature is above 50 degrees F, the asphalt protection boards for the protection course shall be heated before being laid. If heated, they shall be heated to a temperature as many degrees above 50 degrees F as the air temperature is below 50 degrees F. The temperature of the sheets after heating shall not exceed the calculated temperature by more than 10 degrees F. Heating shall be accomplished in a shed by an approved method which will result in bringing the sheets uniformly to the required temperature.
- iii. Each asphaltic panel shall be crowded up closely against adjoining asphaltic panels, using wedges, jacks, bars or other suitable means so as not to injure the water proofing membrane or the edges of the asphaltic panels. Any asphalt board which splits, crumbles or is damaged in any manner during its installation, shall be removed and replaced by a new panel.
- iv. After completion of placing the second layer, unavoidable gaps shall be filled with a compatible sealing compound.
- v. The asphaltic panels shall be covered with ballast as soon as possible after installation to minimize exposure to the weather.
- vi. Where edges or protrusions of asphaltic panels are exposed to prolonged sunlight exposure, coat exposed areas with Fibred Aluminum Roof Coating, meeting ASTM D 2824, Type 2, at a rate of 12 square feet per gallon (1/8" thickness).

3.03 INSTALLATION OF DECK DRAINS

The deck drains bottom pan shall be set into a thick coat of hot asphalt to anchor them in place. The asphalt shall be mopped on the asphaltic panels. The drains shall be carefully set to avoid gaps between sections.

3.04 INSTALLATION OF DOWNSPOUT

The steel downspout shall be installed in accordance with the applicable requirements of Section 541 of the Standard Specifications.

3.05 QUALITY CONTROL

The Contractor shall establish and maintain quality control for work under this section to assure compliance with Contract requirements, and maintain records of this quality control for all construction operations including, but not limited to, the following:

- A. Deck waterproofing
- B. Drainage system

A copy of the records of inspections and tests, as well as the records of corrective action taken, shall be furnished to the SP Lines as directed by the Engineer.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Deck waterproofing will be measured for payment in square foot basis, complete in place. Payment will constitute full compensation for surface preparation and furnishing and placing the seamless spray system, asphaltic panels and all other materials, labor, equipment and incidentals necessary to complete this item as shown on the Plans and specified herein.
- B. DECK DRAINAGE SYSTEM work on this item will not be measured for payment but will be included in the cost of DECK WATERPROOFING, complete in place. Payment will constitute full compensation for furnishing and installing the perforated, half-round, corrugated metal pipe deck drains and bottom pans, end plates, reducer sections, downspouts, fittings, clamps and anchors, and for all other materials, labor, equipment and incidentals necessary to complete this item as shown on the Plans and specified herein.

4.02 PAYMENT

- A. DECK WATERPROOFING shall be paid for at the square foot price, as shown in the Schedule of Prices for DECK WATERPROOFING.
- B. DECK DRAINAGE SYSTEM shall be paid in the price shown in the Schedule of Prices for DECK WATERPROOFING.

STRUCTURE EXCAVATION (SPECIAL)

PART 1 – GENERAL:

1.01 DESCRIPTION OF WORK

This Section specifies the requirements for excavation for structures. The work under this Section includes furnishing all labor, tools, materials and equipment necessary for excavation associated with the construction of permanent structures and will include, but not be limited to: removal and disposal of all unsuitable and/or unstable material encountered within the excavation limits shown on the plans; disposal of excess material; bailing, pumping and draining, as directed by the Engineer; backfilling in excavated areas where Porous Granular Embankment, Special, is not required.

Work under this item shall be in accordance with Section 502 of the Standard Specifications and as shown on the Plans, except as modified herein.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 DISPOSAL OF EXCESS EXCAVATION AND UNSUITABLE MATERIAL

Disposal of excess excavation and unsuitable material will not be paid for separately, but is included in the contract unit price for Structure Excavation (Special). Excess excavation and unsuitable material shall be disposed of outside the right-of-way according to Article 202.03 of the "Standard Specifications". Written authorization or a permit from the disposal site is required prior to removing any material from the site.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Structure Excavation (Special) will be measured for payment as a computed volume in cubic yards as noted on the Plans.

4.02 PAYMENT

This work will be paid for at the contract unit price per cubic yard for STRUCTURE EXCAVATION (SPECIAL), measured as herein specified. The price will be payment in full for all work, equipment and materials necessary for excavating,

removing, backfilling and/or disposing of all excavated materials and dewatering methods.

PRECAST CONCRETE SUBSTRUCTURE

PART 1 – GENERAL

1.01 Description:

This section specifies the requirements for precast concrete cap for the bridge abutment and other miscellaneous work. The Work under this section includes furnishing all labor, materials, tools and equipment required for constructing the cap; reinforcement bars, dowel bars and grout. It also includes all other appurtenant work, as specified herein, shown on the Plans or as directed by the Engineer.

PART 2 – MATERIALS

2.01 Precast Concrete Cap

- A. Precast concrete cap shall conform to the applicable requirements of the Standard Specifications, Sections 503 and 504.
- B. The minimum compressive strength of concrete for precast concrete members shall be 5000 psi at 28 days.
- C. Self-Leveling Grout shall be required at a depth of approximately 0.75" to create a level surface for the Precast Concrete Abutment element as shown in Plans.
- D. Self-Leveling Grout shall be per Section 1024.02 of the Standard Specifications. Self-Leveling Grout shall be approved by Engineer and CNRR.

PART 3 – EXECUTION

3.01 Precast Concrete Cap

- A. Construction of precast concrete cap shall conform to the applicable requirements of the Standard Specifications, Sections 503 and 504.
- B. Precast concrete elements shall be furnished with all materials required for erection.
- C. Precast concrete elements shall be carefully lowered into their proper position and to the specified elevations. After the element is in place and fastened as designated in the Plans, the lifting loops may be cut to ½" below the surface of the cap and the recess filled with non-shrink grout to top of surrounding concrete.

PART 4 – MEASUREMENT AND PAYMENT:

- 4.01 Measurement:** Precast Concrete Substructure will be measured for payment in units of a lump sum at the location designed on the Plans. Individual components

of the Precast Concrete Substructure as described and shown on the Plans will not be measured for payment.

- 4.02 Payment:** This work will be paid for at the contract unit lump sum for Precast Concrete Substructure completely installed and accepted in the location designated on the Plans. This payment shall be considered to be full compensation for all work, including all labor, furnishing and shipping materials, and equipment necessary to construct the cap.

PRECAST BRIDGE APPROACH SLAB

PART 1 – GENERAL

1.01 Description:

This section specifies the requirements for precast bridge approach slab and other miscellaneous work. The Work under this section includes furnishing all labor, materials, tools and equipment required for constructing the bridge approach slab; reinforcement bars, dowel bars, preformed joint filler and grout. It also includes all other appurtenant work, as specified herein, shown on the Plans or as directed by the Engineer.

PART 2 – MATERIALS

2.01 Precast Concrete

- A. Precast approach slab shall conform to the applicable requirements of the Standard Specifications, Sections 503 and 504.
- B. The minimum compressive strength of concrete for precast concrete members shall be 5000 psi at 28 days.
- C. Preformed Joint Filler with a total thickness of 0.5" shall be installed with the Precast Concrete Approach Slab units as shown on the Plans.
- D. Preformed Joint Filler shall be per Section 1051 of the Standard Specifications.

PART 3 – EXECUTION

3.01 Precast Concrete

- E. Construction of precast approach slab shall conform to the applicable requirements of the Standard Specifications, Sections 503 and 504.
- F. Precast concrete elements shall be furnished with all materials required for erection.
- G. Precast concrete elements shall be carefully lowered into their proper position and to the specified elevations. After the element is in place and fastened as designated in the Plans, the lifting loops may be cut to 1/2" below the surface and

the recess filled with non-shrink grout to top of surrounding concrete approach slab.

PART 4 – MEASUREMENT AND PAYMENT:

- 4.01 Measurement:** Precast Bridge Approach Slab will be measured for payment in units of square foot at the location designed on the Plans. Individual components of the Precast Concrete Substructure as described and shown on the Plans will not be measured for payment.
- 4.02 Payment:** This work will be paid for at the contract unit square foot for Precast Bridge Approach Slab completely installed and accepted in the location designated on the Plans. This payment shall be considered to be full compensation for all work, including all labor, furnishing and shipping materials, and equipment necessary to construct the approach slab.

FURNISHING AND ERECTING STRUCTURAL STEEL, SPECIAL

PART 1 – GENERAL

1.01 Description of Work: This section specifies requirements for furnishing and erecting structural steel. The Work under this section shall include furnishing all labor, materials, tools, equipment and incidentals required to furnish and erect structural steel for the bridge including, but not limited to, purchase, preparation and fabrication of structural steel components; all welding, drilling, bolting and other means of connection; carbon structural steel and high-strength low-alloy steel components; spherical graphited bronze expansion bearing plates, anchor bolts and architectural arch; non-destructive testing and any repairs and corrections determined by the Engineer to be necessary; all erection, shim plates and field modifications as required, field connections, temporary erection bents, erection derricks, shoring and cribbing; all shop cleaning including sandblasting, priming and painting; field cleaning including sandblasting, priming and field painting; application of an anti-graffiti coating; all shipping and handling, including special permits if required; and all other appurtenant items required for this Work.

1.02 Standards:

All materials, fabrication, inspection, testing and erection procedures shall conform to the applicable provisions of the following codes except as modified herein:

- A. Standard Specifications, Sections 505 and 506, including the current Supplemental Specifications for these sections.
- B. American Railway Engineering and Maintenance-of-way Association (AREMA) "Manual for Railway Engineering", Chapter 15, "Steel Structures", current

issue, Parts 1, 3 and 4, with particular emphasis on Section 15.1.14, FRACTURE CONTROL PLAN FOR FRACTURE CRITICAL MEMBERS.

- A. CN Guidelines for Design of Railway Structures.
- B. Surface preparation in accordance with the requirements of the latest issue of the following specifications and standards:

Steel Structures and Painting Council:
SSPC-SP1 Solvent Cleaning;
SSPC-SP2 Hand Tool Cleaning;
SSPC-SP3 Power Tool Cleaning;
SSPC-SP6 Commercial Blast Cleaning;
SSPC-SP10 Near White Blast Cleaning;
SSPC-Vis 1 Guide to Pictorial Surface Preparation Standards for Painting Steel Surfaces.

- C. AWS – Bridge Welding Code, D1.5 – Dated 2010 (AWS).

1.03 Submittals:

Submittals shall be made in accordance with Section Standard Specifications and shall include the following:

- A. Mill Affidavits and Certifications: The Contractor shall supply to the Engineer mill chemical and physical test reports, and Charpy test results, when required, for all structural steel.
- B. Shop Drawings: The Contractor shall verify dimensions and bridge layout prior to preparation of Shop Drawings. Prior to fabrication of structural steel, the Contractor shall submit Shop Drawings for structural steel fabrication and erection prepared by a qualified steel detailer. The Shop Drawings shall indicate all connections, lengths, locations of field and shop splices, attachments, erection and fabrication plans, and types of steel used. The Contractor shall review all Shop Drawings and verify all dimensions and procedures. The Contractor shall submit Shop Drawings to the Engineer for his review. Fabrication shall not commence until approval is received from the Engineer. The Contractor shall direct the Shop Drawing preparer to make all corrections and modifications, as directed by the Engineer, and resubmit the Drawings to the Engineer. The Engineer's approval of the Shop Drawings in no way shall relieve the Contractor of responsibility for electability, fabrication and fit in the field.
- C. Bolt, Nut and Washer Affidavits and Certifications: The Contractor shall supply to the Engineer the bolt manufacturer's chemical and physical mill test reports by heat, including nut-proof load and washer hardness.

- D. Non-destructive Testing: The Contractor shall submit to the Engineer all radiographic, ultrasonic, magnetic particle and other test records and test reports. This requirement shall in no way relieve the Contractor of the responsibility for determining the suitability or adequacy of the materials and procedures.
- E. Paint Information: The Contractor shall submit a list of proposed paints, manufacturer's literature and printed application instructions. The contractor shall confirm with the paint manufacturers that the proposed paint system, from different manufactures will work properly.
- F. Anti-Graffiti Coating: The Contractor shall follow the submittal requirements listed in Special Provision: ANTI-GRAFFITI PROTECTION SYSTEM, with all submittals to be approved by the Railway Company and Grundy County.
- G. As-built shop drawings in electronic form shall be delivered to the Railway Company as soon as the shop fabrication is completed, drawings shall be addressed to:

CANADIAN NATIONAL RAILWAYS

George Nowak, P. Eng
Senior Structural Engineer
10229 – 127th Avenue,
Floor 2 Building “B”,
Engineering – Structures,
Edmonton, Alberta
T5E 0B9

1.04 Qualifications:

The structural steel fabricator fabricating the steel, shall be certified under the American Institute of Steel Construction Quality Certification Program, Category III - Major Steel Bridges Including Rolled Beam Bridges, in accordance with Articles 3.1.1(a), 3.1.1.(b) and 3.1.1(c) Part 3, Chapter 15 of the AREMA Specifications. Evidence of certification shall be submitted to the Engineer for his approval before beginning work.

1.05 Fracture Control Plan for Fracture Critical Members:

The Contractor is notified that certain elements of the structure are defined on the Plans as FRACTURE CRITICAL MEMBERS (FCM). The Contractor shall adhere to all requirements of Section 15.1.14 of the AREMA Manual for the fabrication, testing and necessary repairs of these members.

1.06 Inspection and Quality Control:

- A. All materials and workmanship shall be subject to inspection by the Engineer in accordance with Article 505.05 "Inspection", of the Standard Specifications.
- B. The Contractor shall provide access to the work for inspection and testing purposes.
- C. The Engineer shall from time to time during the work inspect surfaces prior to painting for degree of cleanliness and after the painting has been completed make quality control tests, i.e., wet, dry film thicknesses, adhesion, etc.
- D. Areas found to be deficient with respect to preparation of surfaces and/or painting shall be corrected and made good by the Contractor, at his cost, to the satisfaction of the Engineer.

1.07 Non-Destructive Testing of Welding:

Radiographic, ultrasonic and magnetic particle inspections shall be performed on all welded steel construction in accordance with Article 505.04(q)(6) of the Standard Specifications except as modified herein.

- A. The radiographic, ultrasonic and magnetic particle inspections shall be performed by the Contractor or his representative. Such inspections shall be at the Contractor's expense. In addition, the Engineer may use any method of non-destructive testing for examination of weld passes or completed welds.
- B. The Contractor shall give the Engineer sufficient advance notice of the date on which the material will be radiographic, ultrasonic or magnetic particle inspected so that he may be present during the inspection.
- C. An interpretation of all radiographic films shall be furnished to the Engineer by the Contractor. The interpretation report shall be submitted on a form approved by the Engineer. In the event the Contractor questions the Engineer's interpretation of the radiographic films, a joint review of the film will be made; however, the Engineer's final interpretation shall govern.

1.08 The Contractor's attention is directed to the requirement that the new superstructure will be erected in stages as shown on the Plans or as required by the Construction Schedule.

PART 2- PRODUCTS:

2.01 Steel:

- A. All structural steel shall be carbon structural steel conforming to the requirements of Structural Steel, ASTM A709, Grade 50, unless otherwise specified herein or on the Plans.

Grade 50, F3). These components are noted on the Plans as Fracture Critical Members (F.C.M.).

- C. Rimmed or capped steel will not be permitted.
- D. Material noted on the Plans to be corrosion-resistant (C.R.) steel shall conform to High-Strength Low-Alloy Steel, ASTM A709, Grade 50 W.
- E. The upper floor plate must be raised pattern steel floor plates conforming to the requirements of ASTM A 786 and be corrosion resistance steel in accordance with ASTM A588 as noted on the plans as (C.R.*).

2.02 Bearing Plates:

Self-lubricating bronze bearing plates shall be as detailed on the drawings. Either one or both surfaces, as indicated on the drawings, shall be provided with trepanned recesses which shall be filled with a lubricating compound capable of withstanding the atmospheric elements and consisting of graphite and metallic substance with a lubricating binder; the compound shall be pressed into the recesses by hydraulic presses so as to form dense, non-plastic lubricating inserts. The lubricating area shall comprise approximately 25 percent of the total area. The bearing metal shall meet the requirements of A.S.T.M. Specification B22-08, Copper Alloy UNS No. C86300 (Formerly Alloy E). The coefficient of friction shall not exceed 0.10. Acceptable lubricant: G1 LUBRITE LUBRICANT, supplied by Lubrite Technologies.

ACCEPTABLE LUBRICANT SUPPLIERS:

COSMEC XL, supplied by Cosmec, Inc., 70 South Street, Walpole, A02081, Tel. (617) 668-6600 distributed by Goodco, Tel. (514) 661-1011 – general duty application for temperature not exceeding 250 degree.

G1 LUBRITE LUBRICANT, supplied by Lubrite Technologies, 145 Webster Street, Hanover Massachusetts 02339, Tel. (781) 871-1420, Fax. (781) 871-1492.

2.03 Masonry Plate Anchor Bolts:

All anchor bolts for masonry plates shall conform to ASTM F1554 Grade 105, nuts shall conform to requirements of ASTM A563 Heavy Hex, washer shall conform to requirements of ASTM A36 and shall be galvanized in accordance with ASTM F2329.

2.04 High-Strength Bolts

All bolts in structural connections shall be heavy hex high-strength structural bolts conforming to ASTM A325, Type 1 unless noted on plans. All bolts, connecting to the

requirements of ASTM A36 and shall be galvanized in accordance with ASTM F2329.

2.04 High-Strength Bolts

All bolts in structural connections shall be heavy hex high-strength structural bolts conforming to ASTM F3125 Grade A325, Type 3 unless noted on plans. All bolts, connecting to the floorplate and ballast stop plate that are in contact with the deck waterproofing system shall be ASTM F3125 Grade A325 Flat Hd. Countersunk bolts.

2.05 Nuts

All nuts shall be heavy hex nuts conforming to ASTM A563-DH or C. The manufacturer shall wax dip the nuts prior to shipping.

2.06 Washers

Washers shall be hardened washers conforming to ASTM F436, Type 3.

2.07 Identification of Span

- A. Span Identification Plate (8" x 12") shall be located as specify on the plans and shall be installed using two ½" diameter stainless steel cap screws.
- B. The plate and screws will be supplied by the Contractor.

2.08 Bearing Pads

- A. Rubber bearing pads shall conform to AREMA Chapter 15, Part 10, Clause 10.6.2.1.a meeting the requirements of Table 15-10-3 Elastomeric Material Property Test Requirements. The rubber pad shall be exposed to field temperatures falling to -40 degrees F, frequently for short duration and may remain below 5 degrees F continuously for up to 2-months. The test temperature for Low Temperature Properties shall be -22 degrees F.
- B. The fabricator shall submit a certificate from his supplier to the Engineer stating the requirements of the above clause have been met.

2.09 Slide Bearings

Slide bearings shall consist 3/32" thick PTFE sliding surfaces, such as Type CSA
by
CON-SERV INC.

2.10 Paints:

The Paint system shall be one of the following types listed herein. Paint system selected shall be applied in accordance with the manufacturer's specifications, and to the satisfaction of the Engineer.

A. Paint System I

1. "Carbozinc 859", zinc rich epoxy primer & "Carbocoat 2901", long oil epoxy ester, distributed by Corrosion Service Ltd.

B. Paint System II

1. "Amercoat 68A", zinc rich epoxy primer & "Amerlock 400/2", surface tolerant multi-use epoxy; manufactured by Ameron International, (distributed by General Paints in Canada).

C. Color of Paint

1. Each coat shall be of a different color to be approved by the Engineer.
2. Color of top coat (finish coat) shall be Chestnut Brown. This color shall be confirmed with Grundy County before it is applied. A different paint color or manufacturer can substituted by Grundy County at no cost. Any changes from this specification must be approved by the Engineer.

Note: Mixing and application shall be in strict accordance with manufacturer's written instructions.

D. Anti-Graffiti Coating

1. Coating shall meet the requirements of Special Provision X0321865: ANTI-GRAFFITI PROTECTION SYSTEM. Graffiti-resistant coating to be compatible with the selected paint finish coat.

2.11 Metallization

Metalize girder bottom flanges and web around bearing areas shall be in accordance with SSPC-CS Guide 23.00 or ASTM B833 and as shown on the plans. Zinc metallizing shall not be less than 0.01-inch thickness.

2.12 Joint Sealant:

Joint sealant at the ballast stop plate and asphaltic panel interface and between floor plates shall be a two-component, non-staining gray sealing compound with polysulfide liquid polymer gun grade, meeting the requirements of Federal Specification TT-S-227e, Type 2.

PART 3 - EXECUTION:

3.01 Fabrication:

Structural steel shall be fabricated in accordance with Section 505 "Steel Structures", of the Standard Specifications, and also in accordance with Parts 1 and 3, Chapter 15 of the AREMA Manual. Where differences occur in the provisions of the Standard Specifications and the AREMA Manual, the more stringent requirements shall be followed as determined by the Engineer. In addition, Fracture Critical Members, as designated on the Plans, shall also be fabricated in accordance with the requirements of the Fracture Control Plan, Section 1.14, Part 1, Chapter 15 of the AREMA Manual.

3.02 Holes:

Holes for shop and field connections for the bridge shall be sub punched or sub drilled and reamed to size with parts assembled as required by the AREMA Specifications except as otherwise specified herein.

A. All holes for field fasteners of end connections of intermediate and end floor beams, including those in shop-fastened connection angles, ends of floor beams, end floor beam connection plates, loose connection angles and plates and floor beam brackets shall be sub punched or sub drilled and reamed to size through steel templates. The corresponding field holes in the girder, stiffeners, connection plates or connection angles shall be reamed through the same template. Templates shall have hardened steel bushings. As an alternate, field holes may be reamed to size while floor beams and girders are shop-assembled and all parts match marked.

B. Shop and field holes for diaphragms and their supports.

3.03 Shop Assembly:

The girders, floor beams, floor beam brackets, diaphragms, floor plates, ballast stop plates, connection angles and architectural arch shall be assembled at the fabrication plant. Assembled steel shall not be dismantled until after the shop inspection has been completed. Top flanges of floor beams for the bridge shall be in a true plane to provide uniform support for the floor plates. To compensate for over-run or under-run in the depth of the floor beams, the dimension between the tops of floor beams and the bottom of the girder web, marked "HOLD" on the Plans, shall be maintained through the length of the girder. The flanges of girders at bearings shall be perpendicular to the web. The holes in the webs for the floor beam connections shall be reamed through a template.

Bearing shall be assembled complete in the shop and checked for fit and bearing of all contact surfaces and match marked for assembly in the field.

3.04 Connections:

All shop and field connections for the bridge shall be bolted with high-strength bolts, except as otherwise shown or noted on the Plans. All high-strength bolts shall have a hardened washer under the element (nut or bolt head) turned in tightening. Bolts shall be installed by "turn-of-the-nut" method except as otherwise shown or noted on the plans; reference AREMA 15.3.2.3.

Connections are to be prepared to meet AREMA Class B (Slip Coefficient 0.5) with minimum SSPC-SP6 blast cleaning.

3.05 Slide Bearings:

Slide Bearings must be attached to the members according to the manufacturer recommendations.

3.06 Welded Construction:

All welding on the bridge shall be in accordance with the requirements of Chapter 15 of the current edition of AREMA Specifications and the applicable provisions of Article 505.04(q) of the Standard Specifications except as specified herein or on the Plans. In case of conflict between the AREMA Specifications and the Standard Specifications, the AREMA Specifications shall take precedence and shall govern. Electro slag and electro gas welding will not be permitted.

- A. Connections of flanges to webs and all shop splices in flanges or webs shall be shop welded with full penetration groove welds, using the submerged arc automatic welding process. All fillet welding of stiffeners to webs shall also be done by the automatic submerged arc method. All other welds must be done with shielded metal-arc welding.
- B. Welding of fracture critical members (FCM) shall be in accordance with the requirements of Section 1.14 of Chapter 15 of the AREMA Specifications.
- C. Welded splices of the flange plates and girder web not shown on the Plans will be considered for approval by the Engineer upon submittal by the contractor of the splice locations and weld details.
- D. All welding inspection shall be at the Contractor's expense. Inspection procedures and inspection personnel qualifications for non-destructive testing of welded members shall be in accordance with the applicable requirements of Chapter 15 of the AREMA Specifications except as modified herein. The Contractor's attention is directed to the special testing requirements specified in Article 1.14 of Chapter 15 of the AREMA Specification for Fracture Critical Members. The welded work shall be inspected within the following minimum limits:
 - 1. All welds shall be visually inspected by the fabricator.

2. Ultrasonic inspection shall be as follows:
 - a. Bearing stiffeners: 100% at all times.
 - b. All welds between the tension flanges and the webs of girders specified as (FCM) shall be 100% ultrasonically tested.
 - c. Flange to web of plate girders: 100% until quality control has been established to a level of acceptability as determined by the Engineer. Thereafter, at least 30% of each weld shall be inspected (10% at each end of each span and 10% at random lengths and spaces in between). If the 30% inspection reveals defects considered unacceptable by the Engineer, 100% inspection shall be reinstated until acceptable quality control has again been established. This procedure may be repeated as often as may be considered necessary by the Engineer.
3. Magnetic particle inspection shall be made of all fillet welds connecting stiffeners to beams or plate girder webs - 10%.
4. All shop butt welds approved for use in flanges or web plates of plate girders shall be 100% inspected by radiograph.
5. All fillet welds on other members, including bearings, shall be inspected by magnetic particle - 10%.
6. The inspection service shall report the amount of inspection performed in lineal feet, location and length of defects, if any, and furnish a certification that these tests were performed in accordance with these Specifications.
7. Welds requiring repairs shall be retested after repairs are made.
8. For all welding use E-70 Electrodes.
9. CN Guidelines for Design of Railroad Structures, Part 2B "Fabrication Guidelines for Steel Bridges" shall also be followed.
- E. Engineer shall be furnished copies of all welding inspection reports, including a certificate stating that these inspections have been made and that all welds meet the quality requirements of the Standard Specifications, or AREMA Manual of Railway Engineering, Chapter 15, Part 1, Section 14 - Fracture Control Plan for Fracture Critical Members.

3.07 Facing and Bearing Surfaces:

Machine-finished surfaces of the sole plates and base plates of the bearings that are in contact with the bronze bearing plates shall be coated with an approved anti-rust compound applied as soon as the surfaces have been finished and accepted by the Engineer.

3.08 Assembly and Erection:

Structural steel shall be assembled and erected in accordance with Section 505 "Steel Structures," of the Standard Specifications, and also in accordance with Part 4 "Erection," Chapter 15 of the AREMA Manual and CN Guidelines for Design of Railway Structures. Where differences occur in the provisions of the Standard Specifications and the AREMA Manual, the more stringent requirement shall be followed, as determined by the Engineer.

- A. Field welds other than those shown on the Plans or specified herein are prohibited unless specifically authorized by the Engineer.
- B. Bolt heads shall face outward on exterior girder webs.
- C. The Contractor shall prepare the bridge seats, place the bearing units and perform other necessary work before erection to avoid unnecessary delay in erecting the structural steel in place. The Contractor shall carefully establish elevations and required shimming required to ensure that the deck plate on the existing and new spans match in elevation at the pier. A shim pack consisting of 2 -1/8", 2-1/4" and 2-1/2" adjusting shim plates shall be provided for each bearing in addition to all other plates or shims and they shall be placed between the Bed Plate and the Neoprene Pad if required. Shim plates shall match the footprint of the Bed Plate and shall be galvanized.
- D. The Contractor's attention is directed to the requirements that the structural steel shall be delivered and erected as specified in the Construction Procedure, and meet Canadian National requirements for train operations.
- E. The Contractor shall be required to submit to the Engineer an erection plan sufficiently in advance of erection to allow the Engineer time to approve the proposed method. The erection plan shall include the type and size of crane to be used for erection, total weight of the crane, location of the crane and its outriggers in relation to the existing beams, boom heights and maximum "reach-length" of the boom. The Contractor shall not proceed with the steel erection until the erection plan has been approved by the Engineer.

3.09 Unauthorized Fittings:

The use of field welding, except as permitted on the Plans, or the temporary attachment of hooks, pintles, lifting or fitting devices, or field burning of holes are prohibited.

3.10 Preparation of Metal Surfaces:

- A. Clean all surfaces by removing paint, rust, mill scale, welding slag, dirt, oil,

grease and other foreign substances by Commercial Blast cleaning in accordance with SSPC-SP6.

- B. Remove all salts and surface contaminants by water blasting or steam cleaning prior to dry abrasive blasting.
- C. When cleaning by air blasting with sand, provide adequate separators and traps to remove detrimental amounts of water and oil from compressed air before reaching nozzle. Remove traces of blast products from surface and from pockets and corners by brushing with clean brushes, by blowing with clean compressed air, or by vacuum cleaning. Do not damage partially or completed work adjacent to area being cleaned.
- D. Hand and power tool clean areas inaccessible to blasting equipment. Such cleaning shall be in accordance with SSPC-SP2 and SSPC-SP3.

3.11 Protection of Adjacent Properties and Public:

- A. Protect adjacent properties, landscaping, watercourses and public, including vehicles, from any damage due to painting operations.

3.12 Protection of Surfaces:

- A. Apply primer or paint as soon as possible after surface has been cleaned and before deterioration of surface occurs.
- B. In the event that rusting occurs after completion of surface preparation, clean surfaces again.
- C. Prevent contamination of cleaned surfaces by sand, grit, salts, acids, alkali, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats of paint. Must remove such contaminants from surface to the satisfaction of the Engineer and apply paint immediately.
- D. Protect cleaned and freshly painted surfaces from excessive dust produced by traffic, and from dust, sand and grit produced by blasting operation at no extra cost.
- E. Chemical pretreatment of bare metal surfaces shall not be permitted.

3.13 Mixing Paint:

- A. Do not dilute or thin paint for brush application; use as received from manufacturer and thin only as recommended by the manufacturer for spray application.

- B. Mix ingredients in container before use and ensure breaking up of lumps, complete dispersion of settlement pigment, and a uniform composition. If mixing is done by hand, pour off most of vehicle (liquid) into a clean container; lift the pigment in the paint from the bottom of container with a broad, flat paddle; break up lumps and thoroughly mix with vehicle. Return the poured off vehicle to paint with simultaneous stirring or pouring repeatedly from one container to another until composition is uniform.
- C. Mix paint often enough during application to keep pigment in suspension and composition uniform.
- D. Mixing or keeping paint in suspension by means of an air stream bubbling under paint surface will not be permitted.

3.14 Paint Film Thicknesses:

- A. Paint System I - One coat zinc rich primer to a minimum dry film thickness of 2 mils, and two coats epoxy coating to a minimum dry film thickness of 2 mils per coat for a total dry film thickness of 6 mils.
- B. Paint System II - One coat zinc rich primer to a minimum dry film thickness of 3 mils, and two coats epoxy coating to a minimum dry film thickness of 3 mils per coat for a total dry film thickness of 9 mils.
- C. Do not exceed maximum dry film thickness recommended by coating manufacturer.

3.15 Applying Paint:

- A. Applying paint by spraying. Use brushes, sheepskins or daubers only when no other method is practicable in places of difficult access.
- B. Do not apply paint when:
 - 1. Air temperature is below 4 deg C(40 deg F) or when temperature is expected to drop to 0 deg C(32 deg F) before paint has dried.
 - 2. Fog or mist occur at site; it is raining or snowing; there is a danger of rain or snow.
 - 3. Relative humidity is above 85 percent, unless otherwise authorized by the Engineer.
 - 4. Surface to be painted is wet, damp or frosted.
 - 5. Previous coats are not thoroughly dry.
 - 6. Steel temperature is more than 3 deg C below dew point temperature.
 - 7. Wind velocity jeopardizes protection of the public and/or the environment.

- C. Provide all necessary instrumentation to the Engineer or his/her representative to measure atmospheric conditions (i.e. ambient temperature, relative humidity, dew point, wind speed, etc.) as well as wet and dry paint thicknesses.
- D. To maximum extent possible apply each coat of paint as a continuous film of uniform thickness, free of pores. Repaint and permit to dry any thin spots or areas missed in application before next coat of paint is applied.
- E. Stripe coat edges of flanges and angles, rivet heads, nuts, bolts, etc. by spray or brush prior to applying full coat of paint to ensure adequate coverage.
- F. Brush Application:
 - 1. Work paint into all cracks, crevices and corners where possible and paint surfaces not accessible to brushes by spray, daubers or sheepskins.
 - 2. Brush out runs or sags.
 - 3. Leave a minimum of brush marks in applied paint.
- F. Spray Application:
 - 1. Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied and equipped with suitable pressure regulators and gauges.
 - 2. Provide traps or separators to remove oil and water from compressed air and drain periodically during operations.
 - 3. Keep paint ingredients properly mixed in spray pots or containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - 4. Apply paint in a uniform layer, with overlapping at edge of spray pattern.
 - 5. Brush out immediately any runs and sags.
 - 6. Use brushes to work paint into cracks, crevices and blind spots which are not adequately painted by spray. In areas not accessible to spray gun, use brushes, daubers or sheepskins.

3.16 Shop Painting:

- A. Surfaces of plates adjacent to edges to be field welded shall not be painted closer than 2" to the edge of the plate. Unpainted areas shall be coated with an anti-rust compound as specified in Article 506.09 of the Standard Specifications. After welding, these surfaces shall be field painted with the same total number and color of shop and field coats applied to the adjacent surfaces. Surfaces that will be inaccessible for field painting after erection, as specified in Article 506.10 of the Standard Specifications, shall be given two shop coats of shop primer and, prior to erection, shall be field spot painted with primer and given one field top coat of paint.

- B. High strength joints for girder and floor system excluding floorplate connections shall be Class B and blast-cleaned to SSPC-SP6 or better as shown in AREMA Table 15-1-11a. All surfaces that will be in contact with other steel parts that are not to be bolted together with high-strength bolts or welded, that are in sliding contact shall be given two shop coats of shop primer and, prior to erection, shall be field spot painted. These surfaces are as follows: The top surfaces of floor beams in contact with the floor plates; floor beam bracket surfaces in contact with the ballast stop plates; the bottom surfaces of the floor plates that are in contact with their supporting members; the surfaces of the ballast stop plates that are in contact with their supporting members; lower surfaces of floor plates and ballast stop plates in sliding contact; the top and bottom surfaces of plates anchored in the concrete backwalls; and surfaces of all other similar conditions. Anchor bolts embedded in concrete shall not be painted.
- C. The underside of the steel floor plates shall be primed and painted to match the floor beams.
- D. The surfaces of the floor plate and ballast stop plates that are to receive deck waterproofing membrane will not be painted.

3.17 Field Painting

- A. Any field welding of floor plates shall be field painted.
- B. Anti-graffiti coating shall be applied in accordance with the manufacturer's recommendations. It shall be applied to the outside girder surface.

3.18 Steel Transportation to Site:

1. The Contractor/Fabricator will be responsible to contact CN's customer service center at 1-800-220-7808 to make the necessary arrangements for obtaining and coordinating railcars for transporting the girders to the site.
2. CN will not pay for the cost associated with supplying the necessary railcars to the Fabricator's plant and the costs associated with transporting the railcars to destination.

PART 4 – MEASUREMENT AND PAYMENT

Measurement: No separate measurement shall be made for Structural Steel.

Payment: Structural steel and other material complying with the requirements of this item including, furnished and erected complete in place, in accordance with the Specifications and accepted, will be paid for at the Contract Lump Sum Price as shown

in the Schedule of Prices for FURNISHING AND ERECTING STRUCTURAL STEEL, SPECIAL, which price shall be payment in full for all materials and fabrication, shop work, transportation and erection. The costs of cleaning and painting steel structures and applying an anti-graffiti coating will not be paid for separately, but shall be included in the price for FURNISHING AND ERECTING STRUCTURAL STEEL, SPECIAL.

PIPE HANDRAIL, SPECIAL

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

This section specifies requirements for furnishing and installing steel pipe handrails behind the abutment wing walls. The Work under this section includes furnishing all labor, materials, tools, equipment and incidentals necessary to install and anchor the steel pipe handrails. Steel pipe handrail shall either be anchored into concrete using anchor bolts or set in a concrete base, as shown on the Plans. Provide all metal fabrications complete, in place as specified herein, and as required for a complete and proper installation.

Work under this item shall be in accordance with Section 509 of the Standard Specifications, except as modified herein.

1.02 SUBMITTALS

Submit Shop Drawings for the fabrication and erection of the steel pipe handrails, including:

- A. Details for the fabrication and assembly of all miscellaneous metal work, including information covering materials, sizes and shape of members; details of joint connections, pipe sleeves, and bracket connections.
- B. All welding shall be indicated using AWS symbols and showing length, size and spacing (if not continuous). Auxiliary views shall be shown to clarify all welding. Notes such as "1/4" weld", and "tack weld" will not be acceptable.

1.03 QUALITY ASSURANCE

- A. Reference Standards: The work is subject to requirements of applicable portions of the following:
 - 1. AISC "Code of Standard Practice for Steel Buildings and Bridges".
 - 2. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" and including the "Commentary of the AISC Specifications."
 - 3. AWS "Structural Welding Code".

4. Appropriate Specifications of the American Society for Testing and Materials.
 5. Appropriate Specifications of the Steel Structures Painting Council.
- B. Measurement: All measurements shall be verified at the job site. The Contractor will be solely responsible for the accuracy of all dimensions.
 - C. Storage of Materials: Storage of fabricated metal at the job site shall be the responsibility of the Contractor. Materials stored at the job site shall be so placed that no members will be damaged and shall be protected against corrosion or deterioration of any kind. The Engineer reserves the right to reject any material that has become damaged because of improper storage. Rejected material shall be promptly replaced at no additional cost to the Contract.
 - D. Protection: Protect materials against damage from mechanical abuse, salts, acids, staining and other foreign matter by an approved means during transportation, storage and erection and until completion of construction work. All unsatisfactory materials shall be removed from the premises, and all damaged materials replaced with new materials to the satisfaction of the Engineer at no additional cost to the Contract.
 - E. Certification: Welders shall be certified by an approved testing laboratory, and a copy of certification that each operator has passed the tests must be furnished to the Engineer when so requested.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Metal Surfaces: For the fabrication of metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes. Do not use materials that have stains and discolorations, including welds that do not match the material, or do not match the Engineer's approved sample in color and grain characteristics.
- B. Surface Flatness and Edges: For exposed work provide materials which have been produced to the highest commercial standard for flatness with edges and corners sharp and true to angle or curvature as required.
- C. Structural Steel Shapes and Plates: ASTM A709, Grade 36.
- D. New Steel Pipe: Welded or seamless, ASTM A 53, hot-dipped galvanized.
- E. Welding Electrodes: AWS Specifications.

- F. High-strength Bolts, Nuts and Washers: ASTM A-325, galvanized.
- G. Galvanizing: All posts, anchor devices, plates and structural steel tubing shall be hot-dip galvanized after shop fabrication according to AASHTO M 111. All bolts, nuts, washers and anchor rods shall be galvanized according to AASHTO M 232. Stainless steel materials shall not be galvanized. Galvanizing shall be smooth and free of drops, spikes, inclusions, blobs, etc. and otherwise optimized to achieve a smooth finished surface. Where size of assembled item is too large for galvanizing, only those assemblies may be galvanized prior to fabrication.
- H. Concrete: Material shall be according to Article 1020 of the Standard Specifications for Portland Cement Concrete. Class SI concrete shall be used. When concrete is mixed in truck mixers or transported in agitating trucks, the time limit for unloading it may be extended to 120 minutes when approved by the Engineer.

PART 3 - EXECUTION
3.01 FABRICATION

- A. Work under this section shall be executed by a fabricator of established reputation who is regularly engaged in the fabrication of miscellaneous and ornamental iron work. Contractor shall submit for the Engineer's approval name of fabricator that will perform the work.
- B. Shop assembled members shall be welded in a jig or template. No field riveting will be permitted; field connections shall be high strength bolted or welded. All welds shall be ground smooth and flush with adjacent surfaces. Any deviations from straightness may be cause for rejection by Canadian National.
- C. Where welding occurs, it shall be by the electric arc process in accordance with American Welding Society's Code for Arc and Gas Welding in Building Construction.
- D. Execute all welding by operators who have been qualified previously by tests as prescribed by the American Welding Society's "Standard Qualification Procedure" to perform the work required.
- E. Provide all bolts, nuts, washers, lugs, connections, anchors, rods, etc., necessary for complete erection.
- F. No burning of steel will be permitted in the field. Members burned in the shop shall be finished to an acceptable appearance, equal to a sheared finish.

Holes shall not be burned in either shop or field. No cutting of structural shapes shall be done in the field without the consent of the Engineer.

- G. Materials shall be properly marked and match-marked where field assembly is required. The sequence of shipments shall be such as to expedite erection and minimize the field handling of materials.
- H. Use care in handling and erection to ensure that steel shall not be twisted, bent, or otherwise damaged, and should any difficulty be encountered, it shall be immediately reported to the Engineer.
- I. Connections at angles, miters and junctions which cannot be forged or welded shall be made with blind screws from the back or other concealed fastenings. Furnish and install all additional clips, angles, braces, framing and supports required for anchoring work to the existing construction. Provide proper expansion joints in continuous metal work where required, as approved by the Engineer. Exposed work shall be finished smooth and even, with close joints and connections. Exterior joints and connections shall be formed to exclude water.

3.02 SHOP FINISHES

- A. Surfaces within 2" of any field weld location shall be free of materials that would prevent proper welding or produce objectionable fumes while welding is being done. After welding, all weld areas and abrasions shall be touched up with aluminum paint after cleaning.
- B. Prior to finish coat, mechanically clean galvanized surfaces to smooth the surface and remove large deposits from the galvanizing process. Do not damage or remove the galvanizing material as to compromise the corrosion resistance of the system. Alternately, provide other approved method(s) to ensure smooth final finish surface.
- C. Prior to finish coat, mechanically clean and roughen stainless steel elements with sandblast for optimal coating adhesion.
- D. Finish all exposed surfaces of the parapet railing with 2 coats of electrostatic polyester, TGIC powder coating, colored Chestnut Brown, with high UV stability, impact, corrosion, heat and humidity resistance. The combined total thickness of the two finish coats shall be a minimum of 6 mils.
- E. Finish system shall meet or exceed the following:
 - (i) ASTM B 117 Salt Spray (Fog) Test – 1,000 hours. The coated steel shall exhibit no visible evidence of rust.
 - (ii) ASTM D 3363 Hardness, ASTM D2793 Direct Impact, ASTM D822 Weatherability.
 - (iii) ASTM D 3359 Mechanical Adhesion Test

- F. The exposed heads and nuts of all hot-dip galvanized anchor rods shall be spot-painted with an approved paint system to match finish color. The surface to be painted shall first be cleaned with an approved solvent.
- G. Any damage to the coatings shall be repaired promptly in accordance with the manufacturer's recommendations or replaced with undamaged components. Repairs shall be subject to approval by the Engineer. Finish all damaged, cut or other surfaces not powder-coated, subject to approval by the Engineer, with zinc-rich primer (if not already galvanized) and high performance finish coat, compatible with factory coating system, to match finish color.

3.03 INSTALLATION

- A. Steel pipe handrails shall be fabricated and assembled from steel pipe of dimension and gauge as indicated on the Plans.
- B. Metal railings shall be completely shop fabricated, with all runs straight and true, free from kinks and bulges between bends and having properly formed transition where any change in direction occurs. All joints shall be accurately fitted and rigidly secured with hairline contact. All connections shall be welded, with all exposed welds ground down smooth to blend with adjacent parent metal. All edges of horizontal and vertical bars exposed to touch shall be slightly rounded. Fasteners shall be commercial type best suited for application intended. All exposed screws and bolts shall be steel countersunk Phillips head unless otherwise noted. Handrails shall be delivered to the job site as shop assembled, requiring only a minimum fitting when installed.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

This work will be measured for payment in place in lineal feet. The length measured will be the horizontal length of the top longitudinal railing member through all posts and gaps.

4.02 PAYMENT

This work will be paid for at the contract unit price per lineal foot for PIPE HANDRAIL, SPECIAL. The unit price shall include all equipment, materials and labor required to install the handrails behind abutments wing walls.

SUB-BALLAST

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This section specifies requirements for sub-ballast. The Work under this section shall include furnishing all labor, materials, tools and equipment required to furnish, place and compact sub-ballast as required for the laying of the track by others.

1.02 REFERENCES

- A. Except as modified herein, the Work shall conform to the applicable portions of the Standard Specifications, Section 206.

PART 2 – PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. The material shall be a natural coarse aggregate having a CA-6 gradation conforming to Section 1004 of the Standard Specifications except as herein modified. Crushed concrete shall not be used for sub-ballast.

PART 3 – EXECUTION

3.01 SUB-BALLAST PLACEMENT

- A. The sub-ballast shall be placed in two approximately equal layers, thoroughly compacted and shaped to conform with the cross-section shown on the plans.
- B. The sub-grade surface shall be carefully shaped and compacted prior to placing the sub-ballast in order to eliminate any irregularities or depressions. The sub-ballast shall not be placed until the subgrade has been checked and approved by the Engineer, and in no case shall the sub-ballast be placed on a muddy or frozen sub-grade.
- C. Each layer of sub-ballast shall be placed and compacted in accordance with Article 351.05 (a) and (b) of the Standard Specifications, except compaction shall be not less than 95 percent of the maximum density as defined and measured by ASTM D 1557-66T, Method C. If additional moisture is required to obtain the required degree of compaction, additional moisture shall be added by sprinkling the successive layers as directed by the Engineer. No payment for water used in compaction of sub-ballast will be made.
- D. The sub-ballast shall be trimmed to the lines and grades shown on the plans and shall be maintained in a condition and manner satisfactory to the Engineer until the final acceptance and completion of all work under the contract.
- E. Any irregularities that develop in the sub-ballast section during construction preparations and prior to laying track, shall be filled and rolled to a smooth and even surface

true to the sub-grade elevations without additional compensation. The phrase “prior to laying track” shall not be construed to relieve the Contractor of responsibility for portions of sub-ballast adjacent to track previously laid. The operation of trucks or other vehicles over the completed sub-ballast will not be permitted to the extent that such usage would damage the prepared surface prior to laying of track.

3.02 COMPACTION EQUIPMENT

A. Only equipment approved by the Engineer and listed in the following table shall be used for compaction:

COMPACTION EQUIPMENT TABLE			
Material	Equipment	Max. Uncompacted Lift Thickness in Inches	Max. Hourly Placement Rate in C.Y., which may be Compacted by Specified Equipment
Granular Fill	Rubber-Tired Roller 50-Ton	12/6" Sub-Ballast	400
	Crawler-Type Tractor	12/6" Sub-Ballast	350
	Vibratory Compactor 20-Ton	12/6" Sub-Ballast	750
Or Sub-Ballast	Vibratory Compactor 9-Ton	12/6" Sub-Ballast	350
	SELF-PROPELLED RUBBER-TIRED ROLLER	12/6" Sub-Ballast	350

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. No separate measurement will be made for Sub-Ballast

4.02 PAYMENT

A. The Work covered in this section shall be included in the contract lump sum price as shown in the Schedule of Prices for the Sub-Ballast.

CONCRETE STRUCTURES (SPECIAL)

PART 1 – GENERAL

1.01 Description:

This section specifies the requirements for cast-in-place concrete for bridge, abutment, pier and other miscellaneous work. The Work under this section includes furnishing all labor, materials, tools and equipment required for constructing expansion and construction joints and water seals for cast-in-place concrete structures; placing, curing, protecting and finishing cast-in-place concrete; normal and rubbed surfaces; waterproofing of all concrete surfaces to be backfilled or exposed to water, except where covered by geocomposite wall drain, embedded steel items, including anchor bolts, sleeves, plates and dovetail slots; drilling and grouting dowel bars; and all other appurtenant work, as specified herein, shown on the Plans or as directed by the Engineer. This also includes preparation of pier concrete surface including removal of existing waterproofing, sandblasting and intentionally roughening surface pier stem and footing as shown on the plans.

1.02 Standard:

Except as modified herein, the Work shall conform to the applicable portions of the Standard Specifications, Section 503.

1.04 Submittals:

- A. The Contractor shall submit his proposed concrete mix designs for the review and approval of the Engineer.
- B. Manufacturer's Data: Furnish copies of the manufacturer's specifications for the admixtures, bonding agent, and patching compound, including methods of application and installation.
- C. Ready-Mix Delivery Tickets:
 - 1. Maintain a record at the job site showing date, time and place of each pour of concrete, together with ready-mix delivery tickets certifying contents of each pour.
 - 2. Make the record available to Engineer for inspection upon request, and upon completion of the Work deliver the record and the delivery tickets to the Engineer.
- D. The Contractor shall submit his proposed splicer design for use when splicing reinforcement bars at mandatory construction joints.

1.05 Quality Assurance:

- A. Codes and Standards: All Work included in this section shall be performed in accordance with pertinent provisions of the following codes and standards, except where otherwise shown or specified:
 - 1. ACI 301 "Specifications for Structural Concrete for Building"

2. ACI 304 "Recommend Practice for Measuring, Mixing, Transporting and Placing Concrete"
 3. ACI 305 "Recommended Practice for Hot Weather Concreting"
 4. ACI 306 "Recommended Practice for Cold Weather Concreting"
 5. ACI 309 "Recommended Practice for Consolidation of Concrete"
 6. ACI 311 "Recommended Practice for Concrete Inspection"
 7. ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures"
 8. ACI 318 "Building Code Requirements for Reinforced Concrete"
 9. ACI 347 "Formwork for Concrete"
- B. Where provisions of the above codes and standards are in conflict with the building code in force for this Work, the building code shall govern. In case of conflict between the project Specifications and ACI 301, the project Specifications shall govern.
- C. The following material specifications are referred to hereinafter:
1. ASTM A615 "Deformed and Plain Billet-Steel Bars for Concrete Reinforcement"
 2. ASTM C33 "Aggregate for Normal Weight Concrete"
 3. ASTM C94 "Ready Mixed Concrete"
 4. ASTM C150 "Portland Cement"
 5. ASTM C260 "Air-Entraining Admixtures for Concrete"
 6. ASTM C494 "Chemical Admixtures for Concrete"
 7. ASTM A185 "Welded Steel Wire Fabric for Concrete Reinforcement"
 8. ASTM C994 "Preformed Expansion Joint Filler for Concrete (Bituminous Type)"
 9. ASTM D1851 "Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Type)"
- D. The following testing methods are referred to hereinafter:

1. ASTM C31 "Standard Practice for Making and Curing Concrete Test Specimens in the Field"
 2. ASTM C39 "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens"
 3. ASTM C42 "Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete"
 4. ASTM C143 "Standard Test Method for Slump of Hydraulic-Cement Concrete"
 5. ASTM C173 "Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method"
 6. ASTM C192 "Making and Curing Concrete Test Specimens in the Laboratory"
 7. ASTM C231 "Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method"
 8. ASTM E96 "Standard Test Methods for Water Vapor Transmission of Materials"
- E. Unless a date is specified, the edition of all standard specifications or codes current as of 90 days prior to date of bid documents shall be used and applicable copies of the above recommended practices shall be available on the site at all times. Note that ACI 318 includes additional materials and testing specifications which by the above reference to ACI 318, become a part of this Specification.
- F. Ready-Mixed Concrete: All ready-mix structural concrete shall be furnished by an approved supplier whose plant is certified by the National Ready Mix Concrete Association.
- G. Correction of Defective Work: All concrete work which does not conform to the requirements of the Contract Documents, including strength, tolerances, and finishing, shall be corrected as directed by the Engineer at the Contractor's expense. The Contractor shall be responsible for the cost of corrections to any other work affected by or resulting from corrections to the concrete work.

PART – 2 PRODUCTS:

2.01 Concrete Materials:

- A. Portland Cement: ASTM C150, domestic brand, Type 1, normal Portland

cement. The same brand of Portland Cement shall be used for exposed concrete throughout the job unless a change is approved by the Engineer. Air entraining cement is not acceptable.

- B High-early strength concrete may be used subject to the Engineer's approval. All provisions of the specifications shall apply, except that the 7-day compressive strength equal the 28-day strength required for normal concrete.
- C. Coarse Aggregate: ASTM C33, Sections 7 through 10 for crushed stone, and shall meet the following requirements:
 - 1. Size CA-7, for slabs, walls and foundations.
- D. Fine Aggregate: ASTM C33, Sections 3 through 6 for natural sand.
- E. Admixtures: Use air-entraining admixture in all concrete, except concrete to be placed in drilled shafts. Add air-entraining admixture at the manufacturer's prescribed rate to result in concrete at the point of placement having an air content of not less than 5% nor more than 8% of the volume of the concrete.
- F. Water-reducing Admixture: ASTM C494, Type A, "Pozzolith 322N" (Master Builders Co.) "WRDA" (W.R. Grace & Co.) or "Plastocrete 161" (Sika Chemical Corp.).
- G. Air-entraining Admixture: ASTM C260, "Darex" (W.R. Grace & Co.) or "A.E.R." (Sika Chemical Corp.), "MBVR STD." (Master Builders Co.).
- H. Fly Ash: Shall not be used.
- I. Calcium Chloride: Shall not be used.
- J. Water: Shall be potable.
- K. Bonding Agent: Epoxy type: "Resiweld Concrete Bonding R7650 Adhesives" (H. B. Fuller Co.), "PR-930" (Products Research Co.), "Epoweld 812" (Coast Pro-Seal & Manufacturing Co.), "Sta-Crete T1": (Sta-Crete Inc.). Use Bonding Agent where bonded construction joints are required, subject to the Engineer's approval. Apply in accordance with the manufacturer's printed instructions.
- L. Burlap Curing Blankets: Burlap blankets shall be made from whole stock widths of new burlap and shall be two feet longer than the width of slab being placed. The burlap shall be free from substances which may be deleterious to freshly laid concrete. Sacks or burlap reclaimed from uses other than curing shall not be used. Reused burlap shall be in a condition satisfactory to the Engineer. The burlap shall conform to the following requirements:

1. Weight per square yard, not less than 9 oz.
 2. Ash (based on dry weight), not more than 3.0%.
 3. The burlap shall be composed of not less than 95.0% jute and manila fibers.
- M. Waterproof Paper Blankets: Waterproof paper blankets shall meet the requirements of AASHTO M 171 with the following changes and additions:
1. General Requirements: The paper composing the blankets shall be 100% sulphate kraft. The color of the top sheet shall be that which the paper industry terms "white" for this grade of paper and shall meet the approval of the Engineer. Blankets shall be reinforced by jute, cotton or glass yarn of satisfactory weight, completely embedded in the bituminous cement, running in both longitudinal and transverse directions not more than 1/2 inch apart and crossing at approximately right angles. Unspun fibers may be used, in which case approximately 1,400 lineal feet per square yard shall be embedded in the bituminous cement in a manner that will provide adequate reinforcing in both longitudinal and transverse directions. A suitable bituminous cement shall be used.
 2. Impermeability: When tested in accordance with AASHTO T155, mortar specimens having the surfaces sealed with samples of impermeable paper blanket proposed for use, shall show moisture losses no greater than 0.150 grams per square inch of exposed surface after 72 hours.
 3. Tensile Strength: The specimens to be tested wet shall be immersed in water having a temperature between 70° F and 75° F for a period of one hour immediately prior to testing.
- N. White Polyethylene Sheeting: White polyethylene sheeting shall be of single sheet stock manufactured from virgin resin and shall contain no scrap or additives. It shall be free from visible defects and of uniform appearance; and shall not easily tear, puncture or otherwise become unfit for use. Its color shall be white and shall meet the approval of the Engineer. The sheeting shall meet the following physical requirements:
1. Impermeability: When tested by the applicable parts of the method prescribed in Paragraph 2.01.M.2 above, mortar specimens having the surface sealed with samples of the sheeting proposed for use shall show moisture losses no greater than specified.
 2. Tensile Strength and Elongation: When tested in accordance with ASTM D 882 Method B, the polyethylene sheeting shall have a tensile strength of not less than 1,700 pounds per square inch in the machine direction and 1,200 pounds per square inch in transverse direction. The elongation shall not be less than 225 percent in the machine direction and 350 percent in the

transverse direction. Tests shall be made at a temperature between 75° F and 78° F.

- O. Burlap-Polyethylene Blanket: The burlap and polyethylene shall be bonded together so that the blanket acts as a unit. The burlap shall conform to the requirements of Paragraph 2.01.M above. The polyethylene sheeting shall conform to the requirements of Paragraph 2.01.N above. When tested by the applicable parts of the method prescribed in Paragraph 2.01.M above, mortar specimens having the surface sealed with samples of the blanket proposed for use shall show moisture losses no greater than specified herein.
- P. Bar Splicer: The bar splicer shall conform to the requirements as shown on the detail following this specification. The Contractor may propose an alternate method of splicing rebar, but must submit for and receive the approval of the Engineer prior to using an alternative.
- Q. Patching and Surfacing Compound: Epoxy Type: "PR-940 Patching and Surfacing Compound" (Products Research Co.) "Chemcrete" (Protex-A-Cote, Inc.), "Resiweld 7640 Series" with sand aggregate (H. B. Fuller Co.), "Sta-Crete 12" with sand aggregate (Sika Chemical Corp.). Use where patching compound is allowed for certain concrete work, subject to the Engineer's approval. Apply in accordance with the manufacturer's printed instructions. Patching and surfacing compound for use on "exposed" concrete surfaces shall be equal in color and texture to the basic concrete structure, as approved by the Engineer.
- R. Grout: Shall be non-metallic, non-shrink type in accordance with CRD-C 621, Corps of Engineers specification for non-shrink grout. Compressive strength of grout shall be minimum of 5,000 psi in accordance with ASTM C109.

2.02 Curing and Finishing Materials:

- A. The finishing material shall be protective coat as specified in Section 1023.01 of the Standard Specification.
- B. Water seals shall be 6" ribbed type PVC in accordance with Section 1054 of the Standard Specifications. Water seals at expansion joints shall be ribbed with center bulb; water seals at construction joints shall be ribbed flat.
- C. Bitumen-saturated cotton fabric for two-ply membrane waterproofing shall meet the requirements of ASTM Designation D173.

2.03 Design Mixes:

- A. General: The Contractor shall submit the proposed mix designs for the review and approval of the Engineer. The Contractor, at his own expense, shall employ a technical agency, approved by the Engineer, familiar with local construction conditions and materials to design concrete mixes. Alternately,

the Contractor may provide IDOT mix designs approved for the ready-mix supplier.

- B. Mix Designs: Mix designs which are not IDOT approved shall be formulated with ample lead time (6 weeks) to allow testing and verification of the design as hereinafter specified so that mixes can be reviewed by the Engineer prior to job use.
- C. Mix designs reviewed by the Engineer are to be on file in the Contractor's field office prior to pouring concrete.
- D. Concrete mix designs which are not IDOT approved shall be made on the basis of "Laboratory Trial Batches" or of "Field Experience" with the material to be employed, for each type of concrete required, in accordance with the Drawings and Specifications. Chapter 5: "Concrete Quality" of ACI 318 shall apply unless specified otherwise herein.
- E. List design mixes stating where each applies, and properly identified.
- F. The design mixes shall be obtained from the following:
 - 1. All concrete shall be normal weight type, with water reducing admixture.
 - 2. Strength requirements shall be 5,000 psi at 28 days as noted on the Drawings.
 - 3. The maximum slump shall be 3 inches, plus or minus 1 inch, for unpumped concrete; 4-1/2 inches, plus or minus 1 inch for pumped concrete and lean concrete.
 - 4. A water-reducing admixture shall be used in strict accordance with the manufacturer's information on the varying quantities to be used to suit variations in temperatures.
 - 5. All weather exposed concrete shall be air-entrained 5% to 8% of volume.
- G. Verify the adequacy of the design mixes which are not IDOT approved for compressive strength in accordance with ACI 301, and with a minimum of 12 cylinders; 6 tested at 7 days and 6 tested at 28 days with appropriate ASTM procedures for compressive and split cylinder strength.
- H. The Contractor shall immediately notify the technical agency and the Engineer, if, at any time during construction, the concrete, resulting from the approved mix design, proves to be unsatisfactory for any reason, such as: too much water; lack of sufficient plasticity to prevent segregation, honey-comb, etc.; or

insufficient strength. The technical agency shall modify the design, subject to approval of the Engineer until a satisfactory concrete is obtained.

- I. The Engineer will review the concrete test reports (when required) and the design mix for the concrete, to check that all required tests are made and laboratory tests are submitted, to order such changes for the concrete mix as required to produce concrete construction for compliance with the specifications and approved Plans, and to report to the Owner any deviation from the requirements of these Specifications as indicated by records of inspection and reports of tests.

2.04 Ready Mix Concrete:

A. General Requirements:

1. All ready-mixed concrete shall comply with ASTM C94 and as herein specified.
2. The ready-mixed concrete producer shall submit duplicate delivery tickets, one for the Contractor and one for the Engineer, with each load of concrete delivered to the site.
3. Delivery tickets shall provide the following information:
 - a. Date.
 - b. Name of ready-mix concrete plant.
 - c. Contractor.
 - d. Job Location.
 - e. Type (Standard or H.E.S.) and brand of cement.
 - f. Cement content in bags per cubic yard of concrete.
 - g. Truck number.
 - h. Time dispatched, and time unloaded.
 - i. Amount of concrete in load in cubic yards.
 - j. Admixtures in concrete, if any.
 - k. Type of maximum size and aggregate.
 - l. Maximum allowable slump.

B. Special Requirements:

1. Delete the reference in ASTM C94 allowing extra water to be added to the batch for material with insufficient slump. Addition of water to batch will not be permitted unless authorized by the Engineer.
2. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required. When the air temperature is between 85 degrees F and 90 degrees F., reduce the mixing and delivery time from 1-1/2 hours to 74

minutes and when air temperature is above 90 degrees F., reduce the mixing and delivery time to 60 minutes.

PART 3 - EXECUTION:

3.01 Concrete Placement:

- A. Pre-placement Inspection: Before placing concrete, inspect and complete the formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other trades to permit the installation of their Work; cooperate with other trades in setting such work as required. Thoroughly wet wood forms immediately before placing concrete, as required where form coatings are not used. Coordinate the installation of joint materials with placement of forms and reinforcing steel.
- B. General Requirements: Comply with ACI 304 and also with all of the following specific requirements:
1. Short troughs or pipes used as aids in placing concrete shall be arranged and used in such a manner that the ingredients of the concrete are not separated.
 2. Dropping the concrete a distance of more than 5 feet or depositing a larger quantity at any point and running or working it along the forms will not be permitted.
 3. Special care shall be exercised to prevent splashing concrete on forms and reinforcement, and any hardened deposit shall be removed before covering with fresh concrete.
 4. In any given layer, the separate batches shall follow each other so closely that each one shall be placed and compacted before the preceding one has taken its initial set. Green concrete shall not be injured and there shall be no line of separation between the batches, or between layers. The operation of depositing and compacting the concrete shall be conducted so that exposed surfaces shall be smooth and of uniform texture and completely free of honey-combing and voids.
 5. Concrete shall be placed with the aid of internal mechanical vibrator equipment capable of 6,000 to 9,000 impulses per minute. Vibration shall be transmitted directly to the concrete. The duration of vibration at any location shall be held to a minimum necessary to produce thorough compaction.
 6. Concrete shall be placed in layers not over 24 inches deep and each layer shall be vibrated into place in such a manner as will not cause the ingredients to separate. Where necessary, vibration shall be

supplemented by hand spading to secure these results. Vibrators shall be kept constantly in motion and shall not be held in one location long enough to draw a pool of grout or water from the concrete. Maintain spare equipment to avoid breakdown delays.

7. Submit vibration methods and equipment information for prior approval to Engineer.
8. Maintain reinforcing in the proper position during concrete placement operations.
9. Footings and Foundations: The bottom of all excavations shall be properly leveled off before placing concrete. Footings and foundations shall be of sizes and shapes as shown on the Drawings. Concrete shall be placed as soon as possible after excavations have been completed. All concrete shall be placed continuously from bottom to top.
10. The placing of concrete shall be carried on continuously between construction joints. Construction joints shall be as approved by the Engineer and be as detailed. When it is necessary, because of an emergency, to place less than a complete horizontal layer at one operation, the layers shall terminate with a keyed joint.

C. Cold Weather Placement:

1. When cold weather conditions exist that would impair the quality and strength of concrete, place concrete in compliance with ACI 306 "Recommended Practice for Cold Weather Concreting" and as herein specified.
2. When cold weather protection is required it shall be provided with a heated enclosure. Adequate equipment shall be provided for heating concrete materials and protecting the concrete during freezing or near-freezing weather. All concrete materials and reinforcement, forms, fillers, and ground with which the concrete is to come in contact with shall be free from frost. No frozen materials or materials containing ice shall be used.

D. Hot Weather Placement:

1. When hot weather conditions exist that would seriously impair the quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
2. Cool ingredients before mixing to maintain concrete temperature at all times of placement below 90° F. Mixing water may be chilled, or crushed

ice may be used to control the concrete temperature provided the water equivalent of the ice is included in the total amount of mixing water.

3. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that the steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
4. Wet forms thoroughly before placing concrete.
5. Do not use retarding admixture unless approved by the Engineer.

3.02 Concrete Curing and Protection:

A. General Requirements:

1. Curing shall be in accordance with the applicable portions of Section 1020.13 of the Standard Specifications.
2. Protect freshly placed concrete from premature drying and excessive cold or heat, and maintain without drying at a relatively consistent temperature for a period of time necessary for hydration of cement and proper hardening.
3. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 72 hours.
4. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days and in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period. Perform curing of concrete by moisture retaining cover curing, by membrane curing, or by combination thereof, as hereinafter specified.

B. Moisture Curing: Provide moist curing by one of the following methods:

1. Keep concrete surface continuously wet by covering with water.
2. Continuous water-fog spray.
3. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4 inch lap over adjacent absorptive covers.

C. Moisture Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive.

Immediately repair any holes or tears during curing period using cover material and waterproof tape.

- D. Membrane Curing: Apply membrane forming curing compound to damp concrete surfaces as soon as water film has disappeared. Apply uniformly in 1-coat continuous operation by power-spray equipment in accordance with manufacturer's directions. Recoat areas which are subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
- E. Curing Formed Surfaces: Cure formed concrete surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- F. Curing Unformed Surfaces: In general, cure unformed surfaces by membrane curing.
- G. Curing surfaces which are to receive a seamless floor coating or a waterproof membrane: A sprayed on curing compound will not be used unless approved by the surfacing manufacturer. These surfaces will be cured by one of the following methods:
 - 1. Waterproof Paper Method: The surface of the concrete shall be covered with waterproof paper as soon as the concrete has hardened sufficiently to prevent marring the surface. The surface of the concrete shall be wetted immediately before the paper is placed. The blankets shall be lapped at least 12" end to end, and these laps shall be securely weighted with a windrow of earth, or other approved method, to form a closed joint. The same requirements shall apply to the longitudinal laps where separate strips are used for curing edges, except the lap shall be at least 9". The edges of the blanket shall be weighted securely with a continuous windrow of earth or any other means satisfactory to the Engineer to provide an air-tight cover. Any torn places or holes in the paper shall be repaired immediately by patches cemented over the openings, using a bituminous cement having a melting point of not less than 180° F. The blankets may be reused, provided they are air-tight and kept serviceable by proper repairs.

A longitudinal pleat shall be provided in the blanket to permit shrinkage where the width of the blanket is sufficient to cover the entire surface. The pleat will not be required where separate strips are used for the edges. Joints in the blanket shall be sewed or cemented together in such a manner that they will not separate during use.

The Engineer may approve the use of other impermeable covering, in lieu of waterproof paper, provided it has been shown through laboratory and

field investigation that the results obtained are at least as satisfactory as those obtained with waterproof paper.

2. Polyethylene Sheeting Method: The surface of the concrete shall be covered with white polyethylene sheeting as soon as the concrete has hardened sufficiently to prevent marring the surface. The surface of the concrete shall be wetted immediately before the sheeting is placed. The edges of the sheeting shall be weighted securely with a continuous windrow of earth or any other means satisfactory to the Engineer to provide an air-tight cover. Adjoining sheets shall overlap not less than 12" and the laps shall be securely weighted with earth, or any other means satisfactory to the Engineer, to provide an air-tight cover.

Any torn places or holes in the sheeting shall be repaired by cemented patches. When sheets are no longer serviceable as single unit, the Contractor may select from such sheets and reuse those which will serve for further applications, provide two sheets are used as a single unit; however, the double sheet units may be rejected when the Engineer deems that they no longer provide an air-tight cover.

3. Wetted Burlap Method: The surface of the concrete shall be covered with wetted burlap blankets as soon as the concrete has hardened sufficiently to prevent marring of the surface. The blankets shall overlap 6". At least two layers of wetted burlap shall be placed on the finished surface. The burlap shall be kept saturated by means of mechanically operated sprinkling system. In place of the sprinkling system, the following may be used: two layers of burlap covered with impermeable covering. The burlap shall be kept saturated with water. Plastic coated burlap may be substituted for one layer of burlap and impermeable covering.

The blankets shall be placed so that they are in contact with the edges of the concrete, and that portion of the material in contact with the edges shall be kept saturated with water.

3.03 Concrete Joints:

Construction and expansion joints shall be at locations shown on the plans and subject to approval by the Engineer. Joint locations may be modified by the Contractor to accommodate aesthetic form liner pattern sizes; joint re-locations and any subsequent modifications required will be the responsibility of the Contractor, subject to approval by the Engineer. Bar splices shall be used at all construction joints that do not allow enough room to extend the proper length of steel reinforcement for a lap splice.

3.04 Concrete Finishing:

- A. Concrete work which has not been installed as indicated on the Plans, or which is out of line or level, or has defective surfaces shall be considered not

conforming with intent of these Specifications and shall be removed, unless the Engineer grants permission to patch defective areas. Permission to patch any special area shall not be considered a waiver of Engineer's right to require complete removal of defective work if patching does not satisfactorily restore quality and appearance of surface.

- B. Immediately after stripping forms, inspect surfaces, cut ties, remove fins or projections, fill tie holes, patch honeycombing.
- C. Patching shall be done before concrete is thoroughly dry. Patching shall be with same materials and proportions as concrete, except coarse aggregate shall be omitted. Dampen area to be patched. Add only enough water to permit working mortar into defects, strike off and allow to set.
- D. All surfaces of concrete to remain exposed after removal of forms shall have holes left by withdrawal of rods, or the hole left by removal of ends of ties, filled solid with mortar after first being thoroughly wetted. For holes passing entirely through the wall, a plunger type grout gun shall be used to force the mortar through the wall starting at the back face. A piece of burlap or canvas shall be held over the hole on the outside and when the hole is completely filled, the excess mortar shall be struck off with a cloth flush with the surface. Holes not passing entirely through the wall shall be filled with a small tool that will permit packing the hole solidly with mortar. Any excess mortar at the surface of the wall shall be struck off flush with a cloth.
- E. Exterior surfaces of all cast-in-place concrete to remain exposed shall have a form liner textured surface as specified in these specifications, and receive an Anti-Graffiti Protection System coating in accordance with the requirements of these Specifications.
- F. Top surfaces of all cast-in-place concrete shall have a broomed finish in accordance with Section 424 of the Standard Specifications.

3.05 Grouting:

Perform grouting of structural steel setting plates, if any, as shown on the Drawings. Grout shall be mixed and installed in accordance with manufacturer's directions.

3.06 Damp-proofing:

- D. The dirt side of abutments shall be damp-proofed using one asphaltic prime coat and two coats of hot asphalt. The upper limits for damp-proofing shall be 1'-0" down from the top of the retaining walls and tops of backwalls of the abutments. The notches in the abutment backwall for the deck waterproofing system are not to be damp-proofed. Backfilling should be done after the final coat has set and special care shall be used to avoid damage to the damp-proofing.

- E. After all surface defects have been repaired and the curing requirements have been met, the specified clean and dry concrete surfaces shall be primed at a coverage rate of 1-1/4 gallons per 100 square feet. The prime coat may be brushed or sprayed on and, when necessary, may be thinned with mineral spirits up to 15 percent to facilitate application; however, no increase in area over that to be covered by the unthinned primer will be permitted. After the prime coat is dry, the hot asphalt shall be applied in two separate coats at a coverage rate of 25 pounds per 100 square feet for each coat. The direction of application of the second coat shall be at 90 degrees to the direction of application of the first coat, using care to ensure that the surface of the concrete is completely sealed.

3.07 Existing Concrete Surface Preparation:

- A. Existing Abutment that is being converted to a pier - Remove existing water proofing off the back face of the stem and footing. Sandblast and roughen surface as shown on the plans.

PART 4 – MEASUREMENT AND PAYMENT:

4.01 Measurement: Concrete Structures (Special) will be measured for payment in place and the volume computed in cubic yards.

4.02 Payment: This work will be paid for at the contract unit price per cubic yard for CONCRETE STRUCTURES (SPECIAL). The unit price shall include all equipment, materials and labor required to place this concrete and other materials covered by this item.

STAINING CONCRETE STRUCTURES

PART 1 – GENERAL:

This work shall consist of furnishing and applying an anti-graffiti coating to the exposed vertical surfaces and top surfaces of the Retaining Wall, Special, new abutment modified pier, existing abutment, existing steel span and new steel bridge span.

1.01 Description of Work: This work shall consist of providing and applying a concrete stain to following surfaces:

1. Front textured surface of Retaining Wall, Special and new east abutment to at least 1'-0" below final grade, to replicate actual stone masonry.
2. Face of existing west abutment, back wall, and wing walls. Solid band along top of wing walls.
3. All faces of pier.

All work discussed herein shall be performed in coordination with the plans and special provisions for FORM LINER TEXTURED SURFACE and ANTI-GRAFFITI PROTECTION SYSTEM.

1.02 General Requirements: The stain color shall be used on cast stone concrete surfaces to accurately simulate the appearance of real stone, shades, flecking and veining that is apparent in real stone. It shall also demonstrate the color that may be

apparent from aging, such as staining from oxidation, rusting and/or organic staining from soil and/or vegetation.

Exposed bare concrete surfaces of retaining walls, including the 1'-0" solid band at the top of the front face of walls and the top, back and end surfaces of retaining walls, shall be stained a solid color to match the coloring of mortar in joints between the form lined patterns.

1.03 Submittals: Color samples for stain color selection shall be submitted for approval by Engineer and with Grundy County.

PART 2 – MATERIALS:

Deliver stain materials in original and sealed containers, clearly marked with the manufacturer's name, brand name, type of material, batch number, and date of manufacture.

Store concrete stain materials in an area where temperatures will not be less than 50°F (10°C) or more than 100°F (38°C) and in accordance with OSHA and local Fire Code Requirements.

If the contractor elects to use form ties for concrete forming, only fiberglass form ties will be permitted. Use of the removable metallic form ties will not be allowed.

Qualifications of Contractor. The concrete stain applier shall have a minimum of five (5) years demonstrated experience in applying stains to simulate rock. The contractor shall submit evidence of appropriate experience, job listings, and project photographs from previous work.

Samples. Contractor shall apply proposed concrete color staining to the form liner mockup. The purpose of the mockup is to select and verify the masonry pattern and different color concrete stains to be used for the form liner pattern.

5. Apply the concrete stain to one side of the mock-up wall located on the jobsite. Stain shall be of a type and color which will be used on actual walls. Application procedures and absorption rates shall be as hereinafter specified, unless otherwise recommended by the manufacturer in writing to achieve color uniformity.
 - a. Approval by the Engineer shall serve as a standard of comparison with respect to color and overall appearance.
 - b. General application to actual surfaces on the bridge elements shall not proceed until jobsite mockup has been approved in writing by the Engineer.
6. After concrete work on mockup is completed and cured for a minimum of 28 days, and after surface is determined to be acceptable for coloring, apply color stain system.
7. After coloring is determined to be acceptable by the Engineer, construction of project may proceed, using mockup as quality standard.

An additional bare concrete mockup of matching width to the form lined mockup, and 1'-0" depth, shall be stained to match the mortar color between form liner segments and submit in coordination with the above form liner pattern mockup for approval.

Concrete Stain. Special penetrating stain mix as provided by manufacturer, shall achieve color variations discussed herein and as required by the Engineer. Submit manufacturer's literature, certificates and color samples to the Engineer. The stain colors shall be selected by the Engineer from the stain manufacturer's standard colors after viewing the mock-ups.

Stain shall create a surface finish that is breathable (allowing water vapor transmission), and that resists deterioration from water, acid, alkali, fungi, sunlight or weathering. Stain mix shall be water borne, low V.O.C. material, less than 1.5 lb/gal, and shall meet requirements for weathering resistance of 2000 hours accelerated exposure.

Applying Color Stain. Clean surface prior to application of stain materials to assure that surface is free of latency, dirt, dust, grease, efflorescence, paint or other foreign material, following manufacturer's instructions for surface preparation. Do not sandblast. Preferred method to remove latency is pressure washing with water, minimum 3000 psi (a rate of three to four gallons per minute), using fan nozzle perpendicular to and at a distance of one or two feet from surface. Completed surface shall be free of blemishes, discoloration, surface voids and unnatural form marks.

Surfaces to receive stain shall be structurally sound, clean, dry, fully cured, and free from dust, curing agents or form release agents, efflorescence, scale or other foreign materials. Methods and materials used for cleaning of substrate shall be as recommended by the manufacturer of the water-repellant stain. Concrete shall be at least 30 days old prior to concrete stain application. Curing agents must be removed a minimum of 14 days prior to coating to allow the concrete to dry out.

The stain shall be thoroughly mixed in accordance with the manufacturer's directions using an air-driven or other explosion-proof power mixer. Mix all containers thoroughly prior to application. Do not thin the material. Materials shall be applied at the rate as recommended by the manufacturer. Absorption rates may be increased or decreased depending upon surface texture and porosity of the substrate so as to achieve even staining.

Temperature and relative humidity conditions during time of concrete stain application shall be per manufacturer's application instructions. Do not apply materials under rainy conditions or within three (3) days after surfaces become wet from rainfall or other moisture. Do not apply when weather is foggy or overcast. Take precaution to ensure that workmen and work areas are adequately protected from fire and health hazards resulting from handling, mixing and application of materials. Furnish all the necessary equipment to complete the work. Provide drop clothes and other forms of protection necessary to protect all adjoining work and surfaces to render them completely free of overspray and splash from the concrete stain work. Any surfaces, which have been damaged or splattered, shall be cleaned, restores, or replaced to the satisfaction of the Engineer.

Avoid staining the "mortar joints" by providing suitable protection over the joints during the staining process.

Schedule the color stain application with earthwork and back-filling of any wall areas making sure that all simulated stone texture is colored to the minimum distance below grade. Delay adjacent plantings until color application is completed. Coordinate work to permit coloring applications without interference from other grades. Where exposed soil or pavement is adjacent which may spatter dirt or soil from rainfall, or where surface may be subject to over-spray from other processes, provide temporary cover of completed work.

PART 3- MEASUREMENT AND PAYMENT:

3.01 Measurement: This work shall be measured and paid for in place and the area computed in square foot of actual concrete surface area color stained as specified herein.

Color staining form liner mockups will not be measured for payment but included in the square foot price for this item. Required adjustments or corrections needed to address mockup comments and the cost of staining additional mockups, if required, will not be paid for separately, but shall be included in the square foot price for this item.

3.02 Basis of Payment: The staining of the form lined surfaces will be paid for at the contract unit price per square foot for STAINING CONCRETE STRUCTURES. The unit price bid for these items shall include all labor and material costs associated with surface coloring, including satisfactory stained concrete mockup panels to the requirements included herein.

CLEANING AND PAINTING STRUCTURAL STEEL, LOCATION 1

PART 1 – GENERAL

1.01 Description of Work: This work shall consist of cleaning and painting all exposed surfaces of the existing through girder bridge span. This includes steel girders, floor beams, lateral bracing, bearings, walkway elements, handrail, floor plates and connections. Cleaning shall be in accordance with SSPC-SP10 (near white blast cleaning) or SSPC-SP15 (commercial grade power tool cleaning) and per GBSP-25. This task should be coordinated with the CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES NO.1 item. The containment must be coordinated closely with CN and Grundy County.

1.02 MATERIALS

Materials for painting and additional preparation shall be per sections 2.10, 2.11 and Part 3 of FURNISHING AND ERECTING STRUCTURAL STEEL, SPECIAL

PART 2 – MEASUREMENT AND PAYMENT

2.01 Measurement: This work will not be measured for payment. The area of steel to be painted can be calculated on the existing bridge span plans and is for the Contractor's information only.

2.02 Basis of Payment: This work will be paid for as the contract lump sum price for, CLEANING AND PAINTING STRUCTURAL STEEL, LOCATION 1.

CN SPECIAL PROVISIONS

SECTION 02040 EXISTING UTILITIES

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This Section specifies the requirements for locating and protecting existing utilities.

1.02 RELATED SECTIONS

- A. Section 01601 – Damage to Utilities
- B. Section 02100 – Site Preparation
- C. Section 02200 – Earthwork

PART 2 – PRODUCTS

2.01 DESCRIPTION

- A. All products used to repair damaged utilities shall match the existing damaged material, subject to the approval of the ENGINEER.

PART 3 – EXECUTION

3.01 UTILITY CONTACTS

- A. The Contractor shall call JULIE (800-892-0123) and contact the various utility owners prior to any construction activities. The Contractor shall request a site visit to locate the various utilities. The Contractor shall advise the Engineer of any utilities that will require relocation for the proposed construction.
- B. For all railroad utilities, including signals CONTRACTOR shall contact Joe Wojcik (708) 332-4739 or Jeff Minnis (708) 334-2165. The CONTRACTOR shall request a site visit to locate the various utilities. Requests for railroad utility locates must be made 10 days before excavation begins. The CONTRACTOR shall promptly advise the ENGINEER of any utilities which will require relocation for the proposed construction not shown on the plans.

- C. It is, however, the Contractor's responsibility to confirm or establish the existence of **ALL** utility facilities and their exact locations, whether contained in the data submitted by these agencies or not, and to safely schedule all utility relocations.

3.02 UTILITY LOCATION

- A. The Contractor shall make his own investigation to determine the existence, nature and exact location of all utility lines and appurtenances within the limits of this improvement. The cost of this Work will be considered incidental to the Contract.

3.03 DAMAGE DURING CONSTRUCTION

- A. Due care should be exercised by the Contractor to avoid damaging any power, telephone, gas, water or sewer lines near the construction operations. Any utility damaged by the Contractor during construction of the improvement shall be repaired at the Contractor's expense and to the satisfaction of the utility company(s) and the Engineer.

PART 4 – MEASUREMENT AND PAYMENT (Not used)

*****END OF SECTION*****

**SECTION 00440
RECORD OF EMPLOYEE TRAINING**

CONTRACTOR'S PERSONNEL

The following is a list of the Contractor's Personnel who will actively engage in the work of the awarded Contract. The list needs to include Personnel name, Title/Position, date of E-Railsafe Training, and date of CN OTS Training. No change can be made without Engineer's prior written approval.

Item	Name	Title/Position	e-RAILSAFE Training Date	On Track Safety Training Date
1)				
2)				
3)				
4)				
5)				
6)				
7)				
8)				
9)				
10)				
11)				
12)				
13)				
14)				
15)				
16)				
17)				
18)				
19)				
20)				

CN SOUTHERN REGION DESIGN & CONSTRUCTION DEPARTMENT CONTRACTOR MINIMUM TRAINING REQUIREMENTS

1. All employees of contractors not hired by CN that will work on CN property are required to have minimum CN Safety and Security Awareness training. This training can be obtained through the eRailSafe.com website. This training is good for a period of two years.
 - a. Such employees have been exempted from undergoing the background check portion of the eRailSafe.com process, but must take and pass the required Safety and Security Awareness exam portion.
 - b. EXCEPTION: CN has exempted those it classifies as “Delivery Persons” from this training. This will include contractors such as UPS, FedEx, trucking companies, etc. who merely access the property to supply materials or equipment.

2. All employees of CN hired contractors that will work on CN property are required to have minimum CN Safety and Security Awareness training, in addition to undergoing a background check. This training and background check must be obtained through the eRailSafe.com website. This training is good for a period of two years.
 - a. EXCEPTION: CN has exempted those employees of contractors providing paving services at a road crossing under construction or repair from this requirement.
 - b. EXCEPTION: CN has exempted those it classifies as “Delivery Persons” from this training. This will include contractors such as UPS, FedEx, trucking companies, etc. who merely access the property to supply materials or equipment.

3. All employees of CN hired contractors whose duties include and who is engaged in the inspection, construction, maintenance, or repair of railroad track, bridges, roadway, signal and communication systems, roadway facilities, or roadway machinery that will work foul of or have the potential to foul a live track are considered Roadway Workers under FRA regulations and CN Policy. These employees are required to be trained in CN On Track Safety rules and procedures. They must take and pass the required examinations. This training can be provided by CN Rules Department personnel, or as otherwise directed by CN Rules Department. This training must be repeated at least once each calendar year.
 - a. EXCEPTION: CN has exempted those employees of contractors providing paving services at a road crossing under construction or repair from this requirement.
 - b. EXCEPTION: CN has exempted those it classifies as “Delivery Persons” from this training. This will include contractors such as UPS, FedEx, trucking companies, etc. who merely access the property to supply materials or equipment.
 - c. Contractor employees who will operate on-track machinery or those who will provide protection for other contractor employees must also be trained on US Operating Rules pertaining to their duties. They must take and pass the required examination. This training is good for a period of two years.
 - d. “Potential to foul a live track” is considered, at a minimum, to be working within twenty-five feet of the track; or as otherwise to be determined by CN Tech Services Department.

CONTRACTOR EMPLOYEE QUALIFICATIONS

GENERAL STATEMENT:

Contractors working for CN must comply with the requirements below. Exemptions may only be granted by the Regional Chief Engineer or his/her representative in the case of emergencies.

Part 1 – Contractor Obligations CONTRACTOR OBLIGATIONS

1	<p>Identify a Safety Officer who will be a point of contact for CN on:</p> <ul style="list-style-type: none"> a) Safety related matters such as action plans b) Employee qualifications c) Employee training d) Exchanging documentation on policy and procedure changes, etc.
2	<p>Provide CN with a list of the employees working on CN property and their qualifications. This includes the employee’s full name, date of birth as well as:</p> <ul style="list-style-type: none"> a) Training completion dates b) Refresher and re-certification due dates c) Proof of training provider (i.e. CN, other railroad, outside college, etc.). d) CN will only accept CROR and USOR qualifications that are provided by a CN Operating Practices approved training supplier e) Employees who are not on the above list and whose proof of qualifications are not provided will not be allowed on CN property f) Employees must carry documented proof of training in their possession while on CN property g) Contractors must ensure that their employees are briefed and are provided current copies of CN’s standards and policies including the most recent updates.
3	<p>In order to allow new employees access to a CN work site, the following process must be followed:</p> <ul style="list-style-type: none"> a) Contractor must provide their names and qualifications to the Office of the Regional Chief Engineer and Supply Management prior to these employees gaining access to CN property. b) Contractor must receive CN’s acceptance of the qualifications prior to new employees entering CN property.
4	<p>Provide a safety action plan to the Regional Chief Engineer including the following, but not limited to:</p> <ul style="list-style-type: none"> a) An injury prevention program b) Safe track unit operation c) Staying within their track authority limits d) Specify method of ensuring compliance and an auditing process e) Field level risk assessments

Part 2 – Job Specific Training Requirements

NOTE: this does not preclude other training requirements specific to the position: such as crane, welder, machine operation or other trade skills as the job may require.

TRACK TRAINING REQUIREMENTS – CANADA ONLY

Job Title / Role	Contractor Orientation Training (eRailsafe)	CROR	GEIs	Track Inspection Guidelines	Track Unit Operations
Foreman / Asst Foreman	Yes	Yes	Yes	Yes	Yes
Machine Operator – On Track	Yes	Yes	Yes	n/a	Yes
Machine Operator – Tamper	Yes	Yes	Yes	Yes	Yes
Machine Operator – Off Track	Yes	n/a	Yes	n/a	n/a
Flagman	Yes	Yes	Yes	Yes	Yes
Flagman – other*	Yes	Yes	Yes	n/a	n/a
Trackman / Welder / Labourer	Yes	n/a	Yes	n/a	n/a

* Note: This has limited application. It includes protecting utility companies and work not impacting track infrastructure.

TRACK TRAINING REQUIREMENTS – U.S. ONLY

Job Title / Role	Contractor Orientation Training (eRailsafe)	USOR	On-Track Safety	LIFE	Roadway Machine Maintenance	Track Inspection Guidelines
Foreman / Asst Foreman **	Yes	Yes	Yes	Yes	Yes	n/a
Machine Operator – On Track	Yes	Yes	Yes	Yes	Yes	n/a
Machine Operator – Tamper **	Yes	Yes	Yes	Yes	Yes	n/a
Machine Operator – Off Track	Yes	n/a	Yes	Yes	n/a	n/a
Flagman	Yes	Yes	Yes	Yes	Yes	n/a
Welder	Yes	Yes	Yes	Yes	Yes	Yes
Trackman / Labourer	Yes	n/a	Yes	Yes	Yes	n/a

** Note: Oversight of track work performed by contractors in the U.S. is provided by CN employees. Otherwise Track Inspection Guideline qualifications are required.

*****END OF SECTION*****

**SECTION 00600
INSURANCE**

1. Insurance required of CONTRACTOR:

- A. Statutory Workers Compensation and Employer's Liability Insurance.
- B. Automobile Liability Insurance in an amount not less than \$5,000,000 combined single limit.
- C. Commercial General Liability – Occurrence Form (excluding Aircraft and Watercraft) including for work performed around CN's railway tracks (through issuance of endorsement CG 24 17 or equivalent reasonably acceptable to CN) for an inclusive limit of not less than five million dollars (\$5,000,000) per occurrence, ten million dollars (\$10,000,000) aggregate, for bodily injury to persons including death, or damage to or destruction of property (including loss of use). The policy must name the Railroad and its parents in the following form:

Certificate Holder needs to be listed as:
Wisconsin Central Ltd.
17641 South Ashland Avenue
Homewood, IL 60430

Additional Insured needs to be listed as:
All Operating Subsidiaries of North American Railways, Inc.

Waiver of subrogation is required

Deletion of RR exclusion is required (via endorsement CG 24 17 or similar) – COI must state that work within 50ft of RR tracks *is* covered.

The policy must not contain any provisions excluding coverage for injury, loss or damage arising out of or resulting from (a) doing business on, near, or adjacent to railroad track or facilities, or (b) surface or subsurface pollution, contamination or seepage, or from handling, treatment, disposal or dumping of waste materials or substances.

- 2. Before commencing work, CONTRACTOR shall deliver to the Railroad a certificate of insurance evidencing the foregoing coverages and true and complete copies of the policies described above. If the policy is being issued in conjunction with, or as a result of, a city, county or state contract, the policy should be initially submitted to the respective city, county or state agency that will review it first and then forward it to the railroad.
- 3. Common Policy Provisions. Each policy described in paragraph 1, parts A through C, above must include the following provisions:

- A. Each policy shall include a waiver by the insurer of any right of subrogation against any recovery by or on behalf of any insured.
 - B. Each policy shall provide for not less than thirty days prior written notice to the Railroad of cancellation of or any material change in that policy.
4. It is understood and agreed that the foregoing insurance coverage requirements, and CONTRACTOR's compliance with those requirements, is not intended to, and shall not, relieve CONTRACTOR from, or serve to limit, CONTRACTOR's liability and indemnity obligations under the provisions herein.

It is further understood and agreed that, so long as this AGREEMENT shall remain in force, the Railroad shall have the right, from time to time, to revise the amount or form of insurance coverage required under this AGREEMENT as circumstances or changing economic conditions may require. The Railroad shall give CONTRACTOR written notice of any such requested change at least thirty days before the date of expiration of the then-existing policy or policies, which notice constitutes an amendment to this AGREEMENT and shall become a part hereof; CONTRACTOR agrees to, and shall, thereupon provide the Railroad with such revised policy or policies.

5. Insurance required of SUBCONTRACTOR:

*****END OF SECTION*****

**SECTION 00700
RAILROAD COORDINATION**

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, and other Specification Sections, apply to the Work of this Section.

1.02 SECTION INCLUDES

- A. General: The work specified in this Section consists of the administrative and procedural requirements for coordinating and scheduling the Work on or near (within 25 feet) the active OWNER tracks giving notices of intentions to start work thereon, maintaining clearances, arranging for OWNER flagging services, and cleaning that portion of the OWNER property so affected. If Contract related conditions arise which require immediate and unusual remedial work to be accomplished to protect OWNER property and to ensure the continuity of OWNER operations that remedial work is to be performed at no additional expense to the OWNER. Provide the labor, materials, tools, equipment, supervision and coordination to perform the work of this Section. The work under this Section shall include the ordering and use of OWNER flagmen in conjunction with construction performed adjacent to in-service OWNER tracks, as required by CN. Flagmen and associated flagging equipment are to be provided by the respective OWNER.
- B. The OWNER will have final authority in matters affecting the safe maintenance of OWNER traffic.
- C. The OWNER reserves the right to delay any CONTRACTOR/OWNER Coordination Procedures if approval cannot be reasonably granted within the designated Proposal review period. The CONTRACTOR is directed to anticipate difficult situations and to allow adequate time for OWNER review and approval. No additional charges for delays due to the review and approval process will be allowed.

1.03 SUBMITTALS

- A. Submit notice of intention to start work on or affecting the OWNER property or OWNER operations not less than 5 days before that work is scheduled to begin. Work is not to commence without formal approval by the OWNER.
- B. Submit description of work methods which affect the operation and safety of trains to the OWNER. Work blocks requests:
 - < 3 hours must be submitted to OWNER not less than 5 days before any work is scheduled to start

- > 3 hours must be submitted to OWNER not less than 30 days before any work is scheduled to start
- > 6 hours must be submitted to OWNER not less than 40 days before any work is scheduled to start
- > 10 hours must be submitted to OWNER and require COO approval. COO approval can take upwards of 60 days to approve.

Review and approval by the OWNER will not relieve the CONTRACTOR of liability for damages and Claims resulting from such work. Work is not to commence without formal approval by the OWNER.

- C. Submit a schedule for work adjacent to tracks, for acceptance by the OWNER, not less than 5 days before starting work. Detail the schedule to show, hour by hour, the sequence of work for which tracks must be temporarily taken out of service. Include a detailed listing of materials and their source, equipment to be used, emergency equipment available and emergency plans of action. Show which track(s) will remain in operation for various stages of the work, and the timing of construction operations. Work is not to commence without formal approval by the OWNER.

1.04 JOB CONDITIONS

- A. Schedule and execute work on the OWNER property, and on portions of Contract immediately adjacent to active OWNER tracks, in a manner which will not interfere with the OWNER's operations of trains, signals, telephones, telegraphic services, poles and wires. Protect facilities which are located on the OWNER right-of-way.
- B. Interfacing: The CONTRACTOR's access to the Right-of-Way will not be exclusive, and will require prior coordination with and approval by the OWNER for the specific worksite(s). The OWNER will coordinate with other contractors working on the project to determine which contractor will be given priority in the case of conflicting access requests.
1. Do not start work on OWNER property until a Notice of Authorization for that work has been received from the OWNER accompanied by written approval by the OWNER.
 2. Protection:
 - a. Initial Arrangements for flagmen shall be made with OWNER for work affecting their respective tracks, 5 business days in advance, by 2:00 p.m. Saturdays, Sundays and holidays are not considered business days for the purpose of scheduling flagging. Contact:

CN
 Mary Ellen Carmody
 US-Auditor

24002 Vreeland Road
Flat Rock, MI 48134
Phone: (248) 452-4705
Fax: (248) 740-6031
E-Mail: Maryellen.Carmody@cn.ca

Subsequent requests shall be handled via the flag person or the flagging company Supervisor. The contact information for the Supervisor will be provided at the time the flagging protection starts.

- b. Cancellation shall be made by 2:00 p.m. of the prior working day.
- c. The CONTRACTOR shall notify the OWNER at least Five (5) working days prior to beginning any portion of the work on OWNER property and again immediately after the work has been completed.
- d. There are a limited number of flagmen available. Every reasonable effort will be made to provide the CONTRACTOR with a OWNER flagman. However, if the OWNER flagman is not present as requested, the appropriate OWNER official must be notified BEFORE WORK IS TO BEGIN. THE CONTRACTOR MAY AT NO TIME WORK WITHIN 25 FEET OF THE TRACK WITHOUT A FLAGMAN.
- e. When a OWNER flagman informs the CONTRACTOR's foreman that a train is approaching, ALL WORK MUST CEASE AND OPERATORS CLEAR THE TRACKS and dismount machines. If this is not done, the flagman will not allow the train to pass. Any train delay of this type will not be tolerated. Damages will be assessed the CONTRACTOR for the actual cost of train delays of this type, and the assessment for damage may be an amount of approximately \$1,000/hour, but could be significantly higher.
- f. The OWNER has the sole authority to determine the need for flagging services to protect OWNER operations. Flagging services will be furnished by the OWNER. If flagging is requested and not used, cost will be billed to CONTRACTOR. Flagging services will be required when the CONTRACTOR's personnel and equipment are working over the tracks, working closer than 25 feet to centerline of a track, or when the work will disturb the surface or alignment of the OWNER track. Flagging service will be required when boom equipped machinery is working closer to a track centerline than boom length plus 25 feet, unless a solid Temporary Partition is in place. If work affects OWNER operations, the CONTRACTOR and Sub-contractors will be subject to and governed by the OWNER's flagging representative.
- g. The OWNER will provide a maximum of two (2) flaggers at any time. The OWNER will provide the flaggers with a minimum of 96 hours notice up to a

maximum of ten (10) hours per day (between 0700 and 1900), and seven (7) days a week.

- h. The OWNER reserves the right to cancel this access without notice due to emergency conditions, and require the CONTRACTOR to close up or make safe any work in progress and vacate the track.
- i. The project limits for this project require work on the Matteson Subdivisions. Depending on contractor work limits on any given day, more than one flagger may be required. Contractor shall be responsible for arranging the necessary flagging protection.

3. Scheduling:

- a. Defer work which requires flagging service or OWNER inspection service until the flagging protection or inspection service is available at the job site.
- b. Schedule work of a nature which will impede OWNER operations, and which is on OWNER property, in a manner which will minimize the impediment.
- c. When the CONTRACTOR desires flagging service, notify the OWNER not less than 96 hours before the need for flagging services. The OWNER to furnish the flagging service. Work is not to commence until flagging service is approved and provided. The CONTRACTOR is advised to arrange for flagging service far enough in advance to as not to delay construction procedures.
- d. OWNER supplied material may be delivered prior to contractor beginning grading, depending on availability. Delivery will be timed to arrive prior to completion of sub-ballast grading on contractor's approved schedule. The material will be delivered to the job site clear of grading if site conditions permit, otherwise material will be delivered to closest siding or house track for contractor to retrieve with their own forces.

4. Track Clearances: The minimum permissible track clearances to be maintained for passage of trains are as follows:

- a. Vertical: 22'-6" above top of rail.
- b. Horizontal: 25' from centerline of track.
- c. The above permissible track clearances shall be maintained at all tracks. Conditions may already exist within the clearance zone, but the CONTRACTOR is not to place additional items within the clearance zone. Clearance of existing conditions shall not be reduced without special, formal permission from the OWNER.

5. Perform work within the OWNER clearance only under flag protection.

6. If CONTRACTOR occupies OWNER property for construction or access less than 10' from the centerline of an active OWNER track, then provide an unobstructed, continuous walkway for trainmen's use along both sides of single track and along the outer side of outside tracks in multiple-track territory. Provide a walkway of width, the lesser of the width of existing walkways present at start of work and not less than 10' from track centerline. Permit temporary obstruction of tracks or walkway areas only under flag protection, and remove obstruction at the end of each workday. Provide a temporary handrail with toe board 10' from centerline of track in areas where excavation is adjacent to or within the walkway area. Furnish and install low voltage, steady burning, two-directional lamps capable of emitting two (2) foot candles of illumination at ends of handrail and spaces on 25-foot centers along handrail system. Operate lamps 24 hours every day during which handrail system is in place.
7. Coordinate the scheduled Contract work with the work by OWNER employees. Verify in advance any work claimed by local OWNER worker unions.

1.05 COORDINATION WITH OWNER

- A. General: At or before pre-construction coordination meetings, CONTRACTOR shall prepare and furnish to the OWNER a proposed Schedule indicating the general sequence of construction and its effect on the tracks. This Schedule shall indicate any track out of service for periods of less than 24 hours.
 1. At no time will mainline be out of service, without prior approval from OWNER.
 2. The OWNER will review CONTRACTOR's preconstruction Schedule and advise whether or not OWNER can comply with the Schedule and maintain its train operations. If the Schedule is such that the OWNER cannot agree to the general Schedule, CONTRACTOR, and the OWNER will meet to facilitate developing a general Schedule that can be met by CONTRACTOR and will allow OWNER to operate. Work cannot commence without approval of the construction schedule by the OWNER.
- B. Actual Construction Schedules Affecting Train Operation:

At the beginning of each week, but no later than Tuesday morning, CONTRACTOR shall advise the OWNER of variations from general Construction Schedule as it affects the OWNER's tracks for the following week. CONTRACTOR will also provide the OWNER with a detailed plan for work affecting tracks in the next three (3) weeks. At the same time, the CONTRACTOR will supply requirements for OWNER personnel (e.g., flagging services) for the following week.

The timeline for the request for work blocks shall be in accordance with those outlined in **SECTION 00700, Section 1.03 Submittals**.

C. Interface with Rail Traffic:

1. The CONTRACTOR is reminded that the work under this Contract is to be performed on the rail line with existing train operation. The CONTRACTOR shall coordinate with the OWNER for the current schedule of train operations. All work in these areas shall be scheduled with the approval of the OWNER to minimize disruption of train traffic.
2. It is understood that, in the progression of work under the Contract on or near operated trackage of the OWNER, the safe and uninterrupted operation of said trackage shall take precedence over the work and nothing shall be done or caused to be done by the CONTRACTOR, its agents or employees, which will endanger or delay trains on said operated trackage or otherwise interfere with the performance and safety of the OWNER's common carrier obligations. Specifically, it is agreed that:
 - a. Where the Contract Documents require that materials be hauled across or adjacent to active OWNER tracks, the CONTRACTOR shall furnish, erect and maintain the advance warning signs and traffic control devices in accordance with the requirements and the standards of the OWNER so as to control the operation of the CONTRACTOR's personnel and equipment. CONTRACTOR's attention is directed to Paragraph f. hereunder, concerning Notice requirements.
 - b. When the OWNER considers that flagging services are required for the protection of the operated tracks, such flagging services will be provided at no cost to the CONTRACTOR. When the OWNER has decided that flagging services are unnecessary, the CONTRACTOR shall not work within 25 feet of an operated track, unless flagging personnel are on duty. The work will cease within 25 feet of the track while a train is moving over such track. The CONTRACTOR's personnel will immediately obey all instructions relating to work within 25 feet of any operated track given by the OWNER representatives and/or flagging person. Such flagging services supplied or not supplied by the OWNER will not relieve the CONTRACTOR from liability assumed by the CONTRACTOR pursuant to the terms of the Contract Documents.
 - c. Rail operation will always have the right-of-way over CONTRACTOR's operations and the flagging personnel will perform their obligations accordingly.
 - d. The limits of work adjacent to the tracks in service will be designated by the OWNER and shall not be encroached upon or crossed. The CONTRACTOR shall cover any holes and projections or protect material within 10 feet of centerline of active tracks prior to any rail operations. No holes, openings or projections will be allowed overnight within 25 feet of an operated track, unless specifically permitted in writing by the OWNER.

- e. During scheduled rail operations and at the end of each Working Day, the CONTRACTOR will move all its equipment and personnel beyond 25 feet of the centerline of active track, unless specifically permitted, in writing, by the OWNER. If the CONTRACTOR provides a solid barricade separating work area from active tracks, the above-mentioned 25 feet can be repealed, as long as CONTRACTOR's equipment and personnel are behind same barricades.
- f. The CONTRACTOR will constantly keep the OWNER informed of all activity on or near the trackage that will affect safe operations. The CONTRACTOR will provide OWNER with reasonable advance notice, but not less than three (3) work days, of all situations in which it will be working within 25 feet of any tracks or when crossing any tracks. Formal approval is required; no work can commence without formal approval. Formal approval can take longer than three (3) work days. The CONTRACTOR is directed to estimate and anticipate the approval time for each issue. More complex issues will require more time for approval. No work will be allowed to begin without formal approval.
- g. Any activity by CONTRACTOR on or near operated trackage shall be progressed in such a manner that there will be no interruption or delay of scheduled rail service. The CONTRACTOR shall provide back-up equipment to ensure this. Special attention is required by the CONTRACTOR. The CONTRACTOR is to ensure and prove to the satisfaction of the OWNER that, in the event of CONTRACTOR equipment failure or other potential breach of the CONTRACTOR's schedule, back-up equipment and material are immediately available to avoid a delay or interruption of any rail service.
- h. If conditions arise where CONTRACTOR's work damages any OWNER property, such as signals, buried cable, piping or overhead wire, whether believed to be active or not or where work causes track to be out of alignment, either horizontally or vertically, the incident shall be immediately reported to the OWNER. If the OWNER at their sole discretion determine that the OWNER will repair such damage or perform work for the protection of the property, the CONTRACTOR shall pay costs (direct labor, indirect costs, overhead and general and administrative costs) incurred by the OWNER.
- i. CONTRACTOR shall not cause the interruption of visual and electronic signals (including power supplies thereto) used in the guidance of rail traffic.
- j. The CONTRACTOR shall not interfere with the visibility of visual and electronic signals used in the guidance of rail traffic.
- k. The CONTRACTOR shall not interfere with the visibility of track, signals and adjoining platforms by train and/or engine crews. This is including, but not restricted to, interference caused by barriers, materials, equipment, signs, smoke, lights, dust and debris.

- l. If the CONTRACTOR has to cross active tracks with its equipment at locations other than permanent crossings, after acquiring approval of the OWNER, the CONTRACTOR, at its expense, shall request the OWNER to construct and remove a temporary crossing. The OWNER will provide the treated timbers for the work. When such portion of the Work is complete, the temporary crossing shall be removed by the OWNER. Any damage to the existing tracks or related work, by the CONTRACTOR's use of temporary crossing, shall be repaired at the CONTRACTOR's sole expense. The CONTRACTOR shall not cross active tracks with vehicles or equipment except at designated grade crossings when approved by the OWNER and then only with flagging service in place.
- m. CONTRACTOR will keep the flange ways at all temporary and permanent rail crossings clear and all appurtenances free of dirt, debris, ice, snow and any other foreign material.
- n. Any construction which affects existing train operations must be done during the hours to be specified by the OWNER and must be completed in sufficient time to allow for normal train service. Prior approval from the OWNER is required for weekend and night work. In addition, the CONTRACTOR shall comply with the FRA 12 hours service law. It is the contractor's responsibility to supply a sufficient number of competent employees and reserves to assure restoration of scheduled service within the allotted time. The CONTRACTOR must furnish all equipment such as, but not limited to, flags, safety vests, flares, phones and radios.
- o. The CONTRACTOR shall be responsible for the protection of existing equipment and facilities while working on any construction.

PART 2 – PRODUCTS (Reserved)

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Installation of facilities which would affect the operation and safety of trains on OWNER property shall be subject to the following:
 1. If the CONTRACTOR fails to meet the schedule submitted in accordance with Paragraph 1.03.C of this Section, the OWNER will direct the CONTRACTOR to accelerate the work and meet the schedule. The CONTRACTOR shall add additional crews or equipment at no additional cost to the OWNER.
 2. The CONTRACTOR shall maintain equipment and material, verified by the OWNER as adequate, immediately available to perform remedial work to protect

OWNER property and to ensure continuity of OWNER operations. That remedial work shall be performed at no additional expense to the OWNER or the OWNER.

3.02 FIELD QUALITY CONTROL

- A. Construction work on OWNER property is subject to inspection and approval by the OWNER.

3.03 TRACKWAY DRAINAGE

- A. Maintain drainage on the OWNER property free from silt and other obstructions resulting from the work which would foul ballast or clog track drainage.

3.04 CLEAN-UP ON OWNER PROPERTY.

- A. Promptly remove machinery, equipment, surplus materials, falsework, rubbish, and temporary buildings, resulting from the construction within the OWNER property. OWNER property affected by the work shall be left in a condition satisfactory to the OWNER. Promptly repair construction-related damage to OWNER property, and to that of its tenants.

*****END OF SECTION*****

CSX Transportation

**CONSTRUCTION
SUBMISSION CRITERIA**

Public Projects Group
Jacksonville, FL
Date Issued: April 14, 2015

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SECTION VII:	Track Monitoring

INTRODUCTION

The intent of this document is to guide outside agencies and their Contractors when performing work on, over, or with potential to impact CSXT property (ROW). Work plans shall be submitted for review to the designated CSXT Engineering Representative for all work which presents the potential to affect CSXT property or operations; this document shall serve as a guide in preparing these work plans. All work shall be performed in a manner that does not adversely impact CSXT operations or safety; as such, the requirements of this document shall be strictly adhered to, in addition to all other applicable standards associated with the construction. Applicable standards include, but are not limited to, CSXT Standards and Special Provisions, CSXT Insurance Requirements, CSXT Pipeline Occupancy Criteria, as well as the governing local, county, state and federal requirements. It shall be noted that this document and all other CSXT standards are subject to change without notice, and future revisions will be made available at the CSXT website: www.csx.com.

I. DEFINITIONS

1. *Agency* – The project sponsor (i.e., State DOT, Local Agencies, Private Developer, etc.)
2. *AREMA* – American Railway Engineering and Maintenance-of-Way Association – the North American railroad industry standards group. The use of this term shall be in specific reference to the AREMA Manual for Railway Engineering.
3. *Construction Submission* – The Agency or its representative shall submit six (6) sets of plans, supporting calculations, and detailed means and methods procedures for the specific proposed activity. All plans, specifications, and supporting calculations shall be signed/sealed by a Professional Engineer as defined below.
4. *Controlled Demolition* – Removal of an existing structure or subcomponents in a manner that positively prevents any debris or material from falling, impacting, or otherwise affecting CSXT employees, equipment or property. Provisions shall be made to ensure that there is no impairment of railroad operations or CSXT's ability to access its property at all times.
5. *Contractor* – The Agency's representative retained to perform the project work.
6. *Engineer* – CSXT Engineering Representative or a GEC authorized to act on the behalf of CSXT.
7. *Flagman* – A qualified CSXT employee with the sole responsibility to direct or restrict movement of trains, at or through a specific location, to provide protection for workers.
8. *GEC* – General Engineering Consultant who has been authorized to act on the behalf of CSXT.
9. *Horizontal Clearance* – Distance measured perpendicularly from centerline of any track to the nearest obstruction at any elevation between TOR and the maximum vertical clearance of the track.
10. *Professional Engineer* – An engineer who is licensed in State or Commonwealth in which the project is to occur. All plans, specifications, and supporting calculations shall be prepared by the Licensed Professional Engineer and shall bear his/her seal and signature.
11. *Potential to Foul* – Work having the possibility of impacting CSXT property or operations; defined as one or more of the following:
 - a. Any activity where access onto CSXT property is required.
 - b. Any activity where work is being performed on CSXT ROW.
 - c. Any excavation work adjacent to CSXT tracks or facilities, within the Theoretical Railroad Live Load Influence Zone, or where the active earth pressure zone extends within the CSXT property limits.
 - d. The use of any equipment where, if tipped and laid flat in any direction (360 degrees) about its center pin, can encroach within twenty five feet (25'-0") of the nearest track centerline. This is based upon the proposed location of

- the equipment during use, and may be a function of the equipment boom length. Note that hoisting equipment with the potential to foul must satisfy the 150% factor of safety requirement for lifting capacities.
- e. Any work where the scatter of debris, or other materials has the potential to encroach within twenty five feet (25'-0") of the nearest track centerline.
 - f. Any work where significant vibration forces may be induced upon the track structure or existing structures located under, over, or adjacent to the track structure.
 - g. Any other work which poses the potential to disrupt rail operations, threaten the safety of railroad employees, or otherwise negatively impact railroad property, as determined by CSXT.
12. *ROW – Right of Way*; Refers to CSXT Right-of-Way as well as all CSXT property and facilities. This includes all aerial space within the property limits, and any underground facilities.
13. *Submission Review Period* - a minimum of thirty (30) days in advance of start of work. Up to thirty (30) days will be required for the initial review response. Up to an additional thirty (30) days may be required to review any/all subsequent submissions or resubmission.
14. *Theoretical Railroad Live Load Influence Zone* – A 1 horizontal to 1 vertical theoretical slope line starting at bottom corner of tie.
15. *TOR – Top of Rail*. This is the base point for clearance measurements. It refers to the crown (top) of the steel rail; the point where train wheels bear on the steel rails.
16. *Track Structure* – All load bearing elements which support the train. This includes, but is not limited to, the rail, ties, appurtenances, ballast, sub-ballast, embankment, retaining walls, and bridge structures.
17. *Vertical Clearance* – Distance measured from TOR to the lowest obstruction within six feet (6'-0") of the track centerline, in either direction.

II. GENERAL SUBMISSION REQUIREMENTS

- A. A construction work plan is required to be submitted by the Agency or its Contractor, for review and acceptance, prior to accessing or performing any work with Potential to Foul.
- B. The Agency or its representative shall submit six (6) sets of plans, specifications, supporting calculations, and detailed means and methods procedures for the specific proposed work activity.
- C. Construction submissions shall include all information relevant to the work activity, and shall clearly and concisely explain the nature of the work, how it is being performed, and what measures are being taken to ensure that railroad property and operations are continuously maintained.
- D. All construction plans shall include a map of the work site, depicting the CSXT tracks, the CSXT right of way, proposed means of access, proposed locations for equipment and material staging (dimensioned from nearest track centerline), as well as all other relevant project information. An elevation drawing may also be necessary in order to depict clearances or other components of the work.
- E. Please note that CSXT will not provide pricing to individual contractors involved in bidding projects. Bidding contractors shall request information from the agency and not CSXT.
- F. The Contractor shall install a geotextile fabric ballast protection system to prevent construction or demolition debris and fines from fouling ballast. The geotextile ballast protection system shall be installed and maintained by the Contractor to the satisfaction of the Engineer.
- G. The Engineer shall be kept aware of the construction schedule. The Contractor shall provide timely communication to the Engineer when scheduling the work such that the Engineer may be present during the work. The Contractor's schedule shall not dictate the work plan review schedule, and flagging shall not be scheduled prior to receipt of an accepted work plan.

H. At any time during construction activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances that may create a potential hazard to rail operations or CSXT facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSXT and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.

I. Blasting will not be permitted to demolish a structure over or within CSXT's right-of-way. When blasting off of CSXT property but with Potential to Foul, vibration monitoring, track settlement surveying, and/or other protective measures may be required as determined by the Engineer.

J. Blasting is not permitted adjacent to CSXT right-of-way without written approval from the Chief Engineer, CSXT.

K. Mechanical and chemical means of rock removal must be explored before blasting is considered. If written permission for the use of explosives is granted, the Agency or Contractor must submit a work plan satisfying the following requirements:

1. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Agency or Contractor.
2. Electronic detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.
3. No blasting shall be done without the presence of an authorized representative of CSXT. Advance notice to the Engineer is required to arrange for the presence of an authorized CSXT representative and any flagging that CSXT may require.
4. Agency or Contractor must have at the project site adequate equipment, labor and materials, and allow sufficient time, to clean up debris resulting from the blasting and correct any misalignment of tracks or other damage to CSXT property resulting from the blasting. Any corrective measures required must be performed as directed by the Engineer at the Agency's or Contractor's expense without any delay to trains. If Agency's or Contractor's actions result in the delay of any trains including passenger trains, the Agency or Contractor shall bear the entire cost thereof.
5. The Agency or Contractor may not store explosives on CSXT property.
6. At any time during blasting activities, the Engineer may require revisions to the previously approved procedures to address weather, site conditions or other circumstances that may create a potential hazard to rail operations or CSXT facilities. Such revisions may require immediate interruption or termination of ongoing activities until such time the issue is resolved to the Engineer's satisfaction. CSXT and its GEC shall not be responsible for any additional costs or time claims associated with such revisions.

III. HOISTING OPERATIONS

A. All proposed hoisting operations with Potential to Foul shall be submitted in accordance with the following:

1. A plan view drawing shall depict the work site, the CSXT track(s), the proposed location(s) of the lifting equipment, as well as the proposed locations for picking, any intermediate staging, and setting the load(s). All locations shall be dimensioned from centerline of the nearest track. Crane locations shall also be dimensioned from a stationary point at the work site for field confirmation.
2. Computations showing the anticipated weight of all picks. Computations shall be made based upon the field-verified plans of the existing structure. Pick weights shall account for the weight of concrete rubble or other materials attached to the component being removed; this includes the weight of subsequent rigging devices/components. Rigging components shall be sized for the subsequent pick weight.
3. All lifting equipment, rigging devices, and other load bearing elements shall have a rated (safe lifting) capacity that is greater than or equal to 150% of the load it is carrying, as a factor of safety. Supporting calculations shall be furnished to verify the minimum capacity requirement is maintained for the duration of the hoisting operation.

4. Dynamic hoisting operations are prohibited when carrying a load with the Potential to Foul. Cranes or other lifting equipment shall remain stationary during lifting. (i.e., no moving picks).
5. For lifting equipment, the manufacturer's capacity charts, including crane, counterweight, maximum boom angle, and boom nomenclature is to be submitted.
6. A schematic rigging diagram must be provided to clearly call out each rigging component from crane hook to the material being hoisted. Copies of catalog or information sheets shall be provided to verify rigging weights and capacities.
7. For built-up rigging devices, the contractor shall submit the following:
 - i. Details of the device, calling out material types, sizes, connections and other properties.
 - ii. Load test certification documents and/or design computations bearing the seal and signature of a Professional Engineer. Load test shall be performed in the configuration of its intended use as part of the subject demolition procedure.
 - iii. Copies of the latest inspection reports of the rigging device. The device shall be inspected within one (1) calendar year of the proposed date for use.
8. A detail shall be provided showing the crane outrigger setup, including dimensions from adjacent slopes or facilities. The detail shall indicate requirements for bearing surface preparation, including material requirements and compaction efforts. As a minimum, outriggers and/or tracks shall bear on mats, positioned on level material with adequate bearing capacity.
9. A complete written narrative that describes the sequence of events, indicating the order of lifts and any repositioning or re-hitching of the crane(s).

IV. DEMOLITION PROCEDURE

- A. The Agency or its Contractor shall submit a detailed procedure for a controlled demolition of any structure on, over, or adjacent to the ROW. The controlled demolition procedure must be approved by the Engineer prior to beginning work on the project.
- B. Existing Condition of structure being demolished:
 1. The Contractor shall submit as-built plans for the structure(s) being demolished.
 2. If as-built plans are unavailable, the Contractor shall perform an investigation of the structure, including any foundations, substructures, etc. The field measurements are to be made under the supervision of the Professional Engineer submitting the demolition procedure. Findings shall be submitted as part of the demolition means and methods submittal for review by the Engineer.
 3. Any proposed method for temporary stabilization of the structure during the demolition shall be based on the existing plans or investigative findings, and submitted as part of the demolition means and methods for review by the Engineer.
- C. Demolition work plans shall include a schematic plan depicting the proposed locations of the following, at various stages of the demolition:
 1. All cranes and equipment, calling out the operating radii.
 2. All proposed access and staging locations with all dimensions referenced from the center line of the nearest track.
 3. Proposed locations for stockpiling material or locations for truck loading.
 4. The location, with relevant dimensions, of all tracks, other railroad facilities; wires, poles, adjacent structures, or buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions.
 5. Note that no crane or equipment may be set on the CSXT rails or track structure and no material may be dropped on CSXT property.
- D. Demolition submittal shall also include the following information:
 1. All hoisting details, as dictated by Section III of this document.
 2. A time schedule for each of the various stages must be shown as well as a schedule for the entire lifting procedure.

The proposed time frames for all critical subtasks (i.e., torch/saw cutting various portions of the superstructure or substructure, dismantling splices, installing temporary bracing, etc.) shall be furnished so that the potential impact(s) to CSXT operations may be assessed and eliminated or minimized.

3. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor's means and methods submission.
 4. Design and supporting calculations shall be prepared, signed, and sealed by the Professional Engineer for items including the temporary support of components or intermediate stages shall be submitted for review. A guardrail will be required to be installed in a track in the proximity of temporary bents or shoring towers, when located within twelve feet (12'-0") from the centerline of the track. The guardrail will be installed by CSXT forces, at the expense of the Agency or its contractor.
- E. Girders or girder systems shall be stable at all times during demolition. Temporary bracing shall be provided at the piers, abutments, or other locations to resist overturning and/or buckling of the member(s). The agency shall submit a design and details of the proposed temporary bracing system, for review by the Engineer. Lateral wind forces for the temporary conditions shall be considered in accordance with AREMA, Chapter 8, Section 28.6.2. The minimum lateral wind pressure shall be fifteen pounds per square foot (15 psf).
- F. Existing, obsolete, bridge piers shall be removed to a minimum of three feet (3'-0") below the finished grade, final ditch line invert, or as directed by the Engineer.
- G. A minimum quantity of twenty five (25) tons of CSXT approved granite track ballast may be required to be furnished and stockpiled on site by the Contractor, or as directed by the Engineer.
- H. The use of acetylene gas is prohibited for use on or over CSXT property. Torch cutting shall be performed utilizing other materials such as propane.
- I. CSXT's tracks, signals, structures, and other facilities shall be protected from damage during demolition of existing structure or replacement of deck slab.
- J. Demolition Debris Shield
1. On-track or ground-level debris shields (such as crane mats) are prohibited for use by CSXT.
 2. Demolition Debris Shield shall be installed prior to the demolition of the bridge deck or other relevant portions of the structure. The demolition debris shield shall be erected from the underside of the bridge over the track area to catch all falling debris. The debris shield shall not be the primary means of debris containment.
 - i. The demolition debris shield design and supporting calculations, all signed/sealed by a Professional Engineer, shall be submitted for review and acceptance.
 - ii. The demolition debris shield shall have a minimum design load of 50 pounds per square foot (50 psf) plus the weight of the equipment, debris, personnel, and all other loads.
 - iii. The Contractor shall verify the maximum particle size and quantity of the demolition debris generated during the procedure does not exceed the shield design loads. Shield design shall account for loads induced by particle impact; however the demolition procedure shall be such that impact forces are minimized. The debris shield shall not be the primary means of debris containment.
 - iv. The Contractor shall include installation/removal means and methods for the demolition debris shield as part of the proposed Controlled Demolition procedure submission.
 - v. The demolition debris shield shall provide twenty three feet (23'-0") minimum vertical clearance, or maintain the existing vertical clearance if the existing clearance is less than twenty three feet (23'-0").
 - vi. Horizontal clearance to the centerline of the track should not be reduced unless approved by the Engineer.
 - vii. 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 Engineer.
- K. Vertical Demolition Debris Shield
1. This type of shield may be required for substructure removals in close proximity to CSXT track and other facilities, as determined by the Engineer.
 2. The Agency or its Contractor shall submit detailed plans with detailed calculations, prepared, signed, and sealed by a Professional Engineer, of the protection shield.

V. ERECTION PROCEDURE

- A. The Agency or its Contractor shall submit a detailed procedure for erection of a structure with Potential to Foul. The erection procedure must be approved by the Engineer prior to beginning work on the project.
- B. Erection work plans shall include a schematic plan depicting the following, at all stages of the construction:
1. All proposed locations of all cranes and equipment, calling out the operating radii.
 2. All proposed access and staging locations with all dimensions referenced from the center line of the nearest track.
 3. All proposed locations for stockpiling material or locations for truck loading.
 4. The location, with relevant dimensions, of all tracks, other railroad facilities; wires, poles, adjacent structures, or buried utilities that could be affected, showing that the proposed lifts are clear of these obstructions.
- C. No crane or equipment may be set on the CSXT rails or track structure and no material may be dropped on CSXT property.
- D. For erection of a structure over the tracks, the following information shall be submitted for review and acceptance by the Engineer, at least thirty (30) days prior to erection:
1. As-built beam seat elevations – field surveyed upon completion of pier/abutment construction.
 2. Current Top of Rail (TOR) elevations – field measured at the time of as-built elevation collection.
 3. Computations verifying the anticipated minimum vertical clearance in the final condition which accounts for all deflection and camber, based upon the current TOR and as-built beam seat elevations. The anticipated minimum vertical clearance shall be greater than or equal to that which is indicated by the approved plans. Vertical clearance (see definitions) is measured from TOR to the lowest point on the overhead structure at any point within six feet (6'-0") from centerline of the track. Calculations shall be signed and sealed by a Professional Engineer.
- E. Girders or girder systems shall be stable at all times during erection. No crane may unhook prior to stabilizing the beam or girder.
1. Lateral wind forces for the temporary conditions shall be considered in accordance with AREMA, Chapter 8, Section 28.6.2. The minimum lateral wind pressure shall be fifteen pounds per square foot (15 psf).
 2. Temporary bracing shall be provided at the piers, abutments, or other locations to resist overturning and/or buckling of the member(s). The agency shall submit a design and details of the proposed temporary bracing system, for review by the Engineer.
 3. Temporary bracing shall not be removed until sufficient lateral bracing or diaphragm members have been installed to establish a stable condition. Supporting calculations, furnished by the Professional Engineer, shall confirm the stable condition.
- F. Erection procedure submissions shall also include the following information:
1. All hoisting details, as dictated by Section III of this document.
 2. A time schedule for each of the various stages must be shown as well as a schedule for the entire lifting procedure. The proposed time frames for all critical subtasks (i.e., performing aerial splices, installing temporary bracing, installation of diaphragm members, etc.) shall be furnished so that the potential impact(s) to CSXT operations may be assessed and eliminated or minimized.
 3. The names and experience of the key Contractor personnel involved in the operation shall be included in the Contractor's means and methods submission.
 4. A guardrail will be required to be installed in a track in the proximity of temporary bents or shoring towers, when located within twelve feet (12'-0") from the centerline of the track. The guardrail will be installed by CSXT forces, at the expense of the Agency or its Contractor.
 5. Design and supporting calculations prepared by the Professional Engineer for items including the temporary support of components or intermediate stages shall be submitted for review.

VI. TEMPORARY EXCAVATION AND SHORING

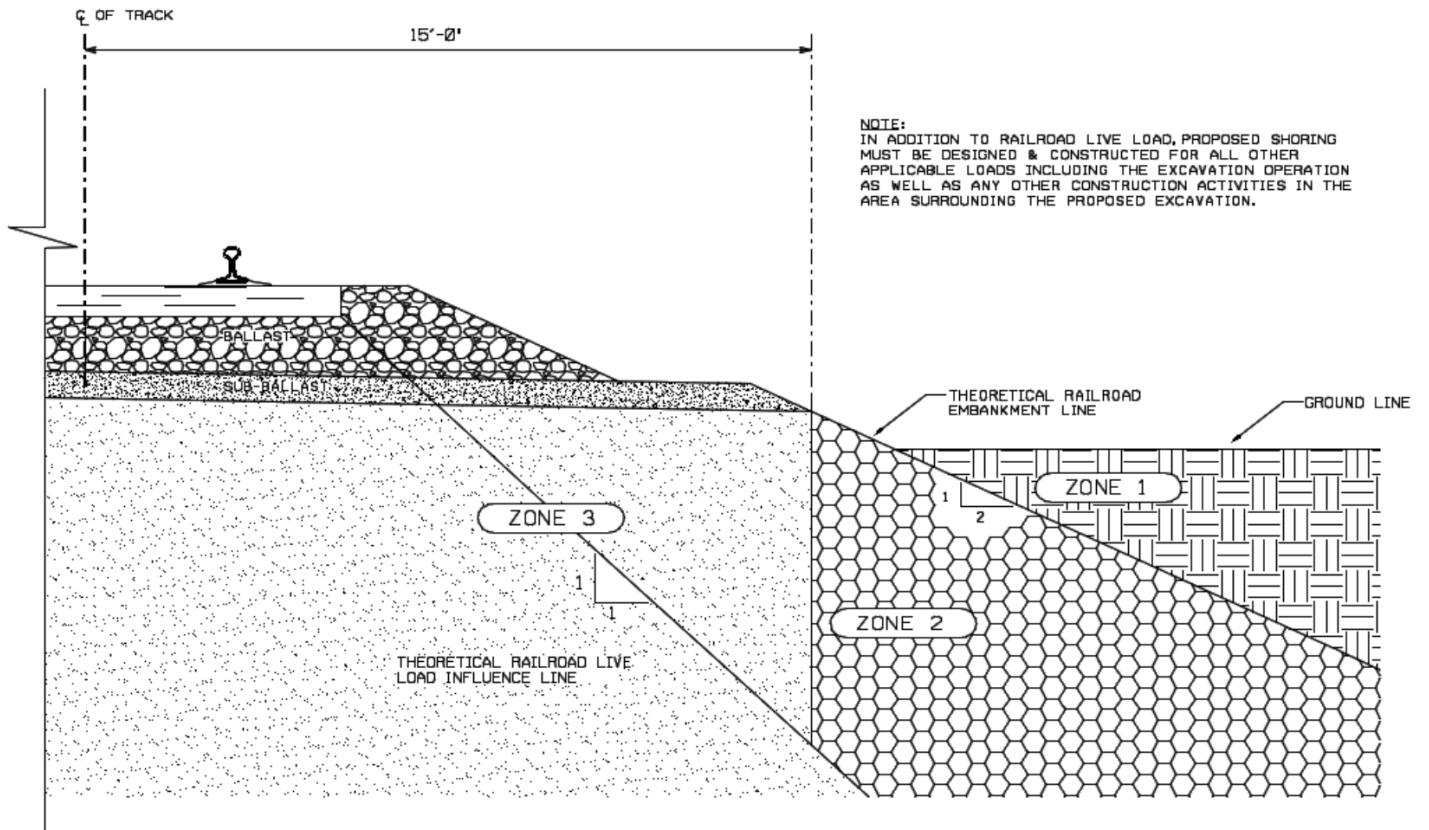
- A. The Agency or its Contractor shall submit a detailed design and procedure for the installation of a sheeting/shoring system adjacent to the tracks. Shoring protection shall be provided when excavating with Potential to Foul, or as otherwise determined by CSXT. Shoring shall be provided in accordance with the AREMA, except as noted below.
- B. Shoring may not be required if all of the following conditions are satisfied:
1. The excavation does not encroach within the Theoretical Live Load Influence Zone. Please refer to Figure 1.

2. The track structure is situated on level ground, or in a cut section, and on stable soil.
 3. The excavation does not adversely impact the stability of a CSXT facility (i.e., signal bungalow, drainage facility, undergrade bridge, building, etc), or the stability of any structure on, over, or adjacent to CSXT property with potential to foul.
 4. Shoring is not required by any governing federal, state, local or other construction code.
- C. Shoring is required when excavating the toe of an embankment. Excavation of any embankment which supports an active CSXT track structure without shoring will not be permitted.
- D. Trench boxes are not an acceptable means of shoring. Trench boxes are prohibited for use on CSXT property or within the Theoretical Railroad Live Load Influence Zone.
- E. Shoring shall be a cofferdam-type, which completely encloses the excavation. However, where justified by site or work conditions, partial cofferdams with open sides away from the track may be permissible, as determined by the Engineer.
- F. Cofferdams shall be constructed using interlocking steel sheet piles, or when approved by the Engineer, steel soldier piles with timber lagging. Wales and struts shall be included when dictated by the design.
- G. The use of tiebacks can be permissible for temporary shoring systems, when conditions warrant. Tiebacks shall have a minimum clear cover of 6'-0", measured from the bottom of the rail. Upon completion of the work, tiebacks shall be grouted, cut off, and remain in place.
- H. All shoring systems on, or adjacent to CSXT right-of-way, shall be equipped with railings or other fall protection, compliant with the governing federal, state or local requirements. Area around pits shall be graded to eliminate all potential tripping hazards.
- I. Interlocking steel sheet piles shall be used for shoring systems qualifying one or more of the following conditions:
1. Within 18'-0" of the nearest track centerline
 2. Within the live load influence zone
 3. Within slopes supporting the track structure
 4. As otherwise deemed necessary by the Engineer.
- J. Sheet piles qualifying for one or more of the requirements listed in Section VI.I (above) of this document shall not be removed. Sheet piles shall be left in place and cut off a minimum of 3'-0" below the finished grade, the ditch line invert, or as otherwise directed by the Engineer. The ground shall be backfilled and compacted immediately after sheet pile is cut off.
- K. The following design considerations shall be considered when preparing the shoring design package:
1. Shoring shall be designed to resist a vertical live load surcharge of 1,880 lbs. per square foot, in addition to active earth pressure. The surcharge shall be assumed to act on a continuous strip, eight feet six inches (8'-6") wide. Lateral pressures due to surcharge shall be computed using the strip load formula shown in *AREMA Manual for Railway Engineering*, Chapter 8, Part 20.
 2. Allowable stresses in materials shall be in accordance with AREMA Chapter 7, 8, and 15.3.
 3. A minimum horizontal clearance of ten feet (10'-0") from centerline of the track to face of nearest point of shoring shall be maintained, provided a twelve feet (12'-0") roadbed is maintained with a temporary walkway and handrail system.
 4. For temporary shoring systems with Potential to Foul, piles shall be plumb under full dead load. Maximum deflection at the top of wall, under full live load, shall be as follows:
 - i. One-half (1/2) inch for walls within twelve feet (12'-0") of track centerline (Measured from centerline of the nearest track to the nearest point of the supporting structure).
 - ii. One (1) inch for walls located greater than twelve feet (12'-0") from track centerline
- L. Shoring work plans shall be submitted in accordance with Section II of this document, as well as the following additional requirements:
1. The work plan shall include detailed drawings of the shoring systems calling out the sizes of all structural members, details of all connections. Both plan and elevation drawings shall be provided, calling out dimensions from the face of shoring relative to the nearest track centerline. The elevation drawing shall also show the height of shoring, and track elevation in relation to bottom of excavation.
 2. Full design calculations for the shoring system shall be furnished.
 3. A procedure for cutting off the sheet pile, backfilling and restoring the embankment.


VII. TRACK MONITORING


- A. When work being performed has the potential to disrupt the track structure, a work plan must be submitted detailing a track monitoring program which will serve to monitor and detect both horizontal and vertical movement of the CSXT track and roadbed.
- B. The program shall specify the survey locations, the distance between the location points, and frequency of monitoring before, during, and after construction. CSXT reserves to the right to modify the survey locations and monitoring frequency as necessary during the project.
- C. The survey data shall be collected in accordance with the approved frequency and immediately furnished to the Engineer for analysis.
- D. If any movement has occurred as determined by the Engineer, CSXT will be immediately notified. CSXT, at its sole discretion, shall have the right to immediately require all contractor operations to be ceased, have the excavated area immediately backfilled and/or determine what corrective action is required. Any corrective action required by CSXT or performed by CSXT including the monitoring of corrective action of the contractor will be at project expense.


FIGURE 1: Theoretical Live Load Influence Zone



NORMAL REQUIREMENTS FOR SHORING ADJACENT TO TRACK

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ZONE 1 - EXCAVATIONS ABOVE AND OUTSIDE OF THE THEORETICAL RAILROAD EMBANKMENT LINE - DO NOT NORMALLY REQUIRE SHORING TO PROTECT RAILROAD ROADBED, SHORING MAY BE REQUIRED FOR OTHER REASONS.
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ZONE 2 - EXCAVATIONS WHOSE BOTTOMS EXTEND INTO ZONE 2 REQUIRE SHORING, BUT THE SHORING MAY NORMALLY BE PULLED AFTER THE EXCAVATION HAS BEEN BACKFIELD.
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ZONE 3 - EXCAVATIONS WHOSE BOTTOMS EXTEND INTO ZONE 3 WILL NORMALLY REQUIRE THE SHORING TO BE LEFT IN PLACE AND CUT-OFF 3' BELOW BASE OF RAIL. SHORING MUST BE DESIGNED FOR COOPER E88 LIVE LOAD

CSX Transportation

CSXT SPECIAL PROVISIONS

Public Projects Group
Jacksonville, FL
Date Issued: July 2017

CSXT SPECIAL PROVISIONS

AUTHORITY OF CSXT ENGINEER

The CSXT Representative shall have final authority in all matters affecting the safe maintenance of CSXT operations and CSXT property, and his or her approval shall be obtained by the Agency or its Contractor for methods of construction to avoid interference with CSXT operations and CSXT property and all other matters contemplated by the Agreement and these Special Provisions.

II. INTERFERENCE WITH CSXT OPERATIONS

A. Agency or its Contractor shall arrange and conduct its work so that there will be no interference with CSXT operations, including train, signal, telephone and telegraphic services, or damage to CSXT's property, or to poles, wires, and other facilities of tenants on CSXT's Property or right-of-way. Agency or its Contractor shall store materials so as to prevent trespassers from causing damage to trains, or CSXT Property. Whenever Work is likely to affect the operations or safety of trains, the method of doing such Work shall first be submitted to the CSXT Representative for approval, but such approval shall not relieve Agency or its Contractor from liability in connection with such Work.

B. If conditions arising from or in connection with the Project require that immediate and unusual provisions be made to protect train operation or CSXT's property, Agency or its Contractor shall make such provision. If the CSXT Representative determines that such provision is insufficient, CSXT may, at the expense of Agency or its Contractor, require or provide such provision as may be deemed necessary, or cause the Work to cease immediately.

III. NOTICE OF STARTING WORK. Agency or its Contractor shall not commence any work on CSXT Property or rights of-way until it has complied with the following conditions:

A. Notify CSXT in writing of the date that it intends to commence Work on the Project. Such notice must be received by CSXT at least 10 business days in advance of the date Agency or its Contractor proposes to begin Work on CSXT property. The notice must refer to this Agreement by date. If flagging service is required, such notice shall be submitted at least thirty (30) business days in advance of the date scheduled to commence the Work.

B. Obtain authorization from the CSXT Representative to begin Work on CSXT property, such authorization to include an outline of specific conditions with which it must comply.

C. Obtain from CSXT the names, addresses and telephone numbers of CSXT's personnel who must receive notice under provisions in the Agreement. Where more than one individual is designated, the area of responsibility of each shall be specified.

IV. WORK FOR THE BENEFIT OF THE CONTRACTOR

A. No temporary or permanent changes to wire lines or other facilities (other than third party fiber optic cable transmission systems) on CSXT property that are considered necessary to the Work are anticipated or shown on the Plans. If any such changes are, or become, necessary in the opinion of CSXT or Agency, such changes will be covered by appropriate revisions to the Plans and by preparation of a force account estimate. Such force account estimate may be initiated by either CSXT or Agency, but must be approved by both CSXT and Agency. Agency or Contractor shall be responsible for arranging for the relocation of the third party fiber optic cable transmission systems, at no cost or expense to CSXT.

B. Should Agency or Contractor desire any changes in addition to the above, then it shall make separate arrangements with CSXT for such changes to be accomplished at the Agency or Contractor's expense.

V. HAUL ACROSS RAILROAD

A. If Agency or Contractor desires access across CSXT property or tracks at other than an existing and open public road crossing in or incident to construction of the Project, the Agency or Contractor must first obtain the permission of CSXT and shall execute a license agreement or right of entry satisfactory to CSXT, wherein Agency or Contractor agrees to bear all costs and liabilities related to such access.

B. Agency and Contractor shall not cross CSXT's property and tracks with vehicles or equipment of any kind or character, except at such crossing or crossings as may be permitted pursuant to this section.

VI. COOPERATION AND DELAYS

A. Agency or Contractor shall arrange a schedule with CSXT for accomplishing stage construction involving work by CSXT. In arranging its schedule, Agency or Contractor shall ascertain, from CSXT, the lead time required for assembling crews and materials and shall make due allowance therefor.

B. Agency or Contractor may not charge any costs or submit any claims against CSXT for hindrance or delay caused by railroad traffic; work done by CSXT or other delay incident to or necessary for safe maintenance of railroad traffic; or for any delays due to compliance with these Special Provisions.

C. Agency and Contractor shall cooperate with others participating in the construction of the Project to the end that all work may be carried on to the best advantage.

D. Agency and Contractor understand and agree that CSXT does not assume any responsibility for work performed by others in connection the Project. Agency and Contractor further understand and agree that they shall have no claim whatsoever against CSXT for any inconvenience, delay or additional cost incurred by Agency or Contractor on account of operations by others.

VII. STORAGE OF MATERIALS AND EQUIPMENT

Agency and Contractor shall not store their materials or equipment on CSXT's property or where they may potentially interfere with CSXT's operations, unless Agency or Contractor has received CSXT Representative's prior written permission. Agency and Contractor understand and agree that CSXT will not be liable for any damage to such materials and equipment from any cause and that CSXT may move, or require Agency or Contractor to move, such material and equipment at Agency's or Contractor's sole expense. To minimize the possibility of damage to the railroad tracks resulting from the unauthorized use of equipment, all grading or other construction equipment that is left parked near the tracks unattended by watchmen shall be immobilized to the extent feasible so that it cannot be moved by unauthorized persons.

VIII. CONSTRUCTION PROCEDURES

A. General

1. Construction work on CSXT property shall be subject to CSXT's inspection and approval.
2. Construction work on CSXT property shall be in accord with CSXT's written outline of specific conditions and with these Special Provisions.
3. Contractor shall observe the terms and rules of the CSXT Safe Way manual, which Agency and Contractor shall be required to obtain from CSXT, and in accord with any other instructions furnished by CSXT or CSXT's Representative.

B. Blasting

1. Agency or Contractor shall obtain CSXT Representative's and Agency Representative's prior written approval for use of explosives on or adjacent to CSXT property. If permission for use of explosives is granted, Agency or Contractor must comply with the following:
 - a. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of Agency or Contractor.
 - b. Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.
 - c. No blasting shall be done without the presence of an authorized representative of CSXT. At least 30 days' advance notice to CSXT Representative is required to arrange for the presence of an authorized CSXT representative and any flagging that CSXT may require.

d. Agency or Contractor must have at the Project site adequate equipment, labor and materials, and allow sufficient time, to (i) clean up (at Agency's expense) debris resulting from the blasting without any delay to trains; and (ii) correct (at Agency's expense) any track misalignment or other damage to CSXT's property resulting from the blasting, as directed by CSXT Representative, without delay to trains. If Agency's or Contractor's actions result in delay of any trains, including Amtrak passenger trains, Agency shall bear the entire cost thereof.

e. Agency and Contractor shall not store explosives on CSXT property.

2. CSXT Representative will:

a. Determine the approximate location of trains and advise Agency or Contractor of the approximate amount of time available for the blasting operation and clean-up.

b. Have the authority to order discontinuance of blasting if, in his or her opinion, blasting is too hazardous or is not in accord with these Special Provisions.

IX. MAINTENANCE OF DITCHES ADJACENT TO CSXT TRACKS

Agency or Contractor shall maintain all ditches and drainage structures free of silt or other obstructions that may result from their operations. Agency or Contractor shall provide erosion control measures during construction and use methods that accord with applicable state standard specifications for road and bridge construction, including either (1) silt fence; (2) hay or straw barrier; (3) berm or temporary ditches; (4) sediment basin; (5) aggregate checks; and (6) channel lining. All such maintenance and repair of damages due to Agency's or Contractor's operations shall be performed at Agency's expense.

X. FLAGGING / INSPECTION SERVICE

A. CSXT has sole authority to determine the need for flagging required to protect its operations and property. In general, flagging protection will be required whenever Agency or Contractor or their equipment are, or are likely to be, working within fifty (50) feet of live track or other track clearances specified by CSXT, or over tracks.

B. Agency shall reimburse CSXT directly for all costs of flagging that is required on account of construction within CSXT property shown in the Plans, or that is covered by an approved plan revision, supplemental agreement or change order.

C. Agency or Contractor shall give a minimum of 30 days' advance notice to CSXT Representative for anticipated need for flagging service. No work shall be undertaken until the flag person(s) is/are at the job site. If it is necessary for CSXT to advertise a flagging job for bid, it may take up to 90-days to obtain this service, and CSXT shall not be liable for the cost of delays attributable to obtaining such service.

D. CSXT shall have the right to assign an individual to the site of the Project to perform inspection service whenever, in the opinion of CSXT Representative, such inspection may be necessary. Agency shall reimburse CSXT for the costs incurred by CSXT for such inspection service. Inspection service shall not relieve Agency or Contractor from liability for its Work.

E. CSXT shall render invoices for, and Agency shall pay for, the actual pay rate of the flagpersons and inspectors used, plus standard additives, whether that amount is above or below the rate provided in the Estimate. If the rate of pay that is to be used for inspector or flagging service is changed before the work is started or during the progress of the work, whether by law or agreement between CSXT and its employees, or if the tax rates on labor are changed, bills will be rendered by CSXT and paid by Agency using the new rates. Agency and Contractor shall perform their operations that require flagging protection or inspection service in such a manner and sequence that the cost of such will be as economical as possible.

XI. UTILITY FACILITIES ON CSXT PROPERTY

Agency shall arrange, upon approval from CSXT, to have any utility facilities on or over CSXT Property changed as may be necessary to provide clearances for the proposed trackage.

XII. CLEAN-UP

Agency or Contractor, upon completion of the Project, shall remove from CSXT's Property any temporary grade crossings, any temporary erosion control measures used to control drainage, all machinery, equipment, surplus materials, falsework, rubbish, or temporary buildings belonging to Agency or Contractor. Agency or Contractor, upon completion of the Project, shall leave CSXT Property in neat condition, satisfactory to CSXT Representative.

XIII. FAILURE TO COMPLY

If Agency or Contractor violate or fail to comply with any of the requirements of these Special Provisions, (a) CSXT may require Agency and/or Contractor to vacate CSXT Property; and (b) CSXT may withhold monies due Agency and/or Contractor; (c) CSXT may require Agency to withhold monies due Contractor; and (d) CSXT may cure such failure and the Agency shall reimburse CSXT for the cost of curing such failure.

APPENDIX

CSX Transportation

SOIL AND WATER MANAGEMENT POLICY

CSXT Design and Construction
Public Projects Group
Jacksonville, FL
Date Issued: July 2017

Soil and Water Management Policy

Public projects that generate soils from CSXT property must adhere to CSXT's soil management policies. CSXT requires soils generated from its property to either be properly disposed in a CSXT approved disposal facility or reused on CSXT property. The management of soils generated from CSXT property should be planned for and properly permitted (if applicable) prior to initiating any work on CSXT property.

Overview

- Soil Reuse: CSXT Environmental Department must review and approve reuse of soil on CSXT property.
- Soil Disposal: If the soil cannot be reused on CSXT property, it must be properly disposed at a CSXT approved disposal facility. CSXT prohibits any contractor from taking soils for off property reuse. CSXT Environmental Department will handle waste characterization and profiling into an approved disposal facility. CSXT prohibits any environmental sampling on its property unless granted through a written Environmental Right of Entry or approved in writing by the CSXT Environmental Department. If Agency has arrangements with a disposal facility not approved by CSXT, Agency can request CSXT to evaluate the disposal facility. Request to evaluate alternate disposal facilities should take place prior to work being initiated on CSXT property.
- If dewatering is planned for a public project, CSXT Environmental Department must review and approve the dewatering plan prior to work being initiated on CSXT property. CSXT prohibits the discharge of water onto its property without prior approval. CSXT prohibits environmental sampling of groundwater or surface water unless granted through a written Environmental Right of Entry or approved in writing by the CSXT Environmental Department.
- It is the policy of CSXT that all materials discarded by or on behalf of CSXT will be managed in accordance with local, state and federal regulations as well as CSXT's best management practices and sustainability goals. To ensure that these goals are achieved, CSXT has mechanisms in place to monitor waste management activities, capture the information necessary to ensure 100% compliance with local, state and federal requirements 100% of the time, and track progress in the CSXT sustainability program. These mechanisms also allow CSXT to complete reporting requirements to federal and state regulatory agencies and document CSXT's progress toward its sustainability goals.
- Containment system, clean up and disposal of all paint and other material removed from a bridge: The clean-up and disposal of material from the surface preparation for painting and actual painting must comply with all appropriate regulations. The materials removed during the surface preparation must not impact the surrounding area including ground, water, or air impacts. Materials must not be stored on CSXT property.



Insurance Requirements for Public Projects

I. Insurance Policies:

Agency and Contractor, if and to the extent that either is performing work on or about CSXT's property, shall procure and maintain the following insurance policies:

1. Commercial General Liability coverage at their sole cost and expense with limits of not less than \$5,000,000 in combined single limits for bodily injury and/or property damage per occurrence, and such policies shall name CSXT as an additional named insured. The policy shall include endorsement ISO CG 24 17 evidencing that coverage is provided for work within 50 feet of a railroad. If such endorsement is not included, railroad protective liability insurance must be provided as described in item 4 below.
2. Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than \$1,000,000, which insurance must contain a waiver of subrogation against CSXT and its affiliates (if permitted by state law).
3. Commercial automobile liability insurance with limits of not less than \$1,000,000 combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name CSXT as an additional named insured. The policy shall include endorsement ISO CA 20 70 evidencing that coverage is provided for work within 50 feet of a railroad. If such endorsement is not included, railroad protective liability insurance must be provided as described in item 4 below.
4. Railroad protective liability insurance with limits of not less than \$5,000,000 combined single limit for bodily injury and/or property damage per occurrence and an aggregate annual limit of \$10,000,000, which insurance shall satisfy the following additional requirements:
 - a. The Railroad Protective Insurance Policy must be on the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.
 - b. CSX Transportation must be the named insured on the Railroad Protective Insurance Policy.
 - c. Name and Address of Contractor and Agency must appear on the Declarations page.
 - d. Description of operations must appear on the Declarations page and must match the Project description.
 - e. Authorized endorsements must include the Pollution Exclusion Amendment - CG 28 31, unless using form CG 00 35 version 96 and later.
 - f. Authorized endorsements may include:
 - (i). Broad Form Nuclear Exclusion - IL 00 21
 - (ii). 30-day Advance Notice of Non-renewal or cancellation
 - (iii). Required State Cancellation Endorsement
 - (iv). Quick Reference or Index - CL/IL 240
 - g. Authorized endorsements may not include:
 - (i). A Pollution Exclusion Endorsement except CG 28 31
 - (ii). A Punitive or Exemplary Damages Exclusion
 - (iii). A "Common Policy Conditions" Endorsement
 - (iv). Any endorsement that is not named in Section 4 (e) or (f) above.
 - (v). Policies that contain any type of deductible

5. All insurance companies must be A. M. Best rated A- and Class VII or better.
6. The CSX OP number or CSX contract number, as applicable, must appear on each Declarations page and/or certificates of insurance.
7. Such additional or different insurance as CSXT may require.

II. Additional Terms

1. Contractor must submit the original Railroad Protective Liability policy, Certificates of Insurance and all notices and correspondence regarding the insurance policies to:

Insurance Department
CSX Transportation, Inc.
500 Water Street, C-907
Jacksonville, FL 32202

insurancedocuments@csx.com

2. Neither Agency nor Contractor may begin work on the Project until it has received CSXT's written approval of the required insurance.

Insurance Requirements Document updated June 2017



Storm Water Pollution Prevention Plan



Route FAU384	Marked Route CH V37 / RIDGE ROAD	Section 11-00134-02-WR
Project Number ZX7F(566)	County GRUNDY	Contract Number 87695

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issues 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.

Print Name Eric Gibson P.E.	Title County Engineer	Agency Grundy County Highway Dept.
Signature 	Date 04/15/2019	

I. Site Description

- A. Provide a description of the project location (include latitude and longitude):
RIDGE ROAD WIDENING IN MINOOKA, IL. (41°27'11"N 88°16'16"W)
- B. Provide a description of the construction activity which is subject of this plan:
Structure modification; excavation and embankment for roadway widening
- C. Provide the estimated duration of this project:
24 months
- D. The total area of the construction site is estimated to be 8.55 acres.
The total area of the site estimated to be disturbed by excavation, grading or other activities is 7.61 acres.
- E. The following is a weighted average of the runoff coefficient for this project after construction activities are completed:
0.6
- F. List all soils found within project boundaries. Include map unit name, slope information and erosivity:
Fox silt loam, 2-4% slopes; Martinsville loam, 2-4% slopes; Oakville fine sand, 6-12 & 20-30% slopes; Lawson Silt Loam, 0-2% slopes, frequently flooded
- G. Provide an aerial extent of wetland acreage at the site:
0.00 Acres
- H. Provide a description of potentially erosive areas associated with this project:
Potentially erosive areas include ditch profiles which will be re-graded, proposed roadway embankments which are as steep as 1V:2H, and excavations near ditches for new structure.

- 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 scopes, etc.):

All construction will occur in two main stages. Activities which will disturb soil include pavement removal, topsoil stripping, structure removal, excavation for new structure, embankment for widened roadway, and shaping of ditches.

- 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 off site 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:

Grundy County

- L. The following is a list of General NPDES ILR40 permittees within whose reporting jurisdiction this project is located.

IDOT, Aux Sable Township, Grundy County

- M. The following is a list of receiving water(s) and the ultimate receiving water(s) for this site. The location of the receiving waters can be found on the erosion and sediment control plans:

Illinois River

- N. Describe areas of the site that are to be protected or remain undisturbed. These areas may include steep slopes, highly erodible soils, streams, stream buffers, specimen trees, natural vegetation, nature preserves, etc.

Adjacent farmland, adjacent ditches, park at school.

- O. The following sensitive environmental resources are associated with this project, and may have the potential to be impacted by the proposed development:

- Floodplain
- Wetland Riparian
- Threatened and Endangered Species
- Historic Preservation
- 303(d) Listed receiving waters for suspended solids, turbidity, or siltation
- Receiving waters with Total Maximum Daily Load (TMDL) for sediment, total suspended solids, turbidity, or siltation
- Applicable Federal, Tribal, State or Local Programs
- Other

303(d) Listed receiving waters (fill out this section if checked above):

- a. The name(s) of the listed water body, and identification of all pollutants causing impairment:

- b. 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:

- c. Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:

- d. Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

2. TMDL (fill out this section if checked above)

a. The name(s) of the listed water body:

[Empty text box]

b. 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:

[Empty text box]

c. 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 the allocation:

[Empty text box]

P. The following pollutants of concern will be associated with this construction project:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Soil Sediment | <input checked="" type="checkbox"/> Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids) |
| <input checked="" type="checkbox"/> Concrete | <input checked="" type="checkbox"/> Antifreeze / Coolants |
| <input checked="" type="checkbox"/> Concrete Truck waste | <input type="checkbox"/> Waste water from cleaning construction equipment |
| <input checked="" type="checkbox"/> Concrete Curing Compounds | <input type="checkbox"/> Other (specify) _____ |
| <input checked="" type="checkbox"/> Solid waste Debris | <input type="checkbox"/> Other (specify) _____ |
| <input checked="" type="checkbox"/> Paints | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Solvents | <input type="checkbox"/> Other (specify) _____ |
| <input checked="" type="checkbox"/> Fertilizers / Pesticides | <input type="checkbox"/> 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 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:

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

- Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.
- 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:

- | | |
|--|--|
| <input type="checkbox"/> Preservation of Mature Vegetation | <input checked="" type="checkbox"/> Erosion Control Blanket / Mulching |
| <input type="checkbox"/> Vegetated Buffer Strips | <input type="checkbox"/> Sodding |

- | | |
|---|--|
| <input type="checkbox"/> Protection of Trees | <input type="checkbox"/> Geotextiles |
| <input checked="" type="checkbox"/> Temporary Erosion Control Seeding | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Temporary Turf (Seeding, Class 7) | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Temporary Mulching | <input type="checkbox"/> Other (specify) _____ |
| <input checked="" type="checkbox"/> Permanent Seeding | <input type="checkbox"/> Other (specify) _____ |

Describe how the stabilization practices listed above will be utilized during construction:

Vegetation disturbance shall be minimized to the areas necessary to complete construction. Temporary seeding and temporary erosion control blanket shall be used to stabilize all erodible/bare areas every 7 days.

Describe how the stabilization practices listed above will be utilized after construction activities have been completed:

All disturbed areas shall be permanently seeded as soon as practical.

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

The following stabilization practices will be used for this project:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Perimeter Erosion Barrier | <input checked="" type="checkbox"/> Rock Outlet Protection |
| <input checked="" type="checkbox"/> Temporary Ditch Check | <input type="checkbox"/> Riprap |
| <input type="checkbox"/> Storm Drain Inlet Protection | <input type="checkbox"/> Gabions |
| <input type="checkbox"/> Sediment Trap | <input type="checkbox"/> Slope Mattress |
| <input type="checkbox"/> Temporary Pipe Slope Drain | <input checked="" type="checkbox"/> Retaining Walls |
| <input type="checkbox"/> Temporary Sediment Basin | <input type="checkbox"/> Slope Walls |
| <input type="checkbox"/> Temporary Stream Crossing | <input type="checkbox"/> Concrete Revetment Mats |
| <input type="checkbox"/> Stabilized Construction Exits | <input type="checkbox"/> Level Spreaders |
| <input type="checkbox"/> Turf Reinforcement Mats | <input type="checkbox"/> Other (specify) _____ |
| <input checked="" type="checkbox"/> Permanent Check Dams | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Permanent Sediment Basin | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Aggregate Ditch | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Paved Ditch | <input type="checkbox"/> Other (specify) _____ |

Describe how the structural practices listed above will be utilized during construction:

Perimeter erosion barrier and temporary ditch checks will be installed prior to soil disturbance and will be used as sediment control devices during construction. Perimeter erosion barrier will be actively maintained until final stabilization has been installed.

Describe how the structural practices listed above will be utilized after construction activities have been completed:

Permanent check dams as velocity dissipation devices to prevent erosive flow velocity from developing in roadside ditches.

D. Treatment Chemicals

Will polymer flocculents or treatment chemicals be utilized on this project: Yes No

If yes above, identify where and how polymer flocculents or treatment chemicals will be utilized on this project.

E. **Permanent 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 on the basis of the technical guidance in Chapter 41 (Construction Site Storm Water Pollution Control) of the IDOT Bureau of Design & Environment 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:

Install permanent vegetation as soon as practical.

F. **Approved State or Local Laws:** The management practices, controls, and provisions contained in this plan will in accordance with IDOT specifications, which are at least as protective as the requirements contained in the Illinois Environmental Protection Agency'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:

Project will comply with IEPA standards.

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:

2. 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:

III. Maintenance

When requested by the Contractor, the Resident Engineer will provide general maintenance guides to the Contractor for the practices associated with this project. 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 Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

Sediment collected by the erosion control systems shall be disposed of on a regular basis, in accordance with manufacturer recommendations and IEPA guidelines, but in no case less than when the height of sediment exceeds one-half the height of the filter device.

IV. Inspections

Qualified personnel shall inspect disturbed areas of the construction site 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 e-mail at: , 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

Additional Inspections Required:

--

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.



Contractor Certification Statement

Reset Form

Prior to conducting any professional services at the site covered by this contract, the Contractor and every subcontractor must complete and return to the Resident Engineer the following certification. A separate certification must be submitted by each firm. Attach to this certification all items required by Section II.G of the Storm Water Pollution Prevention Plan (SWPPP) which will be handled by the Contractors/subcontractor completing this form.

Route	Marked Route	Section
<input type="text"/>	<input type="text"/>	<input type="text"/>
Project Number	County	Contract Number
<input type="text"/>	<input type="text"/>	<input type="text"/>

This certification statement is a part of SWPPP for the project described above, in accordance with the General NPDES Permit No. ILR10 issued by the Illinois Environmental Protection Agency.

I certify under penalty of law that I understand the terms of the Permit No. ILR10 that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

In addition, I have read and understand all of the information and requirements stated in SWPPP for the above mentioned project; I have received copies of all appropriate maintenance procedures; and, I have provided all documentation required to be in compliance with the Permit ILR10 and SWPPP and will provide timely updates to these documents as necessary.

- Contractor
- Sub-Contractor

Print Name	Signature
<input type="text"/>	<input type="text"/>
Title	Date
<input type="text"/>	<input type="text"/>
Name of Firm	Telephone
<input type="text"/>	<input type="text"/>
Street Address	City/State/Zip
<input type="text"/>	<input type="text"/>

Items which the Contractor/subcontractor will be responsible for as required in Section II.G. of SWPPP:

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

Effective: August 1, 2012

Revised: February 1, 2014

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

It is the policy of IDOT to fund IDOT pre-apprenticeship training programs throughout Illinois to provide training and skill-improvement opportunities to assure the increased participation of minority groups, disadvantaged persons and women in all phases of the highway construction industry. The intent of this IDOT Training Program Graduate (TPG) Special Provision is to place certified graduates of these IDOT funded pre-apprentice training programs on IDOT project sites when feasible, and provide the graduates with meaningful on-the-job training intended to lead to journey-level employment. IDOT and its sub-recipients, in carrying out the responsibilities of a state contract, shall determine which construction contracts shall include "Training Program Graduate Special Provisions." To benefit from the incentives to encourage the participation in the additional on-the-job training under this Training Program Graduate Special Provision, the Contractor shall make every reasonable effort to employ certified graduates of IDOT funded Pre-apprenticeship Training Programs to the extent such persons are available within a reasonable recruitment area.

Participation pursuant to IDOT's requirements by the Contractor or subcontractor in this Training Program Graduate (TPG) Special Provision entitles the Contractor or subcontractor to be reimbursed at \$15.00 per hour for training given a certified TPG on this contract. As approved by the Department, reimbursement will be made for training persons as specified herein. This reimbursement will be made even though the Contractor or subcontractor may receive additional training program funds from other sources for other trainees, provided such other source does not specifically prohibit the Contractor or subcontractor from receiving other reimbursement. For purposes of this Special Provision the Contractor is not relieved of requirements under applicable federal law, the Illinois Prevailing Wage Act, and is not eligible for other training fund reimbursements in addition to the Training Program Graduate (TPG) Special Provision reimbursement.

No payment shall be made to the Contractor if the Contractor or subcontractor fails to provide the required training. It is normally expected that a TPG will begin training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project through completion of the contract, so long as training opportunities exist in his work classification or until he has completed his training program. Should the TPG's employment end in advance of the completion of the contract, the Contractor shall promptly notify the designated IDOT staff member under this Special Provision that the TPG's involvement in the contract has ended and supply a written report of the reason for the end of the involvement, the hours completed by the TPG under 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 TPG.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting its performance under this Special Provision.

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 certified TRAINEES TRAINING PROGRAM GRADUATE. The estimated total number of hours, unit price and total price have been included in the schedule of prices.

The Contractor shall provide training opportunities aimed at developing full journeyworker in the type of trade or job classification involved. The initial number of TPGs for which the incentive is available under this contract is 4 . During the course of performance of the Contract the Contractor may seek approval from the Department for additional incentive eligible TPGs. In the event the Contractor subcontracts a portion of the contract work, it shall determine how many, if any, of the TPGs 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 insure that this Training Program Graduate Special Provision is made applicable to such subcontract if the TPGs are to be trained by a subcontractor and that the incentive payment is passed on to each subcontractor.

For the Contractor to meet the obligations for participation in this TPG incentive program under this Special Provision, the Department has contracted with several entities to provide screening, tutoring and pre-training to individuals interested in working in the applicable construction classification and has certified those students who have successfully completed the program and are eligible to be TPGs. A designated IDOT staff member, the Director of the Office of Business and Workforce Diversity (OBWD), will be responsible for providing assistance and referrals to the Contractor for the applicable TPGs. For this contract, the Director of OBWD is designated as the responsible IDOT staff member to provide the assistance and referral services related to the placement for this Special Provision. For purposes of this Contract, contacting the Director of OBWD and interviewing each candidate he/she recommends constitutes reasonable recruitment.

Prior to commencing construction, the Contractor shall submit to the Department for approval the TPGs to be trained in each selected classification. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. No employee shall be employed as a TPG in any classification in which he/she has successfully completed a training course leading to journeyman status or in which he/she has been employed as a journeyman. Notwithstanding the on-the-job training purpose of this TPG Special Provision, some offsite training is permissible as long as the offsite training is an integral part of the work of the contract and does not comprise a significant part of the overall training.

Training and upgrading of TPGs of IDOT pre-apprentice training programs is intended to move said TPGs toward journeyman status and is the primary objective of this Training Program Graduate Special Provision. Accordingly, the Contractor shall make every effort to enroll TPGs by recruitment through the IDOT funded TPG programs to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that it has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance and entitled to the Training Program Graduate Special Provision \$15.00 an hour incentive.

The Contractor or subcontractor shall provide each TPG with a certificate showing the type and length of training satisfactorily completed.

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:

The entities listed above and their officers, employees, and agents shall be indemnified and held harmless in accordance with Article 107.26.

State of Illinois
DEPARTMENT OF TRANSPORTATION
Bureau of Local Roads & Streets

SPECIAL PROVISION
FOR
GROWTH CURVE

Effective: March 1, 2008
Revised: January 1, 2010

All references to Sections and Articles in this Special Provision shall be construed to mean specific Sections and Articles in the Standard Specifications for Road and Bridge Construction adopted by the Department of Transportation.

The Contractor shall perform a growth curve at the beginning of placement of each type of mix and each lift. The growth curve for each type of mix and each lift shall be performed within the first 200 tons (180 metric tons). If an adjustment is made to the specific mix design, the Engineer reserves the right to request an additional growth curve and supporting tests at the Contractor's expense.

Compaction of the growth curve shall commence immediately after the course is placed and at a temperature of not less than 280 °F (140 °C). The growth curve, consisting of a plot of lb/cu ft (kg/cu m) vs. number of passes with the project breakdown roller, shall be developed. Roller speed during the growth curve testing shall be the same as the normal paving operation. This curve shall be established by use of a nuclear gauge. Tests shall be taken after each pass until the highest lb/cu ft (kg/cu m) is obtained. This value shall be the target density provided the HMA Gyratory air voids are within acceptable limits. If the HMA Gyratory air voids are not within the specified limits, corrective action shall be taken, and a new target density shall be established.

A new growth curve is required if the breakdown roller used on the growth curve is replaced with a new roller during production. The target density shall apply only to the specific gauge used. If additional gauges are to be used to determine density specification compliance, the Contractor shall establish a unique minimum allowable target density from the growth curve location for each gauge.

At least one core sample per day shall be taken at a location specified by the Engineer. Core densities will be determined using the Illinois-Modified AASHTO T 166 or T 275 procedure by the Department. The core density shall be according to Articles 1030.05(d)(4) and (d)(7). The QA Manager is responsible for assuring and documenting that the determined number of roller passes has been accomplished. The Engineer reserves the right to take core samples at any time to verify density from the nuclear gauge,

All lifts and confined longitudinal joint edges shall be compacted to an average nuclear gauge density of not less than 95 percent nor greater than 102 percent of the target density obtained on the growth curve. Unconfined longitudinal joint edges shall be compacted to an average nuclear gauge density of not less than 93 percent nor greater than 102 percent of the target density obtained on the growth curve. The average nuclear gauge density shall be based on tests representing one day's production.

Quality Control density tests shall be performed at randomly selected locations within 1/2 mile (800 m) intervals per lift per lane. In no case shall more than one half day's production be completed without density testing being performed. Longitudinal joint density testing shall be performed at each random density test location. Longitudinal joint testing shall be located at a distance equal to the lift thickness or a minimum of 2 in. (50 mm) from each pavement edge.

If the Contractor is not controlling the compaction process and is making no effort to take corrective action, the operation shall stop as directed by the Engineer.

COMPENSABLE DELAY COSTS (BDE)

Effective: June 2, 2017

Revised: April 1, 2019

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

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

- (1) Minor Delay. A minor delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two hours, but not to exceed two weeks.
- (2) Major Delay. A major delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two weeks.
- (3) Reduced Rate of Production Delay. A reduced rate of production delay occurs when the rate of production on the work in conflict with the utility in an unanticipated location decreases by more than 25 percent and lasts longer than seven calendar days.”

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

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

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

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

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

Equipment will be the same as for a minor delay, except Contractor-owned equipment will be limited to two weeks plus the cost of move-out to either the

Contractor's yard or another job and the cost to re-mobilize, whichever is less. Rental equipment may be paid for longer than two weeks provided the Contractor presents adequate support to the Department (including lease agreement) to show retaining equipment on the job is the most economical course to follow and in the public interest.

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

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

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

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

- (1) When adverse weather prevents work on the controlling item.
- (2) When job conditions due to recent weather prevent work on the controlling item.
- (3) When conduct or lack of conduct by the Department or its consultants, representatives, officers, agents, or employees; delay by the Department in making the site available; or delay in furnishing any items required to be furnished to the Contractor by the Department prevents work on the controlling item.
- (4) When delays caused by utility or railroad adjustments prevent work on the controlling item.
- (5) When strikes, lock-outs, extraordinary delays in transportation, or inability to procure critical materials prevent work on the controlling item, as long as these delays are not due to any fault of the Contractor.
- (6) When any condition over which the Contractor has no control prevents work on the controlling item.”

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

“(f) Basis of Payment. After resolution of a claim in favor of the Contractor, any adjustment in time required for the work will be made according to Section 108. Any adjustment in the costs to be paid will be made for direct labor, direct materials, direct equipment, direct jobsite overhead, direct offsite overhead, and other direct costs allowed by the resolution. Adjustments in costs will not be made for interest charges, loss of anticipated profit, undocumented loss of efficiency, home office overhead and unabsorbed overhead

other than as allowed by Article 109.13, lost opportunity, preparation of claim expenses and other consequential indirect costs regardless of method of calculation.

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

Add the following to Section 109 of the Standard Specifications.

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

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

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

- (a) Escalated Material and/or Labor Costs. When the delay causes work, which would have otherwise been completed, to be done after material and/or labor costs have increased, such increases will be paid. Payment for escalated material costs will be limited to the increased costs substantiated by documentation furnished by the Contractor. Payment for escalated labor costs will be limited to those items in Article 109.04(b)(1) and (2), except the 35 percent and 10 percent additives will not be permitted.
- (b) Extended Project Overhead. For the duration of the delay, payment for extended project overhead will be paid as follows.
 - (1) Direct Jobsite and Offsite Overhead. Payment for documented direct jobsite overhead and documented direct offsite overhead, including onsite supervisory and administrative personnel, will be allowed according to the following table.

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

	One Clerk
Over \$50,000,000	One Project Manager, Two Project Superintendents, One Engineer, and One Clerk

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

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

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

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

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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 it 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 or 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

DISPOSAL FEES (BDE)

Effective: November 1, 2018

Replace Articles 109.04(b)(5) – 109.04(b)(8) of the Standard Specifications with the following:

- “(5) Disposal Fees. When the extra work performed includes paying for disposal fees at a clean construction and demolition debris facility, an uncontaminated soil fill operation or a landfill, the Contractor shall receive, as administrative costs, an amount equal to five percent of the first \$10,000 and one percent of any amount over \$10,000 of the total approved costs of such fees.
- (6) Miscellaneous. No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.
- (7) Statements. No payment will be made for work performed on a force account basis until the Contractor has furnished the Engineer with itemized statements of the cost of such force account work. Statements shall be accompanied and supported by invoices for all materials used and transportation charges. However, if materials used on the force account work are not specifically purchased for such work but are taken from the Contractor’s stock, then in lieu of the invoices, the Contractor shall furnish an affidavit certifying that such materials were taken from his/her stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

Itemized statements at the cost of force account work shall be detailed as follows.

- a. Name, classification, date, daily hours, total hours, rate, and extension for each laborer and foreman. Payrolls shall be submitted to substantiate actual wages paid if so requested by the Engineer.
 - b. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.
 - c. Quantities of materials, prices and extensions.
 - d. Transportation of materials.
 - e. Cost of property damage, liability and workmen’s compensation insurance premiums, unemployment insurance contributions, and social security tax.
- (8) Work Performed by an Approved Subcontractor. When extra work is performed by an approved subcontractor, the Contractor shall receive, as administrative costs, an amount equal to five percent of the total approved costs of such work with the minimum payment being \$100.

- (9) All statements of the cost of force account work shall be furnished to the Engineer not later than 60 days after receipt of the Central Bureau of Construction form "Extra Work Daily Report". If the statement is not received within the specified time frame, all demands for payment for the extra work are waived and the Department is released from any and all such demands. It is the responsibility of the Contractor to ensure that all statements are received within the specified time regardless of the manner or method of delivery."

80402

DOWEL BAR INSERTER (BDE)

Effective: January 1, 2017

Revised: January 1, 2018

Add the following to Article 420.03 of the Standard Specifications.

“(l) Mechanical Dowel Bar Inserter1103.20”

Revise the first paragraph of Article 420.05(b)(1) of the Supplemental Specifications to read:

“Preformed or Drilled Holes. If applicable, the tie bars shall be installed after the dowel bars have been tested with the MIT Scan-2 device according to Article 420.05(c)(2)b.2. The tie bars shall be installed with a nonshrink grout or chemical adhesive providing a minimum pull-out strength as follows.”

Revise Article 420.05(c) of the Standard Specifications to read:

“(c) Transverse Contraction Joints. Transverse contraction joints shall consist of planes of weakness created by sawing grooves in the surface of the pavement and shall include load transfer devices consisting of dowel bars. Transverse contraction joints shall be according to the following.”

Revise Article 420.05(c)(2) of the Standard Specifications to read:

“(2) Dowel Bars. Dowel Bars shall be installed parallel to the centerline of the pavement and parallel to the proposed pavement surface. Installation shall be according to one of the following methods.

- a. Dowel Bar Assemblies. The assembly shall act as a rigid unit with each component securely held in position relative to the other members of the assembly. The entire assembly shall be held securely in place by means of nails which shall penetrate the stabilized subbase. At least ten nails shall be used for each 10, 11, or 12 ft (3, 3.3, or 3.6 m) section of assembly.

Metal stakes shall be used instead of nails, with soil or granular subbase. The stakes shall loop over or attach to the top parallel spacer bar of the assembly and penetrate the subgrade or subbase at least 12 in. (300 mm).

At the location of each dowel bar assembly, the subgrade or subbase shall be reshaped and re-tamped when necessary.

Prior to placing concrete, any deviation of the dowel bars from the correct horizontal or vertical alignment (horizontal skew or vertical tilt) greater than 3/8 in. in 12 in (9 mm in 300 mm) shall be corrected and a light coating of oil shall be uniformly applied to all dowel bars.

Care shall be exercised in depositing the concrete at the dowel bar assemblies so the horizontal and vertical alignment will be retained.

- b. Dowel Bar Insertion. The dowel bars may be placed in the pavement slab with a mechanical dowel bar inserter (DBI) attached to a formless paver for pavements ≥ 7.0 in. (175 mm) in thickness. A light coating of oil shall be uniformly applied to all dowel bars.

The DBI shall insert the dowel bars with vibration into the plastic concrete after the concrete has been struck off and consolidated without deformation of the slab. After the bars have been inserted, the concrete shall be refinished and no voids shall exist around the dowel bars. The forward movement of the paver shall not be interrupted by the inserting of the dowel bars.

The location of each row of dowel bars shall be marked in a manner to facilitate where to insert the bars, and where to saw the transverse joint.

1. Placement Tolerances for Dowel Bars. The DBI shall place the dowel bars in the concrete pavement within the following tolerances.

- (a.) Longitudinal Translation (Mislocation). Longitudinal translation (mislocation) shall be defined as the position of the center of the dowel bar along the longitudinal axis, in relation to the sawed joint.

The quality control tolerance for longitudinal translation shall not exceed 2.0 in (50 mm). If this tolerance is exceeded, adjustments shall be made to the paving operation.

Any joint having two or more dowel bars with an embedment length less than 4.0 in. (100 mm) within 12 in. (300 mm) of the same wheelpath will be considered unacceptable. The left and right wheelpaths shall be determined by excluding the middle 2.5 ft (0.8 m) of the pavement lane, and by excluding the outer 1.0 ft (0.3 m) measured from each pavement lane edge. Any joint having an average dowel bar embedment length less than 5.25 in. (130 mm) will also be considered unacceptable. Embedment length shall be defined as the length of dowel bar embedded on the short side of the sawed joint. An unacceptable joint shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

- (b.) Horizontal Translation (Mislocation). Horizontal translation (mislocation) shall be defined as the difference in the actual dowel bar location parallel to the longitudinal or edge joint from its theoretical position as shown on the plans.

The quality control tolerance for horizontal translation shall not exceed 2.0 in. (50 mm). If this tolerance is exceeded, adjustments shall be made to the paving operation.

Any joint having a dowel bar with a translation greater than 4.0 in. (100 mm) will be considered unacceptable, but may remain in place unless the Engineer determines the joint will not function. If the joint is unable to remain in place, the joint shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

(c.) Vertical Translation (Mislocation). Vertical translation (mislocation) shall be defined as the difference in the vertical position of the dowel bar relative to the theoretical midpoint of the slab.

The quality control tolerance for vertical translation shall be as shown in the following table. If these tolerances are exceeded, adjustments shall be made to the paving operation.

Pavement Thickness	Dowel Bar Diameter	Vertical Translation Tolerance Above Midpoint	Vertical Translation Tolerance Below Midpoint
≥7 in. to <8 in. (≥175 mm to <200 mm)	1.25 in. (31 mm)	0.25 in. (6 mm)	0.5 in. (13 mm)
≥8 in. to <9 in. (≥200 mm to <225 mm)	1.50 in. (38 mm)	0.25 in. (6 mm)	0.5 in. (13 mm)
≥9 in. to <10 in. (≥225 mm to <250 mm)	1.50 in. (38 mm)	0.75 in. (19 mm)	0.75 in. (19 mm)
≥10 in. (≥250 mm)	1.50 in. (38 mm)	0.75 in. (19 mm)	1.0 in. (25 mm)

Any joint having a dowel bar with top concrete cover less than T/3, where T is slab thickness, will be considered unacceptable. Any joint having 2 or more dowel bars with bottom concrete cover less than 2.0 in. (50 mm) will also be considered unacceptable. An unacceptable joint shall be replaced with a minimum of 6 ft (1.8 m) of pavement according to Section 442 for Class B patches.

(d.) Vertical Tilt or Horizontal Skew (Misalignment). Vertical tilt or horizontal skew (misalignment) shall be defined as the difference in position of the dowel bar ends with respect to each other. Vertical tilt is measured in the vertical axis whereas horizontal skew is measured in the horizontal axis. Misalignment shall be measured in terms of a joint score. The joint score shall be defined as the degree of misalignment evaluated for a single

transverse joint for each lane of pavement. The joint score shall be determined as follows:

$$Joint\ Score = \left(1 + \left(\frac{x}{x-n} \right) \sum_{i=1}^{x-n} W_i \right)$$

where:

W_i = weighting factor (Table 1) for dowel i

x = number of dowels in a single joint

n = number of dowels excluded from the joint score calculation due to measurement interference

Single Dowel Misalignment – The degree of misalignment applicable to a single dowel bar, calculated as:

$$Single\ Dowel\ Misalignment = \sqrt{(Horizontal\ Skew)^2 + (Vertical\ Tilt)^2}$$

Table 1. Weighting Factors in Joint Score Determination	
Single Dowel Bar Misalignment (SDM)	W, Weighting Factor
SDM ≤ 0.6 in. (15 mm)	0
0.6 in. (15 mm) < SDM ≤ 0.8 in. (20 mm)	2
0.8 in. (20 mm) < SDM ≤ 1 in. (25 mm)	4
1 in. (25 mm) < SDM ≤ 1.5 in. (38 mm)	5
1.5 in. (38 mm) < SDM	10

The quality control tolerance for vertical tilt or horizontal skew shall not exceed 0.6 in. (15 mm). If the tolerance is exceeded for either one, adjustments shall be made to the paving operation.

Any joint having a dowel bar with a vertical tilt or horizontal skew greater than 1.5 in. (38 mm) shall be cut. If more than one dowel bar is required to be cut in the joint, the joint will be considered unacceptable and shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

Single dowel bar misalignment shall be controlled to provide the joint scores shown in the following table.

Number of Dowel Bars in the Joint	Maximum Joint Score
< 5	4
≥ 5 but ≤ 9	8
> 9	12

A joint score greater than the specified maximum will be considered locked. Three consecutive joints with a score greater than the specified maximum total score will all be considered unacceptable.

Three consecutive locked joints shall be corrected by selecting one joint and cutting a dowel bar. Preference shall be given to cutting a dowel bar within the middle 2.5 ft (0.8 m) of the pavement lane to avoid the wheelpaths. If none of the three locked joints will have a joint score less than or equal to the specified maximum after selecting one dowel bar to cut, one of the joints shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

(e.) For unacceptable work, the Contractor may propose alternative repairs for consideration by the Engineer.

2. Testing of Dowel Bar Placement. The placement of the dowel bars shall be tested within 24 hours of paving with a calibrated MIT Scan-2 device according to "Use of Magnetic Tomography Technology to Evaluate Dowel Placement" (Publication No. FHWA-IF-06-006) by the Federal Highway Administration.

A trained operator shall perform the testing, and all testing shall be performed in the presence of the Engineer. The device shall be calibrated to the type and size dowel bar used in the work according to the manufacturer's instructions. Calibration documentation shall be provided to the Engineer prior to construction. The device shall be recalibrated and/or validate readings as required by the Engineer. The device may be utilized as a process control and make necessary adjustments to ensure the dowel bars are placed in the correct location.

(a.) Test Section. Prior to start of production paving, a test section consisting of 30 transverse joints shall be constructed. The test section may be performed on the actual pavement, but production paving shall not begin until an acceptable test section has been constructed. The test section will be considered acceptable when all of the following are met:

- (1.) 90 percent of the dowel bars meet the quality control tolerance for longitudinal, horizontal, or vertical translation (mislocation);
- (2.) 90 percent of the dowel bars meet the quality control tolerance for vertical tilt or horizontal skew deviation (misalignment); and
- (3.) none of the joints are considered unacceptable prior to a corrective measure for mislocation or misalignment.

If the test section fails, another test section consisting of 30 joints shall be constructed.

The test section requirement may be waived by the Engineer if the Contractor has constructed an acceptable test section and successfully used the DBI on a Department contract within the same calendar year.

- (b.) Production Paving. After the test section is approved, production paving may begin. The mislocation and misalignment of each dowel bar for the first ten joints constructed, and every tenth joint thereafter, shall be tested.

If two consecutive days of paving result in 5 percent or more of the joints on each day being unacceptable prior to a corrective measure, production paving shall be discontinued and a new test section shall be constructed.

If any joint is found to be unacceptable prior to a corrective measure, testing of additional joints on each side of the unacceptable joint shall be performed until acceptable joints are found.

- (c.) Test Report. Test reports shall be provided to the Engineer within two working days of completing each day's testing. The test report shall include the following.

(1.) Contract number, placement date, county-route-section, direction of traffic, scan date, Contractor, and name of individual performing the tests.

(2.) Provide the standard report generated from the on-board printer of the imaging technology used for every dowel and joint measured.

(3.) For every dowel measured, provide the joint identification number, lane number and station, dowel bar number or x-location, direction of testing and reference joint location/edge location, longitudinal translation, horizontal translation, vertical translation, vertical tilt, and horizontal skew.

(4.) Identify each dowel bar with a maximum longitudinal, horizontal, or vertical translation that has been exceeded. Identify each dowel bar with a maximum vertical tilt or horizontal skew deviation that has been exceeded.

(5.) Joint Score Details: Provide the joint identification number, lane number, station, and calculated joint score for each joint.

- (6.) Locked Joint Identification: Identify each joint where the maximum joint score is exceeded.
- (d.) Exclusions. Exclude the following from dowel bar mislocation and misalignment measurements.
- (1.) Transverse construction joints (headers).
 - (2.) Dowel bars within 24 in. (610 mm) of metallic manholes, inlets, metallic castings, or other nearby or underlying steel reinforced objects.
 - (3.) The outside dowel bar when tie bars are installed with mechanical equipment in fresh concrete. For tie bar installations involving preformed or drilled holes, installation of the tie bar shall be performed after testing with the MIT Scan-2 device.
 - (4.) Joints located directly under high voltage power lines.
 - (5.) Subject to the approval of the Engineer, any other contributors to magnetic interference.
- (e.) Deficiency Deduction. When the Contractor has cut 25 dowel bars to correct unacceptable joints, the Contractor shall be liable and shall pay to the Department a deficiency deduction of \$500.00 for the cost of the bars. Thereafter, an additional deficiency deduction of \$20.00 for each additional bar cut will be assessed.”

Add the following to Section 1103 of the Standard Specifications.

“1103.20 Mechanical Dowel Bar Inserter. The mechanical dowel bar inserter (DBI) shall be self-contained and supported on the formless paver with the ability to move separately from the paver. The DBI shall be equipped with insertion forks along with any other devices necessary for finishing the concrete the full width of the pavement. The insertion forks shall have the ability to vibrate at a minimum frequency of 3000 VPM.”

80378

EMULSIFIED ASPHALTS (BDE)

Effective: August 1, 2019

Revise Article 1032.06 of the Standard Specifications to read:

“1032.06 Emulsified Asphalts. Emulsified asphalts will be accepted according to the current Bureau of Materials Policy Memorandum, “Emulsified Asphalt Acceptance Procedure”. These materials shall be homogeneous and shall show no separation of asphalt after thorough mixing, within 30 days after delivery, provided separation has not been caused by freezing. They shall coat the aggregate being used in the work to the satisfaction of the Engineer and shall be according to the following requirements.

- (a) Anionic Emulsified Asphalt. Anionic emulsified asphalts RS-1, RS-2, HFRS-2, SS-1h, and SS-1 shall be according to AASHTO M 140, except as follows.
 - (1) The cement mixing test will be waived when the emulsion is being used as a tack coat.
 - (2) The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent.
- (b) Cationic Emulsified Asphalt. Cationic emulsified asphalts CRS-1, CRS-2, CSS-1h, and CSS-1 shall be according to AASHTO M 208, except as follows.
 - (1) The cement mixing test will be waived when the emulsion is being used as a tack coat.
 - (2) The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent.
- (c) High Float Emulsion. High float emulsions HFE-90, HFE-150, and HFE-300 are medium setting and shall be according to the following table.

Test	HFE-90	HFE-150	HFE-300
Viscosity, Saybolt Furol, at 122 °F (50 °C), (AASHTO T 59), SFS ^{1/}	50 min.	50 min.	50 min.
Sieve Test, No. 20 (850 µm), retained on sieve, (AASHTO T 59), %	0.10 max.	0.10 max.	0.10 max.
Storage Stability Test, 1 day, (AASHTO T 59), %	1 max.	1 max.	1 max.
Coating Test (All Grades), (AASHTO T 59), 3 minutes	stone coated thoroughly		
Distillation Test, (AASHTO T 59): Residue from distillation test to 500 °F (260 °C), % Oil distillate by volume, %	65 min. 7 max.	65 min. 7 max.	65 min. 7 max.

Characteristics of residue from distillation test to 500 °F (260 °C): Penetration at 77 °F (25 °C), (AASHTO T 49), 100 g, 5 sec, dmm	90-150	150-300	300 min.
Float Test at 140 °F (60 °C), (AASHTO T 50), sec.	1200 min.	1200 min.	1200 min.

1/ The emulsion shall be pumpable.

- (d) Penetrating Emulsified Prime. Penetrating Emulsified Prime (PEP) shall be according to AASHTO T 59, except as follows.

Test	Result
Viscosity, Saybolt Furol, at 77 °F (25 °C), SFS	75 max.
Sieve test, retained on No. 20 (850 µm) sieve, %	0.10 max.
Distillation to 500 °F (260 °C) residue, %	38 min.
Oil distillate by volume, %	4 max.

The PEP shall be tested according to the current Bureau of Materials Illinois Laboratory Test Procedure (ILTP), "Sand Penetration Test of Penetrating Emulsified Prime (PEP)". The time of penetration shall be equal to or less than that of MC-30. The depth of penetration shall be equal to or greater than that of MC-30.

- (e) Delete this subparagraph.
- (f) Polymer Modified Emulsified Asphalt. Polymer modified emulsified asphalts, e.g. SS-1hP, CSS-1hP, CRS-2P (formerly CRSP), CQS-1hP (formerly CSS-1h Latex Modified) and HFRS-2P (formerly HFP) shall be according to AASHTO M 316, except as follows.
- (1) The cement mixing test will be waived when the polymer modified emulsion is being used as a tack coat.
 - (2) CQS-1hP (formerly CSS-1h Latex Modified) emulsion for micro-surfacing treatments shall use latex as the modifier.
 - (3) Upon examination of the storage stability test cylinder after standing undisturbed for 24 hours, the surface shall show minimal to no white, milky colored substance and shall be a homogenous brown color throughout.
 - (4) The distillation for all polymer modified emulsions shall be performed according to AASHTO T 59, except the temperature shall be 374 ± 9 °F (190 ± 5 °C) to be held for a period of 15 minutes and measured using an ASTM 16F (16C) thermometer.
 - (5) The specified temperature for the Elastic Recovery test for all polymer modified emulsions shall be 50.0 ± 1.0 °F (10.0 ± 0.5 °C).

(6) The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent.

(g) Non-Tracking Emulsified Asphalt. Non-tracking emulsified asphalt NTEA (formerly SS-1vh) shall be according to the following.

Test	Requirement
Saybolt Viscosity at 77 °F (25 °C), (AASHTO T 59), SFS	20-100
Storage Stability Test, 24 hr, (AASHTO T 59), %	1 max.
Residue by Distillation, 500 ± 10 °F (260 ± 5 °C), or Residue by Evaporation, 325 ± 5 °F (163 ± 3 °C), (AASHTO T 59), %	50 min.
Sieve Test, No. 20 (850 µm), (AASHTO T 59), %	0.3 max.
Tests on Residue from Evaporation	
Penetration at 77 °F (25 °C), 100 g, 5 sec, (AASHTO T 49), dmm	40 max.
Softening Point, (AASHTO T 53), °F (°C)	135 (57) min.
Ash Content, (AASHTO T 111), % ^{1/}	1 max.

1/ The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent

The different grades are, in general, used for the following.

Grade	Use
SS-1, SS-1h, RS-1, RS-2, CSS-1, CRS-1, CRS-2, CSS-1h, HFE-90, SS-1hP, CSS-1hP, NTEA (formerly SS-1vh)	Tack Coat
PEP	Prime Coat
RS-2, HFE-90, HFE-150, HFE-300, CRS-2P (formerly CRSP), HFRS-2P (formerly HFP), CRS-2, HFRS-2	Bituminous Surface Treatment
CQS-1hP (formerly CSS-1h Latex Modified)	Micro-Surfacing Slurry Sealing Cape Seal™

80415

EQUIPMENT PARKING AND STORAGE (BDE)

Effective: November 1, 2017

Replace the first paragraph of Article 701.11 of the Standard Specifications with the following.

“701.11 Equipment Parking and Storage. During working hours, all vehicles and/or nonoperating equipment which are parked, two hours or less, shall be parked at least 8 ft (2.5 m) from the open traffic lane. For other periods of time during working and for all nonworking hours, all vehicles, materials, and equipment shall be parked or stored as follows.

- (a) When the project has adequate right-of-way, vehicles, materials, and equipment shall be located a minimum of 30 ft (9 m) from the pavement.
- (b) When adequate right-of-way does not exist, vehicles, materials, and equipment shall be located a minimum of 15 ft (4.5 m) from the edge of any pavement open to traffic.
- (c) Behind temporary concrete barrier, vehicles, materials, and equipment shall be located a minimum of 24 in. (600 mm) behind free standing barrier or a minimum of 6 in. (150 mm) behind barrier that is either pinned or restrained according to Article 704.04. The 24 in. or 6 in. measurement shall be from the base of the non-traffic side of the barrier.
- (d) Behind other man-made or natural barriers meeting the approval of the Engineer.”

80388

HOT-MIX ASPHALT - DENSITY TESTING OF LONGITUDINAL JOINTS (BDE)

Effective: January 1, 2010

Revised: August 1, 2018

Description. This work shall consist of testing the density of longitudinal joints as part of the quality control/quality assurance (QC/QA) of hot-mix asphalt (HMA). Work shall be according to Section 1030 of the Standard Specifications except as follows.

Quality Control/Quality Assurance (QC/QA). Delete the second and third sentence of the third paragraph of Article 1030.05(d)(3) of the Standard Specifications.

Add the following paragraphs to the end of Article 1030.05(d)(3) of the Standard Specifications:

“Longitudinal joint density testing shall be performed at each random density test location. Longitudinal joint testing shall be located at a distance equal to the lift thickness or a minimum of 4 in. (100 mm), from each pavement edge. (i.e. for a 5 in. (125 mm) lift the near edge of the density gauge or core barrel shall be within 5 in. (125 mm) from the edge of pavement.) Longitudinal joint density testing shall be performed using either a correlated nuclear gauge or cores.

- a. Confined Edge. Each confined edge density shall be represented by a one-minute nuclear density reading or a core density and shall be included in the average of density readings or core densities taken across the mat which represents the Individual Test.
- b. Unconfined Edge. Each unconfined edge joint density shall be represented by an average of three one-minute density readings or a single core density at the given density test location and shall meet the density requirements specified herein. The three one-minute readings shall be spaced 10 ft (3 m) apart longitudinally along the unconfined pavement edge and centered at the random density test location.

When a longitudinal joint sealant (LJS) is applied, longitudinal joint density testing will not be required on the joint(s) sealed.”

Revise the Density Control Limits table in Article 1030.05(d)(4) of the Standard Specifications to read:

“Mixture Composition	Parameter	Individual Test (includes confined edges)	Unconfined Edge Joint Density Minimum
IL-4.75	Ndesign = 50	93.0 – 97.4% ^{1/}	91.0%
IL-9.5	Ndesign = 90	92.0 – 96.0%	90.0%
IL-9.5,IL-9.5L	Ndesign < 90	92.5 – 97.4%	90.0%
IL-19.0	Ndesign = 90	93.0 – 96.0%	90.0%
IL-19.0, IL-19.0L	Ndesign < 90	93.0 ^{2/} – 97.4%	90.0%

SMA	Ndesign = 50 & 80	93.5 – 97.4%	91.0%”
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80246

HOT-MIX ASPHALT – OSCILLATORY ROLLER (BDE)

Effective: August 1, 2018
 Revised: November 1, 2018

Add the following to Article 406.03 of the Standard Specifications:

“(j) Oscillatory Roller 1101.01”

Revise Table 1 and Note 3/ of Table 1 in Article 406.07(a) of the Standard Specifications to read:

“TABLE 1 - MINIMUM ROLLER REQUIREMENTS FOR HMA				
	Breakdown Roller (one of the following)	Intermediate Roller	Final Roller (one or more of the following)	Density Requirement
Level Binder: (When the density requirements of Article 406.05(c) do not apply.)	P ^{3/}	--	V _S , P ^{3/} , T _B , T _F , 3W, O _T	To the satisfaction of the Engineer.
Binder and Surface ^{1/} Level Binder ^{1/} : (When the density requirements of Article 406.05(c) apply.)	V _D , P ^{3/} , T _B , 3W, O _T , O _B	P ^{3/} , O _T , O _B	V _S , T _B , T _F , O _T	As specified in Articles: 1030.05(d)(3), (d)(4), and (d)(7).
IL-4.75 and SMA ^{4/ 5/}	T _B , 3W, O _T	--	T _F , 3W, O _T	
Bridge Decks ^{2/}	T _B	--	T _F	As specified in Articles 582.05 and 582.06.

3/ A vibratory roller (V_D) or oscillatory roller (O_T or O_B) may be used in lieu of the pneumatic-tired roller on mixtures containing polymer modified asphalt binder.”

Add the following to EQUIPMENT DEFINITION in Article 406.07(a) contained in the Errata of the Supplemental Specifications:

“O_T - Oscillatory roller, tangential impact mode. Maximum speed is 3.0 mph (4.8 km/h) or 264 ft/min (80 m/min).

O_B - Oscillatory roller, tangential and vertical impact mode, operated at a speed to produce not less than 10 vertical impacts/ft (30 impacts/m).”

Add the following to Article 1101.01 of the Standard Specifications:

“(h) Oscillatory Roller. The oscillatory roller shall be self-propelled and provide a smooth operation when starting, stopping, or reversing directions. The oscillatory roller shall be able to operate in a mode that will provide tangential impact force with or without vertical impact force by using at least one drum. The oscillatory roller shall be equipped with water tanks and sprinkling devices, or other approved methods, which shall be used to wet the drums to prevent material pickup. The drum(s) amplitude and frequency of the tangential and vertical impact force shall be approximately the same in each direction and meet the following requirements:

- (1) The minimum diameter of the drum(s) shall be 42 in. (1070 mm)48 in. (1200 mm);
- (2) The minimum length of the drum(s) shall be 57 in. (1480 mm)66 in. (1650 mm);
- (3) The minimum unit static force on the drum(s) shall be 125 lb/in. (22 N/m); and
- (4) The minimum force on the oscillatory drum shall be 18,000 lb (80 kN).”; and
- (5) Self-adjusting eccentrics, and reversible eccentrics on non-driven drum(s).”

80399

LIGHTS ON BARRICADES (BDE)

Effective: January 1, 2018

Revise Article 701.16 of the Standard Specifications to read:

“701.16 Lights. Lights shall be used on devices as required in the plans, the traffic control plan, and the following table.

Circumstance	Lights Required
Daylight operations	None
First two warning signs on each approach to the work involving a nighttime lane closure and “ROUGH GROOVED SURFACE” (W8-I107) signs	Flashing mono-directional lights
Devices delineating isolated obstacles, excavations, or hazards at night (Does not apply to patching)	Flashing bi-directional lights
Devices delineating obstacles, excavations, or hazards exceeding 100 ft (30 m) in length at night (Does not apply to widening)	Steady burn bi-directional lights
Channelizing devices for nighttime lane closures on two-lane roads	None
Channelizing devices for nighttime lane closures on multi-lane roads	None
Channelizing devices for nighttime lane closures on multi-lane roads separating opposing directions of traffic	None
Channelizing devices for nighttime along lane shifts on multilane roads	Steady burn mono-directional lights
Channelizing devices for night time along lane shifts on two lane roads	Steady burn bi-directional lights
Devices in nighttime lane closure tapers on Standards 701316 and 701321	Steady burn bi-directional lights
Devices in nighttime lane closure tapers	Steady burn mono-directional lights
Devices delineating a widening trench	None
Devices delineating patches at night on roadways with an ADT less than 25,000	None
Devices delineating patches at night on roadways with an ADT of 25,000 or more	None

Batteries for the lights shall be replaced on a group basis at such times as may be specified by the Engineer.”

Delete the fourth sentence of the first paragraph of Article 701.17(c)(2) of the Standard Specifications.

Revise the first paragraph of Article 603.07 of the Standard Specifications to read:

“603.07 Protection Under Traffic. After the casting has been adjusted and Class SI concrete has been placed, the work shall be protected by a barricade for at least 72 hours.”

80392

LUMINAIRES, LED (BDE)

Effective: April 1, 2019

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 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 of two digits ($x.xx \text{ cd/m}^2$); point-by-point illuminance, luminance, and veiling luminance ratios demonstrating that the submitted luminaire meets the lighting metrics specified in the Luminaire Performance Table 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.

Warranty. Replace the last sentence of Article 801.14(a) with the following.

“The warranty, including the maintained minimum luminance, for LED signal head modules, optically programmed LED signal head modules, and LED pedestrian signal head modules shall cover a minimum of 60 months from the date of delivery. The warranty for LED roadway luminaires, LED highmast luminaires, LED underpass luminaires, LED sign lighting luminaires, LED obstruction warning luminaires, and all of their components shall cover a minimum of ten years from the date of delivery.”

Roadway Luminaires. Revise Article 821.02(d) to read.

“(d) Light Source1067.06”

Revise the third paragraph of Article 821.03 to read.

“Each luminaire driver and/or driver arrangement shall be checked to assure compatibility with the project power supply. When the luminaire driver has a readily accessible electrical compartment, the driver shall be attached so as to be easily removed for maintenance.”

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.

When independent luminaire testing is required, the work will be paid for at the contract lump sum price for INDEPENDENT LUMINAIRE TESTING.”

Luminaires. Revise Articles 1067.01 through 1067.06 to read.

“**1067.01 General.** The luminaire shall be mechanically strong and easy to maintain. 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 ($\pm 10\%$) or 347 to 480 volts ($\pm 10\%$) 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.

Luminaires shall be designed to be easily serviced, having fasteners such as quarter-turn clips of the heavy spring-loaded type with large, deep straight slot heads, complete with a receptacle and shall be according to military specification MIL-f-5591.

All hardware shall be captive and not susceptible to falling from the luminaire during maintenance operations. This shall include lens/lens frame fasteners as well hardware holding the removable driver and electronic components in place.

- (i) Vibration Testing. All 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 heavy duty, 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 heavy duty 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 luminaires 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 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.”

MANHOLES, VALVE VAULTS, AND FLAT SLAB TOPS (BDE)

Effective: January 1, 2018

Revised: March 1, 2019

Description. In addition to those manufactured according to the current standards included in this contract, manholes, valve vaults, and flat slab tops manufactured prior to March 1, 2019, according to the previous Highway Standards listed below will be accepted on this contract:

Product	Previous Standards		
Precast Manhole Type A, 4' (1.22 m) Diameter	602401-05	602401-04	602401-03
Precast Manhole Type A, 5' (1.52 m) Diameter	602402-01	602402	602401-03
Precast Manhole Type A, 6' (1.83 m) Diameter	602406-09	602406-08	602406-07
Precast Manhole Type A, 7' (2.13 m) Diameter	602411-07	602411-06	602411-05
Precast Manhole Type A, 8' (2.44 m) Diameter	602416-07	602416-06	602416-05
Precast Manhole Type A, 9' (2.74 m) Diameter	602421-07	602421-06	602421-05
Precast Manhole Type A, 10' (3.05 m) Diameter	602426-01	602426	
Precast Valve Vault Type A, 4' (1.22 m) Diameter	602501-04	602501-03	602501-02
Precast Valve Vault Type A, 5' (1.52 m) Diameter	602506-01	602506	602501-02
Precast Reinforced Concrete Flat Slab Top	602601-05	602601-04	

The following revisions to the Standard Specifications shall apply to manholes, valve vaults, and flat slab tops manufactured according to the current standards included in this contract:

Revise Article 602.02(g) of the Standard Specifications to read:

“(g) Structural Steel (Note 4) 1006.04

Note 4. All components of the manhole joint splice shall be galvanized according to the requirements of AASHTO M 111 or M 232 as applicable.”

Add the following to Article 602.02 of the Standard Specifications:

“(s) Anchor Bolts and Rods (Note 5) 1006.09

Note 5. The threaded rods for the manhole joint splice shall be according to the requirements of ASTM F 1554, Grade 55, (Grade 380).”

Revise the second paragraph of Article 1042.10 of the Standard Specifications to read:

“Catch basin Types A, B, C, and D; Manhole Type A; Inlet Types A and B; Drainage Structures Types 1, 2, 3, 4, 5, and 6; Valve Vault Type A; and reinforced concrete flat slab top (Highway Standard 602601) shall be manufactured according to AASHTO M 199 (M 199M), except the minimum wall thickness shall be as shown on the plans. Additionally, catch basins, inlets, and drainage structures shall have a minimum concrete compressive strength of 4500 psi

(31,000 kPa) at 28 days and manholes, valve vaults, and reinforced concrete flat slab tops shall have a minimum concrete compressive strength of 5000 psi (34,500 kPa) at 28 days.”

80393

MAST ARM ASSEMBLY AND POLE (BDE)

Effective: August 1, 2018

Revise the first sentence of Article 1077.03(b) of the Standard Specifications to read:

“Anchor rods shall be according to Article 1006.09, Grade 105, and shall be threaded a minimum of 7 1/2 in. (185 mm) at one end and threaded a minimum of 2 in. (50 mm) with matching hex head nut at the other end.”

80400

PAVEMENT MARKING REMOVAL (BDE)

Effective: July 1, 2016

Revise Article 783.02 of the Standard Specifications to read:

“783.02 Equipment. Equipment shall be according to the following.

Item	Article/Section
(a) Grinders (Note 1)	
(b) Water Blaster with Vacuum Recovery	1101.12

Note 1. Grinding equipment shall be approved by the Engineer.”

Revise the first paragraph of Article 783.03 of the Standard Specifications to read:

“783.03 Removal of Conflicting Markings. Existing pavement markings that conflict with revised traffic patterns shall be removed. If darkness or inclement weather prohibits the removal operations, such operations shall be resumed the next morning or when weather permits. In the event of removal equipment failure, such equipment shall be repaired, replaced, or leased so removal operations can be resumed within 24 hours.”

Revise the first and second sentences of the first paragraph of Article 783.03(a) of the Standard Specifications to read:

“The existing pavement markings shall be removed by the method specified and in a manner that does not materially damage the surface or texture of the pavement or surfacing. Small particles of tightly adhering existing markings may remain in place, if in the opinion of the Engineer, complete removal of the small particles will result in pavement surface damage.”

Revise the first paragraph of Article 783.04 of the Standard Specifications to read:

“783.04 Cleaning. The roadway surface shall be cleaned of debris or any other deleterious material by the use of compressed air or water blast.”

Revise the first paragraph of Article 783.06 of the Standard Specifications to read:

“783.06 Basis of Payment. This work will be paid for at the contract unit price per each for RAISED REFLECTIVE PAVEMENT MARKER REMOVAL, or at the contract unit price per square foot (square meter) for PAVEMENT MARKING REMOVAL – GRINDING and/or PAVEMENT MARKING REMOVAL – WATER BLASTING.”

Delete Article 1101.13 from the Standard Specifications.

80371

PAYMENTS TO SUBCONTRACTORS (BDE)

Effective: November 2, 2017

Add the following to the end of the fourth paragraph of Article 109.11 of the Standard Specifications:

“If reasonable cause is asserted, written notice shall be provided to the applicable subcontractor and/or material supplier and the Engineer within five days of the Contractor receiving payment. The written notice shall identify the contract number, the subcontract or material purchase agreement, a detailed reason for refusal, the value of payment being withheld, and the specific remedial actions required of the subcontractor and/or material supplier so that payment can be made.”

80390

PORTLAND CEMENT CONCRETE (BDE)

Effective: November 1, 2017

Revise the Air Content % of Class PP Concrete in Table 1 Classes of Concrete and Mix Design Criteria in Article 1020.04 of the Standard Specifications to read:

"TABLE 1. CLASSES OF CONCRETE AND MIX DESIGN CRITERIA		
Class of Conc.	Use	Air Content %
PP	Pavement Patching Bridge Deck Patching (10)	
	PP-1	4.0 - 8.0"
	PP-2	
	PP-3	
	PP-4	
	PP-5	

Revise Note (4) at the end of Table 1 Classes of Concrete and Mix Design Criteria in Article 1020.04 of the Standard Specifications to read:

“(4) For all classes of concrete, the maximum slump may be increased to 7 in (175 mm) when a high range water-reducing admixture is used. For Class SC, the maximum slump may be increased to 8 in. (200 mm). For Class PS, the maximum slump may be increased to 8 1/2 in. (215 mm) if the high range water-reducing admixture is the polycarboxylate type.”

80389

PROGRESS PAYMENTS (BDE)

Effective: November 2, 2013

Revise Article 109.07(a) of the Standard Specifications to read:

“(a) Progress Payments. At least once each month, the Engineer will make a written estimate of the quantity of work performed in accordance with the contract, and the value thereof at the contract unit prices. The amount of the estimate approved as due for payment will be vouchered by the Department and presented to the State Comptroller for payment. No amount less than \$1000.00 will be approved for payment other than the final payment.

Progress payments may be reduced by liens filed pursuant to Section 23(c) of the Mechanics' Lien Act, 770 ILCS 60/23(c).

If a Contractor or subcontractor has defaulted on a loan issued under the Department's Disadvantaged Business Revolving Loan Program (20 ILCS 2705/2705-610), progress payments may be reduced pursuant to the terms of that loan agreement. In such cases, the amount of the estimate related to the work performed by the Contractor or subcontractor, in default of the loan agreement, will be offset, in whole or in part, and vouchered by the Department to the Working Capital Revolving Fund or designated escrow account. Payment for the work shall be considered as issued and received by the Contractor or subcontractor on the date of the offset voucher. Further, the amount of the offset voucher shall be a credit against the Department's obligation to pay the Contractor, the Contractor's obligation to pay the subcontractor, and the Contractor's or subcontractor's total loan indebtedness to the Department. The offset shall continue until such time as the entire loan indebtedness is satisfied. The Department will notify the Contractor and Fund Control Agent in a timely manner of such offset. The Contractor or subcontractor shall not be entitled to additional payment in consideration of the offset.

The failure to perform any requirement, obligation, or term of the contract by the Contractor shall be reason for withholding any progress payments until the Department determines that compliance has been achieved.”

80328

RAILROAD PROTECTIVE LIABILITY INSURANCE (5 AND 10) (BDE)

Effective: January 1, 2006

Description. Railroad Protective Liability and Property Damage Liability Insurance shall be carried according to Article 107.11 of the Standard Specifications, except the limits shall be a minimum of \$5,000,000 combined single limit per occurrence for bodily injury liability and property damage liability with an aggregate limit of \$10,000,000 over the life of the policy. A separate policy is required for each railroad unless otherwise noted.

NAMED INSURED & ADDRESS	NUMBER & SPEED OF PASSENGER TRAINS	NUMBER & SPEED OF FREIGHT TRAINS
Wisconsin Central Ltd. 17641 S. Ashland Avenue Homewood, IL 60430	-0-	2 Trains/day @ 25 mph

DOT/AAR No.: 261023B RR Mile Post: 0022.380
RR Division: CHICAGO TERMINAL RR Sub-Division: ILLINOIS RIVER

For Freight/Passenger Information Contact: Paul Chojenski Phone: 708-332-3557
For Insurance Information Contact: Rob Glass Phone: 708-332-6673

CSX Transportation 500 Water Street C907 Jacksonville, FL 32202	-0-	4 Trains/day @ 40 mph
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DOT/AAR No.: 603741D RR Mile Post: BIF 0051.740
RR Division: CHICAGO RR Sub-Division: NEW ROCK

For Freight/Passenger Information Contact: Amanda Descare Phone: 859-372-6124
For Insurance Information Contact: insurancedocuments@CSX.com

Approval of Insurance. The original and one certified copy of each required policy shall be submitted to the following address for approval:

Illinois Department of Transportation
Bureau of Design and Environment
2300 South Dirksen Parkway, Room 326
Springfield, Illinois 62764

The Contractor will be advised when the Department has received approval of the insurance from the railroad(s). Before any work begins on railroad right-of-way, the Contractor shall submit to the Engineer evidence that the required insurance has been approved by the railroad(s). The Contractor shall also provide the Engineer with the expiration date of each required policy.

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.

80157

RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES (BDE)

Effective: November 1, 2012

Revise: January 1, 2019

Revise Section 1031 of the Standard Specifications to read:

"SECTION 1031. RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES

1031.01 Description. Reclaimed asphalt pavement and reclaimed asphalt shingles shall be according to the following.

- (a) Reclaimed Asphalt Pavement (RAP). RAP is the material produced by cold milling or crushing an existing hot-mix asphalt (HMA) pavement. The Contractor shall supply written documentation that the RAP originated from routes or airfields under federal, state, or local agency jurisdiction.
- (b) Reclaimed Asphalt Shingles (RAS). Reclaimed asphalt shingles (RAS). RAS is from the processing and grinding of preconsumer or post-consumer shingles. RAS shall be a clean and uniform material with a maximum of 0.5 percent unacceptable material, as defined in Central Bureau of Materials Policy Memorandum, "Reclaimed Asphalt Shingle (RAS) Sources", by weight of RAS. All RAS used shall come from a Central Bureau of Materials approved processing facility where it shall be ground and processed to 100 percent passing the 3/8 in. (9.5 mm) sieve and 93 percent passing the #4 (4.75 mm) sieve based on a dry shake gradation. RAS shall be uniform in gradation and asphalt binder content and shall meet the testing requirements specified herein. In addition, RAS shall meet the following Type 1 or Type 2 requirements.
 - (1) Type 1. Type 1 RAS shall be processed, preconsumer asphalt shingles salvaged from the manufacture of residential asphalt roofing shingles.
 - (2) Type 2. Type 2 RAS shall be processed post-consumer shingles only, salvaged from residential, or four unit or less dwellings not subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP).

1031.02 Stockpiles. RAP and RAS stockpiles shall be according to the following.

- (a) RAP Stockpiles. The Contractor shall construct individual, sealed RAP stockpiles meeting one of the following definitions. No additional RAP shall be added to the pile after the pile has been sealed. Stockpiles shall be sufficiently separated to prevent intermingling at the base. Stockpiles shall be identified by signs indicating the type as listed below (i.e. "Homogeneous Surface").

Prior to milling, the Contractor shall request the District provide documentation on the quality of the RAP to clarify the appropriate stockpile.

- (1) Fractionated RAP (FRAP). FRAP shall consist of RAP from Class I, HMA (High and Low ESAL) mixtures. The coarse aggregate in FRAP shall be crushed aggregate and may represent more than one aggregate type and/or quality, but shall be at least C quality. All FRAP shall be fractionated prior to testing by screening into a minimum of two size fractions with the separation occurring on or between the #4 (4.75 mm) and 1/2 in. (12.5 mm) sieves. Agglomerations shall be minimized such that 100 percent of the RAP shall pass the sieve size specified below for the mix into which the FRAP will be incorporated.

Mixture FRAP will be used in:	Sieve Size that 100 % of FRAP Shall Pass
IL-19.0	1 1/2 in. (40 mm)
IL-9.5	3/4 in. (20 mm)
IL-4.75	1/2 in. (13 mm)

- (2) Homogeneous. Homogeneous RAP stockpiles shall consist of RAP from Class I, HMA (High and Low ESAL) mixtures and represent: 1) the same aggregate quality, but shall be at least C quality; 2) the same type of crushed aggregate (either crushed natural aggregate, ACBF slag, or steel slag); 3) similar gradation; and 4) similar asphalt binder content. If approved by the Engineer, combined single pass surface/binder millings may be considered "homogeneous" with a quality rating dictated by the lowest coarse aggregate quality present in the mixture.
- (3) Conglomerate. Conglomerate RAP stockpiles shall consist of RAP from Class I, HMA (High and Low ESAL) mixtures. The coarse aggregate in this RAP shall be crushed aggregate and may represent more than one aggregate type and/or quality, but shall be at least C quality. This RAP may have an inconsistent gradation and/or asphalt binder content prior to processing. All conglomerate RAP shall be processed prior to testing by crushing to where all RAP shall pass the 5/8 in. (16 mm) or smaller screen. Conglomerate RAP stockpiles shall not contain steel slag.
- (4) Non-Quality. RAP stockpiles that do not meet the requirements of the stockpile categories listed above shall be classified as "Non-Quality".

RAP/FRAP containing contaminants, such as earth, brick, sand, concrete, sheet asphalt, bituminous surface treatment (i.e. chip seal), pavement fabric, joint sealants, etc., will be unacceptable unless the contaminants are removed to the satisfaction of the Engineer. Sheet asphalt shall be stockpiled separately.

- (b) RAS Stockpiles. Type 1 and Type 2 RAS shall be stockpiled separately and shall not be intermingled. Each stockpile shall be signed indicating what type of RAS is present.

Unless otherwise specified by the Engineer, mechanically blending manufactured sand (FM 20 or FM 22) up to an equal weight of RAS with the processed RAS will be permitted to improve workability. The sand shall be "B Quality" or better from an

approved Aggregate Gradation Control System source. The sand shall be accounted for in the mix design and during HMA production.

Records identifying the shingle processing facility supplying the RAS, RAS type, and lot number shall be maintained by project contract number and kept for a minimum of three years.

1031.03 Testing. RAP/FRAP and RAS testing shall be according to the following.

(a) RAP/FRAP Testing. When used in HMA, the RAP/FRAP shall be sampled and tested either during or after stockpiling.

(1) During Stockpiling. For testing during stockpiling, washed extraction samples shall be run at the minimum frequency of one sample per 500 tons (450 metric tons) for the first 2000 tons (1800 metric tons) and one sample per 2000 tons (1800 metric tons) thereafter. A minimum of five tests shall be required for stockpiles less than 4000 tons (3600 metric tons).

(2) After Stockpiling. For testing after stockpiling, the Contractor shall submit a plan for approval to the District proposing a satisfactory method of sampling and testing the RAP/FRAP pile either in-situ or by restockpiling. The sampling plan shall meet the minimum frequency required above and detail the procedure used to obtain representative samples throughout the pile for testing.

Each sample shall be split to obtain two equal samples of test sample size. One of the two test samples from the final split shall be labeled and stored for Department use. The Contractor shall extract the other test sample according to Department procedure. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

(b) RAS Testing. RAS or RAS blended with manufactured sand shall be sampled and tested during stockpiling according to Central Bureau of Materials Policy Memorandum, "Reclaimed Asphalt Shingle (RAS) Source".

Samples shall be collected during stockpiling at the minimum frequency of one sample per 200 tons (180 metric tons) for the first 1000 tons (900 metric tons) and one sample per 250 tons (225 metric tons) thereafter. A minimum of five samples are required for stockpiles less than 1000 tons (900 metric tons). Once a ≤ 1000 ton (900 metric ton), five-sample/test stockpile has been established it shall be sealed. Additional incoming RAS or RAS blended with manufactured sand shall be stockpiled in a separate working pile as designated in the Quality Control plan and only added to the sealed stockpile when the test results of the working pile are complete and are found to meet the tolerances specified herein for the original sealed RAS stockpile.

Before testing, each sample shall be split to obtain two test samples. One of the two test samples from the final split shall be labeled and stored for Department use. The

Contractor shall perform a washed extraction and test for unacceptable materials on the other test sample according to Department procedures. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

If the sampling and testing was performed at the shingle processing facility in accordance with the QC Plan, the Contractor shall obtain and make available all of the test results from start of the initial stockpile.

1031.04 Evaluation of Tests. Evaluation of test results shall be according to the following.

- (a) Evaluation of RAP/FRAP Test Results. All of the extraction results shall be compiled and averaged for asphalt binder content and gradation, and when applicable G_{mm} . Individual extraction test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	FRAP/Homogeneous/ Conglomerate
1 in. (25 mm)	
1/2 in. (12.5 mm)	± 8 %
No. 4 (4.75 mm)	± 6 %
No. 8 (2.36 mm)	± 5 %
No. 16 (1.18 mm)	
No. 30 (600 μm)	± 5 %
No. 200 (75 μm)	± 2.0 %
Asphalt Binder	± 0.4 % ^{1/}
G_{mm}	± 0.03

1/ The tolerance for FRAP shall be ± 0.3 %.

If more than 20 percent of the individual sieves and/or asphalt binder content tests are out of the above tolerances, the RAP/FRAP shall not be used in HMA unless the RAP/FRAP representing the failing tests is removed from the stockpile. All test data and acceptance ranges shall be sent to the District for evaluation.

With the approval of the Engineer, the ignition oven may be substituted for extractions according to the ITP, "Calibration of the Ignition Oven for the Purpose of Characterizing Reclaimed Asphalt Pavement (RAP)".

- (b) Evaluation of RAS and RAS Blended with Manufactured Sand Test Results. All of the test results, with the exception of percent unacceptable materials, shall be compiled and averaged for asphalt binder content and gradation. Individual test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	RAS
No. 8 (2.36 mm)	± 5 %

No. 16 (1.18 mm)	± 5 %
No. 30 (600 µm)	± 4 %
No. 200 (75 µm)	± 2.0 %
Asphalt Binder Content	± 1.5 %

If more than 20 percent of the individual sieves and/or asphalt binder content tests are out of the above tolerances, or if the percent unacceptable material exceeds 0.5 percent by weight of material retained on the # 4 (4.75 mm) sieve, the RAS or RAS blend shall not be used in Department projects. All test data and acceptance ranges shall be sent to the District for evaluation.

1031.05 Quality Designation of Aggregate in RAP/FRAP.

(a) RAP. The aggregate quality of the RAP for homogeneous and conglomerate stockpiles shall be set by the lowest quality of coarse aggregate in the RAP stockpile and are designated as follows.

- (1) RAP from Class I, Superpave/HMA (High ESAL), or (Low ESAL) IL-9.5L surface mixtures are designated as containing Class B quality coarse aggregate.
- (2) RAP from Class I binder, Superpave/HMA (High ESAL) binder, or (Low ESAL) IL-19.0L binder mixtures are designated as containing Class C quality coarse aggregate.

(b) FRAP. If the Engineer has documentation of the quality of the FRAP aggregate, the Contractor shall use the assigned quality provided by the Engineer.

If the quality is not known, the quality shall be determined as follows. Coarse and fine FRAP stockpiles containing plus #4 (4.75 mm) sieve coarse aggregate shall have a maximum tonnage of 5000 tons (4500 metric tons). The Contractor shall obtain a representative sample witnessed by the Engineer. The sample shall be a minimum of 50 lb (25 kg). The sample shall be extracted according to Illinois Modified AASHTO T 164 by a consultant laboratory prequalified by the Department for the specified testing. The consultant laboratory shall submit the test results along with the recovered aggregate to the District Office. The cost for this testing shall be paid by the Contractor. The District will forward the sample to the Central Bureau of Materials Aggregate Lab for MicroDeval Testing, according to ITP 327. A maximum loss of 15.0 percent will be applied for all HMA applications.

1031.06 Use of RAP/FRAP and/or RAS in HMA. The use of RAP/FRAP and/or RAS shall be the Contractor's option when constructing HMA in all contracts.

(a) RAP/FRAP. The use of RAP/FRAP in HMA shall be as follows.

- (1) Coarse Aggregate Size. The coarse aggregate in all RAP shall be equal to or less than the nominal maximum size requirement for the HMA mixture to be produced.

- (2) Steel Slag Stockpiles. Homogeneous RAP stockpiles containing steel slag will be approved for use in all HMA (High ESAL and Low ESAL) Surface and Binder Mixture applications.
 - (3) Use in HMA Surface Mixtures (High and Low ESAL). RAP/FRAP stockpiles for use in HMA surface mixtures (High and Low ESAL) shall be FRAP or homogeneous in which the coarse aggregate is Class B quality or better. FRAP from Conglomerate stockpiles shall be considered equivalent to limestone for frictional considerations. Known frictional contributions from plus #4 (4.75 mm) homogeneous FRAP stockpiles will be accounted for in meeting frictional requirements in the specified mixture.
 - (4) Use in HMA Binder Mixtures (High and Low ESAL), HMA Base Course, and HMA Base Course Widening. RAP/FRAP stockpiles for use in HMA binder mixtures (High and Low ESAL), HMA base course, and HMA base course widening shall be FRAP, homogeneous, or conglomerate, in which the coarse aggregate is Class C quality or better.
 - (5) Use in Shoulders and Subbase. RAP/FRAP stockpiles for use in HMA shoulders and stabilized subbase (HMA) shall be FRAP, homogeneous, or conglomerate.
 - (6) When the Contractor chooses the RAP option, the percentage of RAP shall not exceed the amounts indicated in Article 1031.06(c)(1) below for a given Ndesign.
- (b) RAS. RAS meeting Type 1 or Type 2 requirements will be permitted in all HMA applications as specified herein.
- (c) RAP/FRAP and/or RAS Usage Limits. Type 1 or Type 2 RAS may be used alone or in conjunction with RAP or FRAP in HMA mixtures up to a maximum of 5.0 percent by weight of the total mix.
- (1) RAP/RAS. When RAP is used alone or RAP is used in conjunction with RAS, the percentage of virgin asphalt binder replacement shall not exceed the amounts listed in the Max RAP/RAS ABR table listed below for the given Ndesign.

RAP/RAS Maximum Asphalt Binder Replacement (ABR) Percentage

HMA Mixtures <i>1, 2</i>	RAP/RAS Maximum ABR %		
	Binder/Leveling Binder	Surface	Polymer Modified
30	30	30	10
50	25	15	10
70	15	10	10
90	10	10	10

- 1/ For Low ESAL HMA shoulder and stabilized subbase, the RAP/RAS ABR shall not exceed 50 percent of the mixture.
 - 2/ When RAP/RAS ABR exceeds 20 percent, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28). If warm mix asphalt (WMA) technology is utilized and production temperatures do not exceed 275 °F (135 °C), the high and low virgin asphalt binder grades shall each be reduced by one grade when RAP/RAS ABR exceeds 25 percent (i.e. 26 percent RAP/RAS ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28).
- (2) FRAP/RAS. When FRAP is used alone or FRAP is used in conjunction with RAS, the percentage of virgin asphalt binder replacement shall not exceed the amounts listed in the FRAP/RAS table listed below for the given Ndesign

FRAP/RAS Maximum Asphalt Binder Replacement (ABR) Percentage

HMA Mixtures <i>1/, 2/</i>	FRAP/RAS Maximum ABR %						
	Ndesign	Binder/Leveling Binder		Surface		Polymer Modified	
		w/o I-FIT	with I-FIT	w/o I-FIT	with I-FIT	w/o I-FIT	with I-FIT
30	50	55	40	45	10	15	
50	40	45	35	40	10	15	
70	40	45	30	35	10	15	
90	40	45	30	35	10	15	
SMA	--	--	--	--	20	25	
IL-4.75	--	--	--	--	30	35	

- 1/ For Low ESAL HMA shoulder and stabilized subbase, the FRAP/RAS ABR shall not exceed 50 percent of the mixture.
- 2/ When FRAP/RAS ABR exceeds 20 percent for all mixes, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28). If warm mix asphalt (WMA) technology is utilized and production temperatures do not exceed 275 °F (135 °C), the high and low virgin asphalt binder grades shall each be reduced by one grade when FRAP/RAS ABR exceeds 25 percent (i.e. 26 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28).

1031.07 HMA Mix Designs. At the Contractor's option, HMA mixtures may be constructed utilizing RAP/FRAP and/or RAS material meeting the detailed requirements specified herein.

- (a) RAP/FRAP and/or RAS. RAP/FRAP and/or RAS mix designs shall be submitted for verification. If additional RAP/FRAP and/or RAS stockpiles are tested and found that no more than 20 percent of the results, as defined under "Testing" herein, are outside of the control tolerances set for the original RAP/FRAP and/or RAS stockpile and HMA mix design, and meets all of the requirements herein, the additional RAP/FRAP and/or RAS stockpiles may be used in the original mix design at the percent previously verified.
- (b) RAS. Type 1 and Type 2 RAS are not interchangeable in a mix design.

The RAP, FRAP, and RAS stone bulk specific gravities (G_{sb}) shall be according to the "Determination of Aggregate Bulk (Dry) Specific Gravity (G_{sb}) of Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS)" procedure in the Department's Manual of Test Procedures for Materials.

1031.08 HMA Production. HMA production utilizing RAP/FRAP and/or RAS shall be as follows.

- (a) RAP/FRAP. The coarse aggregate in all RAP/FRAP used shall be equal to or less than the nominal maximum size requirement for the HMA mixture being produced.

To remove or reduce agglomerated material, a scalping screen, gator, crushing unit, or comparable sizing device approved by the Engineer shall be used in the RAP feed system to remove or reduce oversized material.

If the RAP/FRAP control tolerances or QC/QA test results require corrective action, the Contractor shall cease production of the mixture containing RAP/FRAP and either switch to the virgin aggregate design or submit a new RAP/FRAP design.

- (b) RAS. RAS shall be incorporated into the HMA mixture either by a separate weight depletion system or by using the RAP weigh belt. Either feed system shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes. The portion of RAS shall be controlled accurately to within ± 0.5 percent of the amount of RAS utilized. When using the weight depletion system, flow indicators or sensing devices shall be provided and interlocked with the plant controls such that the mixture production is halted when RAS flow is interrupted.
- (c) RAP/FRAP and/or RAS. HMA plants utilizing RAP/FRAP and/or RAS shall be capable of automatically recording and printing the following information.

(1) Dryer Drum Plants.

- a. Date, month, year, and time to the nearest minute for each print.
- b. HMA mix number assigned by the Department.

- c. Accumulated weight of dry aggregate (combined or individual) in tons (metric tons) to the nearest 0.1 ton (0.1 metric ton).
- d. Accumulated dry weight of RAP/FRAP/RAS in tons (metric tons) to the nearest 0.1 ton (0.1 metric ton).
- e. Accumulated mineral filler in revolutions, tons (metric tons), etc. to the nearest 0.1 unit.
- f. Accumulated asphalt binder in gallons (liters), tons (metric tons), etc. to the nearest 0.1 unit.
- g. Residual asphalt binder in the RAP/FRAP material as a percent of the total mix to the nearest 0.1 percent.
- h. Aggregate and RAP/FRAP moisture compensators in percent as set on the control panel. (Required when accumulated or individual aggregate and RAP/FRAP are printed in wet condition.)

(2) Batch Plants.

- a. Date, month, year, and time to the nearest minute for each print.
- b. HMA mix number assigned by the Department.
- c. Individual virgin aggregate hot bin batch weights to the nearest pound (kilogram).
- d. Mineral filler weight to the nearest pound (kilogram).
- e. RAP/FRAP/RAS weight to the nearest pound (kilogram).
- f. Virgin asphalt binder weight to the nearest pound (kilogram).
- g. Residual asphalt binder in the RAP/FRAP/RAS material as a percent of the total mix to the nearest 0.1 percent.

The printouts shall be maintained in a file at the plant for a minimum of one year or as directed by the Engineer and shall be made available upon request. The printing system will be inspected by the Engineer prior to production and verified at the beginning of each construction season thereafter.

1031.09 RAP in Aggregate Surface Course and Aggregate Wedge Shoulders, Type B.
The use of RAP in aggregate surface course (temporary access entrances only) and aggregate wedge shoulders, Type B shall be as follows.

- (a) Stockpiles and Testing. RAP stockpiles may be any of those listed in Article 1031.02, except "Non-Quality" and "FRAP". The testing requirements of Article 1031.03 shall not apply. RAP used shall be according to the current Central Bureau of Materials Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications".
- (b) Gradation. One hundred percent of the RAP material shall pass the 1 1/2 in. (37.5 mm) sieve. The RAP material shall be reasonably well graded from coarse to fine. RAP material that is gap-graded or single sized will not be accepted."

80306

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (BDE)

Effective: January 1, 2019

Revise Section 669 of the Standard Specifications to read:

“SECTION 669. REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES

669.01 Description. This work shall consist of the transportation and proper disposal of contaminated soil and groundwater. This work shall also consist of the removal, transportation, and proper disposal of underground storage tanks (UST), their content and associated underground piping to the point where the piping is above the ground, including determining the content types and estimated quantities.

669.02 Equipment. The Contractor shall notify the Engineer of the delivery of all excavation, storage, and transportation equipment to a work area location. The equipment shall comply with OSHA and American Petroleum Institute (API) guidelines and shall be furnished in a clean condition. Clean condition means the equipment does not contain any residual material classified as a non-special waste, non-hazardous special waste, or hazardous waste. Residual materials include, but are not limited to, petroleum products, chemical products, sludges, or any other material present in or on equipment.

Before beginning any associated soil or groundwater management activity, the Contractor shall provide the Engineer with the opportunity to visually inspect and approve the equipment. If the equipment contains any contaminated residual material, decontamination shall be performed on the equipment as appropriate to the regulated substance and degree of contamination present according to OSHA and API guidelines. All cleaning fluids used shall be treated as the contaminant unless laboratory testing proves otherwise.

669.03 Pre-construction Submittals. Prior to beginning this work, or working in areas with regulated substances, the Contractor shall submit a Regulated Substance Pre-Construction Plan (RSPCP) to the Engineer for review and approval using form BDE 2730. The form shall be signed by an Illinois licensed Professional Engineer or Professional Geologist.

As part of the RSPCP, the qualifications of Contractor(s) or firm(s) performing the following work shall be listed.

- (a) On-Site Monitoring. Qualification for on-site monitoring of regulated substance work and on-site monitoring of UST removal requires either pre-qualification in Hazardous Waste by the Department or demonstration of acceptable project experience in remediation and special waste operations for contaminated sites in accordance with applicable Federal, State, or local regulatory requirements.

Qualification for each individual performing on-site monitoring requires a minimum of one-year of experience in similar activities as those required for the project.

(b) Underground Storage Tank. Qualification for underground storage tank (UST) work requires licensing and certification with the Office of the State Fire Marshall (OSFM) and possession of all permits required to perform the work. A copy of the permit shall be provided to the Engineer prior to tank removal.

The qualified Contractor(s) or firm(s) shall also document it does not have any current or former ties with any of the properties contained within, adjoining, or potentially affecting the work.

The Engineer will require up to 30 calendar days for review of the RSPCP. The review may involve rejection or revision and resubmittal; in which case, an additional 30 days will be required for each subsequent review. Work shall not commence until the RSPCP has been approved by the Engineer. After approval, the RSPCP shall be revised as necessary to reflect changed conditions in the field.

CONSTRUCTION REQUIREMENTS

669.04 Contaminated Soil and/or Groundwater Monitoring. Prior to beginning excavation, the Contractor shall mark the limits of removal for approval by the Engineer. Once excavation begins, the work and work area involving regulated substances shall be monitored by qualified personnel. The qualified personnel shall be on-site continuously during excavation and loading of material containing regulated substances. The qualified personnel shall be equipped with either a photoionization detector (PID) (minimum 10.6eV lamp), or a flame ionization detector (FID), and other equipment, as appropriate, to monitor for potential contaminants associated with volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCs). The PID or FID meter shall be calibrated on-site and background level readings taken and recorded daily, and as field and weather conditions change. Any field screen reading on the PID or FID in excess of background levels indicates the potential presence of contaminated material requiring handling as a non-special waste, special waste, or hazardous waste. PID or FID readings may be used as the basis of increasing the limits of removal with the approval of the Engineer but shall in no case be used to decrease the limits.

The qualified personnel shall document field activities using form BDE 2732 (Regulated Substances Monitoring Daily Record) including the name(s) of personnel conducting the monitoring, weather conditions, PID or FID calibration records, a list of equipment used on-site, a narrative of activities completed, photo log sheets, manifests and landfill tickets, monitoring results, how regulated substances were managed and other pertinent information.

Samples will be collected in accordance with the RSPCP. Samples shall be analyzed for the contaminants of concern (COCs), including pH, based on the property's land use history, the encountered abnormality and/or the parameters listed in the maximum allowable concentration (MAC) for chemical constituents in uncontaminated soil established pursuant to Subpart F of 35 Ill. Adm. Code 1100.605. The analytical results shall serve to document the level of contamination.

Samples shall be grab samples (not combined with other locations). The samples shall be taken with decontaminated or disposable instruments. The samples shall be placed in sealed containers and transported in an insulated container to the laboratory. The container shall maintain a temperature of 39 °F (4 °C). All samples shall be clearly labeled. The labels shall indicate the sample number, date sampled, collection location and depth, and any other relevant observations.

The laboratory shall use analytical methods which are able to meet the lowest appropriate practical quantitation limits (PQL) or estimated quantitation limit (EQL) specified in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", EPA Publication No. SW-846; "Methods for the Determination of Organic Compounds in Drinking Water", EPA, EMSL, EPA-600/4-88/039; and "Methods for the Determination of Organic Compounds in Drinking Water, Supplement III", EPA 600/R-95/131, August 1995. For parameters where the specified cleanup objective is below the acceptable detection limit (ADL), the ADL shall serve as the cleanup objective. For other parameters the ADL shall be equal to or below the specified cleanup objective.

669.05 Contaminated Soil and/or Groundwater Management and Disposal. The management and disposal of contaminated soil and/or groundwater shall be according to the following:

- (a) Soil Analytical Results Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels exceed the most stringent maximum allowable concentration (MAC) for chemical constituents in uncontaminated soil established pursuant to Subpart F of 35 Illinois Administrative Code 1100.605, the soil shall be managed as follows:
 - (1) When analytical results indicate inorganic chemical constituents exceed the most stringent MAC but they are still considered within area background levels by the Engineer, the excavated soil can be utilized within the construction limits as fill, when suitable. If the soils cannot be utilized within the construction limits, they shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable.
 - (2) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for a Metropolitan Statistical Area (MSA) County, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a clean construction and demolition debris (CCDD) facility or an uncontaminated soil fill operation (USFO) within an MSA County provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (3) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, or the MAC within the Chicago corporate limits, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an USFO within an MSA County excluding Chicago or within

- the Chicago corporate limits provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
- (4) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as “uncontaminated soil” at a CCDD facility or an USFO within an MSA County excluding Chicago provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (5) When the Engineer determines soil cannot be managed according to Articles 669.05(a)(1) through (a)(4) above, the soil shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable.
- (b) Soil Analytical Results Do Not Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels do not exceed the most stringent MAC, the excavated soil can be utilized within the construction limits or managed and disposed off-site as “uncontaminated soil” according to Article 202.03. However, the excavated soil cannot be taken to a CCDD facility or an USFO for any of the following reasons.
- (1) The pH of the soil is less than 6.25 or greater than 9.0.
 - (2) The soil exhibited PID or FID readings in excess of background levels.
- (c) Soil Analytical Results Exceed Most Stringent MAC but Do Not Exceed Tiered Approach to Corrective Action Objectives (TACO) Residential. When the soil analytical results indicate that detected levels exceed the most stringent MAC but do not exceed TACO Tier 1 Soil Remediation Objectives for Residential Properties pursuant to 35 IAC 742 Appendix B Table A, the excavated soil can be utilized within the right-of-way or managed and disposed off-site as “uncontaminated soil” according to Article 202.03. However, the excavated soil cannot be taken to a CCDD facility or an USFO.
- (d) Groundwater. When groundwater analytical results indicate the detected levels are above Appendix B, Table E of 35 Illinois Administrative Code 742, the most stringent Tier 1 Groundwater Remediation Objectives for Groundwater Component of the Groundwater Ingestion Route for Class 1 groundwater, the groundwater shall be managed off-site as a special waste. The groundwater shall be containerized and trucked to an off-site treatment facility or may be discharged to a sanitary sewer or combined sewer when permitted by the local sewer authority. Groundwater discharged to a sewer shall be pre-treated to remove particulates and measured with a calibrated flow meter to comply with applicable discharge limits. A copy of the permit shall be provided to the Engineer prior to discharging groundwater to the sewer.

All groundwater encountered within trenches may be managed within the trench and allowed to infiltrate back into the ground. If the groundwater cannot be managed within the trench it must be removed as a special or hazardous waste. The Contractor is

prohibited from managing groundwater within the trench by discharging it through any existing or new storm sewer. The Contractor shall install backfill plugs within the area of groundwater contamination.

One backfill plug shall be placed down gradient to the area of groundwater contamination. Backfill plugs shall be installed at intervals not to exceed 50 ft (15 m). Backfill plugs are to be 4 ft (1.2 m) long, measured parallel to the trench, full trench width and depth. Backfill plugs shall not have any fine aggregate bedding or backfill, but shall be entirely cohesive soil or any class of concrete. The Contractor shall provide test data that the material has a permeability of less than 10^{-7} cm/sec according to ASTM D 5084, Method A or per another test method approved by the Engineer.

The Contractor shall use due care when transferring contaminated material from the area of origin to the transporter. Should releases of contaminated material to the environment occur (i.e., spillage onto the ground, etc.), the Contractor shall clean-up spilled material and place in the appropriate storage containers as previously specified. Clean-up shall include, but not be limited to, sampling beneath the material staging area to determine complete removal of the spilled material.

The Contractor shall be responsible for transporting and disposing all material classified as a non-special waste, special waste, or hazardous waste from the job site to an appropriately permitted landfill facility. The transporter and the vehicles used for transportation shall comply with all federal, state, and local rules and regulations governing the transportation of non-special waste, special waste, or hazardous waste.

All equipment used by the Contractor to haul contaminated material to the landfill facility shall be lined with a 6 mil (150 micron) polyethylene liner and securely covered during transportation. The Contractor shall obtain all documentation including any permits and/or licenses required to transport the contaminated material to the disposal facility.

The Contractor shall provide engineered barriers, when required, and shall include materials sufficient to completely line excavation surfaces, including sloped surfaces, bottoms, and sidewall faces, within the areas designated for protection.

The Engineer shall coordinate with the Contractor on the completion of all documentation. The Contractor shall make all arrangements for collection and analysis of landfill acceptance testing. The Contractor shall coordinate for waste disposal approval with the disposal facility. After the Contractor completes these activities and upon receipt of authorization from the Engineer, the Contractor shall initiate the disposal process.

The Contractor shall provide the Engineer with all transport-related documentation within two days of transport or receipt of said document(s). The Engineer shall maintain the file for all such documentation. For management of special or hazardous waste, the Contractor shall provide the Engineer with documentation the Contractor (or subcontractor, if a subcontractor is used for transportation) is operating with a valid Illinois special waste transporter permit at least two weeks before transporting the first load of contaminated material.

The Contractor shall schedule and arrange the transport and disposal of each load of contaminated material produced. The Contractor shall make all transport and disposal arrangements so no contaminated material remains within the project area at the close of business each day. Exceptions to this specification require prior approval from the Engineer within 24 hours of close of business. The Contractor shall be responsible for all other pre-disposal/transport preparations necessary daily to accomplish management activities.

Any waste generated as a special or hazardous waste from a non-fixed facility shall be manifested off-site using the Department's county generator number. An authorized representative of the Department shall sign all manifests for the disposal of the contaminated material and confirm the Contractor's transported volume. Any waste generated as a non-special waste may be managed off-site without a manifest, a special waste transporter, or a generator number.

The Contractor shall select a landfill mandated by definition of the contaminant within the State of Illinois. The Department will review and approve or reject the facility proposed by the Contractor to use as a landfill. The Contractor shall verify whether the selected disposal facility is compliant with those applicable standards as mandated by definition of the contaminant and whether the disposal facility is presently, has previously been, or has never been, on the United States Environmental Protection Agency (U.S. EPA) National Priorities List or the Resource Conservation and Recovery Act (RCRA) List of Violating Facilities. The Contractor shall be responsible for coordinating permits with the IEPA. The use of a Contractor selected landfill shall in no manner delay the construction schedule or alter the Contractor's responsibilities as set forth.

669.06 Non-Special Waste Certification. An authorized representative of the Department shall sign and date all non-special waste certifications. The Contractor shall be responsible for providing the Engineer with the required information that will allow the Engineer to certify the waste is not a special waste.

(a) Definition. A waste is considered a non-special waste as long as it is not:

- (1) a potentially infectious medical waste;
- (2) a hazardous waste as defined in 35 IAC 721;
- (3) an industrial process waste or pollution control waste that contains liquids, as determined using the paint filter test set forth in subdivision (3)(A) of subsection (m) of 35 IAC 811.107;
- (4) a regulated asbestos-containing waste material, as defined under the National Emission Standards for Hazardous Air Pollutants in 40 CFR 61.141;
- (5) a material containing polychlorinated biphenyls (PCB's) regulated pursuant to 40 CFR Part 761;

- (6) a material subject to the waste analysis and recordkeeping requirements of 35 IAC 728.107 under land disposal restrictions of 35 IAC 728;
 - (7) a waste material generated by processing recyclable metals by shredding and required to be managed as a special waste under Section 22.29 of the Environmental Protection Act; or
 - (8) an empty portable device or container in which a special or hazardous waste has been stored, transported, treated, disposed of, or otherwise handled.
- (b) Certification Information. All information used to determine the waste is not a special waste shall be attached to the certification. The information shall include but not be limited to:
- (1) the means by which the generator has determined the waste is not a hazardous waste;
 - (2) the means by which the generator has determined the waste is not a liquid;
 - (3) if the waste undergoes testing, the analytic results obtained from testing, signed and dated by the person responsible for completing the analysis;
 - (4) if the waste does not undergo testing, an explanation as to why no testing is needed;
 - (5) a description of the process generating the waste; and
 - (6) relevant material safety data sheets.

669.07 Temporary Staging. The Contractor shall excavate and dispose of all waste material as mandated by the contaminants without temporary staging. If circumstances require temporary staging, he/she shall request in writing, approval from the Engineer.

When approved, the Contractor shall prepare a secure location within the project area capable of housing containerized waste materials. The Contractor shall contain all waste material in leak-proof storage containers such as lined roll-off boxes or 55 gal (208 L) drums, or stored in bulk fashion on storage pads. The design and construction of such storage pad(s) for bulk materials shall be subject to approval by the Engineer. The Contractor shall place the staged storage containers on an all-weather gravel-packed, asphalt, or concrete surface. The Contractor shall maintain a clearance both above and beside the storage units to provide maneuverability during loading and unloading. The Contractor shall provide any assistance or equipment requested by the Engineer for authorized personnel to inspect and/or sample contents of each storage container. All containers and their contents shall remain intact and undisturbed by unauthorized persons until the manner of disposal is determined. The Contractor shall keep the storage containers covered, except when access is requested by authorized personnel of the Department. The Engineer shall authorize any additional material added to the contents of any storage container before being filled.

The Contractor shall ensure the staging area is enclosed (by a fence or other structure) to ensure direct access to the area is restricted, and he/she shall procure and place all required regulatory identification signs applicable to an area containing the waste material. The Contractor shall be responsible for all activities associated with the storage containers including, but not limited to, the procurement, transport, and labeling of the containers. The Contractor shall clearly mark all containers in permanent marker or paint with the date of waste generation, location and/or area of waste generation, and type of waste (e.g., decontamination water, contaminated clothing, etc.). The Contractor shall place these identifying markings on an exterior side surface of the container. The Contractor shall separately containerize each contaminated medium, i.e. contaminated clothing is placed in a separate container from decontamination water. Containers used to store liquids shall not be filled in excess of 80 percent of the rated capacity. The Contractor shall not use a storage container if visual inspection of the container reveals the presence of free liquids or other substances that could classify the material as a hazardous waste in the container.

The Department will not be responsible for any additional costs incurred, if mismanagement of the staging area, storage containers, or their contents by the Contractor results in excess cost expenditure for disposal or other material management requirements.

669.08 Underground Storage Tank Removal. For the purposes of this section, an underground storage tank (UST) includes the underground storage tank, piping, electrical controls, pump island, vent pipes and appurtenances.

Prior to removing an UST, the Engineer shall determine whether the Department is considered an "owner" or "operator" of the UST as defined by the UST regulations (41 Ill. Adm. Code Part 176). Ownership of the UST refers to the Department's owning title to the UST during storage, use or dispensing of regulated substances. The Department may be considered an "operator" of the UST if it has control of, or has responsibility for, the daily operation of the UST. The Department may however voluntarily undertake actions to remove an UST from the ground without being deemed an "operator" of the UST.

In the event the Department is deemed not to be the "owner" or "operator" of the UST, the OSFM removal permit shall reflect who was the past "owner" or "operator" of the UST. If the "owner" or "operator" cannot be determined from past UST registration documents from OSFM, then the OSFM removal permit will state the "owner" or "operator" of the UST is the Department. The Department's Office of Chief Counsel (OCC) will review all UST removal permits prior to submitting any removal permit to the OSFM. If the Department is not the "owner" or "operator" of the UST then it will not register the UST or pay any registration fee.

The Contractor shall be responsible for obtaining all permits required for removing the UST, notification to the OSFM, using an OSFM certified tank contractor, removal and disposal of the UST and its contents, and preparation and submittal of the OSFM Site Assessment Report in accordance with 41 Ill. Adm. Code Part 176.330.

The Contractor shall contact the Engineer and the OSFM's office at least 72 hours prior to removal to confirm the OSFM inspector's presence during the UST removal. Removal, transport,

and disposal of the UST shall be according to the applicable portions of the latest revision of the "American Petroleum Institute (API) Recommended Practice 1604".

The Contractor shall collect and analyze tank content (sludge) for disposal purposes. The Contractor shall remove as much of the regulated substance from the UST system as necessary to prevent further release into the environment. All contents within the tank shall be removed, transported and disposed of, or recycled. The tank shall be removed and rendered empty according to IEPA definition.

The Contractor shall collect soil samples from the bottom and sidewalls of the excavated area in accordance with 35 Ill. Adm. Code Part 734.210(h) after the required backfill has been removed during the initial response action, to determine the level of contamination remaining in the ground, regardless if a release is confirmed or not by the OSFM on-site inspector.

In the event the UST is designated a leaking underground storage tank (LUST) by the OSFM's inspector, or confirmation by analytical results, the Contractor shall notify the Engineer and the DESU. Upon confirmation of a release of contaminants from the UST and notifications to the Engineer and DESU, the Contractor shall report the release to the Illinois Emergency Management Agency (IEMA) (e.g., by telephone or electronic mail) and provide them with whatever information is available ("owner" or "operator" shall be stated as the past registered "owner" or "operator", or the IDOT District in which the UST is located and the DESU Manager);

The Contractor shall perform the following initial response actions if a release is indicated by the OSFM inspector:

- (a) Take immediate action to prevent any further release of the regulated substance to the environment, which may include removing, at the Engineer's discretion, and disposing of up to 4 ft (1.2 m) of the contaminated material, as measured from the outside dimension of the tank
- (b) Identify and mitigate fire, explosion and vapor hazards;
- (c) Visually inspect any above ground releases or exposed below ground releases and prevent further migration of the released substance into surrounding soils and groundwater; and
- (d) Continue to monitor and mitigate any additional fire and safety hazards posed by vapors and free product that have migrated from the UST excavation zone and entered into subsurface structures (such as sewers or basements).

The UST excavation shall be backfilled according to applicable portions of Sections 205, 208, and 550 with a material that will compact and develop stability. The material shall be approved prior to placement. All uncontaminated concrete and soil removed during tank extraction may be used to backfill the excavation, at the discretion of the Engineer.

After backfilling the excavation, the site shall be graded and cleaned.

669.09 Regulated Substance Final Construction Report. Not later than 90 days after completing this work, the Contractor shall submit a Regulated Substance Final Construction Report (RSFCR) to the Engineer using form BDE 2733 and required attachments. The form shall be signed by an Illinois licensed Professional Engineer or Professional Geologist.

669.10 Method of Measurement. Non-special waste, special waste, and hazardous waste soil will be measured for payment according to Article 202.07(b) when performing earth excavation, Article 502.12(b) when excavating for structures, or by computing the volume of the trench using the maximum trench width permitted and the actual depth of the trench.

Groundwater containerized and transported off-site for management, storage, and disposal will be measured for payment in gallons (liters).

Backfill plugs will be measured in cubic yards (cubic meters) in place, except the quantity for which payment will be made shall not exceed the volume of the trench, as computed by using the maximum width of trench permitted by the Specifications and the actual depth of the trench, with a deduction for the volume of the pipe.

Engineered Barriers will be measured for payment in square yards (square meters).

669.11 Basis of Payment. The work of preparing, submitting and administering a Regulated Substances Pre-Construction Plan will be paid for at the contract lump sum price for REGULATED SUBSTANCES PRE-CONSTRUCTION PLAN.

On-site monitoring of regulated substances, including completion of form BDE 2732 for each day of work, will be paid for at the contract unit price per calendar day, or fraction thereof, for ON-SITE MONITORING OF REGULATED SUBSTANCES.

The installation of engineered barriers will be paid for at the contract unit price per square yard (square meter) for ENGINEERED BARRIER.

The work of removing a UST, soil excavation, soil and content sampling, and the excavated soil, UST content, and UST disposal will be paid for at the contract unit price per each for UNDERGROUND STORAGE TANK REMOVAL.

The transportation and disposal of soil and other materials from an excavation determined to be contaminated will be paid for at the contract unit price per cubic yard (cubic meter) for NON-SPECIAL WASTE DISPOSAL, SPECIAL WASTE DISPOSAL, or HAZARDOUS WASTE DISPOSAL.

The transportation and disposal of groundwater from an excavation determined to be contaminated will be paid for at the contract unit price per gallon (liter) for SPECIAL WASTE GROUNDWATER DISPOSAL or HAZARDOUS WASTE GROUNDWATER DISPOSAL. When groundwater is discharged to a sanitary or combined sewer by permit, the cost will be paid for according to Article 109.05.

Backfill plugs will be paid for at the contract unit price per cubic yard (cubic meter) for BACKFILL PLUGS.

Payment for temporary staging, if required, will be paid for according to Article 109.04.

Payment for accumulated stormwater removal and disposal will be according to Article 109.04. Payment will only be allowed if appropriate stormwater and erosion control methods were used.

Payment for decontamination, labor, material, and equipment for monitoring areas beyond the specified areas, with the Engineer's prior written approval, will be according to Article 109.04.

The sampling and testing associated with this work will be paid for as follows.

- (a) BETX Soil/Groundwater Analysis. When the contaminants of concern are gasoline only, soil or groundwater samples shall be analyzed for benzene, ethylbenzene, toluene, and xylenes (BETX). The analysis will be paid for at the contract unit price per each for BETX SOIL ANALYSIS and/or BETX GROUNDWATER ANALYSIS using EPA Method 8021B.
- (b) BETX-PNAS Soil/Groundwater Analysis. When the contaminants of concern are middle distillate and heavy ends, soil or groundwater samples shall be analyzed for BETX and polynuclear aromatics (PNAS). The analysis will be paid for at the contract unit price per each for BETX-PNAS SOIL ANALYSIS and/or BETX-PNAS GROUNDWATER ANALYSIS using EPA Method 8021B for BETX and EPA Method 8310 for PNAS.
- (c) Priority Pollutants Soil Analysis. When the contaminants of concern are used oils, soil samples shall be analyzed for priority pollutant VOCs, priority pollutants SVOCs, and priority pollutants metals. The analysis will be paid for at the contract unit price per each for PRIORITY POLLUTANTS SOIL ANALYSIS using EPA Method 8260B for VOCs, EPA Method 8270C for SVOCs, and using an ICP instrument and EPA Methods 6010B and 7471A for metals.
- (d) Priority Pollutant Groundwater Analysis. When the contaminants of concern are used oils, non-petroleum material, or unknowns, groundwater samples shall be analyzed for priority pollutant VOCs, priority pollutants SVOCs, and priority pollutants metals. The analysis will be paid for at the contract unit price per each for PRIORITY POLLUTANTS GROUNDWATER ANALYSIS using EPA Method 8260B for VOCs, EPA Method 8270C for SVOCs, and EPA Methods 6010B and 7470A for metals.
- (e) Target Compound List (TCL) Soil Analysis. When the contaminants of concern are unknowns or non-petroleum material, soil samples shall be analyzed for priority pollutant VOCs, priority pollutants SVOCs, priority pollutants metals, pesticides, and Resource Conservation and Recovery Act (RCRA) metals by the toxicity characteristic leaching procedure (TCLP). The analysis will be paid for at the contract unit price per each for TCL SOIL ANALYSIS using EPA Method 8260B for VOCs, EPA Method 8270C for SVOCs,

EPA Method 8081 for pesticides, and ICP instrument and EPA Methods 6010B, 7471A, 1311 (extraction), 6010B, and 7470A for metals.

- (f) Soil Disposal Analysis. When the waste material for disposal requires sampling for disposal acceptance, the samples shall be analyzed for TCLP VOCs, SVOCs, RCRA metals, pH, ignitability, and paint filter test. The analysis will be paid for at the contract unit price per each for SOIL DISPOSAL ANALYSIS using EPA Methods 1311 (extraction), 8260B for VOCs, 8270C for SVOCs, 6010B and 7470A for RCRA metals, 9045C for pH, 1030 for ignitability, and 9095A for paint filter.

The work of preparing, submitting and administering a Regulated Substances Final Construction Report will be paid for at the contract lump sum price REGULATED SUBSTANCES FINAL CONSTRUCTION REPORT.”

80407

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

TRAINING SPECIAL PROVISIONS (BDE)

Effective: October 15, 1975

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 4 . In the event the Contractor subcontracts a portion of the contract work, he 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 insure 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 employed by him 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 that he 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 has successfully completed a training course leading to journeyman status or in which he 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, Manpower Administration, Bureau of Apprenticeship and Training 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 his performance under this Training Special Provision.

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

TRAFFIC CONTROL DEVICES - CONES (BDE)

Effective: January 1, 2019

Revise Article 701.15(a) of the Standard Specifications to read:

“(a) Cones. Cones are used to channelize traffic. Cones used to channelize traffic at night shall be reflectorized; however, cones shall not be used in nighttime lane closure tapers or nighttime lane shifts.”

Revise Article 1106.02(b) of the Standard Specifications to read:

“(b) Cones. Cones shall be predominantly orange. Cones used at night that are 28 to 36 in. (700 to 900 mm) in height shall have two white circumferential stripes. If non-reflective spaces are left between the stripes, the spaces shall be no more than 2 in. (50mm) in width. Cones used at night that are taller than 36 in. (900 mm) shall have a minimum of two white and two fluorescent orange alternating, circumferential stripes with the top stripe being fluorescent orange. If non-reflective spaces are left between the stripes, the spaces shall be no more than 3 in. (75 mm) in width.

The minimum weights for the various cone heights shall be 4 lb for 18 in. (2 kg for 450 mm), 7 lb for 28 in. (3 kg for 700 mm), and 10 lb for 36 in. (5 kg for 900 mm) with a minimum of 60 percent of the total weight in the base. Cones taller than 36 in. shall be weighted per the manufacturer’s specifications such that they are not moved by wind or passing traffic.”

80409

TRAVERSABLE PIPE GRATE FOR CONCRETE END SECTIONS (BDE)

Effective: January 1, 2013

Revised: January 1, 2018

Description. This work shall consist of constructing a traversable pipe grate on a concrete end section.

Materials. Materials shall be according to the following Articles of Division 1000 – Materials of the Standard Specifications.

Item	Article/Section
(a) Traversable Pipe Grate Components (Note 1)	
(b) Chemical Adhesive Resin System	1027
(c) High Strength Steel Bolts, Nuts, and Washers (Note 2).....	1006.08

Note 1. All steel pipe shall be according to ASTM A 53 (Type E or S), Grade B, or ASTM A 500 Grade B, standard weight (SCH. 40). Structural steel shapes and plates shall be according to AASHTO M270 Grade 50 (M 270M Grade 345) and the requirements of Article 1006.04 of the Standard Specifications. All steel components of the grating system shall be galvanized according to AASHTO M 111 or ASTM F 2329 as applicable.

Anchor rods shall be according to ASTM F 1554, Grade 36 (Grade 250).

Note 2. Threaded rods conforming to the requirements of ASTM F 1554, Grade 105 (Grade 725) may be used for the thru bolts.

CONSTRUCTION REQUIREMENTS

Fabrication of the traversable pipe grate shall be according to the requirements of Section 505 of the Standard Specifications and as shown on the plans.

Anchor rods shall be set according to Article 509.06 of the Standard Specifications. Bolts and anchor rods shall be snug tightened by a few impacts of an impact wrench or the full force of a worker using an ordinary spud wrench. Thru bolts shall be snug tightened and shall be brought to a snug tight condition followed by an additional 2/3 turn on one of the nuts. Match marks shall be provided on the bolt and nut to verify relative rotation between the bolt and the nut.

Splicing of pipes shall be made by utilizing full penetration butt welds according to Article 505.04(q) of the Standard Specifications. In lieu of welding, bolted or sleeve type splices may be utilized, provided the splices are located over intermediate supports with no more than one splice per pipe run with the exception that no splice may occur in pipe runs under 30 ft (9 m) in length.

Method of Measurement. This work will be measured for payment in place in feet (meters). The length measured shall be along the pipe grate elements from end to end for both longitudinal and intermediate support pipes.

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for
| TRAVERSABLE PIPE GRATE FOR CONCRETE END SECTION.

80318

WARM MIX ASPHALT (BDE)

Effective: January 1, 2012

Revised: April 1, 2016

Description. This work shall consist of designing, producing and constructing Warm Mix Asphalt (WMA) in lieu of Hot Mix Asphalt (HMA) at the Contractor's option. Work shall be according to Sections 406, 407, 408, 1030, and 1102 of the Standard Specifications, except as modified herein. In addition, any references to HMA in the Standard Specifications, or the special provisions shall be construed to include WMA.

WMA is an asphalt mixture which can be produced at temperatures lower than allowed for HMA utilizing approved WMA technologies. WMA technologies are defined as the use of additives or processes which allow a reduction in the temperatures at which HMA mixes are produced and placed. WMA is produced by the use of additives, a water foaming process, or combination of both. Additives include minerals, chemicals or organics incorporated into the asphalt binder stream in a dedicated delivery system. The process of foaming injects water into the asphalt binder stream, just prior to incorporation of the asphalt binder with the aggregate.

Approved WMA technologies may also be used in HMA provided all the requirements specified herein, with the exception of temperature, are met. However, asphalt mixtures produced at temperatures in excess of 275 °F (135 °C) will not be considered WMA when determining the grade reduction of the virgin asphalt binder grade.

Equipment.

Revise the first paragraph of Article 1102.01 of the Standard Specifications to read:

"1102.01 Hot-Mix Asphalt Plant. The hot-mix asphalt (HMA) plant shall be the batch-type, continuous-type, or dryer drum plant. The plants shall be evaluated for prequalification rating and approval to produce HMA according to the current Bureau of Materials and Physical Research Policy Memorandum, "Approval of Hot-Mix Asphalt Plants and Equipment". Once approved, the Contractor shall notify the Bureau of Materials and Physical Research to obtain approval of all plant modifications. The plants shall not be used to produce mixtures concurrently for more than one project or for private work unless permission is granted in writing by the Engineer. The plant units shall be so designed, coordinated and operated that they will function properly and produce HMA having uniform temperatures and compositions within the tolerances specified. The plant units shall meet the following requirements."

Add the following to Article 1102.01(a) of the Standard Specifications.

"(11) Equipment for Warm Mix Technologies.

- a. Foaming. Metering equipment for foamed asphalt shall have an accuracy of ± 2 percent of the actual water metered. The foaming control system shall be electronically interfaced with the asphalt binder meter.

- b. Additives. Additives shall be introduced into the plant according to the supplier's recommendations and shall be approved by the Engineer. The system for introducing the WMA additive shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes."

Mix Design Verification.

Add the following to Article 1030.04 of the Standard Specifications.

"(e) Warm Mix Technologies.

- (1) Foaming. WMA mix design verification will not be required when foaming technology is used alone (without WMA additives). However, the foaming technology shall only be used on HMA designs previously approved by the Department.
- (2) Additives. WMA mix designs utilizing additives shall be submitted to the Engineer for mix design verification."

Construction Requirements.

Revise the second paragraph of Article 406.06(b)(1) of the Standard Specifications to read:

"The HMA shall be delivered at a temperature of 250 to 350 °F (120 to 175 °C).
WMA shall be delivered at a minimum temperature of 215 °F (102 °C)."

Basis of Payment.

This work will be paid at the contract unit price bid for the HMA pay items involved. Anti-strip will not be paid for separately, but shall be considered as included in the cost of the work.

80288

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012

| Revised: April 2, 2015

| 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 Monday through Sunday 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

DRAINAGE SYSTEM

Effective: June 10, 1994

Revised: June 24, 2015

Description. This work shall consist of furnishing and installing a bridge drainage system as shown on the plans, including all piping, fittings, support brackets, inserts, bolts, and splash blocks when specified.

Material. The pipe and fittings shall be reinforced fiberglass according to ASTM D 2996 RTRP with a 30,000 psi (207 MPa) minimum short-time rupture strength hoop tensile stress. The reinforced fiberglass shall also have an apparent stiffness factor at 5 percent deflection exceeding 200 cu in.-lbf/sq. in. (22.6 cu mm-kPa) and a minimum wall thickness of 0.10 in. (2.54 mm). The adhesive for joining pipe and fittings shall be as recommended by the manufacturer. All pipe supports and associated hardware shall be hot dip galvanized according to AASHTO M 232 (M 232M). The fiberglass pipe and fittings furnished shall be pigmented through out, or have a resin-rich pigmented exterior coat, specifically designed for overcoating fiberglass, as recommended by the manufacturer. The color shall be as specified by the Engineer. The resin in either case shall have an ultraviolet absorber designed to prevent ultraviolet degradation. The ultraviolet protection shall be designed to withstand a minimum of 2,500 hours of accelerated weathering when tested in conformance with the requirements in ASTM Designation: G 154. Lamps shall be UV-8 (313 nm wavelength). The resting cycle shall be 4 hours of ultraviolet exposure at 140°F (60°C), and then 4 hours of condensate exposure at 120°F (49°C). After testing, the surface of the pipe shall exhibit no fiber exposure, crazing, or checking, and only a slight chalking or color change. The supplier shall certify the material supplied meets or exceeds these requirements.

Design. The drainage system shall be designed as an open system with allowances for the differential expansion and contraction expected between the superstructure and the substructure to which the drainage system is attached.

Installation. All connections of pipes and fittings shown on the plans to facilitate future removal for maintenance cleanout or flushing shall be made with a threaded, gasketed coupler or a bolted gasketed flange system. Adhesive bonded joints will be permitted for runs of pipe between such connections. The end run connection shall feature a minimum nominal 6 in. (150 mm) female threaded fiberglass outlet. Straight runs may utilize a 45 degree reducing saddle bonded to the pipe. The female outlet shall be filled with a male threaded PVC plug.

Runs of pipe shall be supported at spacings not exceeding those recommended by the manufacturer of the pipe. Supports that have point contact or narrow supporting areas shall be avoided. Standard slings, clamps, clevis hangers and shoe supports designed for use with steel pipe may be used. A minimum strap width for hangers shall be 1 1/2 in. (40 mm) for all pipe under 12 in. (300 mm) in diameter and 2 in. (50 mm) for diameters 12 in. (300 mm) or greater. Straps shall have 120 degrees of contact with the pipe. Pipes supported on less than 120 degrees of contact shall have a split fiberglass pipe protective sleeve bonded in place with adhesive.

All reinforced fiberglass pipe, fittings, and expansion joints shall be handled and installed according to guidelines and procedures recommended by the manufacturer or supplier of the material.

Basis of Payment. This work will be paid for at the contract lump sum price for DRAINAGE SYSTEM.

CLEANING AND PAINTING EXISTING STEEL STRUCTURES

Effective: October 2, 2001

Revised: April 22, 2016

Description. This work shall consist of the preparation of all designated metal surfaces by the method(s) specified on the plans. This work also includes the painting of those designated surfaces with the paint system(s) specified on the plans. The Contractor shall furnish all materials, equipment, labor, and other essentials necessary to accomplish this work and all other work described herein and as directed by the Engineer.

Materials. All materials to be used on an individual structure shall be produced by the same manufacturer.

The Bureau of Materials and Physical Research has established a list of all products that have met preliminary requirements. Each batch of material, except for the penetrating sealer, shall be tested and assigned a MISTIC approval number before use. The specified colors shall be produced in the coating manufacturer's facility. Tinting of the coating after it leaves the manufacturer's facility is not allowed.

The paint materials shall meet the following requirements of the Standard Specification and as noted below:

<u>Item</u>	<u>Article</u>
(a) Waterborne Acrylic	1008.04
(b) Aluminum Epoxy Mastic	1008.03
(c) Organic Zinc Rich Primer	1008.05
(d) Epoxy/ Aliphatic Urethane	1008.05
(e) Penetrating Sealer (Note 1)	
(f) Moisture Cured Zinc Rich Urethane Primer (Note 2)	
(g) Moisture Cured Aromatic/Aliphatic Urethane (Note 2)	
(h) Moisture Cured Penetrating Sealer (Note 3)	

Note 1: The Epoxy Penetrating Sealer shall be a cross-linked multi component sealer. The sealer shall have the following properties:

- (a) The volume solids shall be 98 percent (plus or minus 2 percent).
- (b) Shall be clear or slightly tinted color.

Note 2: These material requirements shall be according to the Special Provision for the Moisture Cured Urethane Paint System.

Note 3: The Moisture Cured Penetrating Sealer manufacturer's certification will be required.

Submittals. The Contractor shall submit for Engineer review and acceptance, the following plans and information for completing the work. The submittals shall be provided within 30 days

of execution of the contract unless given written permission by the Engineer to submit them at a later date. Work cannot proceed until the submittals are accepted by the Engineer. Details for each of the plans are presented within the body of this specification.

- a) Contractor/Personnel Qualifications. Evidence of Contractor qualifications and the names and qualifications/experience/training of the personnel managing and implementing the Quality Control program and conducting the quality control tests, and certifications for the CAS (Coating Application Specialists) on SSPC-QP1 and QP2 projects.
- b) Quality Control (QC) Program. The QC Program shall identify the following; the instrumentation that will be used, a schedule of required measurements and observations, procedures for correcting unacceptable work, and procedures for improving surface preparation and painting quality as a result of quality control findings. The program shall incorporate at a minimum, the IDOT Quality Control Daily Report form, or a Contractor form (paper or electronic) that provides equivalent information.
- c) Inspection Access Plan. The inspection access plan for use by Contractor QC personnel for ongoing inspections and by the Engineer during Quality Assurance (QA) observations.
- d) Surface Preparation/Painting Plan. The surface preparation/painting plan shall include the methods of surface preparation and type of equipment to be utilized for washing, hand/power tool cleaning, removal of rust, mill scale, paint or foreign matter, abrasive blast or water jetting, and remediation of chloride. If detergents, additives, or inhibitors are incorporated into the water, the Contractor shall include the names of the materials and Safety Data Sheets (SDS). The Contractor shall identify the solvents proposed for solvent cleaning together with SDS.

If cleaning and painting over existing galvanized surfaces are specified, the plan shall address surface preparation, painting, and touch up/repair of the galvanized surfaces.

The plan shall also include the methods of coating application and equipment to be utilized.

If the Contractor proposes to heat or dehumidify the containment, the methods and equipment proposed for use shall be included in the Plan for the Engineer's consideration.

- e) Paint Manufacturer Certifications and Letters. When a sealer is used, the Contractor shall provide the manufacturer's certification of compliance with IDOT testing requirements listed under "Materials" above. A certification regarding the compatibility of the sealer with the specified paint system shall also be included.

When rust inhibitors are used, the Contractor shall provide a letter from the coating manufacturer indicating that the inhibitor is compatible with, and will not adversely affect the performance of the coating system.

If the use of a chemical soluble salt remover is proposed by the Contractor, provide a letter from the coating manufacturer indicating that the material will not adversely affect the performance of the coating system.

The paint manufacturer's most recent application and thinning instructions, SDS and product data sheets shall be provided, with specific attention drawn to storage temperatures, and the temperatures of the material, surface and ambient air at the time of application.

A letter or written instructions from the coating manufacturer shall be provided indicating the length of time that each coat must be protected from cold or inclement weather (e.g., exposure to rain) during its drying period, the maximum recoat time for each coat, and the steps necessary to prepare each coat for overcoating if the maximum recoat time is exceeded.

- f) Abrasives. Abrasives to be used for abrasive blast cleaning, including SDS. For expendable abrasives, the Contractor shall provide certification from the abrasive supplier that the abrasive meets the requirements of SSPC-AB1. For steel grit abrasives, the certification shall indicate that the abrasive meets the requirements of SSPC-AB3.
- g) Protective Coverings. Plan for containing or controlling paint debris (droplets, spills, overspray, etc.). Any tarpaulins or protective coverings proposed for use shall be fire retardant. For submittal requirements involving the containment used to remove lead paint, the Contractor shall refer to Special Provision for Containment and Disposal of Lead Paint Cleaning Residues.
- h) Progress Schedule. Progress schedule shall be submitted per Article 108.02 and shall identify all major work items (e.g., installation of rigging/containment, surface preparation, and coating application).

When the Engineer accepts the submittals, the Contractor will receive written notification. The Contractor shall not begin any paint removal work until the Engineer has accepted the submittals. The Contractor shall not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety concerns. Acceptance of the programs does not relieve the Contractor from the responsibility to conduct the work according to the requirements of Federal, State, or Local regulations and this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Contractor Qualifications. Unless indicated otherwise on the contract plans, for non lead abatement projects, the painting Contractor shall possess current SSPC–QP1 certification. Unless indicated otherwise on the plans, for lead abatement projects the Contractor shall also possess current SSPC-QP2 certification. The Contractor shall maintain certified status throughout the duration of the painting work under the contract. The Department reserves the right to accept Contractors documented to be currently enrolled in the SSPC-QP7, Painting Contractor Introductory Program, Category 2, in lieu of the QP certifications noted above.

Quality Control (QC) Inspections. The Contractor shall perform first line, in process QC inspections. The Contractor shall implement the submitted and accepted QC Program to insure that the work accomplished complies with these specifications. The designated Quality Control inspector shall be onsite full time during any operations that affect the quality of the coating system (e.g., surface preparation and chloride remediation, coating mixing and application, and evaluations between coats and upon project completion). The Contractor shall use the IDOT Quality Control Daily Report form to record the results of quality control tests. Alternative forms (paper or electronic) will be allowed provided they furnish equivalent documentation as the IDOT form, and they are accepted as part of the QC Program submittal. The completed reports shall be turned into the Engineer before work resumes the following day. The Engineer or designated representative will sign the report. The signature is an acknowledgment that the report has been received, but should not be construed as an agreement that any of the information documented therein is accurate.

Contractor QC inspections shall include, but not be limited to the following:

- Suitability of protective coverings and the means employed to control project debris and paint spills, overspray, etc.
- Ambient conditions
- Surface preparation (solvent cleaning, pressure washing including chalk tests, hand/power tool or abrasive blast cleaning, etc.)
- Chloride remediation
- Coating application (specified materials, mixing, thinning, and wet/dry film thickness)
- Recoat times and cleanliness between coats
- Coating continuity and coverage (freedom from runs, sags, overspray, dryspray, pinholes, shadow-through, skips, misses, etc.)

The personnel managing the Contractor's QC Program shall possess a minimum classification of Society of Protective Coatings (SSPC) BCI certified, National Association of Corrosion Engineers (NACE) Coating Inspector Level 2 - Certified, and shall provide evidence of successful inspection of 3 bridge projects of similar or greater complexity and scope that have been completed in the last 2 years. Copies of the certification and experience shall be provided. References for experience shall be provided and shall include the name, address, and telephone number of a contact person employed by the bridge owner.

The personnel performing the QC tests shall be trained in coatings inspection and the use of the testing instruments. Documentation of training shall be provided. The QC personnel shall not

perform hands on surface preparation or painting activities. Painters shall perform wet film thickness measurements, with QC personnel conducting random spot checks of the wet film. The Contractor shall not replace the QC personnel assigned to the project without advance notice to the Engineer, and acceptance of the replacement(s), by the Engineer.

The Contractor shall supply all necessary equipment with current calibration certifications to perform the QC inspections. Equipment shall include the following at a minimum:

- Sling psychrometer or digital psychrometer for the measurement of dew point and relative humidity, together with all necessary weather bureau tables or psychrometric charts. In the event of a conflict between readings with the sling psychrometer and the digital psychrometer, the readings with the sling psychrometer shall prevail.
- Surface temperature thermometer
- SSPC Visual Standards VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning; SSPC-VIS 3, Visual Standard for Power and Hand-Tool Cleaned Steel; SSPC-VIS 4, Guide and Reference Photographs for Steel Prepared by Water Jetting, and/or SSPC-VIS 5, Guide and Reference Photographs for Steel Prepared by Wet Abrasive Blast Cleaning, as applicable.
- Test equipment for determining abrasive cleanliness (oil content and water-soluble contaminants) according to SSPC abrasive specifications AB1, AB2, and AB3.
- Commercially available putty knife of a minimum thickness of 40 mils (1mm) and a width between 1 and 3 in. (25 and 75 mm). Note that the putty knife is only required for projects in which the existing coating is being feathered and tested with a dull putty knife.
- Testex Press-O-Film Replica Tape and Micrometer compliant with Method C of ASTM D4417, Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel, or digital profile depth micrometer compliant with ASTM D4417, Method B. In the event of a conflict between measurements with the two instruments on abrasive blast cleaned steel, the results with the Testex Tape shall prevail. Note that for measuring the profile of steel power tool cleaned to SSPC-SP15, Commercial Grade Power Tool Cleaning, the digital profile depth micrometer shall be used.
- Bresle Cell Kits or CHLOR*TEST kits for chloride determinations, or equivalent
- Wet Film Thickness Gage
- Blotter paper for compressed air cleanliness checks
- Type 2 Electronic Dry Film Thickness Gage per SSPC - PA2, Procedure for Determining Conformance to Dry Coating Thickness Requirements
- Standards for verifying the accuracy of the dry film thickness gage
- Light meter for measuring light intensity during paint removal, painting, and inspection activities
- All applicable ASTM and SSPC Standards used for the work (reference list attached)

The accuracy of the instruments shall be verified by the Contractor's personnel according to the equipment manufacturer's recommendations and the Contractor's QC Program. All inspection equipment shall be made available to the Engineer for QA observations on an as needed basis.

Hold Point Notification. Specific inspection items throughout this specification are designated as Hold Points. Unless other arrangements are made at the project site, the Contractor shall

provide the Engineer with a minimum 4-hour notification before a Hold Point inspection will be reached. If the 4-hour notification is provided and the Work is ready for inspection at that time, the Engineer will conduct the necessary observations. If the Work is not ready at the appointed time, unless other arrangements are made, an additional 4-hour notification is required. Permission to proceed beyond a Hold Point without a QA inspection will be granted solely at the discretion of the Engineer, and only on a case by case basis.

Quality Assurance (QA) Observations. The Engineer will conduct QA observations of any or all phases of the work. The presence or activity of Engineer observations in no way relieves the Contractor of the responsibility to provide all necessary daily QC inspections of his/her own and to comply with all requirements of this Specification.

The Engineer has the right to reject any work that was performed without adequate provision for QA observations.

Inspection Access and Lighting. The Contractor shall facilitate the Engineer's observations as required, including allowing ample time to view the work. The Contractor shall furnish, erect and move scaffolding or other mechanical equipment to permit close observation of all surfaces to be cleaned and painted. This equipment shall be provided during all phases of the work. Examples of acceptable access structures include:

- Mechanical lifting equipment, such as, scissor trucks, hydraulic booms, etc.
- Platforms suspended from the structure comprised of trusses or other stiff supporting members and including rails and kick boards.
- Simple catenary supports are permitted only if independent life lines for attaching a fall arrest system according to Occupational Safety and Health Administration (OSHA) regulations are provided.

When the surface to be inspected is more than 6 ft. (1.8 m) above the ground or water surface, and fall prevention is not provided (e.g., guardrails are not provided), the Contractor shall provide the Engineer with a safety harness and a lifeline according to OSHA regulations. The lifeline and attachment shall not direct the fall into oncoming traffic. The Contractor shall provide a method of attaching the lifeline to the structure independent of the inspection facility or any support of the platform. When the inspection facility (e.g., platform) is more than 2 1/2 ft. (800 mm) above the ground, the Contractor shall provide an approved means of access onto the platform.

The Contractor shall provide artificial lighting in areas both inside and outside the containment where natural light is inadequate, as determined by the Engineer, to allow proper cleaning, inspection, and painting. Illumination for inspection shall be at least 30 foot candles (325 LUX). Illumination for cleaning and painting, including the working platforms, access and entryways shall be at least 20 foot candles (215 LUX). General work area illumination outside the containment shall be employed at the discretion of the Engineer and shall be at least 5 foot candles. The exterior lighting system shall be designed and operated so as to avoid glare that interferes with traffic, workers, and inspection personnel.

Surface Preparation and Painting Equipment. All cleaning and painting equipment shall include gages capable of accurately measuring fluid and air pressures and shall have valves capable of regulating the flow of air, water or paint as recommended by the equipment manufacturer. The equipment shall be maintained in proper working order.

Diesel or gasoline powered equipment shall be positioned or vented in a manner to prevent deposition of combustion contaminants on any part of the structure.

Hand tools, power tools, pressure washing, water jetting, abrasive blast cleaning equipment, brushes, rollers, and spray equipment shall be of suitable size and capacity to perform the work required by this specification. All power tools shall be equipped with vacuums and High Efficiency Particulate Air (HEPA) filtration. Appropriate filters, traps and dryers shall be provided for the compressed air used for abrasive blast cleaning and conventional spray application. Paint pots shall be equipped with air operated continuous mixing devices unless prohibited by the coating manufacturer.

Test Sections. Prior to surface preparation, the Contractor shall prepare a test section(s) on each structure to be painted in a location(s) which the Engineer considers to be representative of the existing surface condition and steel type for the structure as a whole. More than one test section may be needed to represent the various design configurations of the structure. The purpose of the test section(s) is to demonstrate the use of the tools and degree of cleaning required (cleanliness and profile) for each method of surface preparation that will be used on the project. Each test section shall be approximately 10 sq. ft. (0.93 sq m). The test section(s) shall be prepared using the same equipment, materials and procedures as the production operations. The Contractor shall prepare the test section(s) to the specified level of cleaning according to the appropriate SSPC visual standards, modified as necessary to comply with the requirements of this specification. The written requirements of the specification prevail in the event of a conflict with the SSPC visual standards. Only after the test section(s) have been approved shall the Contractor proceed with surface preparation operations. Additional compensation will not be allowed the Contractor for preparation of the test section(s).

For the production cleaning operations, the specifications and written definitions, the test section(s), and the SSPC visual standards shall be used in that order for determining compliance with the contractual requirements.

Protective Coverings and Damage. All portions of the structure that could be damaged by the surface preparation and painting operations (e.g., utilities), including any sound paint that is allowed to remain according to the contract documents, shall be protected by covering or shielding. Tarpaulins drop cloths, or other approved materials shall be employed. The Contractor shall comply with the provisions of the Illinois Environmental Protection Act. Paint drips, spills, and overspray are not permitted to escape into the air or onto any other surfaces or surrounding property not intended to be painted. Containment shall be used to control paint drips, spills, and overspray, and shall be dropped and all equipment secured when sustained wind speeds of 40 mph (64 kph) or greater occur, unless the containment design necessitates action at lower wind speeds. The contractor shall evaluate project-specific conditions to determine the specific type and extent of containment needed to control the paint emissions and

shall submit a plan for containing or controlling paint debris (droplets, spills, overspray, etc.) to the Engineer for acceptance prior to starting the work. Acceptance by the Engineer shall not relieve the Contractor of their ultimate responsibility for controlling paint debris from escaping the work zone.

When the protective coverings need to be attached to the structure, they shall be attached by bolting, clamping, or similar means. Welding or drilling into the structure is prohibited unless approved by the Engineer in writing. When removing coatings containing lead the containment and disposal of the residues shall be as specified in the Special Provision for Containment and Disposal of Lead Paint Cleaning Residues contained elsewhere in this Contract. When removing coatings not containing lead the containment and disposal of the residues shall be as specified in the Special Provision for Containment and Disposal of Non-Lead Paint Cleaning Residues contained elsewhere in this Contract.

The Contractor shall be responsible for any damage caused to persons, vehicles, or property, except as indemnified by the Response Action Contractor Indemnification Act. Whenever the intended purposes of the controls or protective devices used by the Contractor are not being accomplished, work shall be immediately suspended until corrections are made. Damage to vehicles or property shall be repaired by the Contractor at the Contractor's expense. Painted surfaces damaged by any Contractor's operation shall be repaired, removed and/or repainted, as directed by the Engineer, at the Contractor's expense.

Weather Conditions. Surfaces to be painted after cleaning shall remain free of moisture and other contaminants. The Contractor shall control his/her operations to insure that dust, dirt, or moisture do not come in contact with surfaces cleaned or painted that day.

- a) The surface temperature shall be at least 5°F (3°C) above the dew point during final surface preparation operations. The manufacturers' published literature shall be followed for specific temperature, dew point, and humidity restrictions during the application of each coat.
- b) If the Contractor proposes to control the weather conditions inside containment, proposed methods and equipment for heating and/or dehumidification shall be included in the work plans for the Engineer's consideration. Only indirect fired heating equipment shall be used to prevent the introduction of moisture and carbon monoxide into the containment. The heating unit(s) shall be ventilated to the outside of the containment. Any heating/dehumidification proposals accepted by the Engineer shall be implemented at no additional cost to the department.
- c) Cleaning and painting shall be done between April 15 and October 31 unless authorized otherwise by the Engineer in writing.

The Contractor shall monitor temperature, dew point, and relative humidity every 4 hours during surface preparation and coating application in the specific areas where the work is being performed. The frequency of monitoring shall increase if weather conditions are changing. If

the weather conditions after application and during drying are forecast to be outside the acceptable limits established by the coating manufacturer, coating application shall not proceed. If the weather conditions are forecast to be borderline relative to the limits established by the manufacturer, monitoring shall continue at a minimum of 4-hour intervals throughout the drying period. The Engineer has the right to reject any work that was performed, or drying that took place, under unfavorable weather conditions. Rejected work shall be removed, recleaned, and repainted at the Contractor's expense.

Compressed Air Cleanliness. Prior to using compressed air for abrasive blast cleaning, blowing down the surfaces, and painting with conventional spray, the Contractor shall verify that the compressed air is free of moisture and oil contamination according to the requirements of ASTM D 4285. The tests shall be conducted at least one time each shift for each compressor system in operation. If air contamination is evident, the Contractor shall change filters, clean traps, add moisture separators or filters, or make other adjustments as necessary to achieve clean, dry air. The Contractor shall also examine the work performed since the last acceptable test for evidence of defects or contamination caused by the compressed air. Effectuated work shall be repaired at the Contractor's expense.

Low Pressure Water Cleaning and Solvent Cleaning (HOLD POINT). The Contractor shall notify the Engineer 24 hours in advance of beginning surface preparation operations.

- a) Water Cleaning of Lead Containing Coatings Prior to Overcoating. Prior to initiating any mechanical cleaning such as hand/power tool cleaning on surfaces that are painted with lead, all surfaces to be prepared and painted, and the tops of pier and abutment caps shall be washed. Washing is not required if the surfaces will be prepared by water jetting.

Washing shall involve the use of potable water at a minimum of 1000 psi (7 MPa) and less than 5000 psi (34 MPa) according to "Low Pressure Water Cleaning" of SSPC-SP WJ-4. There are no restrictions on the presence of flash rusting of bare steel after cleaning. Paint spray equipment shall not be used to perform the water cleaning. The cleaning shall be performed in such a manner as to remove dust, dirt, chalk, insect and animal nests, bird droppings, loose coating, loose mill scale, loose rust and other corrosion products, and other foreign matter. Water cleaning shall be supplemented with scrubbing as necessary to remove the surface contaminants. . The water, debris, and any loose paint removed by water cleaning shall be collected for proper disposal. The washing shall be completed no more than 2 weeks prior to surface preparation.

If detergents or other additives are added to the water, the detergents/additives shall be included in the submittals and not used until accepted by the Engineer. When detergents or additives are used, the surface shall be rinsed with potable water before the detergent water dries.

After washing has been accepted by the Engineer, all traces of asphaltic cement, oil, grease, diesel fuel deposits, and other soluble contaminants which remain on the steel surfaces to be painted shall be removed by solvent cleaning according to SSPC – SP1,

supplemented with scraping (e.g., to remove large deposits of asphaltic cement) as required. The solvent(s) used for cleaning shall be compatible with the existing coating system. The Contractor shall identify the proposed solvent(s) in the submittals. If the existing coating is softened, wrinkled, or shows other signs of attack from the solvents, the Contractor shall immediately discontinue their use. The name and composition of replacement solvents, together with MSDS, shall be submitted for Engineer acceptance prior to use.

Under no circumstances shall subsequent hand/power tool cleaning or abrasive blast cleaning be performed in areas containing surface contaminants or in areas where the Engineer has not accepted the washing and solvent cleaning. Surfaces prepared by hand/power tool cleaning or abrasive blast cleaning without approval of the washing and solvent cleaning may be rejected by the Engineer. Rejected surfaces shall be recleaned with both solvent and the specified mechanical means at the Contractor's expense.

After all washing and mechanical cleaning are completed, representative areas of the existing coating shall be tested to verify that the surface is free of chalk and other loose surface debris or foreign matter. The testing shall be performed according to ASTM D4214. Cleaning shall continue until a chalk rating of 6 or better is achieved in every case.

- b) Water Cleaning of Non-Lead Coatings Prior to Overcoating. Thoroughly clean the surfaces according to the steps defined above for "Water Cleaning of Lead Containing Coatings Prior to Overcoating." The wash water does not need to be collected, but paint chips, insect and animal nests, bird droppings and other foreign matter shall be collected for proper disposal. If the shop primer is inorganic zinc, the chalk rating does not apply. All other provisions are applicable.
- c) Water Cleaning/Debris Removal Prior to Total Coating Removal. When total coating removal is specified, water cleaning of the surface prior to coating removal is not required by this specification and is at the option of the Contractor. If the Contractor chooses to use water cleaning, the above provisions for water cleaning of lead and non-lead coatings apply as applicable, including collection and disposal of the waste.

Whether or not the surfaces are pre-cleaned using water, the tops of the pier caps and abutments shall be cleaned free of dirt, paint chips, insect and animal nests, bird droppings and other foreign matter and the debris collected for proper disposal. Cleaning can be accomplished by wet or dry methods.

Prior to mechanical cleaning, oil, grease, and other soluble contaminants on bare steel or rusted surfaces shall be removed by solvent cleaning according to SSPC-SP1.

- d) Water Cleaning Between Coats. When foreign matter has accumulated on a newly applied coat, washing and scrubbing shall be performed prior to the application of subsequent coats. The water does not need to be collected unless it contacts existing lead containing coatings.

Laminar and Stratified Rust. All laminar and stratified rust that has formed on the existing steel surfaces shall be removed. Pack rust formed along the perimeter of mating surfaces of connected plates or shapes of structural steel shall be removed to the extent feasible without mechanically detaching the mating surface. Any pack rust remaining after cleaning the mating surfaces shall be tight and intact when examined using a dull putty knife. The tools used to remove these corrosion products shall be identified in the submittals and accepted by the Engineer. If the surface preparation or removal of rust results in nicks or gouges in the steel, the work shall be suspended, and the damaged areas repaired to the satisfaction of the Engineer, at the Contractor's expense. The Contractor shall also demonstrate that he/she has made the necessary adjustments to prevent a reoccurrence of the damage prior to resuming work. If surface preparation reveals holes or section loss, or creates holes in the steel, the Contractor shall notify the Engineer. Whenever possible, the Department will require that the primer be applied to preserve the area, and allow work to proceed, with repairs and touch up performed at a later date.

Surface Preparation (HOLD POINT). One or more of the following methods of surface preparation shall be used as specified on the plans. When a method of surface preparation is specified, it applies to the entire surface, including areas that may be concealed by the containment connection points. In each case, as part of the surface preparation process, soluble salts shall be remediated as specified under "Soluble Salt Remediation." The Contractor shall also note that the surface of the steel beneath the existing coating system may contain corrosion and/or mill scale. Removal of said corrosion and/or mill scale, when specified, shall be considered included in this work and no extra compensation will be allowed.

When a particular cleaning method is specified for use in distinct zones on the bridge, the cleaning shall extend into the existing surrounding paint until a sound border is achieved. The edge of the existing paint is considered to be sound and intact after cleaning if it cannot be lifted by probing the edge with a dull putty knife. The sound paint shall be feathered for a minimum of 1 1/2 in. (40 mm) to achieve a smooth transition between the prepared steel and the existing coatings. Sanders with vacuum attachments, which have been approved by the Engineer, shall be used as necessary to accomplish the feathering.

- a) Limited Access Areas: A best effort with the specified methods of cleaning shall be performed in limited access areas such as the backsides of rivets inside built up box members. The equipment being used for the majority of the cleaning may need to be supplemented with other commercially available equipment, such as angle nozzles, to properly clean the limited access areas. The acceptability of the best effort cleaning in these areas is at the sole discretion of the Engineer.
- b) Near-White Metal Blast Cleaning: This surface preparation shall be accomplished according to the requirements of Near-White Metal Blast Cleaning SSPC-SP 10. Unless otherwise specified in the contract, the designated surfaces shall be prepared by dry abrasive blast cleaning, wet abrasive blast cleaning, or water jetting with abrasive injection. A Near-White Metal Blast Cleaned surface, when viewed without

magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining.

Random staining shall be limited to no more than 5 percent of each 9 sq. in. (58 sq. cm) of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. With the exception of crevices as defined below, surface discoloration is considered to be a residue that must be removed, rather than a stain, if it possesses enough mass or thickness that it can be removed as a powder or in chips when scraped with a pocketknife.

A surface profile shall be created on the steel as defined later under "Surface Profile."

At the discretion of the Engineer, after a best effort cleaning, slight traces of existing coating may be permitted to remain within crevices such as those created between the steel and rivets or bolts/washers/nuts, and between plates. When traces of coating are permitted to remain, the coating shall be tightly bonded when examined by probing with a dull putty knife. The traces of coating shall be confined to the bottom portion of the crevices only, and shall not extend onto the surrounding steel or plate or onto the outer surface of the rivets or bolts. Pitted steel is excluded from exemption considerations and shall be cleaned according to SSPC-SP10.

If hackles or slivers are visible on the steel surface after cleaning, the Contractor shall remove them by grinding followed by reblast cleaning. At the discretion of the Engineer, the use of power tools to clean the localized areas after grinding, and to establish a surface profile acceptable to the coating manufacturer, can be used in lieu of blast cleaning.

If the surfaces are prepared using wet abrasive methods, attention shall be paid to tightly configured areas to assure that the preparation is thorough. After surface preparation is completed, the surfaces, surrounding steel, and containment materials/scaffolding shall be rinsed to remove abrasive dust and debris. Potable water shall be used for all operations. An inhibitor shall be added to the supply water and/or rinse water to prevent flash rusting. With the submittals, the Contractor shall provide a sample of the proposed inhibitor together with a letter from the coating manufacturer indicating that the inhibitor is suitable for use with their products and that the life of the coating system will not be reduced due to the use of the inhibitor. The surfaces shall be allowed to completely dry before the application of any coating.

- c) Commercial Grade Power Tool Cleaning: This surface preparation shall be accomplished according to the requirements of SSPC-SP15. The designated surfaces shall be completely cleaned with power tools. A Commercial Grade Power Tool Cleaned surface, when viewed without magnification, is free of all visible oil, grease, dirt, rust, coating, oxides, mill scale, corrosion products, and other foreign matter, except for staining. In previously pitted areas, slight residues of rust and paint may also be left in the bottoms of pits.

Random staining shall be limited to no more than 33 percent of each 9 sq. in. (58 sq. cm) of surface area. Allowable staining may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Surface discoloration is considered to be a residue that must be removed, rather than a stain, if it possesses enough mass or thickness that it can be removed as a powder or in chips when scraped with a pocketknife.

A surface profile shall be created on the steel as defined later under "Surface Profile."

At the Contractor's option, Near-White Metal Blast Cleaning may be substituted for Power Tool Cleaning – Commercial Grade, as long as containment systems appropriate for abrasive blast cleaning are utilized and there is no additional cost to the Department.

- d) Power Tool Cleaning – Modified SP3: This surface preparation shall be accomplished according to the requirements of SSPC-SP3, Power Tool Cleaning except as modified as follows. The designated surfaces shall be cleaned with power tools. A power tool cleaned surface shall be free of all loose rust, loose mill scale, loose and peeling paint, and loose rust that is bleeding through and/or penetrating the coating. All locations of visible corrosion and rust bleed, exposed or lifting mill scale, and lifting or loose paint shall be prepared using the power tools, even if the material is tight.

Upon completion of the cleaning, rust, rust bleed, mill scale and surrounding paint are permitted to remain if they can not be lifted using a dull putty knife.

- e) Power Tool Cleaning of Shop Coated Steel. When shop-coated steel requires one or more coats to be applied in the field, the surface of the shop coating shall be cleaned as specified under "Water Cleaning of Non-Lead Coatings Prior to Overcoating." If the damage is to a fully applied shop system, water cleaning is not required unless stipulated in the contract. Damaged areas of shop coating shall be spot cleaned according to Power Tool Cleaning - Modified SSPC-SP3. If the damage extends to the substrate, spot cleaning shall be according to SSPC-SP15. The edges of the coating surrounding all spot repairs shall be feathered.

- f) Galvanized Surfaces: If galvanized surfaces are specified to be painted, they shall be prepared by brush-off blast cleaning in accordance with SSPC-SP 16 or by using proprietary solutions that are specifically designed to clean and etch (superficially roughen) the galvanized steel for painting. If cleaning and etching solutions are selected, the Contractor shall submit the manufacturer's technical product literature and SDS for Engineer's review and written acceptance prior to use.

Abrasives. Unless otherwise specified in the contract, when abrasive blast cleaning is specified, it shall be performed using either expendable abrasives (other than silica sand) or recyclable steel grit abrasives. Expendable abrasives shall be used one time and disposed of. Abrasive suppliers shall certify that the expendable abrasives meet the requirements of SSPC-AB1 and that recyclable steel grit abrasives meet SSPC-AB3. Tests to confirm the cleanliness of new

abrasives (oil and water-soluble contamination) shall be performed by the Contractor according to the requirements and frequencies of SSPC-AB1 and SSPC-AB3, as applicable. On a daily basis, the Contractor shall verify that recycled abrasives are free of oil and water-soluble contamination by conducting the tests specified in SSPC-AB2.

All surfaces prepared with abrasives not meeting the SSPC-AB1, AB2, or AB3 requirements, as applicable, shall be solvent cleaned or low pressure water cleaned as directed by the Engineer, and reblast cleaned at the Contractor's expense.

Surface Profile (HOLD POINT). The abrasives used for blast cleaning shall have a gradation such that the abrasive will produce a uniform surface profile of 1.5 to 4.5 mils (38 to 114 microns). If the profile requirements of the coating manufacturer are more restrictive, advise the Engineer and comply with the more restrictive requirements. For recycled abrasives, an appropriate operating mix shall be maintained in order to control the profile within these limits.

The surface profile for SSPC-SP15 power tool cleaned surfaces shall be within the range specified by the coating manufacturer, but not less than 2.0 mils (50 microns).

The surface profile produced by abrasive blast cleaning shall be determined by replica tape or digital profile depth micrometer according to SSPC-PA 17 at the beginning of the work, and each day that surface preparation is performed. Areas having unacceptable profile measurements shall be further tested to determine the limits of the deficient area. When replica tape is used, it shall be attached to the daily report. In the event of a conflict between measurements taken with the replica tape and digital profile depth micrometer, the measurements with the replica tape shall prevail.

The surface profile produced by power tools to SSPC-SP15, shall be measured using the digital profile depth micrometer only. Replica tape shall not be used.

When unacceptable profiles are produced, work shall be suspended. The Contractor shall submit a plan for the necessary adjustments to insure that the correct surface profile is achieved on all surfaces. The Contractor shall not resume work until the new profile is verified by the QA observations, and the Engineer confirms, in writing, that the profile is acceptable.

Soluble Salt Remediation (HOLD POINT). The Contractor shall implement surface preparation procedures and processes that will remove chloride from the surfaces. Surfaces that may be contaminated with chloride include, but are not limited to, expansion joints and all areas that are subject to roadway splash or run off such as fascia beams and stringers.

Methods of chloride removal may include, but are not limited to, steam cleaning or pressure washing with or without the addition of a chemical soluble salt remover as approved by the coating manufacturer, and scrubbing before or after initial paint removal. The Contractor may also elect to clean the steel and allow it to rust overnight followed by recleaning, or by utilizing blends of fine and coarse abrasives during blast cleaning, wet abrasive/water jetting methods of preparation, or combinations of the above. If steam or water cleaning methods of chloride removal are utilized over surfaces where the coating has been completely removed, and

water does not contact any lead containing coatings, the water does not have to be collected. The Contractor shall provide the proposed procedures for chloride remediation in the Surface Preparation/Painting Plan.

Upon completion of the chloride remediation steps, the Contractor shall use cell methods of field chloride extraction and test procedures (e.g., silver dichromate) accepted by the Engineer, to test representative surfaces that were previously rusted (e.g., pitted steel) for the presence of remaining chlorides. Remaining chloride levels shall be no greater than $7\mu\text{g}/\text{sq cm}$ as read directly from the surface without any multiplier applied to the results. The testing must be performed, and the results must be acceptable, prior to painting each day.

A minimum of 5 tests per 1000 sq. ft. (93 sq m) or fraction thereof completed in a given day, shall be conducted at project start up. If results greater than $7\mu\text{g}/\text{sq cm}$ are detected, the surfaces shall be recleaned and retested at the same frequency. If acceptable results are achieved on three consecutive days in which testing is conducted, the test frequency may be reduced to 1 test per 1000 sq. ft. (93 sq. m) prepared each day provided the chloride remediation process remains unchanged. If unacceptable results are encountered, or the methods of chloride remediation are changed, the Contractor shall resume testing at a frequency of 5 tests per 1000 sq. ft. (93 sq. m).

Following successful chloride testing the chloride test areas shall be cleaned. SSPC-SP15, Commercial Grade Power Tool Cleaning can be used to clean the test locations when the specified degree of cleaning is SSPC-SP10.

Surface Condition Prior to Painting (HOLD POINT). Prepared surfaces, shall meet the requirements of the respective degrees of cleaning immediately prior to painting, and shall be painted before rusting appears on the surface. If rust appears or bare steel remains unpainted for more than 12 hours, the affected area shall be prepared again at the expense of the Contractor.

All loose paint and surface preparation cleaning residue on bridge steel surfaces, scaffolding and platforms, containment materials, and tops of abutments and pier caps shall be removed prior to painting. When lead paint is being disturbed, cleaning shall be accomplished by HEPA vacuuming unless it is conducted within a containment that is designed with a ventilation system capable of collecting the airborne dust and debris created by sweeping and blowing with compressed air.

The quality of surface preparation and cleaning of surface dust and debris must be accepted by the Engineer prior to painting. The Engineer has the right to reject any work that was performed without adequate provision for QA observations to accept the degree of cleaning. Rejected coating work shall be removed and replaced at the Contractor's expense.

General Paint Requirements. Paint storage, mixing, and application shall be accomplished according to these specifications and as specified in the paint manufacturer's written instructions and product data sheets for the paint system used. In the event of a conflict between these specifications and the coating manufacturers' instructions and data sheets, the

Contractor shall advise the Engineer and comply with the Engineer's written resolution. Until a resolution is provided, the most restrictive conditions shall apply.

Unless noted otherwise, if a new concrete deck or repair to an existing deck is required, painting shall be done after the deck is placed and the forms have been removed.

- a) **Paint Storage and Mixing.** All Paint shall be stored according to the manufacturer's published instructions, including handling, temperatures, and warming as required prior to mixing. All coatings shall be supplied in sealed containers bearing the manufacturer's name, product designation, batch number and mixing/thinning instructions. Leaking containers shall not be used.

The Contractor shall only use batches of material that have an IDOT MISTIC approval number. For multi-component materials, the batch number from one component is tested with specific batch numbers from the other component(s). Only the same batch number combinations that were tested and approved shall be mixed together for use.

Mixing shall be according to the manufacturer's instructions. Thinning shall be performed using thinner provided by the manufacturer, and only to the extent allowed by the manufacturer's written instructions. In no case shall thinning be permitted that would cause the coating to exceed the local Volatile Organic Compound (VOC) emission restrictions. For multiple component paints, only complete kits shall be mixed and used. Partial mixing is not allowed.

The ingredients in the containers of paint shall be thoroughly mixed by mechanical power mixers according to the manufacturer's instructions, in the original containers before use or mixing with other containers of paint. The paint shall be mixed in a manner that will break up all lumps, completely disperse pigment and result in a uniform composition. Paint shall be carefully examined after mixing for uniformity and to verify that no unmixed pigment remains on the bottom of the container. Excessive skinning or partial hardening due to improper or prolonged storage will be cause for rejection of the paint, even though it may have been previously inspected and accepted.

Multiple component coatings shall be discarded after the expiration of the pot life. Single component paint shall not remain in spray pots, paint buckets, etc. overnight. It shall be stored in a covered container and remixed before use.

The Engineer reserves the right to sample field paint (individual components and/or the mixed material) and have it analyzed. If the paint does not meet the product requirements due to excessive thinning or because of other field problems, the coating shall be removed from that section of the structure and replaced as directed by the Engineer.

- b) **Application Methods.** Unless prohibited by the coating manufacturer's written instructions, paint may be applied by spray methods, rollers, or brushes. If applied with

conventional or airless spray methods, paint shall be applied in a uniform layer with overlapping at the edges of the spray pattern.

The painters shall monitor the wet film thickness of each coat during application. The wet film thickness shall be calculated based on the solids by volume of the material and the amount of thinner added. When the new coating is applied over an existing system, routine QC inspections of the wet film thickness shall be performed in addition to the painter's checks in order to establish that a proper film build is being applied.

When brushes or rollers are used to apply the coating, additional applications may be required to achieve the specified thickness per layer.

- c) Field Touch Up of Shop-Coated Steel. After cleaning, rusted and damaged areas of shop-primed inorganic zinc shall be touched up using epoxy mastic. Damaged areas of shop-applied intermediate shall be touched-up using the same intermediate specified for painting the existing structure. Following touch up, the remaining coats (intermediate and finish, or finish only, depending on the number of coats applied in the shop) shall be the same materials specified for painting the existing structure. When inorganic zinc has been used as the shop primer, a mist coat of the intermediate coat shall be applied before the application of the full intermediate coat in order to prevent pinholing and bubbling.
- d) Recoating and Film Continuity (HOLD POINT for each coat). Paint shall be considered dry for recoating according to the time/temperature/humidity criteria provided in the manufacturer's instructions and when an additional coat can be applied without the development of film irregularities; such as lifting, wrinkling, or loss of adhesion of the under coat. The coating shall be considered to be too cured for recoating based on the maximum recoat times stipulated by the coating manufacturer. If the maximum recoat times are exceeded, written instructions from the manufacturer for preparing the surface to receive the next coat shall be provided to the Engineer. Surface preparation and application shall not proceed until the recommendations are accepted by the Engineer in writing. If surfaces are contaminated, washing shall be accomplished prior to intermediate and final coats. Wash water does not have to be collected unless the water contacts existing lead containing coatings.

Painting shall be done in a neat and workmanlike manner. Each coat of paint shall be applied as a continuous film of uniform thickness free of defects including, but not limited to, runs, sags, overspray, dryspray, pinholes, voids, skips, misses, and shadow-through. Defects such as runs and sags shall be brushed out immediately during application. Dry spray on the surface of previous coats shall be removed prior to the application of the next coat.

Paint Systems. The paint system(s) from the list below shall be applied as specified.

The paint manufacturer's relative humidity, dew point, and material, surface, and ambient temperature restrictions shall be provided with the submittals and shall be strictly followed.

Written recommendations from the paint manufacturer for the length of time each coat must be protected from cold or inclement weather (e.g., exposure to rain), during the drying period shall be included in the submittals. Upon acceptance by the Engineer, these times shall be used to govern the duration that protection must be maintained during drying.

Where stripe coats are indicated, the Contractor shall apply an additional coat to edges, rivets, bolts, crevices, welds, and similar surface irregularities. The stripe coat shall be applied by brush or spray, but if applied by spray, it shall be followed immediately by brushing to thoroughly work the coating into or on the irregular surfaces, and shall extend onto the surrounding steel a minimum of 1 in. (25 mm) in all directions. The purpose of the stripe coat is to assure complete coverage of crevices and to build additional thickness on edges and surface irregularities. If the use of the brush on edges pulls the coating away, brushing of edges can be eliminated, provided the additional coverage is achieved by spray. Measurement of stripe coat thickness is not required, but the Contractor shall visually confirm that the stripe coats are providing the required coverage.

The stripe coat may be applied as part of the application of the full coat unless prohibited by the coating manufacturer. If applied as part of the application process of the full coat, the stripe coat shall be allowed to dry for a minimum of 10 minutes in order to allow Contractor QC personnel to verify that the coat was applied. If a wet-on-wet stripe coat is prohibited by the coating manufacturer or brush or roller application of the full coat pulls the underlying stripe coat, the stripe coat shall dry according to the manufacturers' recommended drying times prior to the application of the full coat. In the case of the prime coat, the full coat can also be applied first to protect the steel, followed by the stripe coat after the full coat has dried.

The thicknesses of each coat as specified below shall be measured according to SSPC-PA2, using Coating Thickness Restriction Level 3 (spot measurements 80% of the minimum and 120% of the maximum, provided the entire area complies with the specified ranges).

- a) System 1 – OZ/E/U – for Bare Steel: System 1 shall consist of the application of a full coat of organic (epoxy) zinc-rich primer, a full intermediate coat of epoxy, and a full finish coat of aliphatic urethane. Stripe coats of the prime and finish coats shall be applied. The film thicknesses of the full coats shall be as follows:
- One full coat of organic zinc-rich primer between 3.5 and 5.0 mils (90 and 125 microns) dry film thickness. The prime coat shall be tinted to a color that contrasts with the steel surface.
 - One full intermediate coat of epoxy between 3.0 and 6.0 mils (75 and 150 microns) dry film thickness. The intermediate coat shall be a contrasting color to both the first coat and finish coat.
 - One full finish coat of aliphatic urethane between 2.5 and 4.0 mils (65 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 9.0 and 15.0 mils (225 and 375 microns).

- b) System 2 – PS/EM/U – for Overcoating an Existing System: System 2 shall consist of the application of a full coat of epoxy penetrating sealer, a spot intermediate coat of aluminum epoxy mastic and a stripe and full finish coat of aliphatic urethane.

A full coat of epoxy penetrating sealer shall be applied to all surfaces following surface preparation. A spot intermediate coat shall consist of the application of one coat of the aluminum epoxy mastic on all areas where rust is evident and areas where the old paint has been removed, feathered and/or damaged prior to, during or after the cleaning and surface preparation operations. After the spot intermediate, a stripe coat and full finish coat of aliphatic urethane shall be applied. The film thicknesses shall be as follows:

- One full coat of epoxy penetrating sealer between 1.0 and 2.0 mils (25 and 50 microns) dry film thickness.
- One spot coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The color shall contrast with the finish coat.
- One full finish coat of aliphatic urethane between 2.5 and 4.0 mils (65 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of the stripe coat, shall be between 8.5 and 13.0 mils (215 and 325 microns). The existing coating thickness to remain under the overcoat must be verified in order to obtain accurate total dry film thickness measurements.

- c) System 3 – EM/EM/AC – for Bare Steel: System 3 shall consist of the application of two full coats of aluminum epoxy mastic and a full finish coat of waterborne acrylic. Stripe coats for first coat of epoxy mastic and the finish coat shall be applied. The film thicknesses of the full coats shall be as follows:

- One full coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The first coat of aluminum epoxy mastic shall be tinted a contrasting color with the blast cleaned surface and the second coat.
- One full intermediate coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The intermediate coat shall be a contrasting color to the first coat and the finish coat.
- A full finish coat of waterborne acrylic between 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 12.0 and 18.0 mils (360 and 450 microns).

- d) System 4 – PS/EM/AC – for Overcoating an Existing System: System 4 shall consist of the application of a full coat of epoxy penetrating sealer, a spot intermediate coat of aluminum epoxy mastic and a stripe and full finish coat of waterborne acrylic.

A full coat of epoxy penetrating sealer shall be applied to all surfaces following surface preparation. A spot intermediate coat shall consist of the application of one coat of the aluminum epoxy mastic on all areas where rust is evident and areas where the old paint has been removed, feathered and/or damaged prior to, during or after the cleaning and surface preparation operations. After the spot intermediate, a stripe coat and full finish coat of waterborne acrylic shall be applied. The film thicknesses shall be as follows:

- One full coat of epoxy penetrating sealer between 1.0 and 2.0 mils (25 and 50 microns) dry film thickness.
- One spot coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The color shall contrast with the finish coat.
- One full finish coat of waterborne acrylic between 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of the stripe coat, shall be between 8.0 and 13.0 mils (200 and 325 microns). The existing coating thickness to remain under the overcoat must be verified in order to obtain accurate total dry film thickness measurements.

- e) System 5 – MCU – for Bare Steel: System 5 shall consist of the application of a full coat of moisture cure urethane (MCU) zinc primer, a full coat of MCU intermediate, and a full coat of MCU finish. Stripe coats of the prime and finish coats shall be applied. The Contractor shall comply with the manufacturer's requirements for drying times between the application of the stripe coats and the full coats. The film thicknesses of the full coats shall be as follows:

- One full coat of MCU zinc primer between 3.0 and 5.0 mils (75 and 125 microns) dry film thickness. The prime coat shall be tinted to a color that contrasts with the steel surface.
- One full MCU intermediate coat between 3.0 and 4.0 mils (75 and 100 microns) dry film thickness. The intermediate coat shall be a contrasting color to both the first coat and finish coat.
- One full MCU finish coat between 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 8.0 and 13.0 mils (200 and 325 microns).

- f) System 6 – MCU – for Overcoating an Existing System: System 6 shall consist of the application of a full coat of moisture cure urethane (MCU) penetrating sealer, a spot coat of MCU intermediate, and a stripe and full coat of MCU finish.

A full coat of MCU penetrating sealer shall be applied to all surfaces following surface preparation. A spot intermediate coat shall consist of the application of one coat of MCU intermediate on all areas where rust is evident and areas where the old paint has been removed, feathered and/or damaged prior to, during or after the cleaning and surface preparation operations. After the spot intermediate, a stripe coat and full coat of MCU finish shall be applied. The Contractor shall comply with the manufacturer's requirements for drying time between the application of the stripe coat and the full finish coat. The film thicknesses shall be as follows:

- One full coat of MCU sealer between 1.0 and 2.0 mils (25 and 50 microns) dry film thickness.
- One full MCU intermediate coat between 3.0 and 4.0 mils (75 and 100 microns) dry film thickness. The color shall contrast with the finish coat.
- One full MCU finish coat 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 6.0 and 10.0 mils (150 and 250 microns). The existing coating thickness to remain under the overcoat must be verified in order to obtain accurate total dry film thickness measurements.

Application of Paint System over Galvanizing: If galvanized surfaces are present and specified to be painted, the Contractor shall apply one of the following as designated on the plans:

- A 2-coat system consisting of a full aluminum epoxy mastic coat and a full waterborne acrylic finish coat from System 3. If red rust is visible, rusted areas shall be spot primed with aluminum epoxy mastic prior to the application of the full coat of aluminum epoxy mastic.
- A 2-coat system consisting of a full epoxy coat and a full urethane coat from System 1. If red rust is visible, rusted areas shall be spot primed with organic zinc prior to the application of the full coat of epoxy.

Surface Preparation and Painting of Galvanized Fasteners: The Contractor shall prepare all fasteners (i.e., galvanized nuts, bolts, etc.) by power tool cleaning in accordance with SSPC-SP 2 or SSPC-SP3 to remove loose material. Following hand/power tool cleaning and prior to painting, the surfaces shall be solvent cleaned according to SSPC-SP 1. Slight stains of torquing compound dye may remain after cleaning provided the dye is not transferred to

cloth after vigorous rubbing is acceptable. If any dye is transferred to a cloth after vigorous rubbing, additional cleaning is required.

The fasteners shall be coated with one coat of an aluminum epoxy mastic meeting the requirements of Article 1008.03 and the same acrylic or urethane topcoat specified above for use on galvanized members.

Repair of Damage to New Coating System and Areas Concealed by Containment. The Contractor shall repair all damage to the newly installed coating system and areas concealed by the containment/protective covering attachment points, at no cost to the Department. The process for completing the repairs shall be included in the submittals. If the damage extends to the substrate and the original preparation involved abrasive blast cleaning, the damaged areas shall be prepared to SSPC-SP15 Power Tool Cleaning - Commercial Grade. If the original preparation was other than blast cleaning or the damage does not extend to the substrate, the loose, fractured paint shall be cleaned to Power Tool Cleaning – Modified SP3.

The surrounding coating at each repair location shall be feathered for a minimum distance of 1 1/2 in. (40 mm) to achieve a smooth transition between the prepared areas and the existing coating.

If the bare steel is exposed, all coats shall be applied to the prepared area. For damaged galvanizing, the first coat shall be aluminum epoxy mastic. If only the intermediate and finish coats are damaged, the intermediate and finish shall be applied. If only the finish coat is damaged, the finish shall be applied.

Special Instructions.

- a) At the completion of the work, the Contractor shall stencil the painting date and the paint code on the bridge. The letters shall be capitals, not less than 2 in. (50 mm) and not more than 3 in. (75 mm) in height.

The stencil shall contain the following wording "PAINTED BY (insert the name of the Contractor)" and shall show the month and year in which the painting was completed, followed by the appropriate code for the coating material applied, all stenciled on successive lines:

CODE U (for field applied System 3 or System 4).

CODE Z (for field applied System 1 or System 2).

CODE AA (for field applied System 5 or System 6).

This information shall be stenciled on the cover plate of a truss end post near the top of the railing, or on the outside face of an outside stringer near one end of the bridge, or at some equally visible surface near the end of the bridge, as designated by the Engineer.

- b) All surfaces painted inadvertently shall be cleaned immediately.

It is understood and agreed that the cost of all work outlined above, unless otherwise specified, has been included in the bid, and no extra compensation will be allowed.

Basis of Payment. This work shall be paid for at the contract Lump Sum price for CLEANING AND PAINTING STEEL BRIDGE, at the designated location, or for CLEANING AND PAINTING the structure or portions thereof described. Payment will not be authorized until all requirements for surface preparation and painting have been fulfilled as described in this specification, including the preparation and submittal of all QC documentation. Payment will also not be authorized for non-conforming work until the discrepancy is resolved in writing.

Appendix 1 – Reference List

The Contractor shall maintain the following regulations and references on site for the duration of the project:

- Illinois Environmental Protection Act
- ASTM D 4214, Standard Test Method for Evaluating Degree of Chalking of Exterior Paint Films
- ASTM D 4285, Standard Test Method for Indicating Oil or Water in Compressed Air
- ASTM D4417, Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
- SSPC-AB 1, Mineral and Slag Abrasives
- SSPC-AB 2, Cleanliness of Recycled Ferrous Metallic Abrasives
- SSPC-AB 3, Ferrous Metallic Abrasive
- SSPC-PA 2, Procedure for Determining Conformance to Dry Coating Thickness Requirements
- SSPC-PA 17, Procedure for Determining Conformance to Steel Profile/Surface Roughness/Peak Count Requirements
- SSPC-QP 1, Standard Procedure for Evaluating Painting Contractors (Field Application to Complex Structures)
- SSPC-QP 2, Standard Procedure for Evaluating the Qualifications of Painting Contractors to Remove Hazardous Paint
- SSPC-SP 1, Solvent Cleaning
- SSPC-SP 2, Hand Tool Cleaning
- SSPC-SP 3, Power Tool Cleaning
- SSPC-SP 10/NACE No. 2, Near White Metal Blast Cleaning
- SSPC-SP WJ-4, Waterjet Cleaning of Metals – Light Cleaning
- SSPC-SP 15, Commercial Grade Power Tool Cleaning
- SSPC-SP 16, Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals
- SSPC-VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning
- SSPC-VIS 3, Visual Standard for Power- and Hand-Tool Cleaned Steel

- SSPC-VIS 4, Guide and Reference Photographs for Steel Cleaned by Water Jetting
- SSPC-VIS 5, Guide and Reference Photographs for Steel Prepared by Wet Abrasive Blast Cleaning
- The paint manufacturer's application instructions, MSDS and product data sheets

CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES

Effective: October 2, 2001

Revised: April 22, 2016

Description. This work shall consist of the containment, collection, temporary storage, transportation and disposal of waste from lead paint removal projects. Waste requiring containment and control includes, but is not limited to, old paint, spent abrasives, corrosion products, mill scale, dirt, dust, grease, oil, salts, and water used for cleaning the surface of existing lead coatings prior to overcoating.

General. The existing coatings contain lead and may also contain other toxic metals. This specification provides the requirements for containment and for the protection of the public, and the environment from exposure to harmful levels of toxic metals that may be present in the paint being removed or repaired. The Contractor shall take reasonable and appropriate precautions to protect the public from the inhalation or ingestion of dust or debris from the operations, and is responsible for the clean-up of all spills of waste at no additional cost to the Department.

The Contractor shall comply with the requirements of this Specification and all applicable Federal, State, and Local laws, codes, and regulations, including, but not limited to the regulations of the United States Environmental Protection Agency (USEPA), Occupational Safety and Health Administration (OSHA), and Illinois Environmental Protection Agency (IEPA). The Contractor shall comply with all applicable regulations even if the regulation is not specifically referenced herein. If a Federal, State, or Local regulation is more restrictive than the requirements of this Specification, the more restrictive requirements shall prevail.

Submittals. The Contractor shall submit for Engineer review and acceptance, the following drawings and plans for accomplishing the work. The submittals shall be provided within 30 days of execution of the contract unless given written permission by the Engineer to submit them at a later date. Work cannot proceed until the submittals are accepted by the Engineer. Details for each of the plans are presented within the body of this specification. The Contractor shall also maintain on site, copies of the standards and regulations referenced herein (list provided in appendix 1).

- a) Containment Plans. The containment plans shall include drawings, equipment specifications, and calculations (wind load, air flow and ventilation when negative pressure is specified). The plans shall include copies of the manufacturer's specifications for the containment materials and equipment that will be used to accomplish containment and ventilation.

When required by the contract plans, the submittal shall provide calculations that assure the structural integrity of the bridge when it supports the containment and the calculations and drawings shall be signed and sealed by a Structural Engineer licensed in the state of Illinois.

When working over the railroad or navigable waterways, the Department will notify the respective agencies that work is being planned. Unless otherwise noted in the plans, the Contractor is responsible for follow up contact with the agencies, and shall provide evidence

that the railroad, Coast Guard, Corps of Engineers, and other applicable agencies are satisfied with the clearance provided and other safety measures that are proposed.

- b) Environmental Monitoring Plan. The Environmental Monitoring Plan shall address the visual inspections and clean up of the soil and water that the Contractor will perform, including final project inspection and cleanup. The plan shall address the daily visible emissions observations that will be performed and the corrective action that will be implemented in the event emissions or releases occur. When high volume ambient air monitoring is required, an Ambient Air Monitoring Plan shall be developed. The plan shall include:
- Proposed monitor locations and power sources in writing. A site sketch shall be included, indicating sensitive receptors, monitor locations, and distances and directions from work area.
 - Equipment specification sheet for monitors to be used, and a written commitment to calibrate and maintain the monitors.
 - Include a procedure for operation of monitors per 40 CFR 50, Appendix B, including use of field data chain-of-custody form. Include a sample chain of custody form.
 - Describe qualifications/training of monitor operator.
 - The name, contact information (person's name and number), and certification of the laboratory performing the filter analysis. Laboratory shall be accredited by one of the following: 1) the American Industrial Hygiene Association (AIHA) for lead (metals) analysis, 2) Environmental Lead Laboratory Accreditation Program (ELLAP) for metals analysis, 3) State or federal accreditation program for ambient air analysis or, 4) the EPA National Lead Laboratory Accreditation Program (NLLAP) for lead analysis. The laboratory shall provide evidence of certification, a sample laboratory chain-of-custody form, and sample laboratory report that provides the information required by this specification. The laboratory shall also provide a letter committing to do the analysis per 40 CFR 50, Appendix G. If the analysis will not be performed per 40 CFR Appendix G, a proposed alternate method shall be described, together with the rationale for using it. The alternate method can not be used unless specifically accepted by the Engineer in writing.
- c) Waste Management Plan. The Waste Management Plan shall address all aspects of handling, storage, testing, hauling and disposal of all project waste, including waste water. Include the names, addresses, and a contact person for the proposed licensed waste haulers and disposal facilities. Submit the name and qualifications of the laboratory proposed for Toxicity Characteristic Leaching Procedure (TCLP) analysis. If the use of abrasive additives is proposed, provide the name of the additive, the premixed ratio of additive to abrasive being provided by the supplier, and a letter from the supplier of the additive indicating IEPA acceptance of the material. Note that the use of any steel or iron based material, such as but not limited to grit, shot, fines, or filings as an abrasive additive is prohibited. The plan shall address weekly inspections of waste storage, maintaining an inspection log, and preparing a monthly waste accumulation inventory table.
- d) Contingency Plan. The Contractor shall prepare a contingency plan for emergencies including fire, accident, failure of power, failure of dust collection system, failure of supplied air system or any other event that may require modification of standard operating

procedures during lead removal. The plan shall include specific procedures to ensure safe egress and proper medical attention in the event of an emergency.

When the Engineer accepts the submittals, the Contractor will receive written notification. The Contractor shall not begin any work until the Engineer has accepted the submittals. The Contractor shall not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety concerns. Acceptance of the plans does not relieve the Contractor from the responsibility to conduct the work according to the requirements of Federal, State, or Local regulations, this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Quality Control (QC) Inspections. The Contractor shall perform first line, in process QC inspections of all environmental control and waste handling aspects of the project to verify compliance with these specification requirements and the accepted drawings and plans. The Contractor shall use the IDOT Environmental Daily Report form to record the results of the inspections. Alternative forms (paper or electronic) will be allowed provided they furnish equivalent documentation as the IDOT form, and they are accepted as part of the QC Program submittal. The completed reports shall be turned into the Engineer before work resumes the following day. Contractor QC inspections shall include, but not be limited to the following:

- Proper installation and continued performance of the containment system(s) in accordance with the approved drawings.
- Visual inspections of emissions into the air and verification that the cause(s) for any unacceptable emissions is corrected.
- Set up, calibration, operation, and maintenance of the regulated area and high volume ambient air monitoring equipment, including proper shipment of cassettes/filters to the laboratory for analysis. Included is verification that the Engineer receives the results within the time frames specified and that appropriate steps are taken to correct work practices or containment in the event of unacceptable results.
- Visual inspections of spills or deposits of contaminated materials into the water or onto the ground, pavement, soil, or slope protection. Included is verification that proper cleanup is undertaken and that the cause(s) of unacceptable releases is corrected.
- Proper implementation of the waste management plan including laboratory analysis and providing the results to the Engineer within the time frames specified herein.
- Proper implementation of the contingency plans for emergencies.

The personnel providing the QC inspections shall possess current SSPC-C3 certification or equal, including the annual training necessary to maintain that certification (SSPC-C5 or equal), and shall provide evidence of successful completion of 2 bridge lead paint removal projects of similar or greater complexity and scope that have been completed in the last 2 years. References shall include the name, address, and telephone number of a contact person employed by the bridge owner. Proof of initial certification and the current annual training shall also be provided.

Quality Assurance (QA) Observations. The Engineer will conduct QA observations of any or all of the QC monitoring inspections that are undertaken. The presence or activity of Engineer observations in no way relieves the Contractor of the responsibility to provide all necessary daily QC inspections of its own and to comply with all requirements of this Specification.

Containment Requirements. The Contractor shall install and maintain containment systems surrounding the work for the purpose of controlling emissions of dust and debris according to the requirements of this specification. Working platforms and containment materials that are used shall be firm and stable and platforms shall be designed to support the workers, inspectors, spent surface preparation media (e.g., abrasives), and equipment during all phases of surface preparation and painting. Platforms, cables, and other supporting structures shall be designed according to OSHA regulations. If the containment needs to be attached to the structure, the containment shall be attached by bolting, clamping, or similar means. Welding or drilling into the structure is prohibited unless approved by the Engineer in writing.

The containment shall be dropped in the event of sustained winds of 40 mph (64 kph) or greater and all materials and equipment secured.

The Contractor shall provide drawings showing the containment system and indicating the method(s) of supporting the working platforms and containment materials to each other and to the bridge. When the use of negative pressure and airflow inside containment is specified, the Contractor shall provide all ventilation calculations and details on the equipment that will be used for achieving the specified airflow and dust collection.

When directed in the contract plans, the Contractor shall submit calculations and drawings, signed and sealed by a Structural Engineer licensed in the state of Illinois, that assure the structural integrity of the bridge under the live and dead loads imposed, including the design wind loading.

When working over railroads, the Contractor shall provide evidence that the proposed clearance and the safety provisions that will be in place (e.g., flagman) are acceptable to the railroad. In the case of work over navigable waters, the Contractor shall provide evidence that the proposed clearance and provisions for installing or moving the containment out of navigation lanes is acceptable to authorities such as the Coast Guard and Army Corps of Engineers. The Contractor shall include plans for assuring that navigation lighting is not obscured, or if it is obscured, that temporary lighting is acceptable to the appropriate authorities (e.g., Coast Guard) and will be utilized.

Engineer review and acceptance of the drawings and calculations shall not relieve the Contractor from the responsibility for the safety of the working platforms and containment, and for providing ample ventilation to control worker and environmental exposures. After the work platforms and containment materials are erected additional measures may be needed to ensure worker safety according to OSHA regulations. The Contractor shall institute such measures at no additional cost to the Department.

Containment for the cleaning operation of this contract is defined as follows:

- The containment system shall maintain the work area free of visible emissions of dust and debris according to all provisions of this Specification, with no debris permitted outside of the regulated area at any time. All debris within the regulated area and within the containment shall be collected at the end of the last shift each day, and properly stored in sealed containers. Cleaning shall be accomplished by HEPA vacuuming unless it is conducted within a containment that is designed with a ventilation system capable of collecting the airborne dust and debris created by sweeping and blowing with compressed air. The ventilation system shall be in operation during the cleaning.
- The containment systems shall comply with the specified SSPC Guide 6 classifications as presented in Table 1 for the method of paint removal utilized.
- TSP-lead in the air at monitoring locations selected by the Contractor shall comply with the requirements specified herein.

The Contractor shall take appropriate action to avoid personnel injury or damage to the structure from the installation and use of the containment system. If the Engineer determines that there is the potential for structural damage caused by the installed containment system, the Contractor shall take appropriate action to correct the situation.

In addition to complying with the specific containment requirements in Table 1 for each method of removal, the Contractor shall provide and maintain coverage over the ground in the areas to be cleaned. This coverage shall be capable of catching and containing surface preparation media, paint chips, and paint dust in the event of an accidental escape from the primary containment. The containment materials shall be cleaned of loose material prior to relocation or dismantling. Acceptable methods of cleaning include blowing down the surfaces with compressed air while the ventilation system is in operation, HEPA vacuuming, and/or wet wiping. If paint chips or dust is observed escaping from the containment materials during moving, all associated operations shall be halted and the materials and components recleaned.

The containment systems shall also meet the following requirements:

a) Dry Abrasive Blast Cleaning - Full Containment with Negative Pressure (SSPC Class 1A)

The enclosure shall be designed, installed, and maintained to sustain maximum anticipated wind forces, including negative pressure. Flapping edges of containment materials are prohibited and the integrity of all containment materials, seams, and seals shall be maintained for the duration of the project. Airflow inside containment shall be designed to provide visibility and reduce worker exposures to toxic metals according to OSHA regulations and as specified in Table 1 and its accompanying text. When the location of the work on the bridge, or over lane closures permit, the blast enclosure shall extend a minimum of 3 ft. (1 m) beyond the limits of surface preparation to allow the workers to blast away from, rather than into the seam between the containment and the structure. The blast enclosure shall have an airlock or resealable door entryway to allow entrance and exit from the enclosure without allowing the escape of blasting residue.

If recyclable metallic abrasives are used, the Contractor shall operate the equipment in a manner that minimizes waste generation. Steps shall also be taken to minimize dust generation during the transfer of all abrasive/paint debris (expendable or recyclable abrasives) for recycling or disposal. Acceptable methods include, but are not limited to vacuuming, screw or belt conveyance systems, or manual conveyance. However manual conveyance is only permitted if the work is performed inside a containment that is equipped with an operating ventilation system capable of controlling the dust that is generated.

Appropriate filtration shall be used on the exhaust air of dust collection and abrasive recycling equipment as required to comply with IEPA regulations. The equipment shall be cleaned/maintained, enclosed, or replaced if visible dust and debris are being emitted and/or the regulated area or high volume monitor lead levels are not in compliance.

Areas beneath containment connection points that were shielded from abrasive blast cleaning shall be prepared by vacuum blast cleaning or vacuum-shrouded power tool cleaning after the containment is removed.

b) Vacuum Blast Cleaning within Containment (SSPC-Class 4A)

Vacuum blasting equipment shall be fully automatic and capable of cleaning and recycling the abrasive. The system shall be designed to deliver cleaned, recycled blasting abrasives and provide a closed system containment during blasting. The removed coating, mill scale, and corrosion shall be separated from the abrasive, and stored for disposal.

The Contractor shall attach containment materials around and under the work area to catch and contain abrasive and waste materials in the event of an accidental escape from the vacuum shroud. This containment is in addition to the ground covers specified earlier.

It is possible that the close proximity of some structural steel members, such as the end diaphragms or end cross-frames underneath transverse deck expansion joints, preclude the use of the vacuum blasting equipment for the removal of the old paint. For surfaces that are inaccessible for the nozzles of the vacuum blasting equipment, the Contractor shall remove the paint by means of full containment inside a complete enclosure as directed by the Engineer.

c) Vacuum-Shrouded Power Tool Cleaning within Containment (SSPC-Class 3P)

The Contractor shall utilize power tools equipped with vacuums and High Efficiency Particulate Air (HEPA) filters. The Contractor shall attach containment walls around the work area, and install containment materials beneath the work area to catch and contain waste materials in the event of an accidental escape from the vacuum shroud. This containment is in addition to the ground covers specified earlier and shall be installed within 10 ft. (3m) of the areas being cleaned.

d) Power Tool Cleaning without Vacuum, within Containment (SSPC-Class 2P)

When the use of power tools without vacuum attachments is authorized by the Engineer, the Contractor shall securely install containment walls and flooring around the work area to capture and collect all debris that is generated. The containment material requirements for this Class 2P are similar to Class 3P used for vacuum-shrouded tools, but the supporting structure will be more substantial in Class 2P to better secure the containment materials from excessive movement that could lead to the loss of waste paint chips and debris. Containment beneath the work shall be within 10 ft. (3m) of the areas being cleaned, and is in addition to the ground covers specified earlier.

e) Water Washing, Water Jetting or Wet Abrasive Blast Cleaning within Containment (SSPC Class 2W-3W)

Water washing of the bridge for the purpose of removing chalk, dirt, grease, oil, bird nests, and other surface debris, and water jetting or wet abrasive blast cleaning for the purpose of removing paint and surface debris shall be conducted within a containment designed, installed, and maintained in order to capture and contain all water and waste materials. The containment shall consist of impermeable floors and lower walls to prevent the water and debris from escaping. Permeable upper walls and ceilings are acceptable provided the paint chips, debris, and water, other than mists, are collected. A fine mist passing through the permeable upper walls is acceptable, provided the environmental controls specified below are met. If paint chips, debris, or water, other than mists, escape the containment system, impermeable walls and ceilings shall be installed.

When water is used for surface cleaning, the collected water shall be filtered to separate the particulate from the water. Recycling of the water is preferred in order to reduce the volume of waste that is generated. The water after filtration shall be collected and disposed of according to the waste handling portions of this specification.

When a slurry is created by injecting water into the abrasive blast stream, the slurry need not be filtered to separate water from the particulate.

Environmental Controls and Monitoring. The Contractor shall prepare and submit to the Engineer for review and acceptance, an Environmental Monitoring Plan. The purpose of the plan is to address the observations and equipment monitoring undertaken by the Contractor to confirm that project dust and debris are not escaping the containment into the surrounding air, soil, and water.

a) Soil and Water. Containment systems shall be maintained to prevent the escape of paint chips, abrasives, and other debris into the water, and onto the ground, soil, slope protection, and pavements. Releases or spills of, paint chips, abrasives, dust and debris that have become deposited on surrounding property, structures, equipment or vehicles, and bodies of water are unacceptable. If there are inadvertent spills or releases, the Contractor shall immediately shut down the emissions-producing operations, clean up the debris, and change work practices, modify the containment, or take other appropriate corrective action as needed to prevent similar releases from occurring in the future.

Water booms, boats with skimmers, or other means as necessary shall be used to capture and remove paint chips or project debris that falls or escapes into the water.

At the end of each workday at a minimum, the work area inside and outside of containment, including ground tarpaulins, shall be inspected to verify that paint debris is not present. If debris is observed, it shall be removed by hand and HEPA-vacuuuming. If wet methods of preparation are used, the damp debris can remain overnight provided it is protected from accidental release by securely covering the waste, folding the waste into the ground tarps, or by other acceptable methods. Prior to commencing work the next day, the debris from the folded ground tarps shall be removed.

Upon project completion, the ground and water in and around the project site are considered to have been properly cleaned if paint chips, paint removal media (e.g., spent abrasives), fuel, materials of construction, litter, or other project debris have been removed.

NOTE: All project debris must be removed even if the debris (e.g., spent abrasive and paint chips) was a pre-existing condition.

- b) Visible Emissions. The Contractor shall conduct observations of visible emissions and releases on an ongoing daily basis when dust-producing activities are underway, such as paint removal, clean up, waste handling, and containment dismantling or relocation. Note that visible emissions observations do not apply to the fine mist that may escape through permeable containment materials when wet methods of preparation are used.

Visible emissions in excess of SSPC-TU7, Method A (Timing Method), Level 1 (1% of the workday) are unacceptable. In an 8-hour workday, this equates to emissions of a cumulative duration no greater than 5 minutes.. This criterion applies to scattered, random emissions of short duration. Sustained emissions from a given location (e.g., 1 minute or longer), regardless of the total length of emissions for the workday, are unacceptable and action shall be initiated to halt the emission.

If unacceptable visible emissions or releases are observed, the Contractor shall immediately shut down the emission-producing operations, clean up the debris, and change work practices, modify the containment, or take other appropriate corrective action as needed to prevent similar releases from occurring in the future.

- c) Ambient Air Monitoring. The Contractor shall perform ambient air monitoring according to the following:
- Monitor Siting. The Contractor shall collect and analyze air samples to evaluate levels of TSP-lead if there are sensitive receptors within 5 times the height of the structure or within 1000 ft. (305 m) of the structure, whichever is greater. If sensitive receptors are not located within these limits, monitoring is not required. Sensitive receptors are areas of public presence or access including, but not limited to, homes, schools, parks, playgrounds, shopping areas, livestock areas, and businesses. The motoring public is not considered to be a sensitive receptor for the purpose of ambient air monitoring.

The Contractor shall locate the monitors according to Section 7.3 of SSPC-TU-7, in areas of public exposure and in areas that will capture the maximum pollutant emissions resulting from the work. The Contractor shall identify the recommended monitoring sites in the Ambient Air Monitoring Plan, including a sketch identifying the above. The monitors shall not be sited until the Engineer accepts the proposed locations. When possible, monitors shall be placed at least 30 feet (9 m) away from highway traffic.

- **Equipment Provided by Contractor.** The Contractor shall provide up to 4 monitors per work site and all necessary calibration and support equipment, power to operate them, security (or arrangements to remove and replace the monitors daily), filters, flow chart recorders and overnight envelopes for shipping the filters to the laboratory. The number of monitors required will be indicated in the Plan Notes. Each monitor shall be tagged with the calibration date.
- **Duration of Monitoring.** Monitoring shall be performed for the duration of dust-producing operations (e.g., paint removal, waste handling, containment clean-up and movement, etc.) or a minimum of 8 hours each day (when work is performed).

The monitoring schedule shall be as follows:

1. For dry abrasive blast cleaning monitoring shall be conducted full time during all days of dust-producing operations (e.g., paint removal, waste handling, containment movement, etc.).
2. For wet abrasive blast cleaning, water jetting, or power tool cleaning, monitoring shall be conducted for the first 5 days of dust producing operations. If the results after 5 days are acceptable, monitoring may be discontinued. If the results are unacceptable, corrective action shall be initiated to correct the cause of the emissions, and monitoring shall continue for an additional 5 days. If the results are still unacceptable, the Engineer may direct that the monitoring continue full time.

When monitoring is discontinued, if visible emissions are observed and/or the Contractor's containment system changes during the course of the project, then air monitoring will again be required for a minimum of two consecutive days until compliance is shown.

- **Background Monitoring.** Background samples shall be collected for two days prior to the start of work while no dust producing operations are underway to provide a baseline. The background monitoring shall include one weekday and one weekend day. The background monitoring shall coincide with the anticipated working hours for the paint removal operations, but shall last for a minimum of 8 hours each day.
- **Monitor Operation and Laboratory Analysis.**

The Contractor shall calibrate the monitors according to the manufacturer's written instructions upon mobilization to the site and quarterly. Each monitor shall be tagged with the calibration date, and calibration information shall be provided to the Engineer upon request.

All ambient air monitoring shall be performed by the Contractor according to the accepted Ambient Air Monitoring Plan and according to EPA regulations 40 CFR Part 50 Appendix B, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method), and 40 CFR Part 50 Appendix G, Reference Method for the Determination of Lead in Suspended Particulate Matter Collected from Ambient Air.

Filters shall be placed in monitors and monitors operated each day prior to start of dust-producing operations and the filters removed upon completion each day. The Contractor shall advise the Engineer in advance when the filters will be removed and replaced. The monitor operator shall record the following information, at a minimum, on field data and laboratory chain-of-custody forms (or equivalent):

1. Monitor location and serial number
2. Flow rate, supported by flow charts
3. Start, stop times and duration of monitoring
4. Work activities and location of work during the monitoring period
5. Wind direction/speed

For the first 5 days of monitoring, the Contractor shall submit the filters, field data and laboratory chain-of-custody forms together with the flow chart recorders (i.e. monitor flow rate and the duration of monitoring) on a daily basis in an overnight envelope to the laboratory for analysis. The laboratory must provide the Engineer with written results no later than 72 hours after the completion of each day's monitoring. At the discretion of the Engineer, if the initial 5 days of monitoring on full time monitoring projects is acceptable, the filters may be sent to the laboratory every 3 days rather than every day. Written results must be provided to the Engineer no later than 5 days after the completion of monitoring for the latest of the 3 days.

- Ambient Air Monitoring Results. The laboratory shall provide the report directly to the Engineer with a copy to the contractor. The report shall include:
 1. Monitor identification and location
 2. Work location and activities performed during monitoring period
 3. Monitor flow rate, duration, and volume of air sampled
 4. Laboratory methods used for filter digestion / analysis
 5. Sample results for the actual duration of monitoring
 6. Sample results expressed in terms of a 24 hour time weighted average. Assume zero for period not monitored.
 7. Comparison of the results with the acceptance criteria indicating whether the emissions are compliant.
 8. Field data and chain-of-custody records used to derive results.

Should revised reports or any information regarding the analysis be issued by the laboratory directly to the Contractor at any time, the contractor shall immediately provide

a copy to the Engineer and advise the laboratory that the Engineer is to receive all information directly from the laboratory.

- Acceptance Criteria. TSP-lead results at each monitor location shall be less than 1.5 µg/cu m per calendar quarter converted to a daily allowance using the formulas from SSPC- TU7 as follows, except that the maximum 24-hour daily allowance shall be no greater than 6 µg/cu m.

The formula for determining a 24-hour daily value based on the actual number of paint disturbance days expected to occur during the 90-day quarter is:

$$DA = (90 \div PD) \times 1.5 \text{ } \mu\text{g/cu m, where}$$

DA is the daily allowance, and

PD is the number of preparation days anticipated in the 90-day period

If the DA calculation is > 6.0 µg/cu m, use 6.0 µg/cu m.

Regulated Areas. Physically demarcated regulated area(s) shall be established around exposure producing operations at the OSHA Action Level for the toxic metal(s) present in the coating. The Contractor shall provide all required protective clothing and personal protective equipment for personnel entering into a regulated area. Unprotected street clothing is not permitted within the regulated areas.

Hygiene Facilities/Protective Clothing/Blood Tests. The Contractor shall provide clean lavatory and hand washing facilities according to OSHA regulations and confirm that employees wash hands, forearms, and face before breaks. The facilities shall be located at the perimeter of the regulated area in close proximity to the paint removal operation. Shower facilities shall be provided when workers' exposures exceed the Permissible Exposure Limit. Showers shall be located at each bridge site, or if allowed by OSHA regulations, at a central location to service multiple bridges. The shower and wash facilities shall be cleaned at least daily during use.

All wash and shower water shall be filtered and containerized. The Contractor is responsible for filtration, testing, and disposal of the water.

The Contractor shall make available to all IDOT project personnel a base line and post project blood level screening for lead and zinc protoporphyrin (ZPP) (or the most current OSHA requirement) levels as determined by the whole blood lead method, utilizing the Vena-Puncture technique. This screening shall be made available every 2 months for the first 6 months, and every 6 months thereafter.

The Contractor shall provide IDOT project personnel with all required protective clothing and equipment, including disposal or cleaning. Clothing and equipment includes but is not limited to disposable coveralls with hood, booties, disposable surgical gloves, hearing protection, and safety glasses. The protective clothing and equipment shall be provided and maintained on the

job site for the exclusive, continuous and simultaneous use by the IDOT personnel. This equipment shall be suitable to allow inspection access to any area in which work is being performed.

All handwash and shower facilities shall be fully available for use by IDOT project personnel.

Site Emergencies.

a) Stop Work. The Contractor shall stop work at any time the conditions are not within specifications and take the appropriate corrective action. The stoppage will continue until conditions have been corrected. Standby time and cost required for corrective action is at the Contractor's expense. The occurrence of the following events shall be reported in writing to IDOT and shall require the Contractor to automatically stop lead paint removal and initiate clean up activities.

- Airborne lead levels at any of the high volume ambient air monitoring locations that exceed the limits in this specification, or airborne lead in excess of the OSHA Action Level at the boundary of the regulated area.
- Break in containment barriers.
- Visible emissions in excess of the specification tolerances.
- Loss of negative air pressure when negative air pressure is specified (e.g., for dry abrasive blast cleaning).
- Serious injury within the containment area.
- Fire or safety emergency
- Respiratory system failure
- Power failure

b) Contingency Plans and Arrangements. The Engineer will refer to the contingency plan for site specific instructions in the case of emergencies.

The Contractor shall prepare a contingency plan for emergencies including fire, accident, failure of power, failure of dust collection system, failure of supplied air system or any other event that may require modification of standard operating procedures during lead removal. The plan shall include specific procedures to ensure safe egress and proper medical attention in the event of an emergency. The Contractor shall post the telephone numbers and locations of emergency services including fire, ambulance, doctor, hospital, police, power company and telephone company on clean side of personnel decontamination area.

A two-way radio, or equal, as approved by the Engineer, capable of summoning emergency assistance shall be available at each bridge during the time the Contractor's personnel are at the bridge site under this contract. The following emergency response equipment described in the contingency plan (generic form attached) shall be available during this time as well: an appropriate portable fire extinguisher, a 55 gal (208 L) drum, a 5 gal (19 L) pail, a long handled shovel, absorbent material (one bag).

A copy of the contingency plan shall be maintained at each bridge during cleaning operations and during the time the Contractor's personnel are at the bridge site under this contract. The Contractor shall designate the emergency coordinator(s) required who shall be responsible for the activities described.

An example of a contingency plan is included at the end of this Special Provision.

Collection, Temporary Storage, Transportation and Disposal of Waste. The Contractor and the Department are considered to be co-generators of the waste.

The Contractor is responsible for all aspects of waste collection, testing and identification, handling, storage, transportation, and disposal according to these specifications and all applicable Federal, State, and Local regulations. The Contractor shall provide for Engineer review and acceptance a Waste Management Plan that addresses all aspects of waste handling, storage, and testing, and provides the names, addresses, and a contact person for the proposed licensed waste haulers and disposal facilities. The Department will not perform any functions relating to the waste other than provide EPA identification numbers, provide the Contractor with the emergency response information, the emergency response telephone number required to be provided on the manifest, and to sign the waste manifest. The Engineer will obtain the identification numbers from the state and federal environmental protection agencies for the bridge(s) to be painted and furnish those to the Contractor.

All surface preparation/paint residues shall be collected daily and deposited in all-weather containers supplied by the Contractor as temporary storage. The storage area shall be secure to prevent unauthorized entry or tampering with the containers. Acceptable measures include storage within a fully enclosed (e.g., fenced in) and locked area, within a temporary building, or implementing other reasonable means to reduce the possibility of vandalism or exposure of the waste to the public or the environment (e.g., securing the lids or covers of waste containers and roll-off boxes). Waste shall not be stored outside of the containers. Waste shall be collected and transferred to bulk containers taking extra precautions as necessary to prevent the suspension of residues in air or contamination of surrounding surfaces. Precautions may include the transfer of the material within a tarpaulin enclosure. Transfer into roll-off boxes shall be planned to minimize the need for workers to enter the roll-off box.

No residues shall remain on surfaces overnight, either inside or outside of containment. Waste materials shall not be removed through floor drains or by throwing them over the side of the bridge. Flammable materials shall not be stored around or under any bridge structures.

The all-weather containers shall meet the requirements for the transportation of hazardous materials and as approved by the Department. Acceptable containers include covered roll-off boxes and 55-gallon drums (17H). The Contractor shall insure that no breaks and no deterioration of these containers occurs and shall maintain a written log of weekly inspections of the condition of the containers. A copy of the log shall be furnished to the Engineer upon request. The containers shall be kept closed and sealed from moisture except during the addition of waste. Each container shall be permanently identified with the date that waste was placed into the container, contract number, hazardous waste name and ID number, and other information required by the IEPA.

The Contractor shall have each waste stream sampled for each project and tested by TCLP and according to EPA and disposal company requirements. The Engineer shall be notified in advance when the samples will be collected. The samples shall be collected and shipped for testing within the first week of the project, with the results due back to the Engineer within 10 days. Testing shall be considered included in the pay item for "Containment and Disposal of Lead Paint Cleaning Residues." Copies of the test results shall be provided to the Engineer prior to shipping the waste.

Waste water generated from bridge washing, hygiene purposes, and cleaning of equipment shall be filtered on site to remove particulate and disposed of at a Publicly Owned Treatment Works (POTW) according to State regulations. The Contractor shall provide the Engineer with a letter from the POTW indicating that they will accept the waste water. If the POTW allows the filtered water to be placed into the sanitary sewer system, the Contractor shall provide a letter from the POTW indicating that based on the test results of the water, disposal in the sanitary sewer is acceptable to them. Water shall not be disposed of until the above letter(s) are provided to, and accepted by, the Engineer.

If approved abrasive additives are used that render the waste non-hazardous as determined by TCLP testing, the waste shall be classified as a non-hazardous special waste, transported by a licensed waste transporter, and disposed of at an IEPA permitted disposal facility in Illinois.

When paint is removed from the bridge without the use of abrasive additives, the paint, together with the surface preparation media (e.g. abrasive) shall be handled as a hazardous waste, regardless of the TCLP results. The waste shall be transported by a licensed hazardous waste transporter, treated by an IEPA permitted treatment facility to a non-hazardous special waste and disposed of at an IEPA permitted disposal facility in Illinois.

The treatment/disposal facilities shall be approved by the Engineer, and shall hold an IEPA permit for waste disposal and waste stream authorization for this cleaning residue. The IEPA permit and waste stream authorization must be obtained prior to beginning cleaning, except that if necessary, limited paint removal will be permitted in order to obtain samples of the waste for the disposal facilities. The waste shall be shipped to the facility within 90 days of the first accumulation of the waste in the containers. When permitted by the Engineer, waste from multiple bridges in the same contract may be transported by the Contractor to a central waste storage location(s) approved by the Engineer in order to consolidate the material for pick up, and to minimize the storage of waste containers at multiple remote sites after demobilization. Arrangements for the final waste pickup shall be made with the waste hauler by the time blast cleaning operations are completed or as required to meet the 90 day limit stated above.

The Contractor shall submit a waste accumulation inventory table to the Engineer no later than the 5th day of the month. The table shall show the number and size of waste containers filled each day in the preceding month and the amount of waste shipped that month, including the dates of shipments.

The Contractor shall prepare a manifest supplied by the IEPA for off-site treatment and disposal before transporting the hazardous waste off-site. The Contractor shall prepare a land ban

notification for the waste to be furnished to the disposal facility. The Contractor shall obtain the handwritten signature of the initial transporter and date of the acceptance of the manifest. The Contractor shall send one copy of the manifest to the IEPA within two working days of transporting the waste off-site. The Contractor shall furnish the generator copy of the manifest and a copy of the land ban notification to the Engineer. The Contractor shall give the transporter the remaining copies of the manifest.

All other project waste shall be removed from the site according to Federal, State and Local regulations, with all waste removed from the site prior to final Contractor demobilization.

The Contractor shall make arrangements to have other hazardous waste, which he/she generates, such as used paint solvent, transported to the Contractor's facility at the end of each day that this waste is generated. These hazardous wastes shall be manifested using the Contractor's own generator number to a treatment or disposal facility from the Contractor's facility. The Contractor shall not combine solvents or other wastes with cleaning residue wastes. All waste streams shall be stored in separate containers.

The Contractor is responsible for the payment of any fines and undertaking any clean up activities mandated by State or federal environmental agencies for improper waste handling, storage, transportation, or disposal.

Contractor personnel shall be trained in the proper handling of hazardous waste, and the necessary notification and clean up requirements in the event of a spill. The Contractor shall maintain a copy of the personnel training records at each bridge site.

Basis of Payment. The soil, water, and air monitoring, containment, collection, temporary storage, transportation, testing and disposal of all project waste, and all other work described herein will be paid for at the contract lump sum price for CONTAINMENT AND DISPOSAL OF LEAD PAINT CLEANING RESIDUES at the designated location. Payment will not be authorized until all requirements have been fulfilled as described in this specification, including the preparation and submittal of all QC documentation, submittal of environmental monitoring and waste test results, and disposal of all waste.

Appendix 1 – Reference List

The Contractor shall maintain the following reference standards and regulations on site for the duration of the project:

- Illinois Environmental Protection Agency – Information Statement on the Removal of Lead-Based Paint from Exterior Surfaces, latest revision
- Illinois Environmental Protection Act
- SSPC Guide 6, Guide for Containing Debris Generated During Paint Removal Operations
- 29 CFR 1926.62, Lead in Construction
- 40 CFR Part 50, Appendix B, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method)
- 40 CFR Part 50, Appendix G, Reference Method for the Determination of Lead in Suspended Particulate Matter Collected from Ambient Air
- SSPC Guide 16, Guide to Specifying and Selecting Dust Collectors
- SSPC TU-7, Conducting Ambient Air, Soil, and Water Sampling Activities During Surface Preparation and Paint Disturbance Activities.

Removal Method	SSPC Class²	Containment Material Flexibility	Containment Material Permeability³	Containment Support Structure	Containment Material Joints⁴
Hand Tool Cleaning	3P ⁶	Rigid or Flexible	Permeable or Impermeable	Minimal	Partially Sealed
Power Tool Cleaning w/ Vacuum	3P ⁶	Rigid or Flexible	Permeable or Impermeable	Minimal	Partially Sealed
Power Tool Cleaning w/o Vacuum	2P	Rigid or Flexible	Permeable or Impermeable	Rigid or Flexible	Fully or Partially Sealed
Water Jetting Wet Ab Blast Water Cleaning ⁷	2W-3W	Rigid or Flexible	Permeable and Impermeable ⁷	Rigid, Flexible, or Minimal	Fully and Partially Sealed
Abrasive Blast Cleaning	1A	Rigid or Flexible	Impermeable	Rigid or Flexible	Fully Sealed
Vacuum Blast Cleaning	4A ⁶	Rigid or Flexible	Permeable	Minimal	Partially Sealed

Removal Method	SSPC Class²	Containment Entryway	Ventilation System Required⁵	Negative Pressure Required	Exhaust Filtration Required
Hand Tool Cleaning	3P ⁶	Overlapping or Open Seam	Natural	No	No
Power Tool Cleaning w/ Vacuum	3P ⁶	Overlapping or Open Seam	Natural	No	No
Power Tool Cleaning w/o Vacuum	2P	Overlapping or Open Seam	Natural	No	No
Water Jetting Wet Ab Blast Water Cleaning ⁷	2W-3W	Overlapping or Open Seam	Natural	No	No
Abrasive Blast Cleaning	1A	Airlock or Resealable	Mechanical	Yes	Yes
Vacuum Blast Cleaning	4A ⁶	Open Seam	Natural	No	No

Notes:

¹This table provides general design criteria only. It does not guarantee that specific controls over emissions will occur because unique site conditions must be considered in the design. Other combinations of materials may provide controls over emissions equivalent to or greater than those combinations shown above.

²The SSPC Classification is based on SSPC Guide 6. Note that for work over water, water booms or boats with skimmers must be employed, where feasible, to contain spills or releases. Debris must be removed daily at a minimum.

³Permeability addresses both air and water as appropriate. In the case of water removal methods, the containment materials must be resistant to water. Ground covers should always be impermeable, and of sufficient strength to withstand the impact and weight of the debris and the equipment used for collection and clean-up. Ground covers must also extend beyond the containment boundary to capture escaping debris.

⁴ If debris escapes through the seams, then additional sealing of the seams and joints is required.

⁵When "Natural" is listed, ventilation is not required provided the emissions are controlled as specified in this Special Provision, and provided worker exposures are properly controlled. If unacceptable emissions or worker exposures to lead or other toxic metals occur, incorporate a ventilation system into the containment.

⁶Ground covers and wall tarpaulins may provide suitable controls over emissions without the need to completely enclose the work area.

⁷This method applies to water cleaning to remove surface contaminants, and water jetting (with and without abrasive) and wet abrasive blast cleaning where the goal is to remove paint. Although both permeable and impermeable containment materials are included, ground covers and the lower portions of the containment must be water impermeable with fully sealed joints, and of sufficient strength and integrity to facilitate the collection and holding of the water and debris for proper disposal. If water or debris, other than mist, escape through upper sidewalls or ceiling areas constructed of permeable materials, they shall be replaced with impermeable materials. Permeable materials for the purpose of this specification are defined as materials with openings measuring 25 mils (1 micron) or less in greatest dimension.

- A. Containment Components - The basic components that make up containment systems are defined below. The components are combined in Table 1 to establish the minimum containment system requirements for the method(s) of paint removal specified for the Contract.
1. Rigidity of Containment Materials - Rigid containment materials consist of solid panels of plywood, aluminum, rigid metal, plastic, fiberglass, composites, or similar materials. Flexible materials consist of screens, tarps, drapes, plastic sheeting, or similar materials. When directed by the Engineer, do not use flexible materials for horizontal surfaces directly over traffic lanes or vertical surfaces in close proximity to traffic lanes. If the Engineer allows the use of flexible materials, The Contractor shall take special precautions to completely secure the materials to prevent any interference with traffic.
 2. Permeability of Containment Materials - The containment materials are identified as air impenetrable if they are impervious to dust or wind such as provided by rigid panels, coated solid tarps, or plastic sheeting. Air penetrable materials are those that are formed or woven to allow air flow. Water impermeable materials are those that are capable of containing and controlling water when wet methods of preparation are used. Water permeable materials allow the water to pass through. Chemical resistant materials are those resistant to chemical and solvent stripping solutions. Use fire retardant materials in all cases.
 3. Support Structure - Rigid support structures consist of scaffolding and framing to which the containment materials are affixed to minimize movement of the containment cocoon. Flexible support structures are comprised of cables, chains, or similar systems to which the containment materials are affixed. Use fire retardant materials in all cases.
 4. Containment Joints - Fully sealed joints require that mating surfaces between the containment materials and to the structure being prepared are completely sealed. Sealing measures include tape, caulk, Velcro, clamps, or other similar material capable of forming a continuous, impenetrable or impermeable seal. When materials are overlapped, a minimum overlap of 8 in. (200 mm) is required.
 5. Entryway - An airlock entryway involves a minimum of one stage that is fully sealed to the containment and which is maintained under negative pressure using the ventilation system of the containment. Resealable door entryways involve the use of flexible or rigid doors capable of being repeatedly opened and resealed. Sealing methods include the use of zippers, Velcro, clamps, or similar fasteners. Overlapping door tarpaulin entryways consist of two or three overlapping door tarpaulins.

6. Mechanical Ventilation - The requirement for mechanical ventilation is to ensure that adequate air movement is achieved to reduce worker exposure to toxic metals to as low as feasible according to OSHA regulations (e.g., 29 CFR 1926.62), and to enhance visibility. Design the system with proper exhaust ports or plenums, adequately sized ductwork, adequately sized discharge fans and air cleaning devices (dust collectors) and properly sized and distributed make-up air points to achieve a uniform air flow inside containment for visibility. The design target for airflow shall be a minimum of 100 ft. (30.5m) per minute cross-draft or 60 ft. (18.3 m) per minute downdraft. Increase these minimum airflow requirements if necessary to address worker lead exposures. Natural ventilation does not require the use of mechanical equipment for moving dust and debris through the work area.
7. Negative Pressure - When specified, achieve a minimum of 0.03 in. (7.5 mm) water column (W.C.) relative to ambient conditions, or confirm through visual assessments for the concave appearance of the containment enclosure.
8. Exhaust Ventilation - When mechanical ventilation systems are used, provide filtration of the exhaust air, to achieve a filtration efficiency of 99.9 percent at 0.02 mils (0.5 microns).

HAZARDOUS WASTE
CONTINGENCY PLAN
FOR
LEAD BASED PAINT REMOVAL PROJECTS

Bridge No.: _____
Location: _____
USEPA Generator No.: _____
IEPA Generator No.: _____

Note:

1. A copy of this plan must be kept at the bridge while the Contractor's employees are at the site.
2. A copy of the plan must be mailed to the police and fire departments and hospital identified herein.

Primary Emergency Coordinator

Name: _____
Address: _____
City: _____
Phone: (Work) _____
(Home) _____

Alternate Emergency Coordinator

Name: _____
Address: _____
City: _____
Phone: (Work) _____
(Home) _____

Emergency Response Agencies

POLICE:

1. State Police (if bridge not in city) Phone: _____
District No. _____
Address: _____
2. County Sheriff _____ Phone: _____
County: _____
Address: _____
3. City Police _____ Phone: _____
District No. _____
Address: _____

Arrangements made with police: (Describe arrangements or refusal by police to make arrangements):

FIRE:

1. City _____ Phone: _____
Name: _____
Address: _____
2. Fire District _____ Phone: _____
Name: _____
Address: _____

3. Other _____ Phone: _____

Name: _____

Address: _____

Arrangements made with fire departments: (Describe arrangements or refusal by fire departments to make arrangements):

HOSPITAL:

Name: _____ Phone: _____

Address: _____

Arrangements made with hospital: (Describe arrangements or refusal by hospital to make arrangements):

Properties of waste and hazard to health:

Places where employees working:

Location of Bridge:

Types of injuries or illness which could result:

Appropriate response to release of waste to the soil:

Appropriate response to release of waste to surface water:

Emergency Equipment at Bridge

Emergency Equipment List	Location of Equipment	Description of Equipment	Capability of Equipment
1. Two-way radio	Truck		Communication
2. Portable Fire Extinguisher	Truck		Extinguishes Fire
3. Absorbent Material	Truck		Absorbs Paint or Solvent Spills
4. Hand Shovel	Truck		Scooping Material
5. 55 Gallon (208 L) Drum	Truck		Storing Spilled Material
6. 5 Gallon (19 L) Pail	Truck		Storing Spilled Material

Emergency Procedure

1. Notify personnel at the bridge of the emergency and implement emergency procedure.
2. Identify the character, source, amount and extent of released materials.
3. Assess possible hazards to health or environment.
4. Contain the released waste or extinguish fire. Contact the fire department if appropriate.
5. If human health or the environment is threatened, contact appropriate police and fire department. In addition, the Emergency Services and Disaster Agency needs to be called using their 24-hour toll free number (800-782-7860) and the National Response Center using their 24-hour toll free number (800-824-8802).
6. Notify the Engineer that an emergency has occurred.
7. Store spilled material and soil contaminated by spill, if any, in a drum or pail. Mark and label the drum or pail for disposal.
8. Write a full account of the spill or fire incident including date, time, volume, material, and response taken.
9. Replenish stock of absorbent material or other equipment used in response.

PIPE UNDERDRAINS FOR STRUCTURES

Effective: May 17, 2000

Revised: January 22, 2010

Description. This work shall consist of furnishing and installing a pipe underdrain system as shown on the plans, as specified herein, and as directed by the Engineer.

Materials. Materials shall meet the requirements as set forth below:

The perforated pipe underdrain shall be according to Article 601.02 of the Standard Specifications. Outlet pipes or pipes connecting to a separate storm sewer system shall not be perforated.

The drainage aggregate shall be a combination of one or more of the following gradations, FA1, FA2, CA5, CA7, CA8, CA11, or CA13 thru 16, according to Sections 1003 and 1004 of the Standard Specifications.

The fabric surrounding the drainage aggregate shall be Geotechnical Fabric for French Drains according to Article 1080.05 of the Standard Specifications.

Construction Requirements. All work shall be according to the applicable requirements of Section 601 of the Standard Specifications except as modified below.

The pipe underdrains shall consist of a perforated pipe drain situated at the bottom of an area of drainage aggregate wrapped completely in geotechnical fabric and shall be installed to the lines and gradients as shown on the plans.

Method of Measurement. Pipe Underdrains for Structures shall be measured for payment in feet (meters), in place. Measurement shall be along the centerline of the pipe underdrains. All connectors, outlet pipes, elbows, and all other miscellaneous items shall be included in the measurement. Concrete headwalls shall be included in the cost of Pipe Underdrains for Structures, but shall not be included in the measurement for payment.

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for PIPE UNDERDRAINS FOR STRUCTURES of the diameter specified. Furnishing and installation of the drainage aggregate, geotechnical fabric, forming holes in structural elements and any excavation required, will not be paid for separately, but shall be included in the cost of the pipe underdrains for structures.

STRUCTURAL REPAIR OF CONCRETE

Effective: March 15, 2006

Revised: April 1, 2016

Description. This work shall consist of structurally repairing concrete.

Materials. Materials shall be according to the following.

Item	Article/Section
(a) Portland Cement Concrete (Note 1)	1020
(b) R1 or R2 Concrete (Note 2)	
(c) Normal Weight Concrete (Notes 3 and 4)	
(d) Shotcrete (High Performance) (Notes 5 and 6)	
(e) Reinforcement Bars	1006.10
(f) Anchor Bolts	1006.09
(g) Water	1002
(h) Curing Compound	1022.01
(i) Cotton Mats	1022.02
(j) Protective Coat	1023.01
(k) Epoxy (Note 7)	1025
(l) Mechanical Bar Splicers	508.06(c)

Note 1. The concrete shall be Class SI, except the cement factor shall be a minimum 6.65 cwt/cu yd (395 kg/cu m), the coarse aggregate shall be a CA 16, and the strength shall be a minimum 4000 psi (27,500 kPa) compressive or 675 psi (4650 kPa) flexural at 14 days. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump, but a cement factor reduction according to Article 1020.05(b)(8) is prohibited. A self-consolidating concrete mixture is also acceptable per Article 1020.04, except the mix design requirements of this note regarding the cement factor, coarse aggregate, strength, and cement factor reduction shall apply.

Note 2. The R1 or R2 concrete shall be from the Department's approved list of Packaged, Dry, Rapid Hardening, Cementitious Materials for Concrete Repairs. The R1 or R2 concrete shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump, and a retarder may be required to allow time to perform the required field tests. The admixtures shall be per the manufacturer's recommendation, and the Department's approved list of Concrete Admixtures shall not apply.

Note 3. The "high slump" packaged concrete mixture shall be from the Department's approved list of Packaged, Dry, Formed, Concrete Repair Mixtures. The materials and preparation of aggregate shall be according to ASTM C 387. The cement

factor shall be 6.65 cwt/cu yd (395 kg/cu m) minimum to 7.05 cwt/cu yd (418 kg/cu m) maximum. Cement replacement with fly ash or ground granulated blast-furnace slag shall be according to Section 1020. The "high slump" packaged concrete mixture shall have a water soluble chloride ion content of less than 0.40 lb/cu yd (0.24 kg/cu m). The test shall be performed according to ASTM C 1218, and the "high slump" packaged concrete mixture shall have an age of 28 to 42 days at the time of test. The ASTM C 1218 test shall be performed by an independent lab a minimum of once every two years, and the test results shall be provided to the Department. The coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm). The packaged concrete mixture shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump. The admixture shall be per the manufacturer's recommendation, and the Department's approved list of Concrete Admixtures shall not apply. A maximum slump of 10 in. (250 mm) may be permitted if no segregation is observed by the Engineer in a laboratory or field evaluation.

Note 4 The "self-consolidating concrete" packaged concrete mixture shall be from the Department's approved list of Packaged, Dry, Formed, Concrete Repair Mixtures. The materials and preparation of aggregate shall be according to ASTM C 387. The cement factor shall be 6.65 cwt/cu yd (395 kg/cu m) minimum to 7.05 cwt/cu yd (418 kg/cu m) maximum. Cement replacement with fly ash or ground granulated blast-furnace slag shall be according to Section 1020. The "self-consolidating concrete" packaged concrete mixture shall have a water soluble chloride ion content of less than 0.40 lb/cu yd (0.24 kg/cu m). The test shall be performed according to ASTM C 1218, and the "self-consolidating concrete" packaged concrete mixture shall have an age of 28 to 42 days at the time of test. The ASTM C 1218 test shall be performed by an independent lab a minimum of once every two years, and the test results shall be provided to the Department. The concrete mixture should be uniformly graded, and the coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm). The fine aggregate proportion shall be a maximum 50 percent by weight (mass) of the total aggregate used. The packaged concrete mixture shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. The admixtures used to produce self-consolidating concrete shall be per the manufacturer's recommendation, and the Department's approved list of Concrete Admixtures shall not apply. The packaged concrete mixture shall meet the self-consolidating requirements of Article 1020.04.

Note 5. Packaged shotcrete that includes aggregate shall be from the Department's approved list of Packaged High Performance Shotcrete, and independent

laboratory test results showing the product meets Department specifications will be required. The product shall be a packaged, pre-blended, and dry combination of materials, for the wet-mix shotcrete method according to ASTM C 1480. A non-chloride accelerator may be used according to the shotcrete manufacturer's recommendations. The shotcrete shall be Type FA or CA, Grade FR, and Class I. The fibers shall be Type III synthetic according to ASTM C 1116.

The packaged shotcrete shall have a water soluble chloride ion content of less than 0.40 lb/cu yd (0.24 kg/cu m). The test shall be performed according to ASTM C 1218, and the hardened shotcrete shall have an age of 28 to 42 days at the time of test. The ASTM C 1218 test shall be performed by an independent lab a minimum of once every two years, and the test results shall be provided to the Department.

Each individual aggregate used in the packaged shotcrete shall have either a maximum ASTM C 1260 expansion of 0.16 percent or a maximum ASTM C 1293 expansion of 0.040 percent. However, the ASTM C 1260 value may be increased to 0.27 percent for each individual aggregate if the cement total equivalent alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) does not exceed 0.60 percent. As an alternative to these requirements, ASTM C 1567 testing which shows the packaged shotcrete has a maximum expansion of 0.16 percent may be submitted. The ASTM C 1260, C 1293, or C 1567 test shall be performed a minimum of once every two years.

The 7 and 28 day compressive strength requirements in ASTM C 1480 shall not apply. Instead the shotcrete shall obtain a minimum compressive strength of 4000 psi (27,500 kPa) at 14 days.

The packaged shotcrete shall be limited to the following proportions:

The portland cement and finely divided minerals shall be 6.05 cwt/cu yd (360 kg/cu m) to 8.50 cwt/cu yd (505 kg/cu m) for Type FA and 6.05 cwt/cu yd (360 kg/cu. m) to 7.50 cwt/cu yd (445 kg/cu m) for Type CA. The portland cement shall not be below 4.70 cwt/cu yd (279 kg/cu m) for Type FA or CA.

The finely divided mineral(s) shall constitute a maximum of 35 percent of the total cement plus finely divided mineral(s).

Class F fly ash is optional and the maximum shall be 20 percent by weight (mass) of cement.

Class C fly ash is optional and the maximum shall be 25 percent by weight (mass) of cement.

Ground granulated blast-furnace slag is optional and the maximum shall be 30 percent by weight (mass) of cement.

Microsilica is required and shall be a minimum of 5 percent by weight (mass) of cement, and a maximum of 10 percent. As an alternative to microsilica, high-reactivity metakaolin may be used at a minimum of 5 percent by weight (mass) of cement, and a maximum of 10 percent.

Fly ash shall not be used in combination with ground granulated blast-furnace slag. Class F fly ash shall not be used in combination with Class C fly ash. Microsilica shall not be used in combination with high-reactivity metakaolin. A finely divided mineral shall not be used in combination with a blended hydraulic cement, except for microsilica or high-reactivity metakaolin.

The water/cement ratio as defined in Article 1020.06 shall be a maximum of 0.42.

The air content as shot shall be 4.0 – 8.0 percent.

Note 6 Packaged shotcrete that does not include pre-blended aggregate shall be from the Department's approved list of Packaged High Performance Shotcrete, and independent laboratory test results showing the product meets Department specifications will be required. The shotcrete shall be according to Note 5, except the added aggregate shall be according to Articles 1003.02 and 1004.02 in addition to each individual aggregate meeting the maximum expansion requirements of Note 5. The aggregate gradation shall be according to the manufacturer. The shotcrete shall be batched and mixed with added aggregate according to the manufacturer.

Note 7. In addition ASTM C 881, Type IV, Grade 2 or 3, Class A, B, or C may be used.

Equipment. Equipment shall be according to Article 503.03 and the following.

Chipping Hammer – The chipping hammer for removing concrete shall be a light-duty pneumatic or electric tool with a 15 lb. (7 kg) maximum class or less.

Blast Cleaning Equipment – Blast cleaning equipment for concrete surface preparation shall be the abrasive type, and the equipment shall have oil traps.

Hydrodemolition Equipment – Hydrodemolition equipment for removing concrete shall be calibrated, and shall use water according to Section 1002.

High Performance Shotcrete Equipment – The batching, mixing, pumping, hose, nozzle, and auxiliary equipment shall be for the wet-mix shotcrete method, and shall meet the requirements of ACI 506R.

Construction Requirements

General. The repair methods shall be either formed concrete repair or shotcrete. The repair method shall be selected by the Contractor with the following rules.

- (a) Rule 1. For formed concrete repair, a subsequent patch to repair the placement point after initial concrete placement will not be allowed. As an example, this may occur in a vertical location located at the top of the repair.
- (b) Rule 2. Formed concrete repair shall not be used for overhead applications.
- (c) Rule 3. If formed concrete repair is used for locations that have reinforcement with less than 0.75 in. (19 mm) of concrete cover, the concrete mixture shall contain fly ash or ground granulated blast-furnace slag at the maximum cement replacement allowed.
- (d) Rule 4. Shotcrete shall not be used for any repair greater than 6 in. (150 mm) in depth, except in horizontal applications, where the shotcrete may be placed from above in one lift.
- (e) Rule 5. Shotcrete shall not be used for column repairs greater than 4 in. (100 mm) in depth, unless the shotcrete mixture contains 3/8 in. (9.5 mm) aggregate.

Temporary Shoring or Cribbing. When a temporary shoring or cribbing support system is required, the Contractor shall provide details and computations, prepared and sealed by an Illinois licensed Structural Engineer, to the Department for review and approval. When ever possible the support system shall be installed prior to starting the associated concrete removal. If no system is specified, but during the course of removal the need for temporary shoring or cribbing becomes apparent or is directed by the Engineer due to a structural concern, the Contractor shall not proceed with any further removal work until an appropriate and approved support system is installed.

Concrete Removal. The Contractor shall provide ladders or other appropriate equipment for the Engineer to mark the removal areas. Repair configurations will be kept simple, and squared corners will be preferred. The repair perimeter shall be sawed a depth of 1/2 in. (13 mm) or less, as required to avoid cutting the reinforcement. Any cut reinforcement shall be repaired or replaced at the expense of the Contractor. If the concrete is broken or removed beyond the limits of the initial saw cut, the new repair perimeter shall be recut. The areas to be repaired shall have all loose, unsound concrete removed completely by the use of chipping hammers, hydrodemolition equipment, or other methods approved by the Engineer. The concrete removal shall extend along the reinforcement bar until the reinforcement is free of bond inhibiting corrosion. Reinforcement bar with 50 percent or more exposed shall be undercut to a depth of 3/4 in. (19 mm) or the diameter of the reinforcement bar, whichever is greater.

If sound concrete is encountered before existing reinforcement bars are exposed, further removal of concrete shall not be performed unless the minimum repair depth is not met.

The repair depth shall be a minimum of 1 in. (25 mm). The substrate profile shall be $\pm 1/16$ in. (± 1.5 mm). The perimeter of the repair area shall have a vertical face.

If a repair is located at the ground line, any excavation required below the ground line to complete the repair shall be included in this work.

The Contractor shall have a maximum of 14 calendar days to complete each repair location with concrete or shotcrete, once concrete removal has started for the repair.

The Engineer shall be notified of concrete removal that exceeds 6 in. (150 mm) in depth, one fourth the cross section of a structural member, more than half the vertical column reinforcement is exposed in a cross section, more than 6 consecutive reinforcement bars are exposed in any direction, within 1.5 in. (38 mm) of a bearing area, or other structural concern. Excessive deterioration or removal may require further evaluation of the structure or installation of temporary shoring and cribbing support system.

Surface Preparation. Prior to placing the concrete or shotcrete, the Contractor shall prepare the repair area and exposed reinforcement by blast cleaning. The blast cleaning shall provide a surface that is free of oil, dirt, and loose material.

If a succeeding layer of shotcrete is to be applied, the initial shotcrete surface and remaining exposed reinforcement shall be free of curing compound, oil, dirt, loose material, rebound (i.e. shotcrete material leaner than the original mixture which ricochets off the receiving surface), and overspray. Preparation may be by lightly brushing or blast cleaning if the previous shotcrete surface is less than 36 hours old. If more than 36 hours old, the surface shall be prepared by blast cleaning.

The repair area and perimeter vertical face shall have a rough surface. Care shall be taken to ensure the sawcut face is roughened by blast cleaning. Just prior to concrete or shotcrete placement, saturate the repair area with water to a saturated surface-dry condition. Any standing water shall be removed.

Concrete or shotcrete placement shall be done within 3 calendar days of the surface preparation or the repair area shall be prepared again.

Reinforcement. Exposed reinforcement bars shall be cleaned of concrete and corrosion by blast cleaning. After cleaning, all exposed reinforcement shall be carefully evaluated to determine if replacement or additional reinforcement bars are required.

Reinforcing bars that have been cut or have lost 25 percent or more of their original cross sectional area shall be supplemented by new in kind reinforcement bars. New bars shall be lapped a minimum of 32 bar diameters to existing bars. A mechanical bar splicer shall be used when it is not feasible to provide the minimum bar lap. No welding of bars shall be performed.

Intersecting reinforcement bars shall be tightly secured to each other using 0.006 in. (1.6 mm) or heavier gauge tie wire, and shall be adequately supported to minimize movement during concrete placement or application of shotcrete.

For reinforcement bar locations with less than 0.75 in. (19 mm) of cover, protective coat shall be applied to the completed repair. The application of the protective coat shall be according to Article 503.19, 2nd paragraph, except blast cleaning shall be performed to remove curing compound.

The Contractor shall anchor the new concrete to the existing concrete with 3/4 in. (19 mm) diameter hook bolts for all repair areas where the depth of concrete removal is greater than 8 in. (205 mm) and there is no existing reinforcement extending into the repair area. The hook bolts shall be spaced at 15 in. (380 mm) maximum centers both vertically and horizontally, and shall be a minimum of 12 in. (305 mm) away from the perimeter of the repair. The hook bolts shall be installed according to Section 584.

Repair Methods. All repair areas shall be inspected and approved by the Engineer prior to placement of the concrete or application of the shotcrete.

- (a) Formed Concrete Repair. Falsework shall be according to Article 503.05. Forms shall be according to Article 503.06. Formwork shall provide a smooth and uniform concrete finish, and shall approximately match the existing concrete structure. Formwork shall be mortar tight and closely fitted where they adjoin the existing concrete surface to prevent leakage. Air vents may be provided to reduce voids and improve surface appearance. The Contractor may use exterior mechanical vibration, as approved by the Engineer, to release air pockets that may be entrapped.

The concrete for formed concrete repair shall be a Class SI Concrete, or a packaged R1 or R2 Concrete with coarse aggregate added, or a packaged Normal Weight Concrete at the Contractor's option. The concrete shall be placed and consolidated according to Article 503.07. The concrete shall not be placed when frost is present on the surface of the repair area, or the surface temperature of the repair area is less than 40 °F (4 °C). All repaired members shall be restored as close as practicable to their original dimensions.

Curing shall be done according to Article 1020.13.

If temperatures below 45°F (7°C) are forecast during the curing period, protection methods shall be used. Protection Method I according to Article 1020.13(d)(1), or Protection Method II according to Article 1020.13(d)(2) shall be used during the curing period.

The surfaces of the completed repair shall be finished according to Article 503.15.

- (b) Shotcrete. Shotcrete shall be tested by the Engineer for air content according to Illinois Modified AASHTO T 152. The sample shall be obtained from the discharge end of the nozzle by shooting a pile large enough to scoop a representative amount for filling the air meter measuring bowl. Shotcrete shall not be shot directly into the measuring bowl for testing.

For compressive strength of shotcrete, a 18 x 18 x 3.5 in. (457 x 457 x 89 mm) test panel shall be shot by the Contractor for testing by the Engineer. A steel form test panel shall have a minimum thickness of 3/16 in. (5 mm) for the bottom and sides. A wood form test panel shall have a minimum 3/4 in. (19 mm) thick bottom, and a minimum 1.5 in. (38 mm) thickness for the sides. The test panel shall be cured according to Article 1020.13 (a) (3) or (5) while stored at the jobsite and during delivery to the laboratory. After delivery to the laboratory for testing, curing and testing shall be according to ASTM C 1140.

The method of alignment control (i.e. ground wires, guide strips, depth gages, depth probes, and formwork) to ensure the specified shotcrete thickness and reinforcing bar cover is obtained shall be according to ACI 506R. Ground wires shall be removed after completion of cutting operations. Guide strips and formwork shall be of dimensions and a configuration that do not prevent proper application of shotcrete. Metal depth gauges shall be cut 1/4 in. (6 mm) below the finished surface. All repaired members shall be restored as close as practicable to their original dimensions.

For air temperature limits when applying shotcrete in cold weather, the first paragraph of Article 1020.14(b) shall apply. For hot weather, shotcrete shall not be applied when the air temperature is greater than 90°F (32°C). The applied shotcrete shall have a minimum temperature of 50°F (10°C) and a maximum temperature of 90°F (32°C). The shotcrete shall not be applied during periods of rain unless protective covers or enclosures are installed. The shotcrete shall not be applied when frost is present on the surface of the repair area, or the surface temperature of the repair area is less than 40°F (4°C). If necessary, lighting shall be provided to provide a clear view of the shooting area.

The shotcrete shall be applied according to ACI 506R, and shall be done in a manner that does not result in cold joints, laminations, sandy areas, voids, sags, or separations. In addition, the shotcrete shall be applied in a manner that results in maximum densification of the shotcrete. Shotcrete which is identified as being unacceptable while still plastic shall be removed and re-applied.

The nozzle shall normally be at a distance of 2 to 5 ft. (0.6 to 1.5 m) from the receiving surface, and shall be oriented at right angles to the receiving surface. Exceptions to this requirement will be permitted to fill corners, encase large diameter reinforcing bars, or as approved by the Engineer. For any exception, the nozzle shall never be oriented more than 45 degrees from the surface. Care shall be taken to keep the front face of the reinforcement bar clean during shooting operations. Shotcrete shall be built up from behind the reinforcement bar. Accumulations of rebound and overspray shall be continuously removed prior to application of new shotcrete. Rebound material shall not be incorporated in the work.

Whenever possible, shotcrete shall be applied to the full thickness in a single layer. The maximum thickness shall be according to Rules 4 and 5 under Construction Requirements, General. When two or more layers are required, the minimum number shall be used and shall be done in a manner without sagging or separation. A flash coat (i.e. a thin layer of up to 1/4 in. (6 mm) applied shotcrete) may be used as the final lift for overhead applications.

Prior to application of a succeeding layer of shotcrete, the initial layer of shotcrete shall be prepared according to the surface preparation and reinforcement bar cleaning requirements. Upon completion of the surface preparation and reinforcement bar treatment, water shall be applied according to the surface preparation requirements unless the surface is moist. The second layer of shotcrete shall then be applied within 30 minutes.

Shotcrete shall be cut back to line and grade using trowels, cutting rods, screeds or other suitable devices. The shotcrete shall be allowed to stiffen sufficiently before cutting. Cutting shall not cause cracks or delaminations in the shotcrete. For depressions, cut material may be used for small areas. Rebound material shall not be incorporated in the work. For the final finish, a wood float shall be used to approximately match the existing concrete texture. A manufacturer approved finishing aid may be used. Water shall not be used as a finishing aid. All repaired members shall be restored as close as practicable to their original dimensions.

Contractor operations for curing shall be continuous with shotcrete placement and finishing operations. Curing shall be accomplished using wetted cotton mats, membrane curing, or a combination of both. Cotton mats shall be applied according to Article 1020.13(a)(5) except the exposed layer of shotcrete shall be covered within 10 minutes after finishing, and wet curing shall begin immediately. Curing compound shall be applied according to Article 1020.13(a)(4), except the curing compound shall be applied as soon as the shotcrete has hardened sufficiently to prevent marring the surface, and each of the two separate applications shall be applied in opposite directions to ensure coverage. The curing compound shall be according to Article 1022.01. Note 5 of the Index Table in Article 1020.13 shall apply to the membrane curing method.

When a shotcrete layer is to be covered by a succeeding shotcrete layer within 36 hours, the repair area shall be protected with intermittent hand fogging, or wet curing with either

burlap or cotton mats shall begin within 10 minutes. Intermittent hand fogging may be used only for the first hour. Thereafter, wet curing with burlap or cotton mats shall be used until the succeeding shotcrete layer is applied. Intermittent hand fogging may be extended to the first hour and a half if the succeeding shotcrete layer is applied by the end of this time.

The curing period shall be for 7 days, except when there is a succeeding layer of shotcrete. In this instance, the initial shotcrete layer shall be cured until the surface preparation and reinforcement bar treatment is started.

If temperatures below 45°F (7°C) are forecast during the curing period, protection methods shall be used. Protection Method I according to Article 1020.13(d)(1), or Protection Method II according to Article 1020.13(d)(2) shall be used during the curing period

Inspection of Completed Work. The Contractor shall provide ladders or other appropriate equipment for the Engineer to inspect the repaired areas. After curing but no sooner than 28 days after placement of concrete or shooting of shotcrete, the repair shall be examined for conformance with original dimensions, cracks, voids, and delaminations. Sounding for delaminations will be done with a hammer or by other methods determined by the Engineer.

The acceptable tolerance for conformance of a repaired area shall be within 1/4 in. (6 mm) of the original dimensions. A repaired area not in dimensional conformance or with delaminations shall be removed and replaced,

A repaired area with cracks or voids shall be considered as nonconforming. Exceeding one or more of the following crack and void criteria shall be cause for removal and replacement of a repaired area.

1. The presence of a single surface crack greater than 0.01 in. (0.25 mm) in width and greater than 12 in. (300 mm) in length.
2. The presence of two or more surface cracks greater than 0.01 in. (0.25 mm) in width that total greater than 24 in. (600 mm) in length.
3. The presence of map cracking in one or more regions totaling 15 percent or more of the gross surface area of the repair.
4. The presence of two or more surface voids with least dimension 3/4 in. (19 mm) each.

A repaired area with cracks or voids that do not exceed any of the above criteria may remain in place, as determined by the Engineer.

If a nonconforming repair is allowed to remain in place, cracks greater than 0.007 in. (0.2 mm) in width shall be repaired with epoxy according to Section 590. For cracks less than or equal to

0.007 in. (0.2 mm) in width, the epoxy may be applied to the surface of the crack. Voids shall be repaired according to Article 503.15.

Publications and Personnel Requirements. The Contractor shall provide a current copy of ACI 506R to the Engineer a minimum of one week prior to start of construction.

The shotcrete personnel who perform the work shall have current American Concrete Institute (ACI) nozzle men certification for vertical wet and overhead wet applications, except one individual may be in training. This individual shall be adequately supervised by a certified ACI nozzle men as determined by the Engineer. A copy of the nozzle men certificate(s) shall be given to the Engineer.

Method of Measurement. This work will be measured for payment in place and the area computed in square feet (square meters). For a repair at a corner, both sides will be measured.

Basis of Payment. This work will be paid for at the contract unit price per square foot (square meter) for STRUCTURAL REPAIR OF CONCRETE (DEPTH GREATER THAN 5 IN. (125 MM), STRUCTURAL REPAIR OF CONCRETE (DEPTH EQUAL TO OR LESS THAN 5 IN. (125 MM)).

When not specified to be paid for elsewhere, the work to design, install, and remove the temporary shoring and cribbing will be paid for according to Article 109.04.

With the exception of reinforcement damaged by the Contractor during removal, the furnishing and installation of supplemental reinforcement bars, mechanical bar splicers, hook bolts, and protective coat will be paid according to Article 109.04.

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

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 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 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.

**MINIMUM WAGES FOR FEDERAL AND FEDERALLY
ASSISTED CONSTRUCTION CONTRACTS**

This project is funded, in part, with Federal-aid funds and, as such, is subject to the provisions of the Davis-Bacon Act of March 3, 1931, as amended (46 Sta. 1494, as amended, 40 U.S.C. 276a) and of other Federal statutes referred to in a 29 CFR Part 1, Appendix A, as well as such additional statutes as may from time to time be enacted containing provisions for the payment of wages determined to be prevailing by the Secretary of Labor in accordance with the Davis-Bacon Act and pursuant to the provisions of 29 CFR Part 1. The prevailing rates and fringe benefits shown in the General Wage Determination Decisions issued by the U.S. Department of Labor shall, in accordance with the provisions of the foregoing statutes, constitute the minimum wages payable on Federal and federally assisted construction projects to laborers and mechanics of the specified classes engaged on contract work of the character and in the localities described therein.

General Wage Determination Decisions, modifications and supersedes decisions thereto are to be used in accordance with the provisions of 29 CFR Parts 1 and 5. Accordingly, the applicable decision, together with any modifications issued, must be made a part of every contract for performance of the described work within the geographic area indicated as required by an applicable DBRA Federal prevailing wage law and 29 CFR Part 5. The wage rates and fringe benefits contained in the General Wage Determination Decision shall be the minimum paid by contractors and subcontractors to laborers and mechanics.