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Letting April 26, 2019

Notice to Bidders, Specifications and Proposal



**Contract No. 62G97
WILL County
Section 2018-048-B-R
Route FAU 341
Project STP-JZG0(324)
District 1 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. April 26, 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. 62G97
WILL County
Section 2018-048-B-R
Project STP-JZG0(324)
Route FAU 341
District 1 Construction Funds**

Jack column retrofitting, repairing bascule girders, modification of center and tail lock, repairing steel grid deck and railings, and painting of Brandon Rd over the Des Plaines River in Joliet.

- 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

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 FOR
 SUPPLEMENTAL SPECIFICATIONS
 AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2019

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

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

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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 for Materials" in effect on the date of invitation for bids, and the "Supplemental Specifications and Recurring Special Provisions" adopted January 1, 2019 indicated on the Check Sheet included herein which apply to and govern FAU Route 341 (Brandon Road), Project STP-JZGO(324), Section 2018-048-B-R, Will County, Contract No. 62G97, and in case of conflict with any part, or parts, of said Specifications, the said Special Provisions shall take precedence and shall govern.

FAU Route 341 (Brandon Road)
Project STP-JZGO(324)
Section 2018-048-B-R
Will County
Contract No. 62G97

LOCATION OF IMPROVEMENT

The improvement is located at SN 099-9903 along Brandon Road (F.A.U 0341) over Des Plaines River in the City of Joliet, Will County, Illinois.

DESCRIPTION OF IMPROVEMENT

The existing structure (S.N. 099-9903) is a dual double-leaf, Bascule bridge, carrying the eastbound and westbound traffic of Brandon Road over the Des Plaines River. The proposed work consists of cleaning and painting, jack column retrofitting, repairing bascule girders, replacing sections of open steel grid deck, repairing bridge railings, modification of center locks, tail locks and miscellaneous mechanical and electrical tasks, and any incidental and collateral work necessary to complete the project as shown on the plans and as described herein.

COMPLETION DATE PLUS WORKING DAYS

Effective: September 30, 1985

Revised: January 1, 2007

Revise Article 108.05 (b) of the Standard Specifications as follows:

"When a completion date plus working days is specified, the Contractor shall complete all contract items and safely open all roadways to traffic by 11:59 PM on, **December 31, 2019** except as specified herein.

The Contractor will be allowed to complete all clean-up work and punch list items within **5** working days after the completion date for opening the roadway to traffic. Under extenuating circumstances the Engineer may direct that certain items of work, not affecting the safe opening of the roadway to traffic, may be completed within the working days allowed for clean up work and punch list items. Temporary lane closures for this work may be allowed at the discretion of the Engineer.

Article 108.09 or the Special Provision for "Failure to Complete the Work on Time", if included in this contract, shall apply to both the completion date and the number of working days.

COORDINATION WITH ADJACENT AND/OR OVERLAPPING CONTRACTS

Effective: May 30, 2003

Revised: June 26, 2003

This contract abuts and/or overlaps with other concurrent and future contracts as listed below. Each contract includes work items requiring close coordination between the various contractors regarding the sequence and timing for execution of such work items in accordance with Article 105.08 of the Standard Specifications and as herein noted. This contract also includes critical work items that affect the future staging of traffic and the completion dates of other contracts. These critical items along with their completion dates are listed after each contract. The list below identifies known contracts, but other contracts may become active prior to construction and the Contractor shall be also be responsible for coordination with these contracts. Such contracts will be identified at the time of the pre-construction meeting.

- (a) Contract #60P55
 - (1) Local Centralized Control and Operation

- (b) Contract #62C04

Critical items affecting the above contract:

- (1) Structural repairs on the Jefferson Street Bridge.

- (c) Contract #62G14 (Fiber Optic Network Installation to support Centralized Control 60P55)

Critical items affecting the above contract:

- (1) Coordination of fiber optic network design.
- (2) Installation schedule for fiber optic cable segments.
- (3) Testing and labeling of fiber optic cables.
- (4) Coordination of traffic control and road closures.

Add the following paragraph to the beginning of Article 105.08.

“The Contractor shall identify all such work items (including the critical items listed in the Contract) at the beginning of the contract and coordinate the sequence and timing for their execution and completion with the other Contractors through the Engineer. All of these work items shall be identified as separate line items in the Contractor’s proposed Construction Progress Schedule. Items requiring coordination between contracts are not limited to those critical items listed herein. The Contractor shall exercise diligent effort to coordinate all contract work for the benefit of the project effort as a whole. Additional compensation or the extension of contract time will not be allowed for the progress of the work items affected by the lack of such coordination by the Contractor.”

STATUS OF UTILITIES (D-1)

Effective: June 1, 2016

Utility companies and/or municipal owners located within the construction limits of this project have provided the following information in regard to their facilities and the proposed improvements. The tables below contain a description of specific conflicts to be resolved and/or facilities which will require some action on the part of the Department’s contractor to proceed with work. Each table entry includes an identification of the action necessary and, if applicable, the estimated duration required for the resolution.

UTILITIES TO BE ADJUSTED

Conflicts noted below have been identified by following the suggested staging plan included in the contract. The company has been notified of all conflicts and will be required to obtain the necessary permits to complete their work; in some instances resolution will be a function of the construction staging. The responsible agency must relocate or complete new installations as noted in the action column; this work has been deemed necessary to be complete for the Department’s contractor to then work in the stage under which the item has been listed.

Pre-Stage

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION

Stage 1

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION

Stage 2

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION

No conflicts to be resolved (or if there are conflicts they are to be listed as noted above)

Pre-Stage: _____ **Days Total Installation**
Stage 1: _____ **Days Total Installation**
Stage 2: _____ **Days Total Installation**

The following contact information is what was used during the preparation of the plans as provided by the Agency/Company responsible for resolution of the conflict.

Agency/Company Responsible to Resolve Conflict	Name of contact	Address	Phone	e-mail address

UTILITIES TO BE WATCHED AND PROTECTED

The areas of concern noted below have been identified by following the suggested staging plan included for the contract. The information provided is not a comprehensive list of all remaining utilities, but those which during coordination were identified as ones which might require the Department’s contractor to take into consideration when making the determination of the means and methods that would be required to construct the proposed improvement. In some instances the contractor will be responsible to notify the owner in advance of the work to take place so necessary staffing on the owners part can be secured.

Pre-Stage

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER	ACTION
	Aerial Telephone & Fiber	Reference: AT&T #JW310	AT&T	To be watched & protected

Stage 1

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER	ACTION

Stage 2

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER	ACTION

The following contact information is what was used during the preparation of the plans as provided by the owner of the facility.

Agency/Company Responsible to Resolve Conflict	Name of contact	Address	Phone	e-mail address
AT&T	Janet C. Ahern	AT&T Legal Mandate Engineering 1000 Commerce Drive, Oak Brook, Illinois 60523	630-573-6414	ja1763@att.com

The above represents the best information available to the Department and is included for the convenience of the bidder. The days required for conflict resolution should be taken into account in the bid as this information has also been factored into the timeline identified for the project when setting the completion date. The applicable portions of the Standard Specifications for Road and Bridge Construction shall apply.

Estimated duration of time provided in the action column for the first conflicts identified will begin on the date of the executed contract regardless of the status of the utility relocations. The responsible agencies will be working toward resolving subsequent conflicts in conjunction with contractor activities in the number of days noted.

The estimated relocation dates must be part of the progress schedule submitted by the contractor. A utility kickoff meeting will be scheduled between the Department, the Department's contractor and the utility companies. The Department's contractor is responsible for contacting J.U.L.I.E. prior to any and all excavation work.

COORDINATION OF MARINE NAVIGATION

Description. This work consists of conforming all operations in the waterway to the requirements or directions of the U.S. Coast Guard.

U.S. Coast Guard Coordination. The Contractor shall bear full responsibility for all required coordination with the U.S. Coast Guard. All communications with the U.S. Coast Guard shall be coordinated through the IDOT Resident Engineer. The Contractor shall submit a work plan for approval to the Coast Guard (copy also to be provided to the Engineer) prior to starting any work. This shall include a description of the Contractor's method of doing the repairs, the days and hours of the week that work will be done, the location of work barges in relation to the navigation channel, and any other means and methods that may affect navigation. This also shall include dates and times of any desired scheduled river closures. The Contractor shall not start work until he is in receipt of a Conditions Approval from the Coast Guard.

The actual river closures allowed shall be fully at the discretion of the Coast Guard. The Department shall not be held responsible for any requirements, stipulations, limitations, etc. related to waterway disruptions as imposed by the Coast Guard, which conflict with the requirements of the Contract Documents. Any such conflict shall not be considered cause for delay or additional payment.

The Contractor shall bear full responsibility for all fines, fees, and damages resulting from noncompliance with the requirements of this section, Coast Guard regulations and requirements, and/or any other applicable local, state, or federal laws and regulations.

Signing. During construction activity on the six movable bridges, four channel warning signs shall be securely erected, one on each channel bank upstream and downstream of the centerline of the affected bridge for the duration of construction activity.

The signs shall be a minimum of 4 feet by 8 feet exterior grade, $\frac{3}{4}$ -inch thick plywood and shall be painted with two coats of exterior grade white enamel paint. The lettering shall be painted with black exterior grade paint. The letters shall be a minimum of 8 inches high, using uppercase block lettering indicating "Bridge Construction 500 Feet Ahead".

At the completion of new construction for each bridge, the Contractor shall provide and install permanent signs to display IDOT bridge tender marine radio channel and telephone number contact information to marine vessels. Signs shall be installed on the upstream and down stream sides of each movable bridge. Construction and materials for signs shall follow Federal Highway Administration MUTCD guidelines for General Service Signs having reflective blue foreground with white letters/numbers, symbols, and borders. Sign content and design shall follow current 33 CFR 117.24 regulations and shall be as required by the local Coast Guard District Commander. Final locations for signs shall be approved by the Coast Guard.

Observer. Whenever construction is in operation over and/or adjacent to the channel, one observer shall be positioned to watch for oncoming marine vessels from either direction. An audible signal shall be sounded for all work to cease when a marine vessel is 500 feet from the bridge. An all clear signal shall be sounded when the vessel has passed the construction area and work may resume. The observer shall have a radio that can be used to communicate with the marine vessel.

The Contractor's Observer shall use the radio at all times to listen when a vessel is approaching and from which direction.

All work, including flame-cutting, welding, and similar spark-producing operations, shall be suspended whenever a marine vessel, regardless of size, is approaching the bridge and is within 500 feet of the bridge and shall remain suspended until the entire marine vessel has completely passed away from the bridge area.

Obstructions. Should the Contractor, during progress of work, lose, throw overboard, sink or misplace any material, machinery, plant, or appliance, he shall immediately recover and remove the same. The Contractor shall give immediate notice, with the description and location of any item not recovered immediately, to the Coast Guard; and when required by the Coast Guard, shall mark or buoy such item until it is recovered and removed.

Lighting. The Contractor shall provide and maintain whatever navigation lights and other navigation signals or facilities as may be required by the Coast Guard on all temporary construction or vessels and on all existing permanent construction. Temporary lights, signals or facilities, when required by the Coast Guard, shall be provided and maintained by the Contractor until final acceptance of the work under this contract.

Notice of Unscheduled River Closure. The Contractor shall be responsible to arrange with the Coast Guard for times and dates when work on the bridge shall require restrictions to the navigation of the waterway. A two week (14 day) advance notice will be required for any unscheduled river closure for a period of 8 hours or one day. The Contractor shall work continuously (around the clock in multiple shifts) during any unscheduled waterway disruption and re-open the waterway as soon as the work necessitating the disruption is completed.

River Level. Due to unpredictable weather conditions, work may have to be stopped until the river level returns to normal pool elevations. This decision will be made by the Coast Guard.

U.S. Coast Guard Contact Person. The contact person from the Coast Guard for this rehabilitation project is:

Mr. Eric Washburn
U.S. Coast Guard
Coast Guard 8th District
1222 Spruce Street
St. Louis, Missouri 63103-2832
Phone: (314) 269-2378

Basis of Payment. All costs incurred by the Contractor in complying with the above requirements shall be considered as completely covered by the prices bid for the various items of work included in the Contract.

MAINTENANCE OF ROADWAYS

Effective: September 30, 1985

Revised: November 1, 1996

Beginning on the date that work begins on this project, the Contractor shall assume responsibility for normal maintenance of all existing roadways within the limits of the improvement. This normal maintenance shall include all repair work deemed necessary by the Engineer, but shall not include snow removal operations. Traffic control and protection for maintenance of roadways will be provided by the Contractor as required by the Engineer.

If items of work have not been provided in the contract, or otherwise specified for payment, such items, including the accompanying traffic control and protection required by the Engineer, will be paid for in accordance with Article 109.04 of the Standard Specifications.

TRAFFIC CONTROL PLAN

Effective: September 30, 1985

Revised: January 1, 2007

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, and 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 District One Bureau of Traffic at least 72 hours in advance of beginning work.

STANDARDS:

701901

DETAILS:

- TC- 21 Detour Signing for Closing State Highways.
- TC- 22 Arterial Information Sign

SPECIAL PROVISIONS:

- Maintenance of Roadways
- Temporary Information Signing (D-I)
- Public Convenience and Safety (D-1)
- Lights on Barricades (BDE)
- Equipment Parking and Storage (BDE)
- Coordination with Adjacent Contracts - Contract #60P55

TEMPORARY INFORMATION SIGNING

Effective: November 13, 1996

Revised: January 2, 2007

Description.

This work shall consist of furnishing, installing, maintaining, relocating for various states of construction and eventually removing temporary informational signs. Included in this item may be ground mount signs, skid mount signs, truss mount signs, bridge mount signs, and overlay sign panels which cover portions of existing signs.

Materials.

Materials shall be according to the following Articles of Section 1000 - Materials:

	Item	Article/Section
a.)	Sign Base (Notes 1 & 2)	1090
b.)	Sign Face (Note 3)	1091
c.)	Sign Legends	1092
d.)	Sign Supports	1093
e.)	Overlay Panels (Note 4)	1090.02
Note 1.	The Contractor may use 5/8 inch (16 mm) instead of 3/4 inch (19 mm) thick plywood.	
Note 2.	Type A sheeting can be used on the plywood base.	
Note 3.	All sign faces shall be Type A except all orange signs shall meet the requirements of Article 1106.01.	
Note 4.	The overlay panels shall be 0.08 inch (2 mm) thick.	

GENERAL CONSTRUCTION REQUIREMENTS

Installation.

The sign sizes and legend sizes shall be verified by the Contractor prior to fabrication.

Signs which are placed along the roadway and/or within the construction zone shall be installed according to the requirements of Article 701.14 and Article 720.04. The signs shall be 7 ft (2.1 m) above the near edge of the pavement and shall be a minimum of 2 ft (600 mm) beyond the edge of the paved shoulder. A minimum of two (2) posts shall be used.

The attachment of temporary signs to existing sign structures or sign panels shall be approved by the Engineer. Any damage to the existing signs due to the Contractor's operations shall be repaired or signs replaced, as determined by the Engineer, at the Contractor's expense.

Signs which are placed on overhead bridge structures shall be fastened to the handrail with stainless steel bands. These signs shall rest on the concrete parapet where possible. The Contractor shall furnish mounting details for approval by the Engineer.

Method of Measurement.

This work shall be measured for payment in square feet (square meters) edge to edge (horizontally and vertically).

All hardware, posts or skids, supports, bases for ground mounted signs, connections, which are required for mounting these signs will be included as part of this pay item.

Basis of Payment.

This work shall be paid for at the contract unit price per square foot (square meter) for TEMPORARY INFORMATION SIGNING.

PUBLIC CONVENIENCE AND SAFETY (D-1)

Effective: May 1, 2012

Revised: July 15, 2012

Add the following to the end of the fourth paragraph of Article 107.09:

"If the holiday is on a Saturday or Sunday, and is legally observed on a Friday or Monday, the length of Holiday Period for Monday or Friday shall apply."

Add the following sentence after the Holiday Period table in the fourth paragraph of Article 107.09:

"The Length of Holiday Period for Thanksgiving shall be from 5:00 AM the Wednesday prior to 11:59 PM the Sunday After"

Delete the fifth paragraph of Article 107.09 of the Standard Specifications:

"On weekends, excluding holidays, roadways with Average Daily Traffic of 25,000 or greater, all lanes shall be open to traffic from 3:00 P.M. Friday to midnight Sunday except where structure construction or major rehabilitation makes it impractical."

TRAFFIC CONTROL AND PROTECTION, (SPECIAL)

Specific traffic control plan details and Special Provisions have been prepared for this contract. This work shall include all labor, materials, transportation, handling and incidental work necessary to furnish, install, maintain and remove all traffic control devices required as indicated in the plans and as approved by the Engineer.

When traffic is to be directed over a detour route, the Contractor shall furnish, erect, maintain and remove all applicable traffic control devices along the detour route according to the details shown in the plans.

Method of Measurement: All traffic control indicated on the traffic control plan details and specified in the Special Provisions will be measured for payment on a lump sum basis.

Basis of Payment: All traffic control and protection will be paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (SPECIAL).

Temporary pavement markings will be paid for separately unless shown on a Standard.

GENERAL REQUIREMENTS

RECORD DRAWINGS

The Record Drawings for the existing Brandon Road Bridge over the Des Plaines River are available at the Illinois Department of Transportation, 105 Bridge St, Joliet, IL. Contact: Sarah Wilson at 847-705-4180.

GENERAL CONSTRUCTION PROCEDURES

Description: The Contractor shall complete all construction operations according to the Contract Plans, applicable Standard Specifications, Detail Specifications, and as directed by Engineer. The Contractor shall not commence with construction operations until the required obligations for structural stability, verification of dimensions; procedure requirements, right-of-way, and systems coordination as detailed in these specifications are fulfilled to the satisfaction of the Engineer.

Structural Stability: The Contractor shall be responsible for the stability of the movable spans in all phases of construction. Prior to the replacement of steel members detailed on the Structural Drawings, the Contractor shall submit a construction procedure showing each step of the removal and replacement process. The Contractor shall also submit calculations sealed by a Licensed Structural Engineer registered in the state of Illinois showing that all members will remain stable and not become overstressed during any step of the removal and replacement process. All submittals shall be approved by the Engineer prior to replacement of steel members.

Verification of Dimensions: Plan dimensions and details relative to the existing structure have been taken from existing plans and are subject to nominal construction variations. It shall be the Contractor's responsibility to verify such dimensions and details in the field and make the necessary approved adjustments prior to construction or ordering of materials. Such variations shall not be cause for additional compensation for a change in Scope of Work. However, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.

Procedure Requirements: To satisfy navigational requirements, the Contractor shall complete all construction operations detailed in the Contract Plans and Specifications.

Basis of Payment: The cost of complying with the requirements of this specification section shall be considered incidental to the contract.

RELATIONS WITH COAST GUARD

As required by the U.S. Coast Guard, the Des Plaines River must remain navigable at all times. Accordingly, marine traffic shall not be interrupted by this project. The Contractor will be responsible for maintaining a navigable channel through the project area at all times. The Contractor is required to follow all rules and regulations of the U.S. Coast Guard. It is the Contractor's responsibility to keep the Coast Guard apprised of the work schedule. Minimum channel widths as shown on the plans must be maintained. If it is determined later that the barge inhibits vessel movements while placed inside the draw, then this determination may be revised. If the work barge needs to be moved and placed across the channel, away from the sides, at any time, then additional coordination will be necessary to ensure safe, clear passage for vessel traffic. If the bridge navigation lights are affected during the rehabilitation, then temporary navigation lights must be installed. Additionally, required lighting must also be displayed on the work barge at night and during non-work hours. The Coast Guard office (Eighth Coast Guard District, 1222 E. Spruce Street, St. Louis, MO 63103-2398), must be notified at least 30 days prior to the start of the work or placement of a barge in the waterway. Authorization to perform the work and place equipment in the waterway will be provided at that time.

It is also the responsibility of the Contractor to coordinate with other work in progress in the vicinity of Brandon Road Bridge, to minimize disruption to river navigation. Work must be coordinated to avoid "snaking" river traffic back and forth across the channel. Contractor is not allowed to contact the Coast Guard directly, all correspondence shall be routed and approved by IDOT.

All work required to comply with Coast Guard closure and navigation requirements shall be included in the total contract.

CONSTRUCTION SITE ACCESS

The Contractor is required to provide access for the Engineer to all construction site locations and work activities taking place throughout the duration of the project. The access will be needed in order for the Engineer to perform the appropriate construction evaluation and inspection of the Brandon Road Bridge and other pertinent work that is included in the contract.

REMOVE AND RE-ERECT EXISTING BRIDGE RAIL

Description: This work consists of removing and re-erecting a section of top rail of the existing bridge railing to install the missing splice at the location as shown on the plans and according to the plan details.

Construction Requirements: This removal and re-erection of the existing railing shall be accomplished in a manner that will avoid scratching, denting or other damage that may affect the durability or appearance of the railing.

The railing section shall be cleaned, checked for any damage, and the finish touched-up. The railing section if damaged by the removal operation shall be replaced in-kind by the Contractor at no additional cost. The work shall be as directed by the Engineer.

After the installation of the splicer, the railing section shall be mounted to the railing posts with new bolts. Existing rail to rail post bolts shall not be reused.

Threaded rods, bolts, nuts and washers shall conform to AASHTO M 164 (M 164M) for steel railing and posts. All threaded rods, bolts, nuts and washers, shall be galvanized according to AASHTO M 232 (M 232M).

Method of Measurement: This work will be measured in feet. The length paid for will be the overall length along the rail from end to end, in place, at the location of re-erection.

Basis of Payment: This work will be paid for at the contract unit price per foot for REMOVE AND RE-ERECT EXISTING BRIDGE RAIL, which price shall include removal, temporary storage if needed, splice installation, re-erection, and all new hardware required to satisfactorily complete the work. The cost of splice shall be paid for under STRUCTURAL STEEL REPAIR.

OPEN GRID DECK SYSTEMS

Description: This work shall consist of removing selected panels of the existing open grid steel deck and replacing with new panels as shown in the plans. The work shall include removing and reinstalling the existing steel rails as necessary to accomplish the work. The work shall include repairs to selected existing cracked welds of the deck panels which are to remain. The Contractor shall furnish all materials, equipment, labor and other essentials to accomplish this work and all other work described herein and as directed by the Engineer.

Materials: The materials for this work shall meet the quality requirements of Article 1006.04 of the Standard Specifications, except as noted in the plans and these Special Provisions.

The steel grid deck panels shall be as shown in the plans as manufactured by one of the following (or equal):

Bailey Bridges, Inc.	(256) 845-7575
IDS	(412) 682-3041
LB Foster	(412) 928-3452

Further information may be obtained from:

Bridge Grid Flooring Manufacturers Association (BGFMA)
300 East Cherry Street
North Baltimore, OH 45872
Tel: 1-877-257-5499
Fax: 419-257-0332
www.bgfma.org

The steel grid deck shall be fabricated using ASTM A36/A709 Grade 36 steel. Welding shall be in conformance with established grid industry practice, including the permitted use of Gas Metal Arc Welding (MIG). Weld qualification and weld procedures shall be in accordance with Article 505.04 (q) of the Standard Specifications and shall be approved prior to deck panel fabrication.

Unless otherwise specified, bolts, nuts and washers shall conform to the specifications of ASTM A325, ASTM A563, and ASTM F436 respectively. All fasteners shall be galvanized in accordance with ASTM A153/A153M.

The panel layout shall match in-kind the existing layout. It shall be the Contractor's responsibility to field verify all dimensions in order to make necessary changes prior to fabrication. The fabricator shall develop the layout and detail it on the shop drawings.

Galvanized coatings shall conform to ASTM A123/A123M. Any defects in galvanizing shall be repaired as specified in ASTM A780.

Construction Details

Steel Grid Deck: The steel grid deck shall be fabricated to the dimensions and properties as shown on the plans and shop drawings. Weld sizes shall be in conformance with established grid industry practice unless otherwise indicated on the contract plans.

After the attachment of plates, and other components as described in the plans and specifications, the grid panels shall be galvanized in accordance with ASTM A123/A123M.

To avoid embrittlement of field welds, zinc shall be essentially absent within a quarter inch of the area to be welded. To avoid zinc in weld areas, a product such as "Galva-Stop" may be applied before galvanizing to prevent the coating from adhering. Alternatively, properly performed grinding may be permitted by the Engineer to remove zinc provided that the maximum thickness of zinc remaining after grinding is 1 mil (0.001"). The Contractor must demonstrate to the satisfaction of the Engineer a means for visually distinguishing between ground zinc and ground steel. After welding, the grid and beam area shall be cleaned and spot painted with a high zinc content spray ("cold galvanizing") or with the aluminum-epoxy mastic.

The steel grid deck panels shall be fabricated within the following tolerances:

Panel Length (L)	±0.25" (in the direction of main bar)
Panel Width (W)	+0, -0.125" (in the direction of cross bar)
Squareness (Diagonals 'D1' and 'D2')	$ D1-D2 \leq 0.5"$
Longitudinal Camber	0.003*L
Transverse Camber	0.004*W
Sweep (side bow) ('L' in feet, tolerance in inches) (See Note 1)	0.025*L (for L ≤ 40'-0") 0.00065*L ² (for L > 40'-0")
Main Bar Verticality	0.04*H ('H' = full bar height) (See Note 2)
Cross Bar Verticality	0.04*H ('H' = full bar height) (See Note 2)
Bar Spacing (Main Bar & Cross Bar)	±0.125" center to center (See Note 2)

Note 1: Sweep tolerances applicable for galvanized panels with standard puddle welds connecting components and diagonal grids less than 25' in length.

Note 2: No more than 1% of all locations can violate specified tolerance.

Lifting locations and procedures shall be included on the shop drawing submission. Care shall be taken to avoid twisting of the panels or bending of the panels in the weak (perpendicular to main bar) direction. Use of multiple pick points is recommended. Steel grid panels must be properly blocked with wood (with due regard to built-in panel camber) during transportation and storage in order to avoid distortion or other damage.

Field Installation: After removal of the designated panels, grind smooth and paint the remnants of the existing welds to the supporting structural steel.

Installation shall be in accordance with this specification and the most recent version of BGFMA TS-02, "Installation Tolerances and Guidelines for Open Grid Decks," published by the Bridge Grid Flooring Manufacturers Association. The steel grid deck panels shall be installed within the following tolerances:

- 1.) Alignment: Main bearing bar and cross bar misalignment between adjacent grid deck panels shall be no more than 1/4".
- 2.) Gap: Distance between main bearing bars and cross bars between adjacent grid deck panels shall be between 0 and 1/2".

The fracture critical bascule girders top flange shall be ground smooth to remove all existing welds from locations where existing panel is being removed. Perform NDT on all previous weld locations on girder top flange. Use clamps as shown on the plans to attach the new panel to girder top flange only. Cost of performing NDT on exiting welds and clamping system will not be paid separately and shall be included in Open Steel Floor Pay Item.

Panels will be delivered to the job site free from any defects and bearing the proper identifying marks. Check the panels for defects and identification. Repair or replace the grid panels or metal forms damaged during shipment and storage, to the satisfaction of the Engineer.

The Contractor will not be permitted to stock pile new or removed deck panels on the bridge.

The removed grid deck panel shall be salvaged and be given to IDOT.

Position panels on the beams and align with adjacent panels. Measure from fixed points to avoid cumulative error. Adjustment to proper elevation shall be made through the use of approved shims or other means. Square up panels as necessary.

The Contractor shall reinstall the bridge rails, matching in-kind the existing anchorage details and replacing with new materials any fasteners which are loosened during removal and reinstallation of the guide rails. At no additional cost to the Contract, the Contractor shall replace any rail materials which are damaged during removal and replacement.

Repair of Existing Welds: As shown on the plans and as directed by the Engineer, the Contractor shall inspect all welds for any cracks in addition to the panels identified on the plans with crack welds and repair all cracked welds of the existing deck panels which are to remain. Where space permits (within a distance of 3 inches), existing cracked welds may be repaired by placing a new weld adjacent to the broken weld. In the absence of available space the Contractor shall remove the existing weld by grinding and shall then replace the weld. Weld sizes and spacing shall be in accordance with the plan details. The previously stated prohibitions against welding over zinc and the methods for protective coating of the weld areas shall apply to the repair welds.

Method of Measurement: Steel grid deck panels shall be measured in square feet as the total gross area of the new grid deck panels installed. Measurements will be taken from the outside edge to outside edge of each the grid panel in both directions. This work shall include all materials, equipment, and labor necessary to remove and dispose of the existing open steel floor and install the new open steel floor as detailed on the Plans, specified herein, and as directed by the Engineer. Repair of existing open steel floor welds shall be measured per each panel with multiple cracks.

Basis of Payment: This work will be paid for at the contract unit price per square foot for OPEN STEEL FLOOR and at the contract unit price per each panel for REPAIR OF EXISTING OPEN STEEL FLOOR WELDS.

STRUCTURAL STEEL REPAIR

Effective: December 15, 2000

Revised: January 1, 2007

Description: This work shall consist of furnishing all labor, equipment and materials necessary to furnish and install steel repair plates and members, according to Section 505 and removal and disposal of structural steel members as necessary according to Section 501 of the Standard Specifications, as indicated on the plans and in this special provision.

Construction Requirements: Existing members noted in the plans to have structural steel repair, that are also noted to be straightened, shall be straightened prior to the connection of any new steel repair plates or members. If beam straightening is required, it shall not be included in this item and shall be paid for separately.

Where required to align with existing holes, field drilling of holes in new members shall be accomplished using existing holes as a template unless field measurements are used to verify the plan dimensions. Burning of holes will not be permitted. All field drilling and grinding necessary to furnish and install the new steel plates and members shall be included in this item.

The removal and disposal of any existing members, bolts or rivets necessary for the installation of the new members as shown in the plans shall be included in this item. Burning of existing rivets will only be allowed near steel surfaces which are to be removed and discarded. Burning of existing rivets will not be allowed for members to remain in place or members that are to be removed and reinstalled. When burning of rivets is not allowed, the head of the rivet shall be sheared off and the shank driven or drilled out. Extreme care shall be taken while removing the rivets so as not to damage the existing structural steel which is to remain. All damage to existing members which are to remain shall be repaired or the member replaced to the satisfaction of the Engineer. Repair or replacement of damaged members shall be at the Contractor's expense.

Basis of Payment: This work shall be paid for at the contract unit price per pound (kilogram) for STRUCTURAL STEEL REPAIR.

BEAM STRAIGHTENING

Description: This item shall consist of furnishing all material, equipment and labor to straighten both the deformed bascule girder webs designated on the plans as directed by the Engineer.

Construction Requirements: The Contractor shall mechanically straighten the girder webs designated on the plans utilizing jacking and/or pulling methods. The Contractor shall provide and locate jacking/pulling units to satisfactorily straighten the webs to the limits contained herein. The use of heat will not be allowed to facilitate the beam straightening process.

The reaction to the horizontal force required to straighten the webs may be transmitted by pulling against stiff, steel vertical braces bearing against the top and bottom flanges of the girders. The braces shall be designed to transmit the loads directly to both the top and bottom girder flanges equally, and shall be secured to and held by the flanges. The pulling unit shall bear against blocking and/or plates against the web to transmit the force. The contractor may opt to provide and firmly connect stiff vertical braces on both sides of the web to jack against the web. The jack(s) shall bear against plates to transmit the force to the webs.

The webs shall be straightened as near plumb as practical but not to exceed the "as built" sweep, camber or rolling distortions of the flanges.

Any hole drilling to the bascule webs performed to complete this work shall be within the limits of the final Web Repair Plates and stiffening details shown in the plans.

Submittal Requirements: The contractor shall submit his plan and method of beam straightening with equipment to be used and any applicable design stamped by a licensed structural engineer in the State of Illinois for approval by the Engineer prior to ordering materials and performing straightening work.

Basis of Payment: The work as specified herein shall include all materials, equipment and labor necessary to satisfactorily straighten the girder webs and shall be paid for at the contract unit price per each for BEAM STRAIGHTENING.

STEEL GRID DECK REPAIRS

Description: This item shall consist of furnishing all material, equipment and labor to install an end trim bar to the existing grid deck panels as indicated on the plans and as directed by the Engineer.

Construction Requirements: As shown on the plans and as directed by the Engineer, the Contractor shall repair the existing panels at the rear and center breaks by field welding a continuous galvanized end trim bar to the existing cantilever secondary bars as detailed on the plans. Any broken tertiary "D" bars and diagonal bars shall also be repaired by welding a galvanized bar at these locations as directed by the Engineer.

The ends of the secondary bars may need to be trimmed to accommodate the thickness of the end bar. The Contractor shall mechanically trim the existing secondary bars at the locations marked on the plan. No flame cutting of the secondary bars shall be allowed. The Contractor shall take extreme care not to damage any adjacent grid deck elements.

The end trim bars and tertiary bars shall be galvanized as per special provision for Open Steel Floor.

Basis of Payment: The work as specified herein shall include all materials, equipment and labor necessary to satisfactorily install the end trim bars to the existing steel grid deck panels and replacement of any missing/broken tertiary bars shall be paid for at the contract lump sum price for STEEL GRID DECK REPAIRS.

TEMPORARY SUPPORT SYSTEM

Description: This work shall consist of designing, furnishing, installing and subsequent removal of the temporary support systems shown on the plans.

General: A temporary support system shall be installed at the existing piers called out on the plans prior to commence any repair work on jack columns. Each system shall be designed to support the allowable loads called out on the plans and shall be constructed to adequately support the dead load from the superstructure. No live load will be allowed during the rehabilitation of jack columns.

The system shown on the plans is a general representation of a possible support system. The contractor shall employ an Illinois Licensed Structural Engineer to design the final system.

Construction: The Contractor shall verify locations of all existing machinery and utilities before installing any of the temporary support system components. 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 Department. The temporary support system shall be installed according to the approved plans designed by an Illinois Licensed Structural Engineer, or as directed by the Engineer. No removal of the existing superstructure or substructures will be allowed until the temporary support systems are in place.

The temporary support system shall be removed and disposed of by the Contractor when the rehabilitation of jack columns is complete or as directed by the Engineer. Removed system components shall become the property of the Contractor.

The Contractor shall submit details and calculations, prepared and sealed by an Illinois Licensed Structural Engineer, of the temporary support system he/she proposes to use (for each location where support is required) for approval by the Engineer before ordering of material and installation of the support systems. Such approval shall in no way relieve the Contractor of responsibility for the safety of the structure.

Method of Measurement: The temporary support system furnished and installed according to the plans or as directed by the Engineer will be included for payment. Installation at each pier shall constitute one Temporary Support System.

Basis of Payment: This work shall be paid at the contract unit price of each for TEMPORARY SUPPORT SYSTEM, which price shall be payment in full and shall include all design, labor, materials and equipment necessary to complete the work as required.

MECHANICAL SPECIAL PROVISIONS

GENERAL

SCOPE OF WORK

- i. Brandon Road Rehabilitation of Mechanical Machinery work consists of furnishing all labor, equipment and materials as shown in the Contract Plans and as specified herein. Mechanical work includes supplying, installing, adjusting, painting, lubricating and testing to place in correct, satisfactory operating condition the mechanical elements specified in the contract documents.
- ii. Work includes supplying all labor, materials, tools, services, and equipment required to perform the installation, rehabilitation, adjustment, and testing of the mechanical elements. All machinery items are to be modified, replaced, or installed as indicated in the Contract Plans and these Special Provisions. All new equipment shall be installed with new fasteners, where fasteners are used.

Work shall include the following:

- a) Remove existing span drive motor brakes, motor brake wheels, and motor brake mount. Return existing span drive motor brakes, and motor brake wheels to owner.
- b) Remove existing span drive machinery brakes, machinery brake wheels, machinery brake wheel couplings, and machinery brake mount. Return existing span drive machinery brakes, machinery brake wheels and machinery brake wheel couplings to owner.
- c) Remove existing center lock actuator, lockbar, and rear guides. Return actuators, lockbar, and rear guide to owner.
- d) Remove existing tail lock actuators. Return actuators to owner.
- e) Remove existing air buffer cylinders. Contractor to dispose of buffer cylinders.
- f) Provide and install new span drive motor brakes, motor brake wheels, motor brake enclosures, and motor brake mounts.
- g) Provide and install new span drive machinery brakes, machinery brake wheels, machinery brake wheel couplings, machinery brake enclosures, and machinery brake mounts.
- h) Provide and install new center lock operator. Realign existing center lock guides and receivers.
- i) Provide and install new tail lock actuators and pins connecting actuator to rotating catch.
- j) Provide and install new air buffer cylinders.
- k) Perform initial balance testing, and final balancing testing of the main bascule leaves, adjusting final balance to recover initial balance condition, $\pm 5\%$.
- l) Provide and install new shims under live load shoes. Adjust shims in accordance with these specifications.
- m) Clean, inspect, and re-lubricate the tail lock machinery.
 - a. The tail lock machinery (base, bearings, and rotating catch) shall be cleaned, inspected, and re-lubricated using lubricant specified in the original design contract plans. Any corrosion on components to remain shall be removed using mechanical tools and primer and paint shall be applied to the clean steel components per the applicable section of these specifications.

A. RELATED WORK

TAIL LOCK ACTUATOR REPLACEMENT
CENTER LOCK ELECTRICAL REHABILITATION
CENTER LOCK REPLACEMENT
REPLACEMENT OF SPAN DRIVE MOTOR BRAKES AND SPAN DRIVE MACHINERY BRAKES
AIR BUFFER CYLINDER REPLACEMENT
STRUCTURAL REPAIRS
ROTARY LIMIT SWITCH REPLACEMENT
BRIDGE BALANCING

B. REFERENCES

- i. Portions or all of certain recognized industry or association standards or specifications referred to as a requirement in these Special Provisions are to be considered as binding as though reproduced in full herein unless supplemented and/or modified by more stringent requirements of the Contract Documents. Unless otherwise stated, the reference standard or specification which is current at the time of the Contract Documents are issued, will apply.
 - a) American Association of State Highway and Transportation Officials, LRFD Movable Highway Bridge Design Specifications. (AASHTO LRFD)
 - b) American Bearing Manufacturers Association - ABMA.
 - c) American Institute of Steel Construction - AISC.
 - d) Association of Iron and Steel Engineers - AISE.
 - e) American Iron and Steel Institute - AISI
 - f) American National Standards Institute - ANSI.
 - g) American Society of Mechanical Engineers - ASME.
 - h) American Society for Testing and Materials - ASTM.
 - i) American Welding Society - AWS. ANSI/AWS D1.1/D1.1M:2010, Structural Welding Code.
 - j) International Organization for Standardization - ISO.
 - k) National Electrical Contractors Association - NECA.
 - l) National Electrical Manufacturers Association - NEMA.
 - m) National Fluid Power Association - NFPA.
 - n) National Lubricating Grease Institute - NLGI.
 - o) Occupational Safety and Health Act - OSHA.
 - p) Society of Automotive Engineers - SAE.
 - q) Steel Structures Painting Council - SSPC.
 - r) Underwriters Laboratories - UL.

C. QUALITY ASSURANCE

- i. All materials shall be supplied by manufacturers who have supplied similar materials for similar applications for a period not less than ten (10) years. Products used in this work shall be produced by manufacturers regularly engaged in the manufacture of the specified products. Where two or more units of the same class of equipment are required, these units must be products of the same manufacturer.
- ii. For the fabrication, installation, cleaning, painting, aligning, testing, and all other work required for the mechanical systems, use adequate numbers of skilled, trained, and experienced mechanics who are thoroughly familiar with the requirements and methods required for the proper execution of the work. Provide personnel and supervisory personnel with a minimum of two jobs as previous experience in the installation of hoisting machinery of this size or larger. Contractor's superintendent, who is fully authorized to act on behalf of the Contractor, shall be continuously present at the site during the work. The Contractor will be responsible for repairs of all damage to the bridge, the bridge buildings, the bridge equipment, and other surroundings that result from the contractor's operations.

- iii. For the installation, adjustment, and alignment of all specialized machinery components, provide for the presence, at the job site, of manufacturer's service personnel skilled in these specialties. Such service personnel shall be properly equipped with all necessary instruments to assure that related components have been installed within acceptable tolerances and to make all necessary adjustments for attaining the specified ratings. Contractor shall perform any required alignment adjustments as directed by the manufacturer's representative.
- iv. Contractor shall have a minimum of ten years' experience in the assembly and installation of industrial quality mechanical equipment of the type required under this contract. Submit documentation of previous experience for verification and approval. Include a brief description of each project, the owner and contact person's name and current phone number for each project listed.
- v. A quality assurance (QA) program shall be prepared for the project by the contractor for all bridge machinery work. All QA program documentation must be submitted that includes but is not limited to the following:
 - a) Welding Procedure Specifications.
 - b) Welding Procedure Qualification Records.
 - c) Workers Welding Certificates.
 - d) QA/QC programs for individual fabricators.
 - e) Work Plan.
 - f) Material Test Reports.
 - g) Test Results for the mechanical elements.
- vi. Prepare submittals for bridge machinery under the responsible charge of one lead Engineer who shall coordinate the work with other components of the design and construction.
 - a) Submit shop drawings, product data, catalog cuts and certifications for approval according to the requirements of these Special Provisions for all mechanical equipment proposed for purchase or being fabricated.

D. SUBMITTALS

- i. No final drawings for a particular item can be submitted until the comments are resolved and IDOT approval is given. No work shall begin on the particular item until comments are resolved and IDOT approval is given. The contractor shall allow 21 days for the review of submittals and 7 days for processing in and out of the office. If more than one component is submitted within a seven-day period, an additional 7 days will be allowed for the reviews. Submittals shall be approved by the contractor, as indicated with the contractor signature, prior to submission for review.

E. SHOP DRAWINGS

- i. Shop drawing submittals shall comply with IDOT Standard Specifications for Road and Bridge Construction and herein.
- ii. Submit shop drawings for complete systems and related or interconnected equipment together. Partial or incomplete submittals will not be accepted for review. Coordinate the work of machinery component manufacturers where components interface. Contractor shall review and approve all shop and working plans to coordinate the proper configuration and assembly of the various machinery components prior to submission for approval. All equipment shall be shown in place in the structural and architectural building backgrounds.

- iii. State grade and extent of finish machining, with all tolerances and allowances, for each part for which a specific fit is required. Finished surfaces shall be as defined by the ANSI B46.1, Surface Texture; and fits shall be as defined by the ANSI B4.1, Preferred Limits and Fits for Cylindrical Parts, unless otherwise stated herein, ANSI B4.1 shall also apply to fits for non-cylindrical parts.
- iv. Show manufactured components in outline on drawings, with sufficient dimensions and data to determine the clearances required for installation and operation. Manufacturer's certified dimension prints shall state the name of the job; pertinent ratings of the equipment; and shall indicate, where applicable, the provisions for adding, draining, and checking the level of lubricant; the method of lubrication and type of fittings; and the location of inspection openings.
- v. Specific steps in fabrication shall be outlined in sequence.
- vi. Clearly indicate heat treatment, stress relieving, normalizing, tempering, and all other processes.
- vii. Weld types and joint sizes shall be shown on the shop drawings. Welding procedures shall be submitted in accordance with AWS D1.1, Structural Welding Code, and shall include:
 - a) Temporary welds, tack welds, jigs and other temporary measures required for construction of the elements shall be shown.
 - b) All weld processes, including pre-qualified and contractor proposed welding procedures.
 - c) Detailed welding drawings, weld sequencing plan, including proposed inspection plans, repair procedures, and welder qualifications.
 - d) Procedures for controlling distortion of elements.
 - e) Disposition rates, preheat and inter pass temperatures, sequencing, inspection controls by the contractor and other related items for the control of welding.
- viii. Furnish complete data regarding the design and construction of all manufactured items to be furnished as part of the machinery under this Contract, including material specifications, cross-sectional assembly drawings, detail drawings of component parts, characteristic curves, and the dimensions of principal elements.
- ix. Complete shop bills of materials shall be made for all machinery parts. If the bills are not indicated on working drawings, submit prints of the bills for review in the same manner as specified for the drawings. State the weight of each piece of machinery on the shop drawing upon which it is detailed or billed.
- x. Shop drawings shall give identifying marks and essential dimensions for locating each part or assembled unit.

F. CLOSEOUT SUBMITTALS

- i. Submit drawings of all materials, as fabricated, following fabrication. Any deviations from the Design Plans or approved shop drawings shall be clearly indicated. These drawings shall be stamped "As Built", immediately above the title block.

G. DELIVERY, STORAGE, AND HANDLING

- i. Delivery, storage, and handling of materials and equipment shall be in strict accordance with manufacturer's recommendations.
- ii. Coat finished metal surfaces and unpainted metal surfaces that might be damaged by corrosion as soon as practicable after disassembly or finishing with a corrosion preventative compound. Remove coating from all surfaces prior to assembly and painting after installation.

- iii. Protect all machinery parts from weather, dirt and all other injurious conditions during disassembly, manufacture, shipment and while awaiting erection. Protect all shaft journals that are shipped disassembled from their bearings during shipment and before erection by a packing of oil-soaked fabric secured in place by burlap and covered with heavy metal thimbles or heavy timber lagging securely attached. Take every precaution to ensure that the bearing surfaces will not be damaged and that all parts shall arrive at their destination in satisfactory condition.
- iv. Mount assembled units on skids or otherwise crate for protection during handling and shipment.
- v.

I. MATERIALS

A. STANDARD PRODUCTS

- i. All equipment and materials furnished under the items specified herein shall be new. All equipment, materials and workmanship shall be first class in every particular manner.
- ii. Materials and equipment not being fabricated as unique items to this installation shall be essentially the standard catalogued products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest standard design that complies with the specification requirements. Materials and equipment shall essentially duplicate items that have been in satisfactory commercial or industrial use at least two years prior to bid opening. Where two units of the same class of equipment are required, these units shall be products of a single manufacturer. Each major component of equipment shall have the manufacturer's name and address and the model and serial number on a nameplate, securely affixed in a conspicuous place. The nameplate of the distributing agent will not be acceptable.

B. MANUFACTURER'S RECOMMENDATIONS

- i. Storage, delivery, and installation of materials or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed. Printed copies of these recommendations shall be furnished to the Engineer prior to fabrication. Fabrication of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material. Provide as part of the work all special machining and installation required by the component manufacturer.
- ii.

C. STRUCTURAL STEEL

- i. Steel components of manufactured items shall conform to the materials recommended by the manufacturer.
- ii. Provide suitable supports, structurally adequate.
- iii. Mill top surfaces of all new supports after fabrication to provide a uniform surface. All surfaces requiring milling shall have adequate material allowance for milling to the minimum finish dimensions required.
- iv. Weldments for machinery base supports shall be neat and shall have all exposed sharp corners and edges removed. Mounting surfaces of the frames shall be straight and flat such that full contact with the equipment being supported is obtained.
- v. All welding required herein or called for on the plans shall be done in accordance with the requirements of AWS D1.1, Structural Welding Code.

- vi. Treat all welding and weldments supporting machinery as main members and all welding as joining primary components. All welds shall be performed and inspected as welds subject to both tension and compression.
- vii. Weldments shall be stress relieved by heat prior to final machining. The fitting up and welding procedure shall be such that distortion of the work will be a minimum. If necessary to obtain this result, suitable welding fixtures shall be used. The Contractor shall submit welding procedures, together with the working drawings for the parts to the Engineer for approval.
- viii. All welds shall be inspected by magnetic particle tests on at least 10% of the length of each size and type weld. Location of tests shall be selected at random so as to be typical for each size and type of weld. Inspection of welds and basis of acceptance shall be in accordance with the requirements of Section 6 of AWS.
- ix. All field welds shall be stress relieved unless otherwise indicated within these Special Provisions or unless specific written permission is granted to omit the stress relieving process for each particular weld. The Contractor shall submit his proposed weld procedures for all field welds. Proposed stress relieving procedures will be required to be included in the weld procedures before approval will be granted.

D. CASTINGS

- i. Castings shall be true to pattern in form and dimensions, free from pouring faults, sponginess, cracks, blow holes, and other defects in positions affecting their strength and value for the service intended. All castings shall be sandblasted or otherwise effectively cleaned of scale and sand, to present a smooth, clean, and uniform surface. All unfinished edges of castings shall be neatly cast with rounded corners, and all inside angles shall have ample fillets. All surfaces requiring finish shall have adequate material allowance for machining to finish dimensions. Machined bosses shall be provided on cast steel machinery parts to give proper seats for bolt heads and nuts.
- ii. Blow holes appearing upon finished castings shall be so located that a straight line laid in any direction will not cut a total length of cavity greater than one inch in any one foot, nor shall any single blow hole exceed one inch in any dimension or have an area greater than one-half square inch. Blow holes shall not have a depth injuriously affecting the strength of the casting. Minor defects which do not impair the strength may, with approval by the Engineer, be welded by an approved process and be inspected by magnetic particle examination, performed by the Contractor at no additional cost to the Contract. The defects shall be removed to solid metal by chipping, drilling, or other satisfactory method, and, after welding, the castings shall be annealed, if required by the Engineer. Castings which have been welded without the Engineer's permission will be rejected.
- iii. All steel castings that have solid sections 4" thick or greater are to be ultrasonically tested in accordance with ASTM A609, Method A, Quality Level 3. Castings that do not pass this test may be rejected. Test results, whether positive or negative, are to be submitted to the Engineer.
- iv. All bronze castings are to be finished all over except as noted.

E. FORGINGS

- i. All forgings shall be reduced to size from a single bloom or ingot until perfect homogeneity is secured. The blooms or ingots shall have a cross-sectional area at least three times that required after finishing. No forging shall be done at less than a red-heat. Forged rounds for shafts shall be true, straight, and free from all injurious flaws, seams, or cracks. Forgings shall provide adequate material allowance for machining to finish dimensions. All forgings shall be thoroughly annealed before being machined.
- ii. All shafts shall be accurately finished, round, smooth, and straight; and when turned to different diameters, they shall have rounded fillets at the shoulders. All journal bearing areas on shafts and pins shall be accurately turned, ground, and polished with no trace of tool marks or scratches on the journal surface or adjoining shoulder fillets. Journal diameters shall be finished to the limits specified in AASHTO Specifications.

F. SHAFTING AND PINS

- i. Rolled material is to be acceptable for shafting and pins up to 4" diameter. Larger diameter shafts and those having integral flanges or pinions are to be forged. Forged shafts over 8" in diameter are to have a hole bored lengthwise through the center. The diameter of the hole are to be about 1/5 the diameter of the shaft.
- ii. All shafts are to conform to tolerances in ASTM A29 unless otherwise indicated. Turned, ground and polished shafting straightness tolerances are to be 0.002" per foot for shafts up to and including 1 1/2" in diameter and 0.003" per foot for shafts over 1 1/2" in diameter.
- iii. Each end of all shafts, when finished to the required lengths, is to have a 60-degree lathe center, with clearance hole, at the exact center of the shaft. Shafts that are bored with an inspection hole are to have the ends prepared for the attachment of a centering device equivalent to the lathe center. Furnish all such devices as part of the work.
- iv. Where shown on the Contract Plans, stepped shafts are to have fillets blended in smoothly to adjacent surfaces without tool marks or scratches. Unless otherwise required herein or on the drawings to have a finer finish, the surfaces are to have an ANSI maximum roughness of 63 micro-inches.
- v. Test all shafting for its mechanical properties, and furnish a material test certificate to the Engineer. Each finished shaft is to be free from camber and is to run without vibration, noise, or chatter at all speeds up to and including 120% of the maximum operating speed.

G. KEYS AND KEYWAYS

- i. Keys and keyways shall be provided between couplings or clutches and their respective shafts. Keys and keyways are to conform to the dimensions and tolerances for rectangular and flat keys of ANSI Standard B 17. 1, Keys and Keyseats, unless otherwise specified. All keys are to be effectively held in place, preferably by setting them into closed-end keyways milled into the shaft. The ends of all such keys are to be rounded to a half circle of diameter equal to the width of the key. Keyways are to have a radius in the inside corners. Keyways are not to extend into any bearing. If two keys are used in a hub, they are to be located 120 degrees apart and in line with wheel arms where practicable.
- ii. Unless otherwise specified herein or in the Contract Plans, keys shall be machined from alloy-steel forgings, ASTM A668, Class K. Keys shall have a FN2 fit at the sides of the key slot and a RC6 fit between the top and bottom. Keys shall be finished to 63 micro inch all around.

H. COUPLINGS

- i. All couplings and shaft fits and finishes shall meet the requirements of AASHTO specifications for hubs on shafts. Couplings shall, in general, be finish-bored and have keyways cut by the Coupling Manufacturer to dimensions and tolerances established on the working drawings and then shipped to the manufacturers of the various components for shop installation on the shafts.
- ii. Gear and grid couplings shall have provisions for lubricating all contact surfaces and the housings shall be oil-tight under all operating conditions.

I. BEARING AND BUSHINGS

- i. Bearings and bushings shall be as specified herein. All bearing and bushing fits and finishes shall be in accordance with AASHTO.
- ii. Sleeve bearing (bushing) cap bolts shall be secured with double hex nuts and base bolts are sub-drilled in the shop 0.030 inch under bolt shank diameter to permit field reaming. The cap shall be equipped with an Alemite large button head lubrication fitting. Sleeve bearings shall be furnished with 1/4 inch thick brass liners consisting of one solid piece 0.125 inch $+0.002"/-0.000"$ thick and one piece 0.125 inch $+0.002"/-0.000"$ thick in 0.003 inch laminations between the cap and bearing base for clearance adjustments.
- iii. Bronze for bushings shall conform to the requirements for ASTM B22 Alloy UNS C91100 unless otherwise noted. All grease grooves shall be machine cut and smooth. The sides of all grease grooves shall be rounded to a radius of half the width of the groove.

J. SPAN DRIVE MOTOR BRAKES AND SPAN DRIVE MACHINERY BRAKES

- i. Mill Duty shoe type with an electro/hydraulic thruster type actuator; AC thruster type shoe brake, spring set and electrically released. The motor brakes are to be rated by the manufacturer for 155 ft-lbs and have 8 inch wheels. The motor brakes shall be factory set at 140 ft-lbs. The machinery brakes are to be rated by the manufacturer for 550 ft-lbs and have 13 inch wheels. The machinery brakes shall be factory set to 420 ft-lbs.
- ii. Furnish motor brakes and machinery brakes completely assembled with the Eldro type thruster model "Ed" actuator. All brakes shall be from the same manufacturer and the manufacturer must have a minimum of 10 years of supplying brakes for industrial applications.
- iii. The Hy-Thrust actuators must be the ELDRO type model "Ed" actuator manufactured by EMG. The actuator shall be actuated by a 480 Volt 3 phase 60 HZ, totally enclosed, squirrel cage ball bearing motor with moisture proof windings and cast-iron conduit box. The actuator motor shall be of ample capacity for the intended application. The rated stalled thrust of each actuator shall be not less than 135 percent of the thrust actually required to release the brake with the torque adjusted to the maximum continuous rated value. Motor brakes and machinery brakes are to set automatically when for any reason power is removed from the actuator motor.
- iv. Oil used in the thruster-operating chamber of the motor brake shall be hydraulic oil specifically recommended by the thruster manufacturer for low temperature operation. It shall have a free operating temperature range between -13 degrees below zero and 122 degrees above zero Fahrenheit. Throughout this temperature range there shall not be any material change of operating characteristics.

- v. All thrusters shipped, must be filled with hydraulic fluid at the factory prior to shipment. All thrusters must meet IP65 standards. The external thruster material shall be aluminum for light weight and corrosion protection. Thruster motors shall be rated for inverter duty operation. The motor shall be located in a separate dry section of the thruster, and air-cooled. Motors immersed in oil are not acceptable.
- vi. Each thruster shall be supplied with independent time delay valves adjustable between 0 and 5 seconds for both setting and releasing the brake. Only an internal time delay valve constructed of stainless steel is acceptable. Adjustment must be infinitely adjustable between the minimum and maximum settings. These adjustments must be allowable with the brake in full service. A single time delay for both setting and releasing is not acceptable. The release delay shall be factory set at one second. The set delay shall be factory set at three seconds. The reserve stroke of the actuator shall be properly set at the factory.
- vii. Provide each motor brake with a manual release lever and a latching type device for holding the brake in the released position. Mount hand release attachment permanently on the motor brakes and machinery brakes and arrange so that the motor brake can be released easily and quickly without the use of apparatus not permanently attached to the motor brakes and machinery brakes. Hand release shall not affect any torque setting or brake adjustment.
- viii. Hand release shall be capable of being released without removing the brake cover. Mechanism shall latch in both the released and non-active positions. It shall provide, at a minimum, 90% of the power release stroke and not inhibit the working stroke of the actuator when fully retracted.
- ix. Each motor brake shall contain 3 lever type limit switches for use in control and indicating circuits. The limit switches shall be oil and watertight (NEMA 4). All limit switches shall be NEMA rated and have two N.O. and two N.C. contacts. One limit switch shall actuate on positive setting of the motor brake shoes on the drum to indicate motor brake set. The second limit switch shall actuate on positive electrical release of the motor brake to indicate that the motor brake is electrically released. A third limit switch shall actuate when the latching hand release is engaged to indicate that the motor brake is manually released.
- x. Each motor brake shall be furnished with an enclosed external torque spring. This shall provide stepless torque adjustment down to 40% of the maximum brake torque. The actual setting must be visible from permanently mounted calibrated torque indicator provided on the torque spring assembly. The calibrated torque indicator shall be stainless steel or brass. At a minimum the torque indicator shall show the maximum, minimum, and recommended torque settings. The indicator shall show evenly space graduations between the minimum and maximum torque settings.
- xi. Include Auto Equalization to ensure that the motor brake shoes and brake wheel have an equidistant air gap between them. Auto equalization shall be adjusted by the brake manufacturer.
- xii. Motor brakes and machinery brakes shall not have an automatic adjustment for lining wear.
- xiii. A 304-stainless steel enclosure shall be provided for the motor brakes and machinery brakes. The new brake enclosures shall be supplied by the brake manufacturer and have a minimum rating of NEMA 3R. The new brake mounts shall accommodate attachment of the new enclosures. The enclosures shall have a shaft slot for the latching hand release, which must be outside of the enclosure. The motor brake cover is to have a slot for the motor shaft. The machinery brake is to have a slot for the motor shaft and machinery shaft.

- xiv. Stainless steel or brass nameplates permanently affixed to each motor brake must be engraved with, but not limited to, the following information:
 - a) Manufacturer.
 - b) Model number.
 - c) Maximum rated brake torque.
 - d) Recommended brake torque.
 - e) Brake lining material.
- xv. Stainless steel or brass nameplates permanently affixed to each brake actuating device must be engraved with, but not limited to, the following information:
 - a) Manufacturer.
 - b) Model number.
 - c) Push capacity of actuator.
 - d) Stroke of the actuator.
 - e) Volts, phase, Hz, watts.
 - f) Type of fluid required in reservoir.

K. SPAN DRIVE MOTOR BRAKES AND SPAN DRIVE MACHINERY BRAKES SHOP TESTING

- i. Submit detailed procedures for shop testing of the brakes for review by the Departmental Representative. Shop testing shall not commence until comments have been resolved.
- ii. Inspect and test all brakes in the manufacturer's shop prior to shipment in accordance with the written procedures. Contractor shall give no less than ten (10) working days' notice to the Departmental Representative of when the brakes will be ready for inspection and testing. The brakes shall be burnished prior to testing with a minimum of 60% contact. All brakes shall be inspected and tested at the same time. For each brake, the Contractor shall successfully demonstrate the following:
 - a) Proper adjustment of the engage and disengage delays.
 - b) Proper adjustment of the actuator reserve stroke.
 - c) Proper fluid level in the actuator.
 - d) Proper adjustment of the shoe gap and auto equalization.
 - e) Proper function of the manual disengage mechanism with locking in both the engaged and manually disengaged position.
 - f) Proper electrical and mechanical function of the limit switches.
 - g) Proper calibration of the torque scale shall be demonstrated by establishing the accuracy of the maximum rated holding torque, 40% of the maximum rated holding torque, and design holding torque scale readings. The measurements shall be repeated clockwise and counter clockwise, no less than ten times at each of the three scale readings for each brake. The brakes shall be released, drum rotated to a random position, and brake reset between each measurement. The measured static holding torque measurements shall be within 5% of the torque scale reading for all ten measurements at all three scale positions. For a given setting the clockwise and counterclockwise readings shall be within 5% of the torque scale reading. All testing shall be performed on calibrated rotating testing equipment. The brake shall be set to the required torque. The testing equipment shall increase the torque on the drum until the drum begins to rotate. The testing equipment shall record the maximum static break-away torque at the point the drum begins to rotate.

- iii. Upon successful completing of testing, the brake manufacturer shall set the brake to the required as-installed torque setting and provide a certificate of compliance. The certificate of compliance shall show the date, final brake torque setting, final set and release delay settings, final actuator reserve stroke setting, actuator fluid level, final shoe gap measurements, brake serial number, and all measured torque values. The certificate must certify that the brake has been properly adjusted and passed all tests before leaving the factory.

L. CENTER LOCK OPERATORS

- i. The center lock operators shall be of the size as indicated on the Plans. The lock bar operator and lock bar shall be supplied by the same manufacturer
- ii. Travel by the lock bar in each direction is governed by a two pole, snap-action limit switch. Limit switches shall provide two normally open and two normally closed contacts for each length of travel.
- iii. An ac snap-action interlock switch to be provided and wired such that when the protective cover is removed, this switch will interrupt the power to the lock bar motor for maintenance or manual operation. A safety interlock switch shall be included, which when properly wired into the motor controller circuits, interrupts power to the lock bar motor when the hand crank is used.
- iv. The lock bar operator shall consist of double reduction helical gears of heat treated alloy steel. Anti-friction bearings are to be used throughout. The unit shall be provided with a removable hand crank for manual operation with a protective cover for the shaft end.
- v. The lock bar operator shall have an 18-inch working stroke. The operation of the lock bar will take approximately 12 seconds to complete its 18-inch stroke. The lock bar operator should provide approximately 8,800 Lbs.
- vi. A high starting torque, induction type frame 145 motor is used. This motor has a speed of 1,800 rpm. It is wired for 3 phase, 60 hertz, 240/480 volts and has a 15-minute duty rating in which temperature does not exceed 55°C. Class b insulation is used. The totally enclosed non-ventilated, squirrel cage, ball bearing motor has a steel frame and end bell.
- vii. An adjustable motor mounted magnetic disc type brake is to be provided by the lock bar operator manufacturer. Brake to be rated 15 ft.-lbs. minimum torque for intermittent service and include a manual release.
- viii. Operators shall be rated by the manufacturer as suitable for a damp, marine environment.
- ix. Operator housing, mounting brackets, and fasteners shall be cleaned and painted with an inorganic, zinc rich primer and paint system indicated herein for the rest of the machinery and structural steel.
- x. The operator shall be tested prior to shipment. Notify the engineer a minimum of ten working days prior to shop testing of the operator. The operator shall be cycled a minimum of ten times. One cycle includes a complete extension of the bar followed by fully retracting the bar. The manufacturer is to set the limit switches to their proper positions so that the lockbar moves as indicated in the plans. The proper position of the limit switches is to be demonstrated during testing.

M. TAIL LOCK ACTUATORS

- i. Tail lock actuators shall have a 7.9-inch stroke and be rated for 175 pounds of thrust. The units shall fit into the existing mounting locations with no modification to the existing equipment to remain.
- ii. Actuators shall operate on 480 V a.c., 3-phase power, and include internal limit switches for controlling the range of operation
- iii. Actuators shall be rated by the manufacturer as suitable for a damp, marine environment.
- iv. Actuator trunnion mounting brackets shall be steel alloy. Brackets shall be provided by the actuator manufacturer. Brackets shall be cleaned and painted by the Contractor with an inorganic, zinc rich primer and paint system indicated herein for the rest of the machinery and structural steel.
- v. The tail lock actuator is to be shipped in its mid-stroke position (middle point between fully retracted and fully extended).

N. FASTENERS

- i. All bolts for connecting machinery parts to each other or to supporting members shall be as shown on the drawings.
- ii. Bolts shall be hex cap screws with dimensions conforming to the latest issue of ANSI B18.2 Square and Hexagonal Bolts and Nuts. Holes for finished body turned fasteners shall be individually reamed for an RC5 fit.
- iii. Bolts, cap screws and studs shall have turned shanks and cut threads. Bolts shall have semi-finished, washer faced, hexagonal heads. All finished shanks of turned fasteners shall be 0.040 inch larger in diameter than the diameter of the threads, which shall determine the head and nut dimensions. The shank of all turned fasteners shall have a Class RC5 fit in the finished holes in accordance with ANSI Standard B4.1. The material used for machined turned shank fasteners shall meet requirements of ASTM A449. Fasteners shall be fully detailed on shop drawings.
- iv. Bolts shall be connected using nuts meeting the requirements of ASTM A563.
- v. Unless otherwise specified on the plans, socket-head cap screws shall meet the requirements of ASTM F879 (Stainless Steel) for diameters less than 5/8-inch and ASTM F835 (Alloy Steel) for diameters 5/8-inch and greater.
- vi. Unless otherwise specified on the plans, threads for bolts, nuts and cap screws shall conform to unified coarse thread series and shall have a Class 2 tolerance for bolts and nuts or Class 2A tolerance for bolts and Class 2B tolerance for nuts in accordance with the ANSI B 1.1, "Unified Screw Threads."
- vii. Bolts shall be installed with a hardened plain washer meeting the requirements of ASTM F 436 at each end. Fasteners connecting machinery elements to structural elements shall be provided with double nuts unless otherwise indicated in the plans.
- viii. Bolt holes through unfinished surfaces shall be spot-faced for the head and nut, square with the axis of the hole.
- ix. Wherever possible, bolts connecting machinery parts to structural parts or other machinery parts shall be inserted through the thinner element into the thicker element.
- x. The dimensions of socket-head cap screws, socket flat-head cap screws, and socket set screws shall conform to ANSI B18.3; and the screws shall be made of heat-treated alloy steel and be cadmium-plated.
- xi. Unless otherwise called for on the plans or specified herein, set screws shall be of the headless, safety type; shall have threads of the coarse thread series; and shall have cut points. Set screws shall neither be used to transmit torque nor as the fastening or stop for any equipment that contributes to the stability or operation of the equipment.

- xii. All threads for bolts, nuts, and cap screws shall conform to the coarse thread series and shall have a Class 2 tolerance for bolts and nuts or Class 2A tolerance for bolts and Class 2B tolerance for nuts in accordance with the ANSI B 1.1, "Unified Screw Threads."
- xiii. Cotter pins shall be of the extended prong square cut type and sized as shown on the plans and shall conform to the requirements of ANSI B18.8.

O. SHIMS

- i. Where shown on the plans, all machinery shims required for leveling and alignment of equipment shall be stainless steel neatly trimmed to the dimensions shown on the plans. Shims shall be Stainless Steel ASTM A666 Type 316.
- ii. Shims shall be shown and fully dimensioned as detailed on the plans. Shims with open side or U-shaped holes for bolts will not be permitted. No shims shall have less than two holes for bolts. Bolt holes shall not be punched at machine shop to prevent distortion of the shims.
- iii. In general, sufficient thicknesses shall be furnished to secure 0.003 inch variations of the shim allowance plus one shim equal to the full allowance. Contractor shall anticipate the need for tapered shims to achieve proper alignment of equipment. Shim packs to be provided to the nominal thicknesses shown on Plans. Spare shim packs will be provided at each location.

P. GREASE FITTINGS

- i. Where grease fittings are called out on the plans a 5/8" Standard Button-Head Grease Fittings suitable for use on heavy machinery shall be used. The grease fitting shall have 1/4" NPTF male threads, constructed of Zinc-Plated steel and use a plunger type check valve.
- ii. All grease fittings shall be conveniently located for greasing, and if necessary, they shall be connected to the points requiring lubrication from convenient lubrication stations by 3/8 inch stainless steel piping with a minimum bursting pressure of 12,000 psi. All pipe shall be securely supported and located so that it shall be protected from injury and excessive vibration. All lubricating equipment shall be installed in perfect working condition. Where multiple lubrication fittings are tied into one station, a label shall identify the point of lubrication for each fitting. Labels shall be made of laminated micarta or textolite with chamfered edges, and shall be engraved to show black letters on a white background. They shall be mounted with stainless steel screws.

Q. LUBRICATION, LUBRICANTS, AND CHARTS

- i. Contractor is to provide lubricant and lubricate machinery that is impacted by construction activities. The contractor is to protect machinery, shafts, bearings, and gears during construction activities. If lubricant becomes lost or contaminated during construction it shall be replaced with lubricant as regularly used by IDOT.
- ii. Lubricant for new machinery shall comply, where appropriate with lubricant that is regularly used by IDOT in an effort to minimize the number of different types of lubricant.
- iii. The Contractor shall furnish sufficient lubricant to provide for the initial lubrication of each component on the structure requiring lubrication. Maintenance lubricants shall not be required for synthetic gearbox oil which will have an indefinite service life. All synthetic oils purchased for use on the bridge shall be provided by a manufacturer which has facilities for annual testing of the oil furnished.
- iv. The Contractor shall coordinate the grease requirements with the various suppliers to attempt to limit the different types of greases to no more than three.

- v. The Contractor shall furnish one copy of a lubrication chart on Mylar showing the location of all lubricating fittings and other points of the mechanical and electrical equipment, which require lubrication of any kind, and shall show the kind of lubricant to be used at each point and the frequency of lubrication. The chart shall be framed under glass in a neat wooden frame and shall be placed as directed by IDOT within the control house.

R. PAINT

- i. Main Drive Operating Machinery – The main drive machinery shall be painted using a three-coat system conforming to all requirements stated GBSP25 Cleaning and Painting Existing Steel Structures except for the following:
 - a) Site glasses.
 - b) Contact surfaces of brakes, shafts, gears, bearings, and couplings.
 - c) Nameplates.
- ii. All painted surfaces of the machinery components shall be cleaned to bare metal in accordance with SSPC-SP11.
- iii. All unfinished machinery surfaces shall be made free of all chips, dirt, rust, scale, sand, grease, and other foreign matter by wire brushing, or other approved means as stated elsewhere.
- iv. After proper surface preparation, prime all unfinished machinery surfaces with coats of primer in accordance with the requirements given under GBSP25 Cleaning and Painting Existing Steel Structures. All new machinery shall be given one shop coat of primer. All rubbing surfaces on new machinery shall be protected from the elements with a corrosion preventative compound approved by the Commissioner.
- v. After installation is complete, all machinery surfaces remaining exposed to the elements, except rubbing surfaces, shall be thoroughly cleaned and given two field coats of paint prepared as specified elsewhere.
- vi. After completion of the operating tests and acceptance of the machinery, all accumulated oil, grease, dirt, and other foreign matter shall be solvent cleaned in accordance with SSPC-SP1 from exposed machinery surfaces, except rubbing surfaces.
- vii. Nameplates on all manufacturers' components shall be readable, clean and free of all paint before acceptance of the machinery.

S. INSTRUMENTATION MACHINERY

- i. The instrumentation system gearboxes, couplings, shafts, and bearings will be comprised of standard sized stock items, suitable for intended purposes.

T. MACHINERY GUARDS AND SHIELDS

- i. The Contractor or manufacturer shall furnish suitable guards for equipment being installed as required in order to conform to the requirements of the AASHTO Specifications or OSHA. The guards shall be a minimum of 18 gage ASTM A666, type 316 stainless steel. All guards shall be easily removable and replaceable as required for maintenance purposes. Consideration of the use of hinges and retaining bolts using wing nuts for this purpose is required. All guard hardware shall be marine-grade, corrosion resistant design.

U. BALANCE BLOCKS

- i. As a minimum, submit the following for review and approval: Shop drawings for concrete or cast-iron counterweight adjusting blocks; provide weight of block; and product data for coal tar epoxy coating for cast-iron blocks.

II. CONSTRUCTION REQUIREMENTS

A. INSTALLATION

- i. The new machinery specified and as approved on the shop drawings and related electrical equipment shall be installed according to best millwright practice.
- ii. The Contractor shall coordinate the work with subcontractors to provide for the necessary shop assembly and field installation of all of the equipment. Machinery manufacture and installation shall conform to all applicable requirements in AASHTO and all applicable requirements with special requirements and additions as specified herein.
- iii. The Contractor shall remove and dispose of the existing materials as required by the plans and specifications. Where removal of materials and equipment is called for, such materials and equipment shall become the property of the Contractor and shall be legally disposed of away from City property. Under no circumstances shall material be dropped in the waterway.

B. MAIN SPAN BALANCE TESTING REQUIREMENTS

- i. Submit a Bridge Balance Plan before beginning work on the bridge.
- ii. Notify the Engineer a minimum of 28 days prior to the date that is anticipated for any Balance Testing.
- iii. Measure the initial balance condition of the leaves prior to any work starting on the bridge.
- iv. Maintain bridge balance during the course of construction. Maintain balance in accordance with the Leaf Balancing Plan. Verify the condition of balance at time intervals appropriate with the work being performed in order to ensure a Balanced Condition at all times. Remove, add, and arrange blocks throughout the course of the Work as required to achieve or maintain a proper and safe balance condition. The final determination of what shall be considered a safe balance condition during construction shall be made by the Engineer. Submit interim balance reports for review.
- v. Complete all work on the leaves prior to initiation of the final balance adjustments. Perform the final balancing of the leaves and achieve an acceptable final balance condition. The final balance condition shall not vary from the initial balance condition by more than 37 kip-ft about the trunnions at any point through the full range of motion of the leaves. The allowable angle of the center of gravity defined as a point about the trunnion, shall not vary by more than 5° through the full range of motion of the leaves. The final balance condition shall be checked by implementing the same equipment, methods, and procedures used to test the balance condition prior to construction. Following each balance adjustment, the contractor shall repeat the balance testing to verify the balance condition.
- vi. Balance plan, testing, balance report, and all related balance calculations shall be developed and performed by a Professional Engineer registered in the State of Illinois. The engineer shall have successfully conducted strain gauge testing and analysis on a minimum of five bascule bridges. A complete balance plan along with the resume of the engineer performing the work shall be submitted to the Commissioner for review prior to testing. All comments shall be resolved prior to testing.

- vii. Given the numerous variables that may have an effect on the measurements, schedule testing generally as follows in order that measurements taken on one day may be better correlated with measurements taken on another day:
 - a) In the morning at sunrise so as to minimize the differential in ambient temperature.
 - b) At a time with no wind; if wind exists, preferably the wind should not be in a direction along centerline of the bridge. Sustained winds must be less than 10 miles per hour.
 - c) For each balance test, obtain and record the following data: Time of day, ambient temperature, weather conditions, wind speed and direction at the roadway surface.
- viii. The Balance Plan shall include the following:
 - a) Introduction
 - b) Field survey and documentation of initial configuration of adjusting blocks.
 - c) Means and methods for measuring the location and weight of all materials to be added or removed from the movable leaves
 - d) Methods for recording and tracking the measured location and weights of materials
 - e) Spreadsheets for calculating and tracking changes to the balance condition during construction
 - f) Means and methods for making balance adjustments during construction
 - g) Identify milestones where the balance condition will be measured and compared to the calculated theoretical balance condition during construction
 - h) Balance test equipment, means, methods, and procedures including type and method of installation of strain gauge rosettes, method of transmission of low level signals, data acquisition equipment, and recording equipment.
 - i) List of equipment (Including catalog cuts for equipment to be used)
 - j) Figures identifying proposed location of strain gauges, angle transducers, amplifiers, cable or radio links, data acquisition equipment and all associated cabling
 - k) Elementary wiring diagrams of interconnection of strain gauges, angle transducers, amplifiers, data acquisition equipment and recorders
 - l) Method of analyzing recorded data
 - m) Complete calculations deriving balance results from strain gauge data including relevant ratios and other imbalance variables
 - n) Balance Report format
- ix. Perform balance testing using the dynamic strain gauge method. Weld strain gauge rosettes on the main drive shafts of each main drive system. Two main drive shafts must be instrumented simultaneously on each leaf. Sufficiently clean the areas of the shafts where the gauges are to be mounted to remove all contaminants. Mount two strain gauge rosettes on each shaft at 180° from each other and wired in a Wheatstone bridge configuration so as to measure torsion only. The gauges shall be connected to a data acquisition system capable of providing a permanent record of the strain in the shafts versus span position. Span position shall be recorded using an inclinometer mounted to the leaf. The output for the span position shall be recorded simultaneously and on the same data acquisition system with the imbalance strain.
- x. The data acquisition system shall be capable of recording and displaying the strain for each shaft separately and also providing the additive total strain for all shafts at any given point. Numerically convert the strains in the shafts to torque about the trunnions. Average the data from the three test runs and process this data to give a torque curve for the full range of motion of the leaves versus opening angle. The data from the acceleration and deceleration ranges of motion shall be neglected when calculating the curve fit. However, the curve fit shall be extrapolated through the full range of motion of the leaves.

- xi. The leaves shall be tested through at least three complete cycles and a permanent record of each test shall be maintained. The data collected shall be used to determine the overall span imbalance. For the measured data to be considered valid, the data from each individual test run (as compared to the other two test runs) shall not vary by more than 37 kip-ft about the trunnion at any point through the entire range of motion of the leaves.
- xii. After the balance tests have been completed, the contractor shall submit formal balance reports signed and sealed by the professional engineer who conducted the tests. At a minimum, one report shall be submitted for the initial balance test, one report at an intermediate stage of construction, and one report for the final post construction balance test. The reports shall include the following:
 - a) Introduction.
 - b) Field survey and documentation of configuration of adjusting blocks
 - c) Discussion of results.
 - d) Conclusions.
 - e) Graphical representations of span balance and friction versus span position through the entire range of motion.
 - a. On one graph for each leaf Include the following:
 - i. Total opening leaf torque about the trunnions
 - ii. Total closing leaf torque about the trunnions
 - iii. Total imbalance torque about the trunnions
 - iv. Total frictional torque about the trunnions
 - v. Total imbalance torque about the trunnions fitted curve
 - b. On another graph for each leaf include the following:
 - i. shaft torque for each instrumented shaft
 - f) Along with the report, the contractor shall provide the raw data used in the span balance analysis. This includes time, span position, opening leaf torque, closing leaf torque, imbalance, friction, and torque for each shaft for each test run in Microsoft Excel format. Provide Excel tables of processed balance results for the data shown in the graphs.
 - g) The reports will be bound in between heavy plastic covers.

C. FIELD TESTING AND INSTALLATION

- i. Prior to any work being performed on the machinery, the Contractor shall submit to the Engineer for approval a detailed mechanical work procedure. This procedure shall give in detail the methods for installation and testing of new machinery. Procedures shall include duration of time involved with the work and shall show coordination with structural, electrical and architectural work which will be coinciding with the mechanical work.
- ii. Before final drilling or reaming, all parts shall be adjusted to exact alignment by means of shims furnished for each part. Components shall be aligned to the installation tolerances listed in the manufacturers regularly published literature and to the values shown on the plans. After final alignment and bolting, all parts shall operate smoothly.
- iii. Bolt holes in structural steel for connecting machinery shall, in general, be drilled from the solid after final alignment of the machinery. Sufficient installation holes, sub-drilled 1/4 inch (6 mm) undersize for undersize temporary bolts, may be used for installation and alignment of the machinery. After the machinery has been aligned in its final position, full-size holes for the remaining bolts shall be drilled or sub-drilled and reamed, the full-size bolts installed, and the temporary bolts removed. The undersize holes used for temporary bolts shall then be reamed full size and full-size bolts installed.

- iv. The machinery shall be installed and adjusted by competent mechanics skilled in the type of work involved. They shall be provided with all necessary measuring and leveling instruments as may be required including but not limited to dial indicators, machinist levels, feeler gauges, gauge blocks, calipers, and laser alignment equipment. Contractor shall provide all necessary equipment and methods to the Engineer to verify proper alignment of all machinery has been obtained to the satisfaction of the Engineer.
- v. The machinery shall be installed with the utmost care in the field. Ropes, slings or other equipment used for installation shall be carefully placed to prevent scratches, abrasions or other damage.
- vi. The alignment of all components shall be checked by the use of laser alignment tools, dial indicators, gauge blocks, and/or feeler gages both before and after final bolting up of the machinery in the presence of the Engineer. Installation tolerances listed in the manufacturer's regularly published literature shall be considered maximum values. The installation shall be such that the installed tolerances are no more than those recommended unless otherwise approved by the Engineer. Any re-adjustment after final bolting required by the Engineer in order to conform to this requirement shall be made by the Contractor at no additional cost.
- vii. After installation is complete, the Contractor shall make a thorough inspection to insure that all parts are aligned and adjusted as closely as practicable without actual operation, and that all bolts are properly tightened. The lubricants listed on the lubrication charts shall conform to the recommendations of the Manufacturers of the units.
- viii. When the bridge machinery is ready for testing, the bridge machinery shall be operated through not less than five complete cycles in each mode of operation.
- ix. During the foregoing test runs, all parts shall be inspected to detect overheating, misalignment, or incorrect adjustment. All such defects shall be corrected at no additional cost. The bridge machinery systems shall successfully complete five consecutive operations, without issue, before final acceptance.

D. LIVE LOAD SHOE SHIMMING AND LEAF ALIGNMENT

- i. Prior to modification of the live load shoes and their shims the contractor is to complete a detailed survey of the field conditions complete with a detailed plan to modify the live load shoes to achieve the requirements detailed in this specification. The field survey at a minimum is to include the following measurements:
 - a) Elevation of the tips of each leaf at the roadway deck. Measurement to be taken at the center line and 2 feet inward from each curb.
 - b) Relative elevation of the tips of each leaf at the roadway deck with respect to each other. Measurements to be taken at the center line and 2 feet inward from each curb using a steel rule.
 - c) Elevation of the approach road way and tail of leaf. Measurement to be taken at joint of each leaf at the center line and 2 feet inward from each curb.
 - d) Relative elevation of the tails of each leaf at the roadway deck with respect to the approach. Measurements to be taken at the center line and 2 feet inward from each curb using a steel rule.
 - e) Estimated contact or clearance at the live load contact surfaces.

- ii. When all four of the live load supports have been installed with the nominal shims indicated, each leaf shall be lowered until there is approximately 1/2" of space below each live load shoe. Use the following procedure to obtain equal loading on the two live load shoes for each leaf. After adjusting the thickness of the shims under each live load shoes, lower the leaves by releasing the brakes and check the tips and tails of the bascule leaves to see if they are at the proper elevation and are properly aligned with one another. Readjust shims under the strike plate if necessary.
 - a) Release all brakes on the span drives for the leaf in question to allow the span to settle down bringing at least one live load shoe into contact with its strike plate. Note that the span locks should not be driven at this time.
 - b) If both live load shoes contact their strike plates, raise the leaf and insert a temporary shim 1/2" thick under the upstream shoe (Su). Lower the leaf by releasing the brakes. Measure the clearance (Cd) under the downstream shoe (Sd). Raise the leaf and remove the 1/2" temporary shim from under the upstream shoe and insert it under the downstream shoe. Lower the leaf by releasing the brakes. Measure the clearance (Cu) under the upstream shoe. If the clearances Cu and Cd measured under the two live load shoes with the temporary shim in place are equal no additional shim adjustment is required at this time. If Cu is greater than Cd, additional shims must be installed under Su with a thickness of $T=(Cu-Cd)/2$. If Cd is greater than Cu, additional shims must be installed under Sd with a thickness of $T=(Cd-Cu)/2$.
 - c) If one of the live load shoes does not contact its strike plate measure the clearance (C1) under that shoe (S1). Raise the leaf and install a temporary shim of thickness (C1+1/2") at S1. Lower the leaf and measure the resulting clearance C2 at the other shoe (S2). Install permanent shims at S1. The thickness (T) of the permanent shims will be $T=[C1+(1/2"-C2)/2]$.
- iii. After the shimming described above to equalize the loads on the live load supports has been completed for both leaves, additional shim adjustments may be required to bring the tips of the two leaves to the proper elevation and to align the roadways at the tips and tails of the two leaves. The following procedures should be followed to complete the shimming of the live load supports:
 - a) Lower both leaves to the fully closed position with all four live load shoes in firm contact with their strike plates.
 - b) Measure the differences in elevation between the roadways at the tips of the two leaves, at the center of the roadway and at the point on the roadway 2 ft. inboard of each curb. The elevations of the tips of the bascule girders are to be within 1/16" of each other.
 - c) Measure the differences in elevation between the roadways at the tails of the two leaves, at the center of the roadway and at the point on the roadway 2 ft. inboard of each curb. The elevations of the tails of the bascule leaves are to be within 1/16" of the approach roadway.
 - d) Determine what adjustment in shim thickness is required at the live load supports to properly align the roadways at the tips of the two leaves and to position them at the proper elevation with respect to the approach span roadways.
 - e) Install additional shims (or remove shims) at the live load shoes as required to position the roadways at the tips of the leaves at the proper elevation with respect to the roadways on the approach spans and to properly align the roadways on the two leaves vertically with one another. An equal amount of shims must be added or removed from the two live load shoes on a given leaf.

- f) After adjusting the thickness of the shims under each live load shoes, lower the leaves by releasing the brakes and check the tips of the bascule leaves to see if they are at the proper elevation and are properly aligned with one another. Readjust shims under the strike plate if necessary.
- iv. Full contact of the live load supports will be considered when a 0.002" feeler gage cannot be inserted between at least 50% of the shoe and the strike plate contact surface.

E. CENTER LOCK TESTING AND INSPECTION

- i. Field testing of the center locks shall include fully cycling the locks while monitoring motor currents six times. The center locks shall cycle in less than 12 seconds. Current readings of the center lock operator shall be recorded through the full range of motion; the current readings shall not exceed the nameplate full current rating at any time during the operation.
- ii. The vertical alignment of the movable span tips shall be maintained and secured per the alignment criteria established in the structural portion of these specifications with the center locks engaged.
- iii. The final adjustment and installation of the center locks shall take place after the live load supports are properly adjusted.
- iv. Prior to installing the lock bar a straight edge shall be placed flat on the bronze bearings of the guide and receiver. The straight edge shall contact both bronze bushings. The gap between the bronze bushings and the straight edge at any point is to be no greater than 0.003".
- v. The position of the operator shall be such that there is an equal amount of reserve stroke remaining following operation in the driving and in the retracting direction.

F. TAIL LOCK TESTING AND INSPECTION

- i. Field testing of the tail locks shall include fully cycling the locks while monitoring motor currents six times. The tail locks shall cycle in less than 5 seconds. Current readings of the tail lock actuator shall be recorded through the full range of motion; the current readings shall not exceed the nameplate full current rating at any time during the operation. Proper alignment with the span latch shall be verified.

G. BUFFER TESTING AND INSPECTION

- i. After installation of the buffers the exhaust valve is to be adjusted to optimize seating of the leaves as required by the engineer. The buffer cylinder operation shall be coordinated with the operation of the control system to provide a soft and smooth landing of the leaves.

H. TRAINING

- i. The contractor shall provide five days of instruction for personnel. The instruction shall include all aspects of inspection, maintenance, and operation of all machinery components including but not limited to the following:
 - a) Normal maintenance.
 - b) Checking and adding lubricants.
 - c) Normal operation.
 - d) Brake adjustments.
 - e) Adjustments to machinery components.

I. SPAN DRIVE MOTOR BRAKES AND SPAN DRIVE MACHINERY BRAKES

- i. Inspect and test all brakes in the field after installation and prior to operation in accordance with written procedures. Contractor shall give no less than ten (10) working day's notice to the Departmental Representative of when the brakes will be ready for inspection and testing. All brakes shall be inspected and tested at the same time. For each brake, the Contractor shall successfully demonstrate the following:
 - a) Proper adjustment of the engage and disengage delays.
 - b) Proper adjustment of the actuator reserve stroke.
 - c) Proper fluid level in the actuator.
 - d) Proper adjustment of the shoe gap.
 - e) Proper adjustment of the torque setting through the use of the torque scale.
 - f) Proper function of the manual disengage mechanism with locking in both the engaged and manually disengaged position.
 - g) Proper electrical and mechanical function of the limit switches.
- ii. Once static inspection of the brakes has been completed. The brakes are to be electrically cycled, engaged and released, a minimum of 10 times. The shoes to wheel contact is to be a minimum of 70% and proven when a 0.002" feeler gage cannot be inserted over 30% of the brake shoe contact surface.

III. METHOD OF MEASUREMENT

- i. Replacement of center locks shall be measured for payment by complete replacement of each center lock assembly. Center lock assembly to be installed, aligned, and function per the contract plans.
- ii. Refurbishing of operating machinery shall be measured for payment by complete refurbishing of machinery per the contract plans
- iii. Bridge balancing shall be measured for payment by successfully meeting the required balance conditions per the contract plans.

IV. BASIS OF PAYMENT

- i. REFURBISHING OF OPERATING MACHINERY L SUM
- ii. REPLACEMENT OF CENTER LOCKS EACH
- iii. BRIDGE BALANCING L SUM

ELECTRICAL SPECIAL PROVISIONS

DESCRIPTION.

- A. The work shall consist of furnishing, installing, and placing in satisfactory operating condition the electrical equipment as indicated on the Plans, called for in these specifications, or as may be required to complete the work indicated. The work shall include but not be limited to the furnishing, installing, testing and placing in satisfactory operating condition the new center lock operators, new leaf drive motor brakes, new leaf drive machinery brakes, new tail lock actuators, new leaf position rotary limit switches, and conduit, wiring, and enclosures as indicated on the Plans. The Contractor's attention is also directed to the requirements for electrical work appearing in other items of these Specifications.

- B. It is the intent and purpose of these Specifications to cover and include all apparatus and appliances to properly install, wire, connect, equip, test, adjust, and put into approved working order the respective portions of the electrical work herein specified. The work shall also include disconnecting and removing the existing equipment and facilities to be replaced. Any incidental apparatus, appliance, material, or labor not herein specifically mentioned or included that may be found necessary to comply with the requirements of the related documents and referenced standards or codes shall be furnished by the Contractor just as if specifically mentioned in these Specifications and without extra cost.
- C. The alignment and fastening of electrical equipment to be incorporated into the bridge machinery, such as the leaf drive brakes, tail lock actuators, center lock operators, leaf position limit switches and position indicator transmitters, shall be done under "Mechanical Work".
- D. Contractor shall investigate spaces through which equipment must be moved. Arrange to have equipment shipped from manufacturer in crated sections of size suitable for moving through restricted available spaces.
- E. Shop drawings and maintenance manuals shall be provided as specified hereinafter.
- F. The electrical work shall include but not be limited to the following:
 - 1. As-Found Documentation, Removals, and Equipment Preservations
 - a. Create As-Found electrical drawings detailing the conductors to be replaced.
 - b. Remove and dispose of the existing leaf position rotary limit switches.
 - c. Remove existing conduits, enclosures, and conductors – including flexible cables – routed from the main distribution panel in the near leaf machinery area to the center locks and near leaf clearance/navigation (red/green) lights.

The Department shall designate where the removed equipment the Department wishes to keep should be delivered.
 - 2. Electrical work shall also include but not be limited to:
 - a. Replace multi-conductor SOWA type cables to the tail lock motors and limit switches.
 - b. Furnish and install new leaf position rotary limit switches.
 - c. Repair or replace near side bridge position indicator synchro-transmitter.
 - d. Furnish and install new conduits, enclosures, safety disconnect switches, and conductors from the auxiliary panel in the bottom of the operator's house out to the center locks and clearance/navigation lights.
 - e. Replace brake thruster and limit switch flexible conduits and conductors as part of the brake replacement. Refer to the Mechanical section of these specifications for more details.
 - f. Replace gaskets and latches on the near side machinery area main distribution cabinet.

MATERIALS.

- A. Conformance
 - 1. All electrical equipment and its installation shall conform to the requirements of the latest revision of the Standard Specifications for Movable Highway Bridges of the American Association of State Highway and Transportation Officials (AASHTO), except as may be otherwise provided herein.
 - 2. Materials and construction shall conform to the requirements of the current NFPA 70, National Electrical Code (NEC) and to any applicable local rules and ordinances. The Contractor shall obtain any required permits and approvals of all Departments or Agencies having jurisdiction.
 - 3. All electrical components shall have an approved listing by Underwriter's Laboratories (UL), where such a listing exists.
- B. Protection of Electrical Equipment
 - 1. Protect electrical equipment from water damage, rain, condensation, and water dripping or splashing on equipment and wiring, at all times during shipment, storage and construction (prior to final acceptance). Provide temporary electrical connections to equipment heaters, or provide temporary heaters, as required to prevent damage from moisture.
 - 2. Provide climate-controlled environment for the storage of control equipment/assemblies during construction.
 - 3. Thoroughly dry out and put through special dielectric tests any apparatus that has been subjected to possible injury by water or dampness (including the interiors of motor control equipment or any other electrical devices). Acceptable tests will only be those submitted to, and approved by the Engineer.
 - 4. Protect equipment from damage from mishandling, dropping, or impact. Do not install damaged equipment.
- C. Equipment and Material Provisions
 - 1. All equipment and materials shall be new. All equipment, materials, and workmanship shall be first-class in every particular and shall be manufactured and erected to the satisfaction of the Engineer. The Contractor shall warrant the in-service working of the electrical installations for one year or the manufacturer's warranty period, whichever is greater, following project acceptance by The Department. If the Contractor has any objection to any feature of the electrical equipment as designed and laid out, he must state his objection at once in writing to the Engineer prior to fabrication and/or installation, otherwise his objection will be ignored if offered as an excuse for malfunctioning of the equipment or for defective or broken apparatus. Changes shall be made at the discretion of the Engineer.
 - 2. Each piece of electrical equipment and apparatus shall have a corrosion-resisting metal (either brass or stainless steel) nameplate on which is stamped the name of the manufacturer, the rating or capacity of the equipment or apparatus, etc.

3. All metal parts of the installation, except structural steel, shall be of corrosion-resisting material, such as bronze or stainless steel. Malleable iron or steel with a hot-dip galvanized finish shall be used where specified herein. Structural steel shall conform to the requirements given under "Structural Steel".
4. All mounting hardware and all wire and cable terminals shall be vibration proof.
5. If any changes from the Plans or these Specifications are deemed necessary by the Contractor, details of such changes and the reasons therefore shall be submitted for approval as soon as practicable, but before the first submittal. No such changes shall be made nor work started without approval of the Engineer.
6. Material requirements for specific apparatus, equipment, and materials are found in the articles under "Construction Requirements" in this item.

D. Qualifications

1. Due to the critical and complex technical requirements of this section, only those suppliers who can demonstrate that they possess requisite knowledge, capabilities and experience with the exact equipment being supplied shall be acceptable. In order to provide this equipment the supplier shall be pre-certified.
2. To be pre-certified a supplier must show proof of experience in designing, furnishing, and commissioning similar systems on at least 5 movable bridges in the last ten years.
3. Designate a listing of electrical journeymen to perform the electrical work in accordance with the provisions of this Section. Perform all such work either by, or under the immediate supervision of an electrical journeyman. For this project, "under the immediate supervision" means that the journeyman is in the immediate vicinity and physically involved in performing the electrical work. Helpers are expected to aid the journeyman in the performance of the work and not to act as non-credentialed surrogates of a remote journeyman. Non-approved helpers may only perform tasks of a support nature that do not directly involve responsibility for the installation, connection, or adjustment of electrical materials.

E. Tools and Procedures

1. Manufacturer Requirements:
 - a. Install, apply, or adjust all electrical equipment and materials in accordance with the manufacturer's recommendations including the usage of the manufacturer specified tooling. The tooling used for field installation must be the same as, or the manufacturer's approved equivalent to, the tooling utilized in the approval testing.

2. Quality Assurance:
 - b. Tooling Identification: When applicable, the approved tooling will provide a suitable identification mark to the work to allow verification that the appropriate tool was used to perform the work. For example, use crimping dies that contain identification marks that emboss the crimps made with them with an identification embossment.
 - c. Quality Isolation: Where possible, the requirement to provide a level of workmanship quality is transferred to the tooling rather than the skills of the worker. As examples, but not limited to:
 - d. Conductor Stripping: Use approved non-nicking strippers rather than the operator's skill with knife edged stripping tools to prevent wire nicking.
 - e. Crimp Tightness: Proper crimping will depend upon the exclusive use of controlled cycle crimping tools that require the proper degree of compression before releasing the work rather than upon the operator's judgment of how hard the tool handle is being squeezed.
 - f. Tie Tightness: Determine proper tensioning of cable and wrap ties by the use of the manufacturer's specified calibrated tensioning tool rather than the operator's judgment of what is "tight enough."
 - g. Fastener Torque: Tighten fasteners with a recommended torque, where the proper tightness is important to the performance of the function (which includes all electrical terminals), with a calibrated torque (limiting) screwdriver or other torque-indicating tool.
3. Test Equipment
 - a. Provide test and measurement instruments suitable to perform the required tests including ratings and measurement accuracy as specified by the manufacturer. Clearly indicate the exact make and model of instrument used and include manufacturer's specification data indicating the suitability of the instrument's specifications in all procedure submittals.
 - b. Do not use any test instrument unless it is calibrated and certified by an independent certification laboratory to the required accuracy and in accordance with the instrument manufacturer's requirements within a maximum interval of the preceding 12 months. Certify all calibrations as traceable to the National Institute of Standards and Technology (NIST) or other recognized standardization authority.
 - c. Test instrument operating manuals and certification certificates shall be available on the project site for reference by the Engineer whenever the instrument is being used or evaluated.

4. Test Performance
 - a. The journeyman electrician, or other proposed test equipment operator, must demonstrate knowledge of the test equipment operating and testing procedures to the Engineer's satisfaction before performing tests. Only test results signed by the approved testing technician will be acceptable under the requirements of this Section.
 - b. All testing shall be done in accordance to the latest edition of the International Electrical Testing Association (NETA) Acceptance Testing Specifications.
- F. Working Drawings and Samples
 1. Working Drawings
 - a. The contractor shall prepare and submit for review within thirty (30) working days after the award of the Contract the following working drawings executed in accordance with the provisions of the Contract:
 - 1) Certified dimension prints of all operators, actuators, leaf brakes, and limit switches.
 - 2) A complete wiring diagram of the as-found conditions of the equipment and wiring to be replaced, including all power and control connections. Each electrical device and each wire between devices shall be identified by an individual unique designation of letters, numbers, or a combination of both; and such designations shall be used wherever the devices or wires appear on other drawings. Wire numbers shall match the numbering used in the 1990-91 rehabilitation shop drawings where applicable. A complete set of catalog cuts for materials to be furnished shall be included for review at the time of schematic submittal.
 - 3) A schedule of electrical components to be installed, listed by their designations as shown on the schematic wiring diagram and shall state for each device its rating, number of poles or contacts, function, catalog number, and location.
 - 4) A complete interconnection diagram(s) for all electrical apparatus to be installed. The diagram(s) shall be of the elementary type and shall show the external connections of all devices and equipment. Interconnection lists will not be acceptable in lieu of a true interconnection diagram.
 - 5) Complete schematic conduit and cable diagrams showing the interconnection of all devices and equipment to be installed, including junction boxes, and showing all conduit. The size of each conduit, and the wire number and size of each conductor in conduit shall be shown on the diagrams. Each conduit shall be suitably numbered or lettered, and percent wire fill shall be shown. Submittal of the Contract Plans conduit and cable schedule will not be acceptable.

- 6) A complete set of layout and installation drawings for the electrical work showing the location and installation, including support and mounting details, of all electrical apparatus and equipment. These drawings shall be made to scale and shall show the exact location of all conduits, cables, boxes, operators, actuators, brakes, limit switches, disconnect switches, and other electrical equipment and the method of supporting them on the structure.
 - 7) Any other drawings, which may, in the opinion of the Engineer, be necessary to show the electrical work.
- b. Certified dimension prints of the apparatus shall state in the certification the name of the job, the application of the apparatus, device designation, number required, right-hand or left-hand assembly, electrical rating, number of poles or contacts, material, finish, and any other pertinent data to show that the apparatus meets the specified requirements.
 - c. Upon completion of the work, the Contractor shall correct all working drawings, including all working drawings submitted by the electrical system vendor, to show the work as-built and shall provide two (2) sets of 22 inch x 36 inch, 4 mil thick mylar reproducible of all as-built working drawings. One (1) set to be submitted to the Resident Engineer and one (1) set to be delivered to IDOT.
 - d. All as-built working drawings submitted by the electrical system vendor, including all electrical schematics, system documentation, dimension drawings of equipment, and devices, shall also be submitted in a computerized file form as well as on mylar reproducible as specified above. The computerized file form for all electronic files shall be in "PDF" format. The electrical system vendor shall provide all pertinent drawings and data on DVD read-only disks. The electrical system vendor shall verify the compatibility of his computerized file form to IDOT's systems prior to submission.
 - e. The preparation and submission of working drawings shall meet the provision for shop drawings in accordance with all the general specifications requirements included under other relevant sections.
 - f. The Contractor shall submit for inspection and test, if directed by the Engineer, samples of any apparatus or device that he proposes to use as a part of the electrical installation.
- G. Operation and maintenance Manuals
1. The Contractor shall submit all manufacturer's operation and maintenance manuals for new equipment installed. Manuals shall include:
 - a. Certified dimensional prints.
 - b. Complete schematic wiring diagrams.
 - c. Operation and adjustment instructions.
 - d. Maintenance requirements and instructions.
 - e. Warranty information.

CONSTRUCTION REQUIREMENTS

- A. Maintaining Existing Facilities
 - 1. The Department will be responsible for maintaining the ability of the movable leaves to operate during all stages of the center lock and tail lock work. The Contractor shall be prepared to be off the leaves within 30-minutes of being provided notice of a need to operate the leaves. This condition is not applicable for a leaf secured in the raised position.
 - 2. Brakes shall be replaced with the leaf in the raised position. No brakes shall be removed without a leaf securing system installed on the associated leaf that will prevent movement of that leaf in the case of high winds. Refer to the structural plans for leaf securing system details.
- B. Construction Scheduling
 - 1. The disconnecting and removal of existing facilities, the modification or rehabilitation of other existing equipment, the installation of new apparatus and equipment and the connections of all existing and new apparatus shall be coordinated with the structural and mechanical work under this contract and shall be done in conformance with the requirements governing the sequencing and scheduling of construction as shown on the Plans and specified herein. Component sizes must be coordinated with existing or proposed access to their installed or temporary locations.
 - 2. The Contractor shall prepare and maintain an updated progress schedule to indicate phases of work. The schedule shall be submitted to the Department for review and approval prior to the start of work.
- C. Connections to Existing Facilities
 - 1. The Contractor shall make all connections required between the new equipment and the existing circuits and apparatus to provide for proper operation of the leaves and their auxiliary equipment, in accordance with the requirements specified herein.
- D. Cutting, Patching and Miscellaneous
 - 1. The contractor shall perform all necessary drilling, cutting, and patching required for installing his work, but only per submitted drawings that have been approved by the Engineer and the Department. All cutting of concrete, structural steel, sidewalks, floor slabs, walls, and other portions shall be done by skilled personnel.
 - 2. After completion of the work, the Contractor shall repair all damage caused by his installation or removal of items and shall finish the job in a workmanlike manner satisfactory to the Engineer. Holes in the walls, ceiling, or floor shall be patched and finished to match the existing surfaces. Painted surfaces shall be repainted after being repaired. Any damage to windows, window framing, sash, sills, frames or any other architectural trim shall be repaired to the satisfaction of the Department by the Contractor at his own expense.

- E. Manufacturer's Field Start-Up Service and Testing
 - 1. The manufacturer's field service engineering personnel shall be experienced in the adjustment and functioning of the particular control equipment furnished by the manufacturer. The personnel shall be capable of locating and correcting faults or defects and of obtaining from the manufacturer, without delay, new parts or replacements for apparatus that, in the opinion of the engineer, does not perform satisfactorily.
- F. Field Testing
 - 1. The Contractor shall arrange for and provide all the necessary field tests, as directed by the Engineer, to demonstrate that the newly installed electrical components are in proper working order and in accordance with the Plans and Specifications. The tests shall include, but not be limited to, continuity and insulation resistance testing of conductors and operational testing of center locks, tail locks, leaf drive motor brakes, leaf drive machinery brakes, bridge position rotary limit switches, newly installed conduit and wiring, and navigation lights.
 - 2. Should the acceptance tests show that any piece of equipment, cable or wiring connection, and interlocking, in the judgment of the Engineer, is defective or functions improperly; such adjustments and/or replacements shall be made by the Contractor as to make the installation satisfactory to the Engineer and at no extra cost to the Department unless the failure can be demonstrated as unrelated to the work of the Contractor.
 - 3. Other field tests for specific equipment shall be as specified in the various sections of these Specifications.

MATERIALS AND EQUIPMENT

Furnish only new materials that conform to the standards of the UL, in every case where such a standard is established for the particular type of material and its intended application. Prior to purchase of any materials or equipment required to be furnished and installed, submit a complete list of all such materials and equipment including manufacturer's catalog numbers, catalog data sheets, illustrations, and shop drawings to the Engineer for approval.

- A. Equipment Labels
 - 1. All electrical devices such as disconnect switches, boxes, and equipment enclosures shall have a label affixed to each unit. The labels shall be sized to permit at least 1/4-inch tall engraved lettering of the full name of the device per the plans. Abbreviation are not allowed. Text shall indicate name/function of each item. Disconnect switches shall provide a label indicating the voltage within. Labels shall be securely attached using stainless steel screws. The Contractor shall submit to the Engineer for review, schedule of all labels with sizes, locations, and text.

- B. Center Lock Circuit Breakers
 - 1. Circuit breakers shall be quick-make, quick-break magnetic circuit protector type, rated for 65kAIC@480 V a.c., 3-phase, feed-thru with instantaneous trip functions. Units shall be magnetic only with non-interchangeable trip rated for motor FLA range of 6.9-25.2 amperes and a magnet range of 90-300 amperes. Units shall be matched to the mounting configuration of the existing units to be replaced, as shown on the Plans.
- C. Magnetic Across the Line Starters for Center Locks
 - 1. Furnish full voltage reversing starters with 120 VAC magnetic contactor coils. Equip all contactor coils with a combination R/C-MOV surge suppressor across the coil circuit to prevent inductive switching transients from damaging any connected circuitry. Contactors shall be NEMA size 1 – rated for at least a 10 horsepower 3-phase motor at 480 V a.c. Overloads shall have replaceable heater elements and be capable of being sized for 125% of new center lock operator rated full load motor current.
 - 2. Provide an adequate number of auxiliary contacts, of both the normally open and closed type, to match existing units to be replaced.
 - 3. Starters shall mount in the same fashion as the existing to be replaced units.
- D. Center Lock Overload Protection Modules
 - 1. Center lock overload protection modules shall be of the “fail-safe” type relay that de-energizes when motor current rises above pre-set value. They shall include a time delay to prevent tripping due to start-up, in-rush current. Units shall be powered by 120 V a.c., and have an adjustable trip point that can be set for new center lock operator’s rate current. Relay contacts shall be rated for 10 amperes@120 V a.c. resistive. Units shall not automatically reset, but require a manual reset after tripping.
- E. Raceways/Wireways/Troughs
 - 1. Conduits
 - a. All wiring shall be installed in PVC coated rigid galvanized steel (RGS) conduit, except in the locations where flexible cable has been designated for use.
 - b. The PVC coated RGS conduit must be UL listed. The PVC coating must have been investigated by UL as providing the primary corrosion protection for the rigid metal conduit. Ferrous fittings for general service locations must be UL listed with PVC as the primary corrosion protection. Hazardous location fittings, prior to plastic coating must be UL listed. All conduit and fittings must be new, unused material. Applicable UL standards may include: UL 6 Standard for Safety, Fittings for Conduit and Outlet Boxes.
 - c. The conduit shall be hot dipped galvanized inside and out with a clear urethane coating over hot dipped galvanized threads.
 - d. A PVC sleeve extending one pipe diameter or two inches, whichever is less, shall be formed at every female fitting opening except unions. The inside sleeve diameter shall be matched to the outside diameter of the conduit.

- e. The PVC coating on the outside of the conduit couplings shall have a series of longitudinal ribs 40 mils in thickness to protect the coating from tool damage during installation.
- f. Form 8 condulets shall be supplied with plastic encapsulated stainless steel cover screws.
- g. A urethane coating shall be uniformly and consistently applied to the interior of all conduit and fittings. This internal coating shall be a nominal 2 mil thickness. Conduit or fittings having areas with thin or no coating shall be unacceptable.
- h. The PVC exterior and urethane interior coatings applied to the conduit shall afford sufficient flexibility to permit field bending without cracking or flaking at temperatures above 30°F (-1°C).
- i. All male threads on elbows and nipples shall be protected by application of a urethane coating.
- j. All female threads on fittings or conduit couplings shall be protected by application of a urethane coating.
- k. Independent certified test results shall be available to confirm coating adhesion.
- l. All conduits shall be standard weight, threaded, rigid steel conduit conforming to the requirements of ANSI Standard C80.1. All conduits shall be hot-dip galvanized, inside and out, to meet the requirements of the above standard for protective coating. Conduit couplings and fittings shall be made of malleable iron or steel, hot-dip galvanized.
- m. All conduit fittings that serve as part of the raceway shall be coated with the same exterior PVC coating and interior urethane coating. The plastic interior coating and the interior urethane coating shall be factory applied by the same manufacturer who produces the hot-dip galvanized conduit. PVC coated conduit shall be installed in accordance with the manufacturer's installation manual and shall be certified by the manufacturer or their certified representative.
- n. Conduits shall not be less than 1/2 inch in diameter. The interior surfaces shall have a smooth finish and be free of burrs or projections, which might cause injury to the cables. All conduits shall be free from blisters, cracks, or injurious defects and shall be reamed at each end after being threaded. Conduits shall be installed so as to be continuous and watertight between boxes or equipment. Conduits shall be protected at all times from the entrance of water or other foreign matter by being well-plugged overnight or when the work is temporarily suspended. Manufacturer's plugs shall be used to protect open conduits from water intrusion – tape is not a suitable alternative.

- o. Conduit bends and offsets shall be made by cold bending using approved methods and equipment. The use of a pipe tee or vise for bending conduit will not be permitted. Conduit that has been crushed, or in any way deformed, shall be discarded. All bends shall be long sweep, free from kinks, and of such easy curvatures as to permit the drawing of conductors without injury. Conduit runs shall be made with as few couplings as standard lengths will permit, and the total angle of all bends between any two boxes or cabinets shall not exceed 270-degrees, unless otherwise approved by the Engineer. The radius of curvature of pipe bends shall not be less than eight times the inside diameter of said conduit. Long running threads will not be permitted. Pull boxes shall be used whenever necessary to facilitate the installation of the wire.
- p. All new conduits shall, wherever practicable, be concealed in the walls, ceilings, or floors. Where conduits pass through the floors or walls of the houses, they shall be cast-in-place, or they shall be provided with galvanized pipe sleeves for free passage of the conduits. After the conduits are installed, the openings shall be caulked with an elastic compound and escutcheon plates provided on the interior walls, ceilings, and floors.
- q. Conduits shall be securely clamped and supported at intervals not exceeding 5 feet in length, or other supporting lengths approved by the Engineer.
- r. Conduit runs exposed on the steel structure shall be securely clamped to the steel work. The clamps, in general, shall consist of PVC coated U-bolts attached to structural steel supports bolted to the members. The minimum thickness of the structural supports shall be 3/8 inch. Supports shall be arranged so that conduits rest on top of the support and U-bolts rest on top of the conduits. The use of J-bolts to fasten structural supports or to clamp conduits will not be permitted.
- s. All U-bolts shall be provided with medium-series lock washers and hexagonal nuts. The bolts, nuts, and washers shall be of stainless steel conforming to the requirements of the Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes, ASTM Designation A276, Type 316. U-bolts used for securing PVC coated conduits shall be manufactured from stainless steel with PVC coating.
- t. Where conduits are to be mounted exposed on non-steel surfaces, they shall be securely clamped to the surface using bent plate pipe supports with back spacers held by not less than two bolts. The stock size for the bent steel plate supports shall be 1/4 inch thick by 2 inches wide. Back plates shall be of 3/8-inch thick steel. Supports and spacers shall be hot-dip galvanized. Bolts shall be not less than 1/2 inch in diameter and shall be of stainless steel conforming to the requirements specified for U-bolts.

- u. At any point where a conduit crosses an expansion joint longitudinally or where movement between adjacent sections of conduit can be expected, conduit expansion fittings shall be installed. The fittings shall be bronze expansion fittings and shall be provided with flexible bonding jumpers to maintain the electrical continuity across the joints. The fittings shall permit a total conduit movement of 4 inches.
- v. At any point where a conduit crosses a joint laterally or where an offsetting type movement between adjacent sections of conduit can be expected, expansion and deflection fittings shall be installed. The fittings shall permit a movement of 3/4 inch from the normal in any direction.
- w. Flexible conduits for the connections between the rigid conduit system, all motors, and limit switches shall be made with sections of PVC coated, flexible, metallic, liquid tight conduit. Each section shall not exceed 18 inches without prior approval of the Engineer.
- x. All conduit embedded in concrete, insofar as possible, shall be completely encased by concrete of not less than 3 inches, measured in any direction, and shall be securely held in place during pouring and construction operations. A group of conduits terminating together shall be held in place by a template.
- y. All conduit and fittings shall be carefully examined before being installed, and all pieces having defects shall be set aside and removed from the site. All bends shall be made with standard size conduit elbows. Bends and offsets can be made with a power bender or hicky without kinking or destroying the plastic surface or smooth bore of the conduit when approved by the Engineer. Conduit shall be assembled hand-tight and then using strap wrenches tightened two more turns. Wrench marks or chuck marks shall be touched up with the appropriate touch-up compound. All cuttings and threading shall be performed as recommended by the conduit manufacturer. All conduit, enclosures, and fittings shall be mechanically joined together to form a continuous electrical conductor to provide effective electrical continuity.
- z. Ends of abandoned conduits, spare conduits, and empty conduits and stubs shall be capped during and after construction, using caps specifically identified by the manufacturer as intended for this purpose, and care shall be taken to ensure that no moisture or other matter is in or enters the conduits. Tape is not considered a suitable capping/sealing method for any raceway or enclosure.
- aa. All conduits shall be pitched not less than 1 inch in 10 feet (except by special permission). Where conduits cannot be drained to pull boxes, a drain "T" with drain fitting shall be installed at the low point and drained to a 1-cubic foot dry well of broken stone. Drain fittings shall be of stainless steel and shall be capable of passing 25 cc of water per minute.

- bb. The ends of all conduits projecting into boxes and equipment enclosures shall be provided with bronze insulated grounding bushings. The insulated portion shall be of molded phenolic compound, and each fitting shall have a screw type combination lug for bonding. Insulated bushings shall be the O.Z./Gedney Type RBLG, or Engineer approved equal. All bushing in any box or enclosure shall be bonded together with No. 10 AWG bare copper wire unless shown differently on Plans.
- cc. All conduits shall be carefully cleaned both before and after installation. Upon completion of the conduit and box installation, the Contractor shall clear each conduit by snaking with a steel band, to which shall be attached an approved tube cleaner equipped with a mandrel of a diameter not less than 80% of the nominal inside diameter of the conduit and shall then draw in the cables.
- dd. Both ends of each conduit run shall be provided with a brass tag having the same number stamped thereon in accordance with the conduit diagrams, and these tags shall be securely fastened to the conduit ends with No. 20 AWG brass wire.

F. Boxes

- 1. All boxes shall be sized, at a minimum, as per NEC Article 314. All boxes that contain both power and control conductors shall be provided with dividers. All outside location boxes shall be stainless steel, NEMA 4X, 14-gauge, Type 316.
 - a. Junction and Terminal Boxes
 - 1) Junction and terminal boxes shall be NEMA 4X, 14-gauge, Type 316 stainless steel enclosures with hinged, 14-gauge stainless steel doors supported by a continuous stainless steel hinge with removable pin. Seams shall be continuously welded and ground smooth. Each enclosure shall be provided with stainless steel fast operating door clamp assemblies and oil-resistant gasket to insure a watertight seal. Boxes and cabinets shall be Bulletin A51S and A4S with clamp assemblies A-L23SS as manufactured by Hoffman Engineering Company or equivalent as manufactured by Henessey or Weigmann or Engineer approved equal. Additional stainless steel box construction and sizes shall be as indicated on the Plans.
 - 2) Surface mounted interior and exterior boxes shall be provided with external mounting lugs. No box shall be drilled for more conduits or cables than actually enter it. Exterior boxes shall be provided with 1/2 inch combination drain and breather fittings.

- 3) Terminal boxes shall be of sufficient size to provide ample room for the terminal blocks and interior wiring, and for the installation of conduit terminations. Interior mounting buttons with tapped holes or back panels shall be provided for mounting the terminal blocks. Mounting screws for terminal strips shall not protrude through the outside of the box. Terminal blocks shall be provided in each terminal box for the connection of all conductors including spare conductors entering the box plus at least ten percent spare terminals. The only exceptions shall be for the brake and tail lock conductor connections as indicated in the Plans. Terminal blocks shall be one-piece blocks with stainless steel hardware and stainless steel or plated brass screws no smaller than No. 8-32. All wires on terminals shall be secured with crimped insulated closed ring lugs.
- 4) Replacement latches and gaskets for the near side main distribution panel shall be from the original manufacturer and meet the standards for the original items being replaced. Replacement latches and gaskets shall be installed per the manufacturer's recommendations.

G. Hardware and Supports

1. Raceways, whether exposed or concealed, shall be securely supported and fastened at intervals of nominally every 5-feet and within 18 inches of each outlet, elbow, fitting, panel, and device. Support suspended raceways with metal ring or trapeze hangers and threaded steel rods having a safety factor of 4
2. Conduits and boxes mounted externally on walls or bridge structure shall be set no less than 1-1/2 inches clear from the supporting structure to prevent accumulation of dirt and debris. Parallel horizontal conduit shall be spaced at least 1 inch apart and they shall be securely clamped to the anchorage to prevent rattling or wear.
3. Install raceway exposed, wall-mounted or suspended with 3/8 inch metal rods at intervals not exceeding 5 feet. Wall-mounted raceways shall be supported using stainless steel strut utilizing 2 hole hold down clamp or pipe/conduit clamp. The use of one hole finger type conduit clamp is not acceptable. Suspended raceways shall be supported from overhead structural system. Provide details of standard arrangement in plans specify other support details to be submitted for approval.
4. Provisions shall be made to isolated dissimilar metals.
5. Where mounting on structural steel, all corrosion shall be removed and surface shall be cleaned, primed, and painted as indicated in the Mechanical Section of these specifications.
6. All multi-conductor SOW cable shall be supported on the ends with strain relief type fittings. In the case of the droop cables, stainless steel wire mesh grips shall be used on each end.

7. Furnish and install liquid tight flexible metal conduit connection to motors and equipment subject to vibration with 90 degrees loop minimum to allow for isolation. Also furnish and install liquid tight conduit to all limit switches and all equipment where the electrical connection point is exposed and equipment is in damp locations. Maximum length of flexible conduit shall be 36 inches. Furnish and install ground wire.
- H. Wiring and Cables
1. All wiring and cables and their insulation and covering shall be of a nationally recognized brand, acceptable to the Engineer, and shall have marks always used on the particular brand for identifying it.
 2. All wiring and cables shall conform to the requirements of NEMA Publication No. WC-70, and UL Standard 44. Before wire and cable orders are placed with any manufacturer, the Contractor shall submit for approval typical published test data for the type of insulation proposed, showing that it meets the requirements of NEMA Publication No. WC-70 for 0-600V rated circuit voltage phase-to-phase. The wire shall be listed by Underwriters Laboratories for use in accordance with Article 310 of the National Electrical Code.
 3. All materials used to fabricate insulated wiring and cables shall be certified to be from stock not more than 1 year old.
 4. Single Conductors
 - a. Except where otherwise noted, wiring in conduits shall be single-conductor.
 - b. All single conductors shall be of stranded copper large enough to carry safely the maximum currents required without injurious heating or serious voltage drop. Conductors shall not be smaller than No. 12 AWG for power applications and control applications circuits, except as approved for control cabinet and desk wiring or for lighting fixtures.
 - c. All conductors shall have Class B concentric stranding per UL Standard 44, except for conductors in flexible cables. A suitable separator over the conductor may be used at the option of the manufacturer.
 - d. Each conductor shall be insulated with a cross linked polyethylene jacket complying with the physical and electrical requirements of UL Standard 44 for Type XHHW-2. The average thickness of insulation, for a given conductor size, shall be as specified in UL Standard 44 for Type XHHW-2. The minimum thickness at any point shall be not less than 90% of the specified average thickness. The insulation shall be applied tightly to the conductor and shall be free-stripping.

- e. Equipment ground conductors shall be bare, stranded, coated copper conforming to Class B stranding and the requirements of NEMA Publication No. WC-70, and UL Standard 44. Insulated ground conductor shall be sized in conformance with NEC and UL-listed as type XHHW-2 unless otherwise specified in the Contract Documents.
 - f. The wire shall be identified by surface marking indicating manufacturer's identification, conductor size and metal, voltage rating, UL Symbol and type designation. Color coding shall be as specified by NEC.
 - g. All conductors shall be labeled with permanent, oil and water-resistant, preprinted identification bands or sleeves. Conductors shall be identified at every tap, termination and in all junction boxes, pull boxes and equipment enclosures per the current edition of AASHTO LRFD Movable Highway Bridge Design Specifications.
5. Droop and Navigation/Clearance Light Cables
- a. Droop cables and navigation/clearance light cables shall be flexible multi-conductor cables, type SOW.
 - b. Conductors shall be extra-flexible stranding (Class K), soft drawn tinned copper per ASTM B-33, ASTM B-172, and UL-62.
 - c. Insulation shall be color-coded thermoset (EPDM) 90°C insulation with nylon jacket, per UL-62 and ICEA S-68-516.
 - d. Cabling shall be conductors that are cabled (maximum of two layers) with non-wicking, non-hygroscopic fillers around a glass strength member, and an overall binder of rubberized fabric tape and reinforced braid.
 - e. Jacket shall be conductors that are oil-resistant thermoset (NBR/PVC) jacket per UL-62 and ICEA S-68-516.
6. Wire and Cable Testing
- a. Test each circuit for continuity and short-circuits for its complete length before connecting to load. Verify identification numbers for the entire length of the circuit. Inspect wire and cable for physical damage and proper connection.

- b. Perform the insulation resistance test at 1,000 VDC for 1 minute. Minimum insulation resistance for new cable will be 100 M-ohms or greater. When insulation resistance must be determined with all motor control center, panelboards, switches, and over current devices in place, the insulation resistance when tested at 500 VDC will be no less than 50 M-ohms. Perform the insulation resistance testing for conductors as required by the NETA ATS (International Electrical Testing Association- Acceptance Testing Specifications for Electric Power Distribution Equipment and Systems – latest edition), including dielectric absorption testing. Any measured resistance values less than 100 M ohms shall not be acceptable. The Engineer will witness the test. Record the test results and submit to the Engineer for review prior to energizing the circuit. Include a table of the test results with the “as-built” drawings with additional columns left blank for recording future readings.
7. Construction
- a. Wiring shall not be installed in any conduit before all joints are made up tightly and the conduits rigidly secured in place. The drawing of cables into conduits shall be done without injury to the wires or their insulation or covering. No lubricant of any kind shall be used for the pulling of wires, unless specifically authorized by the Engineer. Sufficient slack shall be left in all cables to permit proper connections in boxes, cabinets, and enclosures.
 - b. Both ends of every single length of conductor shall be permanently and clearly tagged in accordance with the same numbers or designations appearing on the approved wiring diagrams.
 - c. Each terminal of all terminal blocks shall be permanently marked to show the same number or designation as appears on the wire connected thereto.
 - d. Splicing of wires will not be permitted, except for wiring to service lighting fixtures and receptacles. Wherever it becomes necessary to joint or branch conductors, terminal blocks shall be used, and wires shall be clearly tagged.
 - e. The conductor sizes and number of wires shown on the Plans are the minimum permissible. The Contractor shall provide wiring and cables of sufficient size and number as may be required for the installation in accordance with the wiring diagrams on his approved working drawings. In each conduit and multi conductor cable containing ten or more conductors, at least one spare wire shall be provided for every ten conductors actually used.

- f. Where multi conductor cables enter any cabinets or boxes, they shall be provided with watertight cable terminators. Each cable terminator shall provide a watertight seal by compressing a tapered neoprene-sealing ring around the outer jacket of the cable.
8. Conduit and Wiring Diagrams and Schedules
- a. The number and sizes of conduits, boxes, cabinets, wires and cables shown on the Contract Plans schematic layout diagrams and schedules are the minimum permissible for the power and control circuits of the systems shown on these Contract Plans. The Contractor shall provide conduits, conductors and cables of sufficient number and size, including spares, as may be required for the installation in accordance with the final wiring diagrams on the approved working drawings, and in compliance with NEC and all other applicable codes. The Contractor shall number and tag spare conductors as such, and spare conductors shall be shown on all shop and record drawings.
 - b. The schematic conduit diagrams on the Contract Plans and all associated tables, schedules and details do not purport to show all pull and terminal boxes, junction boxes, mounting hardware and supports associated with the complete and final installation of all bridge systems. The contractor shall furnish and install any additional boxes, supports and other hardware required to conform with these item's construction and installation specifications, and in compliance with all applicable codes.
 - c. Flexible conduit sections, hardware and supports required for connections to motors and limit switches are not indicated on the Contract Plans.
 - d. The schematic conduit diagrams do not purport to show physical layout and locations, of the equipment or of the associated conduit, wiring, boxes and other hardware, and should not be used for such purposes as substitutes for working or installation drawings. The Contractor is solely responsible to produce and submit for Engineer's approval such drawings as specified under these Special Provisions.
 - e. Fittings, mounting supports, brackets, etc. are not shown on the conduit and wiring schematic diagrams.

I. Brakes

a. Construction Requirements

After the leaf drive motor brakes and machinery brakes have been installed (refer to the Mechanical section of these specifications for details), the brake motors and limit switches shall be electrically connected per the Plans. After connecting to the electrical system, the brakes shall be electrically tested. Tests shall include:

- a. Operate thrusters and measure motor currents with a recently calibrated (within 1-year) ammeter. Measured motor currents shall be recorded and submitted to the Engineer. Any measured currents above the nameplate rated value will be grounds for rejection of the brake thruster.
- b. Test the Brake Released limit switches to ensure operation of the desk indicator light per the limit switch development in the Plans.
- c. Test the Brake Hand Operated limit switches to ensure the leaf drive command is disabled if both brakes are manually released. Operation of limit switches should be per the limit switch development in the Plans.

J. Center Lock Operator

1. Construction Requirements

After the center lock operators have been installed (refer to the Mechanical section of these specifications for details), the operator motors and limit switches shall be electrically connected per the Plans. After connecting to the electrical system, the center lock operators shall be electrically tested. Tests shall include:

- 1) Check direction of motor rotation by momentarily operating the center lock operator in either the “drive” or “pull” direction while someone is monitoring the movement of the operator. If the operator moves in the intended direction, continue with setting the limit switches. If the operator moves in the direction opposite what is desired, reverse two of the motor power leads in the auxiliary panel at the motor starter. Test rotation again to verify. Use caution when doing this test as to not drive the operators to either extreme of travel. Be prepared to stop the operator motor using the local disconnect switch or the breaker in the auxiliary panel in case the bridge control circuit should fail for some reason.
- 2) Set the “Lock-In” and “Lock-Out” limit switches to achieve the conditions indicated in the limit switch development of the Plans. The “In” and “Out” positions should be as indicated in the Plans. Adjust the limit switches per the manufacturers recommendations.
- 3) After proper rotation has been achieved and the limit switches have been properly adjusted, measure and record all three phases of motor current, for pulling and driving the lock bars, using a recently calibrated (within 1-year) ammeter. Recorded current measurements shall be submitted to the Engineer, and any currents measured that exceed the nameplate rating shall be cause for rejection of the operator motor. The existing overload protection modules shall be adjusted as necessary to meet the manufacturer’s recommended setting for the measure motor currents.

K. Tail Lock Actuator

1. Construction Requirements

After the tail lock actuators have been installed (refer to the Mechanical section of these specifications for details), the actuator motors and limit switches shall be electrically connected per the Plans. After connecting to the electrical system, the tail lock actuators shall be electrically tested. Tests shall include:

1. Check direction of motor rotation by momentarily operating the tail lock actuator in either the “drive” or “pull” direction while someone is monitoring the movement of the operator. If the actuator moves in the intended direction, continue with setting the limit switches. If the actuator moves in the direction opposite what is desired, reverse two of the motor power leads in the auxiliary panel at the motor starter. Test rotation again to verify. Use caution when doing this test as to not drive the actuators to either extreme of travel. Be prepared to stop the actuator motor using the local disconnect switch or the breaker in the auxiliary panel in case the bridge control circuit should fail for some reason.
2. Set the “Lock-In” and “Lock-Out” limit switches to achieve the conditions indicated in the limit switch development of the Plans. The “In” and “Out” positions should be as indicated in the Plans. Adjust the limit switches per the manufacturers recommendations.
3. After proper rotation has been achieved and the limit switches have been properly adjusted, measure and record all three phases of motor current, for pulling and driving the tail locks, using a recently calibrated (within 1-year) ammeter. Recorded current measurements shall be submitted to the Engineer, and any currents measured that exceed the nameplate rating shall be cause for rejection of the tail lock actuator.

L. Leaf Position Rotary Limit Switches

1. Rotary limit switches shall have a weather-sealed NEMA 4X, 316 Stainless Steel housings design. Cover shall be designed to positively retain a gasket. A drain plug and breather shall allow condensation to evaporate or drain from housing. Construction shall be heavy-duty, durable and suitable for marine environment.
2. Rotary limit switches shall have 10 adjustable cam and switch sets. Cams shall be adjustable from 4° to 356°. Cams shall be individually adjustable and shall be firmly and immovably engaged to the shaft under operating conditions. Loosening of a single nut shall allow independent and individual adjustment of any individual cam or cam half. Adjustment of a cam shall not affect setting of other cams or cause movement of other cams. Re-tightening of the nut shall secure all cams to the shaft. Each cam shall consist of a pair of cam halves to permit independent setting of make and break points. An integral gear reducer with an 8:1 ratio shall be provided for the input shaft. Contacts block shall be snap action, double pole double throw. Both contacts shall be operated by the same armature. Contact blocks shall be furnished and installed with plug-in sockets. Contacts shall be rated for a minimum of 10 A at 120 V ac. The number of circuits shall be as specified. Individual switches shall have clearly labeled screw-type wire connections and corrosion-resistant contacts.

- M. Leaf Position Indicator Transmitter
1. Leaf position indicator transmitter shall be repaired or replaced and signal receiver on desk shall be coordinated (and repaired as needed) to provide an accurate indication to the operator of the near leaf position. If replacement unit is required, it shall have the same ratings as the existing to be replaced so as no electrical modifications are required.
- N. Painting
- The requirements for painting machinery shall also apply to painting electrical equipment, unless otherwise specified.
- 1) Shop Painting:
Electrical equipment such as conduits, boxes, supports, and other devices which have a stainless or galvanized finish and equipment such as motors, brakes, and enclosures which normally are given a factory finish need not be shop painted. All other electrical equipment shall be given one shop coat of inorganic, zinc rich primer.
 - 2) Field Painting:
Electrical equipment which is normally given a factory painted finish suitable to the Engineer need not be field painted. All other electrical equipment, such as conduits, boxes, device enclosures, supporting clips and brackets, and other devices, shall be given two field coats of paint as specified under the requirements for painting machinery in the Machinery Section of these specifications. Before applying the two field coats, galvanized surfaces shall be cleaned free of all grease, oil, dirt, and foreign material and shall be etched with copper sulphate solution, after which the solution shall be applied. In lieu of etching and a coat of shop paint, the Contractor may use galvanizing primer as a first coat for galvanized surfaces. The final field coat on electrical equipment in the control house shall be of a color and type of paint to match the house interior.

METHOD OF MEASUREMENT.

Replacement of the miscellaneous electrical equipment shall be measured for payment by complete replacement of specified equipment per the contract plans.

BASIS OF PAYMENT.

A.	Payment will be made under:	
	<u>Pay Item</u>	<u>Pay Unit</u>
	MISCELLANEOUS ELECTRICAL WORK	Lump Sum

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	4.0 - 8.0"
	Bridge Deck Patching (10)	
	PP-1	
	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.”

JACKING EXISTING SUPERSTRUCTURE

Effective: January 11, 1993

Revised: April 13, 2018

Description: This work shall consist of furnishing all material, equipment and labor for the construction and subsequent removal of jacking support systems complete, including jacks, jack supports, shims and all necessary cribbing. Included under this item shall be all work to raise and support the existing structure as specified on the plans and as noted herein.

Submittals: The Contractor shall submit details and calculations of his/her proposed jacking systems, cribbing and procedures for approval of the Engineer before commencing work. The system shall be designed and sealed by a Structural Engineer licensed in Illinois. Approval will not relieve the Contractor of responsibility for the safety of the structure.

Construction Requirements: Jacking and cribbing shall be done only under main beams, with jacking against diaphragms prohibited unless specifically allowed on the plans. Mud sills for timber cribbing shall be placed on firm, level, tamped ground that has been inspected by probes for soft spots. Uneven settlement should be anticipated and correction shims provided for mud sills that are partially on stabilized shoulders or pavement.

If unforeseen field conditions preclude the execution of the approved jacking plan, the Engineer may require the Contractor to provide additional supports or measures. All changes to the revised jacking plan shall be approved by the Structural Engineer that sealed the jacking plan. Neither added precautions nor the failure of the Engineer to order additional protection will in any way relieve the Contractor of sole responsibility for the safety of lives, equipment and structure.

Jacks shall be provided with a ram head plate approximately equal in contact area as the sole plate at the beam. This plate shall be "C" clamped to the beam flange when clearances will not allow the jack to be placed equidistant from the ends of the plate. The centerline of the ram head must be in line with the centerline of the beam. A needle beam or fabricated jacking yoke with two jacks will be allowed provided the design meets with the approval of the Engineer.

The jacking support system shall be such that all beams that are attached transversely by a bridge deck and/or diaphragms or crossframes, for each individual structure, shall be raised simultaneously in the sequence prescribed in the plans and all jacking tolerances stated below apply. If the bridge deck is removed and the diaphragms or crossframes between adjacent beams are detached, then the beams do not need to be raised simultaneously and only the longitudinal jacking tolerances stated below apply. The system shall be installed in such a manner to prevent lateral movement and remain stable during all phases of the work. In all cases where multiple jacks are used for a lift the hydraulic jacks shall be equipped with gages so that jacking pressures can be equalized or the needle and blocking beams equipped with adjustable machinist levels so that a uniform amount of lift can be accomplished. The jacking tolerances shall be as follows:

- (a) Jacking Existing Superstructure with bridge deck in place. The differential jacking height shall not exceed 1/8 in. (4 mm) transversely between adjacent beams and 1/4 in. (7 mm) longitudinally between adjacent supports.
- (b) Jacking Existing Superstructure when entire bridge deck is removed. The differential jacking height shall not exceed 1/4 in. (7 mm) transversely between adjacent beams and 3/4 in. (19 mm) longitudinally between adjacent supports.

The Contractor shall be responsible for restoring to their original condition, prior to jacking, the drainage ditches, pavement, or slopewall disturbed by the cribbing footings. If applicable, existing diaphragms or cross frames at the stage construction line shall be disconnected prior to jacking and reconnected using new H.S. bolts after jacking is completed.

Basis of Payment: This work, as herein specified, will be paid for at the contract lump sum price for JACKING EXISTING SUPERSTRUCTURE.

Additional supports or measures resulting from unforeseen field conditions will be paid for according to Article 109.04.

CLEANING AND PAINTING CONTACT SURFACE AREAS OF EXISTING STEEL STRUCTURES

Effective: June 30, 2003

Revised: April 13, 2018

Description. This work shall consist of the surface preparation and painting of existing steel structures in areas that will be in contact with new steel.

The existing steel at primary connections (faying surfaces) shall be prepared, and primed as specified herein prior to connecting new structural steel to the existing structure.

The existing steel at secondary connections shall be prepared, and if bare metal is exposed, primed as specified herein prior to connecting new structural steel to the existing structure.

General. The existing coatings shall be assumed to contain lead and may also contain other toxic metals. Any plans that may be furnished for the work, and any dimensions or other information given regarding a structure, are only for the purpose of assisting bidders in determining the type and location of steel to be cleaned and painted. It is the responsibility of the Contractor to verify this information and the accuracy of the information provided shall in no way affect the price bid for structural steel.

Materials. The Bureau of Materials and Physical Research has established a list of all products that have met preliminary requirements. Each batch of material must be tested and approved before use.

The paint materials shall meet the requirements of the following articles of the Standard Specification:

<u>Item</u>	<u>Article</u>
a) Organic Zinc Rich Primer	1008.05
b) Aluminum Epoxy Mastic	1008.03

Submittals:

- a) Manufacturer's application instructions and product data sheets. Copies of the paint manufacturer's application instructions and product data sheets shall be furnished to the Engineer at the field site before steel cleaning begins.
- b) Waste Management Plan. The Waste Management Plan shall address all aspects of waste handling, storage, testing, hauling and disposal. 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.
- c) 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.

Construction Requirements. 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, coating mixing and application, and evaluations between coats and upon completion of the work). The Contractor shall provide artificial lighting in areas 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 priming, including the working platforms, access, and entryways shall be at least 20 foot candles (215 LUX).

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 protective devices are not being accomplished, as determined by the Engineer, work shall be immediately suspended until corrections are made. Painted surfaces damaged by any Contractor's operation shall be removed and repainted, as directed by the Engineer, at the Contractor's expense.

Weather Conditions. Surfaces to be primed after cleaning shall remain free of moisture and other contaminants. The Contractor shall control his/her operations to insure that dust, dirt, or moisture does not come in contact with surfaces cleaned prior to painting. Surfaces painted shall be protected until the coating is sufficiently cured to protect itself from damage.

Restrictions on ambient conditions shall be as per the coating manufacturer's written specifications.

Surface Preparation: Prior to making connections or painting, all loose abrasives, paint, and residue shall be contained, collected, removed from the surface area and properly disposed of as specified later in this specification.

Soluble Salt Remediation. 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 runoff 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 the 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 as specified below.

Painted surfaces of new steel damaged by abrasive blasting or by the Contractor's operations shall be repainted, as directed by the Engineer, at the Contractor's expense.

- a) Primary Connections. Primary connections shall be defined as faying (contact) surfaces of high-strength bolted connections specifically noted in plans.

The surfaces of existing steel in all areas that will be in direct contact with new steel shall be prepared according to SSPC-SP15, Commercial Grade Power Tool Cleaning using vacuum-shrouded power tools equipped with HEPA filtration. The surface preparation shall remove all rust, mill scale, and existing paint from the contact surface. At the Contractors option, vacuum blast cleaning according to SSPC-SP6, Commercial Blast Cleaning may be substituted for SSPC-SP15 at no additional cost to the Department. The surface profile for primary connection surfaces shall be 1.5 to 3.5 mils (38 to 90 microns).

- b) Secondary Connections. Secondary connections shall be defined as all surface areas of existing members that will be in contact with new steel except as previously defined as primary connections.

These surfaces of existing steel in all areas that will be in direct contact with new steel shall be prepared according to SSPC-SP3, Power Tool Cleaning using vacuum-shrouded power tools equipped with HEPA filtration. The surface preparation shall remove all loose rust, loose mill scale, and loose, checked, alligatored and peeling paint from the contact surface. At the Contractors option, vacuum blast cleaning according to SSPC-SP6, Commercial Blast Cleaning or SSPC-SP15, Commercial Grade Power Tool Cleaning may be substituted for SSPC-SP3 at no additional cost to the Department. The surface profile for abrasive blast cleaning and Commercial Grade Power Tool Cleaning shall be 1.5 to 3.5 mils (38 to 90 microns).

Painting. The manufacturer's written instructions shall be followed for paint storage, mixing, thinning, application, ambient conditions, and drying times between coats. The surface shall be free of dirt, dust, and debris prior to the application of any coat. The coatings 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.

The Engineer will approve surface preparation prior to priming.

- a) For Primary connections the surface of the prepared steel cleaned to bare metal shall be primed with an organic zinc rich primer between 3.5 and 5.0 mils (90 and 125 microns) dry film thickness.
- b) For Secondary Connections the surface of the prepared steel cleaned to bare metal shall be painted with one coat of epoxy mastic between 5 and 7 mils (125 microns to 180 microns) in thickness. Areas not cleaned to bare metal need not be painted.

The primer shall cure according to the manufacturers instructions prior to connecting new structural steel to the existing structure.

The surrounding coating at each prepared 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.

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 uncontained surfaces overnight. 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. The costs of testing shall be considered included in this work. Copies of the test results shall be provided to the Engineer prior to shipping the waste.

The existing paint removed, 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.

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 will be considered included in the cost of "Furnishing and Erecting Structural Steel", "Erecting Structural Steel", or "Structural Steel Repair", as applicable, according to the Standard Specifications, unless otherwise specified on the plans.

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 effect 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. Effected 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 the 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 manufacturers 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 torqueing compound dye may remain after cleaning provided the dye is not transferred to a 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 pose 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

Table 1 (Continued)					
Containment Criteria for Removal of Paint Containing Lead and Other Toxic Metals¹					
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.

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.”

CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE)

Effective: June 1, 2010

Revised: November 1, 2014

The reduction of emissions of particulate matter (PM) for off-road equipment shall be accomplished by installing retrofit emission control devices. The term “equipment” refers to diesel fuel powered devices rated at 50 hp and above, to be used on the jobsite in excess of seven calendar days over the course of the construction period on the jobsite (including rental equipment).

Contractor and subcontractor diesel powered off-road equipment assigned to the contract shall be retrofitted using the phased in approach shown below. Equipment that is of a model year older than the year given for that equipment’s respective horsepower range shall be retrofitted:

Effective Dates	Horsepower Range	Model Year
June 1, 2010 ^{1/}	600-749	2002
	750 and up	2006
June 1, 2011 ^{2/}	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006
June 1, 2012 ^{2/}	50-99	2004
	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006

1/ Effective dates apply to Contractor diesel powered off-road equipment assigned to the contract.

2/ Effective dates apply to Contractor and subcontractor diesel powered off-road equipment assigned to the contract.

The retrofit emission control devices shall achieve a minimum PM emission reduction of 50 percent and shall be:

- a) Included on the U.S. Environmental Protection Agency (USEPA) *Verified Retrofit Technology List* (<http://www.epa.gov/cleandiesel/verification/verif-list.htm>), or verified by the California Air Resources Board (CARB) (<http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>); or
- b) Retrofitted with a non-verified diesel retrofit emission control device if verified retrofit emission control devices are not available for equipment proposed to be used on the project, and if the Contractor has obtained a performance certification from the retrofit device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

Note: Large cranes (Crawler mounted cranes) which are responsible for critical lift operations are exempt from installing retrofit emission control devices if such devices adversely affect equipment operation.

Diesel powered off-road equipment with engine ratings of 50 hp and above, which are unable to be retrofitted with verified emission control devices or if performance certifications are not available which will achieve a minimum 50 percent PM reduction, may be granted a waiver by the Department if documentation is provided showing good faith efforts were made by the Contractor to retrofit the equipment.

Construction shall not proceed until the Contractor submits a certified list of the diesel powered off-road equipment that will be used, and as necessary, retrofitted with emission control devices. The list(s) shall include (1) the equipment number, type, make, Contractor/rental company name; and (2) the emission control devices make, model, USEPA or CARB verification number, or performance certification from the retrofit device manufacturer. Equipment reported as fitted with emissions control devices shall be made available to the Engineer for visual inspection of the device installation, prior to being used on the jobsite.

The Contractor shall submit an updated list of retrofitted off-road construction equipment as retrofitted equipment changes or comes on to the jobsite. The addition or deletion of any diesel powered equipment shall be included on the updated list.

If any diesel powered off-road equipment is found to be in non-compliance with any portion of this special provision, the Engineer will issue the Contractor a diesel retrofit deficiency deduction.

Any costs associated with retrofitting any diesel powered off-road equipment with emission control devices 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. The Contractor's compliance with this notice and any associated regulations shall not be grounds for a claim.

Diesel Retrofit Deficiency Deduction

When the Engineer determines that a diesel retrofit deficiency exists, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency continues to exist. The calendar day(s) will begin when the time period for correction is exceeded and end with the Engineer's written acceptance of the correction. The daily monetary deduction will be \$1,000.00 for each deficiency identified.

The deficiency will be based on lack of diesel retrofit emissions control.

If a Contractor accumulates three diesel retrofit deficiency deductions for the same piece of equipment in a contract period, the Contractor will be shutdown until the deficiency is corrected. Such a shutdown will not be grounds for any extension of the contract time, waiver of penalties, or be grounds for any claim.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (DBE)

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 **2.00%** of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

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

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

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

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

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

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

- (a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases and will be considered by the Department.

- (1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.
- (2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items with its own forces.
- (3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- (4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.
 - b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable. In accordance with the above Bidding Procedures, the documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.
- (5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

- (6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.
 - (7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.
 - (8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.
- (b) If the Department determines the bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided it is otherwise eligible for award. If the Department determines the bidder has failed to meet the requirements of this Special Provision or that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification will also include a statement of reasons for the adverse determination. If the Utilization Plan is not approved because it is deficient as a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no more than a five calendar day period to cure the deficiency.
- (c) The bidder may request administrative reconsideration of an adverse determination by emailing the Department at "DOT.DBE.UP@illinois.gov" within the five calendar days after the receipt of the notification of the determination. The determination shall become final if a request is not made on or before the fifth calendar day. A request may provide additional written documentation or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be reviewed by the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

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

- (a) DBE as the Contractor: 100 percent goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE does not count toward the DBE goals.
- (b) DBE as a joint venture Contractor: 100 percent goal credit for that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work performed by the DBE's own forces.
- (c) DBE as a subcontractor: 100 percent goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subcontractor from the Contractor or its affiliates. Work that a DBE subcontractor in turn subcontracts to a non-DBE does not count toward the DBE goal.
- (d) DBE as a trucker: 100 percent goal credit for trucking participation provided the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible. At least one truck owned, operated, licensed, and insured by the DBE must be used on the contract. Credit will be given for the following:
 - (1) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
 - (2) The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission is receives as a result of the lease arrangement.

(e) DBE as a material supplier:

- (1) 60 percent goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.
- (2) 100 percent goal credit for the cost of materials of supplies obtained from a DBE manufacturer.
- (3) 100 percent credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a DBE regular dealer or DBE manufacturer.

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

- (a) NO AMENDMENT. No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be emailed to the Department at DOT.DBE.UP@illinois.gov.
- (b) CHANGES TO WORK. Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request for Approval of Subcontractor, Department form BC 260A or AER 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, a new Request for Approval of Subcontractor will not be required. However, the Contractor must document efforts to assure the existing DBE subcontractor is capable of performing the additional work and has agreed in writing to the change.
- (c) SUBCONTRACT. The Contractor must provide copies of DBE subcontracts to the Department upon request. Subcontractors shall ensure that all lower tier subcontracts or agreements with DBEs to supply labor or materials be performed in accordance with this Special Provision.

- (d) ALTERNATIVE WORK METHODS. In addition to the above requirements for reductions in the condition of award, additional requirements apply to the two cases of Contractor-initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition of award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:
- (1) The replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item of work) in a modification of the condition of award; or
 - (2) The DBE is aware its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or
 - (3) The DBE is not capable of performing the replacement work or has declined to perform the work at a reasonable competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.
- (e) TERMINATION AND REPLACEMENT PROCEDURES. The Contractor shall not terminate or replace a DBE listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in this Special Provision. The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the Contractor obtains the Department's written consent as provided in subsection (a) of this part. Unless Department consent is provided for termination of a DBE subcontractor, the Contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the DBE in the Utilization Plan.

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

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

- (1) The listed DBE subcontractor fails or refuses to execute a written contract;
- (2) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the Contractor;
- (3) The listed DBE subcontractor fails or refuses to meet the Contractor's reasonable, nondiscriminatory bond requirements;
- (4) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
- (5) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1200 or applicable state law.
- (6) The Contractor has determined the listed DBE subcontractor is not a responsible contractor;
- (7) The listed DBE subcontractor voluntarily withdraws from the projects and provides written notice to the Contractor of its withdrawal;
- (8) The listed DBE is ineligible to receive DBE credit for the type of work required;
- (9) A DBE owner dies or becomes disabled with the result that the listed DBE subcontractor is unable to complete its work on the contract;
- (10) Other documented good cause that compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the Contractor can self-perform the work for which the DBE contractor was engaged or so that the Contractor can substitute another DBE or non-DBE contractor after contract award.

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

- (f) FINAL PAYMENT. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than 30 calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Resident Engineer. If full and final payment has not been made to the DBE, the DBE Payment Agreement shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the DBE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages. The Contractor may request an administrative reconsideration of any amount deducted as damages pursuant to subsection (h) of this part.
- (g) ENFORCEMENT. The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.
- (h) RECONSIDERATION. Notwithstanding any other provision of the contract, including but not limited to Article 109.09 of the Standard Specifications, the Contractor may request administrative reconsideration of a decision to deduct the amount of the goal not achieved as liquidated damages. A request to reconsider shall be delivered to the Contract Compliance Section and shall be handled and considered in the same manner as set forth in paragraph (c) of "Good Faith Effort Procedures" of this Special Provision, except a final decision that a good faith effort was not made during contract performance to achieve the goal agreed to in the Utilization Plan shall be the final administrative decision of the Department. The result of the reconsideration process is not administratively appealable to the U.S. Department of Transportation.

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."

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."

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.”

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.”

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.”

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.”

SUBCONTRACTOR AND DBE PAYMENT REPORTING (BDE)

Effective: April 2, 2018

Add the following to Section 109 of the Standard Specifications.

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

- (a) first tier subcontractors;
- (b) lower tier subcontractors affecting disadvantaged business enterprise (DBE) goal credit;
- (c) material suppliers or trucking firms that are part of the Contractor’s submitted DBE utilization plan.

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

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: November 2, 2017

Revised: April 1, 2019

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

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

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

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 1. 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.

IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL PROVISION

Effective: August 1, 2012

Revised: February 2, 2017

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

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

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

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

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

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

Basis of Payment: This work will be paid for at the contract unit price of \$15.00 per hour for each utilized certified TPG Program trainee (TRAINEES TRAINING PROGRAM GRADUATE). The estimated total number of hours, unit price, and total price must be included in the schedule of prices for the Contract submitted by Contractor prior to beginning work. The initial number of TPG trainees for which the incentive is available for this contract is 1.

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

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

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

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

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.”

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.

**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.

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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.