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Letting August 4, 2017

Specifications and Proposal
FOR REVIEW AND INSPECTION ONLY

Illinois Department of Transportation

Springfield, Illinois 62764

Contract No. 64E26
ROCK ISLAND County
Section (81-1)R-1&81-1(HBR,HBR-1,HBR-2)
Route FAI 74
Project NHPP-NHS-0074(326)
District 2 Construction Funds

Prepared by

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Checked by

(Printed by authority of the State of Illinois)

Illinois Department of Transportation

NOTICE TO BIDDERS

1. **TIME AND PLACE OF OPENING BIDS.** Electronic bids are to be submitted to the electronic bidding system (iCX-Integrated Contractors Exchange). All bids must be submitted to the iCX system prior to 10:00 a.m. August 4, 2017 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. 64E26
   ROCK ISLAND County
   Section (81-1)R-1&81-1(HBR,HBR-1,HBR-2)
   Project NHPP-NHS-0074(326)
   Route FAI 74
   District 2 Construction Funds

   2.007 miles of reconstruction from 7th Ave to 0.9 miles South of Avenue of the Cities in Moline.

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

Randall S. Blankenhorn,
Secretary

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2017

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 1-1-17)

SUPPLEMENTAL SPECIFICATIONS

RECURRING SPECIAL PROVISIONS

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

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STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction, Adopted 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" indicated on the Check Sheet included herein, which apply to and govern the construction of FAI Route 74 (I-74), Project NHPP-NHS-0074 (326), Section (81-1)R-1 & 81-1(HBR, HBR-1, HBR-2), Rock Island County, Contract No. 64E26 and in case of conflict with any part, or parts, of said Specifications, the said Special Provisions shall take precedence and shall govern.

LOCATION OF PROJECT

Project is located along Interstate 74 just south of 7th Avenue to approximately 0.9 miles south of 23rd Avenue (Avenue of the Cities) in Moline, Illinois and includes Interstate, ramp, and local road improvements.

DESCRIPTION OF PROJECT

Work on this project consists of, but is not limited to, the following:

Reconstruction of Interstate 74 from Illinois Station 49+03.54 to Station 155+00 including,

- Construction of I-74 eastbound and westbound mainline roadway,
- Construction of the bridge carrying I-74 westbound over 19th Street, Structure Number 081-0179 and the bridge carrying I-74 eastbound over 19th Street, Structure Number 081-0180,
- Construction of I-74 westbound exit ramp 7th-A to 7th Avenue including Structure Number 081-0181, I-74 eastbound entrance ramp 7th-B from 7th Avenue, I-74 westbound exit ramp AC-A to Avenue of the Cities, I-74 eastbound entrance ramp AC-B from Avenue of the Cities, I-74 eastbound exit ramp AC-C to Avenue of the Cities, and I-74 westbound entrance ramp AC-D from Avenue of the Cities,
- Construction of the bridge carrying I-74 westbound over 12th Avenue, Structure Number 081-0182 and the bridge carrying I-74 eastbound over 12th Avenue, Structure Number 081-0183,

- Construction of the bridge carrying I-74 westbound over SB 19th Street, Structure Number 081-0184 and the bridge carrying I-74 eastbound over SB 19th Street, Structure Number 081-0185,
- Construction of retaining walls along I-74 mainline, Ramps 7th-A, and Ramp 7th-B,
- Proposed lighting improvements,
- Proposed Intelligent Transportation System (ITS) improvements,
- Proposed Drainage improvements, and
- Construction of Aesthetic Identity Elements.

TRAFFIC CONTROL PLAN
Effective: January 14, 1999 Revised: January 13, 2017

Traffic Control shall be according to the applicable sections of the Standard Specifications for Road and Bridge Construction, the applicable guidelines contained in the National Manual on Uniform Traffic Control Devices for Streets and Highways, Illinois Supplement to the National Manual on Uniform Traffic Control Devices, these special provisions, and any special details and Highway Standards contained herein and in the plans.

Special attention is called to Articles 107.09 and 107.14 of the Standard Specifications for Road and Bridge Construction and the following Highway Standards relating to traffic control.

Standards:

701001	701006	701011	701101	701106	701301
701311	701400	701401	701411	701416	701426
701427	701428	701451	701456	701501	701601
701606	701611	701701	701801	701901	704001

Details:

- Staging Plans
- District Standard WORK ZONE SIGN DETAILS (DIST STD 34.1)
- District Standard URBAN LANE INSIDE CLOSURE, MULTILANE, 2W, WITH MOUNTABLE MEDIAN (DIST STD 35.1)
- District Standard TRAFFIC CONTROL FOR TRANSITION AREAS (DIST STD 38.1)
- District Standard TRAFFIC CONTROL TYPICAL WEAVE (DIST STD 39.1)
- District Standard TRAFFIC CONTROL FOR ROAD CLOSURE (DIST STD 40.1)
- District Standard TRAFFIC CONTROL AND PROTECTION AT TURN BAYS (TO REMAIN OPEN TO TRAFFIC) (DIST STD 94.2)

General:

Where construction activities involve sidewalks on both sides of the street, the work shall be staged so that both sidewalks are not out of service at the same time.

Signs:

No bracing shall be allowed on post-mounted signs.

Post-mounted signs shall be installed using standard 720011, 728001, 729001, on 4"x4" wood posts, or on any other "break away" connection if accepted by the FHWA and corresponding letter is provided to the resident.

All signs are required on both sides of the road when the median is greater than 10 feet and on one way roadways.

The "WORKERS" (W21-1a(O)-48) signs shall be replaced with symbol "Right or Left Lane Closed Ahead" (W4-2R or L(O)-48) signs on multilane roadways.

"BUMP" (W8-1(O)48) signs shall be installed as directed by the Engineer.

"UNEVEN LANES" W8-11(O)48 signs shall be installed at 1 mile intervals or as directed by the Engineer.

"LOW SHOULDER" W8-9(O)48 signs shall be installed at 1 mile intervals or as directed by the Engineer.

"NO PASSING ZONES NOT STRIPED NEXT ___ MILES" (G20-I 100(O)) signs shall be 60" x 36".

When covering existing Department signs, no tape shall be used on the reflective portion of the sign. Contact the District sign shop for covering techniques.

All regulatory signs shall be maintained at a 5 foot minimum bottom (rural), 7 foot minimum (urban).

Any plates or direct applied sheeting used to alter signs shall have the same sheeting as the base sign.

No more than one kind of alteration shall be used to alter a sign.

Any post stubs without a sign in place and visible shall have a reflector placed on each post.

Devices:

Cones or reflectorized cones shall not be used during hours of darkness.

A minimum of 3 drums spaced at 4 feet shall be placed at each return when the side road is open.

On all standards, and the devices listed in Section 701 of the Standard Specifications, the device spacing shall be revised to the following dimensions:

Where the spacing shown on the standard is 25 feet, the devices shall be placed at 20 feet.
Where the spacing shown on the standard is 50 feet, the devices shall be placed at 40 feet.
Where the spacing shown on the standard is 100 feet, the devices shall be placed at 80 feet.

Direction Indicator Barricades shall exclusively be used in lane closure tapers. The backside of the direction indicator barricades shall be striped like a type II barricade when opposing traffic is within 12 feet of the device. The taper shall be continuous. It shall not be broken for access to turn lanes, side roads, ramps, or large commercial driveways. The taper shall be moved further away and shall be completed prior to the access point.

Vertical barricades shall not be used in weaves, and in the gore areas on Highway Standard 701411.

Vertical barricades shall not be used as a device on I-74.

Lights:

Steady burn mono-directional lights are required on devices delineating a widening trench.

Flaggers:

Flagger at Sideroads and Commercial Entrances:
Effective: August 1, 2011 Revised: December 29, 2015

Flaggers shall comply with all requirements and signaling methods contained in the Department's "Traffic Control Field Manual" current at the time of letting. The flagger equipment listed for flaggers employed by the Illinois Department of Transportation shall apply to all flaggers.

All workers and flaggers shall wear ANSI Class E pants and an ANSI Class 2 vest that in combination meet the requirements of ANSI/ISEA 107-2004 for Conspicuity Class 3 garments during hours of darkness.

In addition to the flaggers shown on applicable standards, on major sideroads, flaggers shall be required on all legs of the intersection. Major sideroads for this project shall be 12th Avenue, 7th Avenue, 19th Street, and Avenue of the Cities.

In addition to the flaggers shown on applicable standards, a flagger shall be required on high volume commercial entrances listed below. High volume commercial entrances for this project shall be None.

When the mainline flagger is within 200 feet of an intersection, the sideroad flagger shall be required.

When the road is closed to through traffic and it is necessary to provide access for local traffic, all flaggers as shown on the applicable standards will be required. No reduction in the number of flaggers shall be allowed.

Revise Article 701.20(i) of the Standard/Supplemental Specifications to read:

> "Signs, barricades, other traffic control devices, or flaggers required by the Engineer, over and above those shown in the contract documents, will be paid for according to Article 109.04."

Pavement Marking:

All temporary pavement markings shall be urethane paint.

Short term pavement markings on a milled surface shall be paint.

Temporary pavement markings shall not be included in the cost of the standard rather it shall be paid for separately at the contract unit prices of specified temporary pavement marking items.

Changeable Message Signs:

A changeable message sign shall be in place for a minimum of 2 weeks (10 business days) prior to the start of work, for a stage switch, for a major change in traffic patterns, new signals, and prior to beginning construction. Locations for change in traffic patterns have been shown on the plan sheets for the following locations:

- Southbound 19th Street approaching 12th Avenue intersection
- Southbound 19th Street approaching 7th Avenue intersection
- Westbound 7th Avenue approaching 19th Street intersection
- Eastbound 7th Avenue approaching 19th Street intersection
- Westbound Avenue of the Cities approaching NB 19th Street intersection
- Eastbound Avenue of the Cities approaching NB 19th Street intersection
- Northbound 19th Street (one-way) near Avenue of the Cities intersection
- Westbound 12th Avenue in advance of the 19th Street intersection
- Eastbound 12th Avenue in advance of the 19th Street intersection
- Stage 1-0 through 1-4 Eastbound I-74 and Westbound I-74
- Winter 1 westbound I-74
- Stage 2 Westbound I-74
- Winter 2 Westbound I-74
- Stage 3-1, 3-2, and 3-3 Westbound I-74

Additional changeable message signs may be required by the Resident Engineer.

Payment for changeable message signs that are not shown in an applicable Traffic Control and Protection Standard shall be paid for at the contract unit price per calendar month, or portion thereof, as CHANGEABLE MESSAGE SIGN.

Highway Standards Application:

Traffic Control and Protection Standard 701411:

Method of Measurement. Each ramp will be measured as a separate location and will be considered as a separate location for payment, regardless of the number of installations at that ramp.

This work shall be included in the contract unit price per Each for TRAFFIC CONTROL AND PROTECTION, STANDARD 701411.

Interstates and multi-lane divided highways: The Contractor shall equip all machinery and vehicles with flashing amber lights, installed so the illumination is visible from all directions.

The median crossover will generally not be available for Contractor use. It may be used only when both lanes adjacent to the median are closed. Under no condition shall left turn lanes be made to cross the median from lanes open to traffic. Where interchanges are not available, the Contractor shall only be allowed to turn around where left turn lanes are present.

Parking of personal vehicles within the interstate right-of-way will be strictly prohibited. Parking of construction equipment within the right-of-way will be permitted only at locations approved by the Engineer.

Traffic Control and Protection Standard 701416: This work shall be done according to Section 701 of the Standard Specifications and the Typical Application of Traffic Control Devices for Highway Construction, Standard 701416, Stage 3 staging plans and as specified herein.

This work shall be included in the contract unit price per Lump Sum for TRAFFIC CONTROL AND PROTECTION, STANDARD 701416.

Traffic Control and Protection Standard 701428: This work shall be done according to Section 701 of the Standard Specifications and the Typical Application of Traffic Control Devices for Highway Construction, Standard 701428, and as specified herein.

This standard shall be used, regardless of the ADT on the roadway.

This work will not be measured for payment.

Traffic Control and Protection Standards 701456: This work shall be done according to Standard 701456 and Section 701 of the Standard Specifications. Flagger is required only when actively working on the ramp.

This work shall be included in the contract unit price per Lump Sum for TRAFFIC CONTROL AND PROTECTION, STANDARD 701456.

Traffic Control and Protection Standard 701701: This work shall be done according to Section 701 of the Standard Specifications and the Typical Application of Traffic Control Devices for Highway Construction, Standard 701701, and as specified herein.

The "left" leg of the intersection shown on this standard also applies when the right turn lane is closed. When the right turn lane is closed, "RIGHT TURN LANE CLOSED AHEAD" shall be substituted for the LEFT TURN LANE CLOSED AHEAD" and the set up would be a mirror image to what is shown.

This work shall be included in the contract unit price per Lump Sum for TRAFFIC CONTROL AND PROTECTION STANDARD 701701.

Traffic Control and Protection Standards for Patching Layout on Multi-Lane Roads: This work shall be done according to Standard 701606 and Section 701 of the Standard Specifications. The contractor shall be required to install 701606 three calendar days in advance of the areas to be patched for the protection of the State personnel laying out the locations for pavement patching.

The barricades as shown in 701611 shall not encroach on the lanes open to traffic at any time. The only exception to this will be in the immediate work area when workers are present, then the barricades may be moved out to permit the construction operation.

Beam Removal and Beam Setting over 19th Street and 12th Avenue:

Two lanes in each direction may be closed for up to twenty (20) minutes to set or remove bridge beams. One lane in each direction shall be closed according to Standard 701601. The second lane in each direction shall be closed using flaggers. At the end of the twenty minute period, the lane(s) shall be opened to traffic and all queued traffic shall be cleared prior to closing the lane(s) again.

This work shall be completed during nighttime hours, 9:00 PM Monday to 6:00 AM Friday. Traffic control set up shall not begin prior to 9:00 PM on any day and shall be completely removed by 6:00 AM the following morning. No lane closures shall be allowed on Friday, Saturday, and Sunday evenings. During legal holidays, Section 107 of the Standard Specifications shall apply.

All workers and flaggers shall wear ANSI Class E pants and an ANSI Class 2 vest that in combination meet the requirements of ANSI/ISEA 107-2004 for Conspicuity Class 3 garments during hours of darkness.

Traffic control devices shall be removed from the traffic lanes and all lanes shall be opened to traffic thirty (30) minutes after bridge beam removal/setting operations cease, or defined by work restriction hours, whichever comes first.

Changeable Message Signs shall be placed on each direction of travel for the road to be closed 48 hours prior to the beam removal or setting operation providing notification of the closures. These changeable message signs required for removal of or setting of beams shall not be paid for separately but shall be included in the cost of TRAFFIC CONTROL AND PROTECTION, STANDARD 701501, 701601, or 701606.

The Contractor shall be liable if they fail to completely open and keep open all traffic lanes on the road in accordance with the limitations specified. The Contractor shall be liable to the Department in the amount of $500 for each lane blocked as liquidated and ascertained damages for each and every fifteen (15) minute interval, or portion thereof, that a lane is blocked outside the allowable time limitations. Such damages may be deducted by the Department from any monies due to the Contractor. These damages shall apply during the contract time and during any extensions of the contract time.

Standard 701601 shall not be paid for separately during bridge beam removal/setting operations, but shall be included in TRAFFIC CONTROL AND PROTECTION, STANDARD 701601.

This work shall be included in the contract unit price per Lump Sum for TRAFFIC CONTROL AND PROTECTION, STANDARD 701601.

District Standards Application:

Traffic Control for Road Closure (19th Street and 12th Avenue): This work shall be done according to the District Standard 40.1 TRAFFIC CONTROL FOR ROAD CLOSURE, the Staging Plans, and Section 701 of the Standard Specifications.

"NO LEFT TURN", "NO RIGHT TURN", and "LANE ASSIGNMENT" signing shall be required as shown in the plan details.

The Contractor shall notify the Department via email at DOT.D2.TrafficNotice@illinois.gov. **This request shall be submitted a minimum of one week (7 days) prior to the anticipated closure date.** The Contractor shall notify Metrolink at 309/786-2705.

Signing and devices required to close the road, according to the Traffic Control for Road Closure detail and contained herein, shall be the responsibility of the Contractor. Detour signing required to detour traffic to alternate routes shall be the responsibility of the Contractor. No detour or road closure shall be erected on Friday, Saturday or Sunday. The road shall not be closed until the detour signing is completely installed, verified, and ready to accept traffic.

The “ROAD CLOSED” sign on the Type III barricades shall be unobstructed and visible to traffic at all times. No equipment, debris, or other materials shall be stored within 20 feet of the first set of Type III barricades, unless approved by the Engineer.

The Contractor shall not drive around the outside of the Type III barricades, but shall relocate the barricades temporarily for access. When it is necessary for the barricades to be moved for access, the Contractor shall move the devices into the left lane and/or left shoulder area behind barricades that are to remain in place. At no time shall the barricades be turned parallel to traffic flow for access purposes.

If a path becomes evident around the outside of the barricades, the Contractor shall be required to place additional Type III barricades to prevent driving around the existing barricades. Additional barricades shall be included in the cost of applicable Traffic Control Standards. Any damage caused by vehicles driving around the outside of barricades shall be repaired by the Contractor at no additional expense to the Department.

A 1:3 compacted gravel wedge is required at the end of the closure limits when there is a 12” or greater difference in elevation (drop-off) between the pavement and the work area.

Reconstruction of 19th Street and 12th Avenue is to occur in two segments under full closure in accordance with District Standard 40.1, the Staging Plans, and Section 701 of the Standard Specifications.

Segment 1 Closure: 19th Street from STA 1938+21.30 to the Avenue of the Cities Intersection
Segment 2 Closure: 12th Avenue from STA 128+30.50 to 132+05 and 19th Street from STA 1929+34.57 to STA 1938+21.30

Closure of 19th Street for the construction of Segment 1 shall occur in Stage 1. The closure shall occur no earlier than **April 2, 2018** and shall be open to traffic no later than the end of the first construction season, **November 20, 2018**.

Closure of 12th Avenue and 19th Street for the construction of Segment 2 shall occur no more than **45 calendar days** prior to the completion of Segment 1.

Both Segment 1 and Segment 2 closures shall be removed and all lanes opened to traffic at the same time at the end of the first construction season.

The road closure shall be completed using Type III barricades in compliance with Standards 701901, and signing according to Traffic Control for Road Closure detail. Two flashers shall be installed above each Type III barricade. The "ROAD CLOSED" (R11-2) or “ROAD CLOSED TO THRU TRAFFIC” (R11-4) signs shall be placed as shown in Standard 701901. Flashers shall be installed above all warning signs involving a night time road closure.

The Contractor shall be required to notify the Bureau of Project Implementation and affected residents prior to a complete closure.

All cost involved in conforming with this provision shall be considered a part of TRAFFIC CONTROL AND PROTECTION, (SPECIAL).

Sheet piling and shoring adjacent to 19th St southbound temporary run-around and construction of proposed piers is required during Stages 2 and 3. See structural plans for piling and shoring details.

Coordination with the adjacent contractor to the north is required to provide the necessary traffic control along 19th Street and the I-74 mainline for each contract.

Method of Measurement. This work shall be paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION, (SPECIAL).

TEMPORARY SIGNALS: The Contractor will be required to have someone available at all times to receive phone calls during non-work hours and who is able to reach the job site within one hour of being called. This person will be able to repair the temporary signals or will be able to have flaggers on site within another hour to flag traffic until the signals are again in operation. Failure to have a person on site within an hour after the initial call out will result in the Contractor being charged liquidated damages by the Department of One Thousand Dollars ($1,000). Failure to have traffic restored either with repaired signals or with flaggers within two hours after the initial call out will result in the Contractor being charged liquidated damages by the Department of One Thousand Dollars ($1,000) per hour until traffic is restored. The Contractor may use a traffic control subcontractor for the first call, however this does not relieve the prime Contractor from having a person on call.

Traffic Signal Work: No traffic signal work shall begin until all of the traffic signal hardware is on the job site. The existing traffic signal system shall remain in operation during the modernization work. The work shall be scheduled so that a minimum of two signal indications for each phase remains in operation. No signal indication shall be absent for more than seven calendar days.

The Contractor will be allowed to shut down the existing signal system not to exceed 8 hours to replace the existing controller and cabinet. During this shutdown, the intersection will operate as a 4-way "Stop". Flaggers or Stop Signs required for the 4-way “Stop” condition shall be included in the cost of the TEMPORARY SIGNALS.

Tubular Marker Maintenance: This item shall consist of all materials and labor necessary to maintain the tubular marker required as part of Traffic Control and Protection, Standards 701601 and District Standard 39.1.

The re-attachment of the tubular marker to the base shall be considered included in the cost of the Traffic Control and Protection used.

Any unit which needs repair because the attachment of the base to the pavement fails at any time after installation shall be re-attached by the Contractor no additional cost to the Department. Any tubular marker which needs to be replaced within seven calendar days after installation shall be replaced by the Contractor at no additional cost to the Department.

The quantity listed in the contract is only an estimate of the anticipated number of units requiring repair.

Any tubular marker which needs to be replaced after seven calendar days shall be paid for at the contract unit price per Each for TUBULAR MARKER MAINTENANCE to maintain the tubular marker required as part of Traffic Control and Protection, Standards 701601 and District Standard 39.1.

TEMPORARY LINEAR DELINEATION PANELS

Two (2) Panels shall be placed on each section of temporary concrete barrier 6 inches from the top. The panels shall be alternating white and fluorescent orange and have a spacing of 18 inches apart and centered horizontally on each section of temporary concrete barrier. Each panel shall not be less than 34 inches in length and 6 inches in width. The panels shall be constructed of cube-corner retroreflective material in standard highway colors permanently bonded to an aluminum substrate. The lateral edges of each panel shall be hemmed. The panel assembly shall have a repeating raised lateral ridge every 2.25 inches. Each ridge shall be 0.34 inches high with a 45 degree profile and a 0.28 inch radius top. Each panel shall be attached/adhered to as per the manufacturer specifications and/or recommendations.

Daytime color requirements shall be determined from measurement of the retroreflective sheeting applied to aluminum test panels. Daytime color shall be measured instrumentally using a spectrophotometer employing annular 45/0 (or equivalent 0/45) illuminating and viewing geometry. Measurements shall be made in accordance with ASTM E1164 for ordinary colors or ASTM E2153 for fluorescent colors. Chromaticity coordinates shall be calculated for CIE Illuminant D65 and the CIE 1931 (2o) Standard Colorimetric Observer in accordance with ASTM E308 for ordinary colors or ASTM E2152 for fluorescent colors.

Chromaticity Limits for White

	x	y	x	y	x	y	x	y	Limit Y (%) Min	Max
White	0.303	0.287	0.368	0.353	0.340	0.380	0.274	0.316	40	-

Chromaticity Limits for Orange

	x	y	x	y	x	y	x	y	Total Luminance Factor Y (%) Min
Fluor Orange	0.595	0.351	0.645	0.355	0.583	0.416	0.542	0.403	30

The TEMPORARY LINEAR DELINEATION PANELS will not be paid for separately, but shall be included in the cost of TEMPORARY CONCRETE BARRIER.

There shall be no I-74 Lane Closures allowed at the following times when not staged as shown in the plans:

- **Sunday: 10:00 am to 8:00 pm**
- **Monday through Friday: 6:00 am to 7:00 pm**
- **Saturday: 9:00 am to 6:00 pm**

There shall be no Avenue of the Cities Lane Closures allowed at the following times when not staged as shown in the plans:

- **During Stage 2 mainline detour**
- **Monday through Friday: 6:00 am to 9:00 am and 4:00pm to 6:00pm**

Additional restrictions due to local events or inclement weather may also be imposed. Any additional lane closures on local roads other than what is shown on the plans shall be approved by Traffic Operations. Work hour restrictions may be impacted.

The Contractor shall coordinate with IDOT Traffic Operations (DOT.D2.TrafficNotice@illinois.gov), City of Moline, and the Quad Cities Marathon Director (**http://qcmarathon.org/**) to determine the potential for accommodating the marathon route each year during construction. Typically, the marathon is held in late September of each year. The 2017 race date is scheduled for September 24, 2017. Race dates are not yet scheduled at the time of letting for years 2018 through 2020. Accommodating the marathon route will be dependent on the timing of the marathon, construction progress, and work zone configuration.

Maintenance of Traffic:

The Contractor shall be required to notify the City of Moline, emergency response agencies (i.e.: fire, ambulance, police), school bus companies, MetroLINK and the Department of Transportation (Bureau of Project Implementation) regarding any changes in traffic control.

The Contractor shall submit maintenance of local traffic plan to the Engineer at the preconstruction meeting telling how local access will be maintained at each access location. It will show which locations will be completely closed, and which locations will be constructed utilizing Traffic Control Standards, and/or barricades. This traffic plan shall be approved by the Engineer before any roadway is closed to traffic.

Placing and removing pavement marking shall be completed using Traffic Control and Protection Standard 701311, 701401, 701426, 701427 or 701701.

The partial ramp closures shall be completed using Traffic Control and Protection Standard 701456 and as shown on the Staging Plans.

PRECAST BLOCK REVETMENT MAT
Effective: January 1, 2015 Revised: December 29, 2015

This work shall consist of furnishing and placing Precast Block Revetment Mat, as a permanent scour countermeasure in accordance with the grades, details and design dimensions as shown on the plans.

This work shall be completed according to Section 285 of the Standard Specifications and as specified herein:

The manufacturer shall use the alignment and cross-section of the channel, the design depth of flow, channel slope and design velocity provided in the plans to design the block size, block weight, block configuration, and mat configuration utilizing HEC 23 criteria.

The manufacturer shall be required to submit the design for the block mat, based on the existing field conditions and the hydraulic information for the various plan locations provided in the contract plans to the Resident Engineer, four weeks prior to delivery of the block to the jobsite.

Block used above normal pool elevation shall be open-cell to allow for vegetation growth. The block used below normal pool elevation shall be closed-cell block, unless otherwise noted in the plans.

The anchors (if required), cable and fittings shall be as specified by the manufacturer, and at the spacing specified by the manufacturer and shall not be paid for separately.

A 4 in. layer of clean aggregate, as specified by the manufacturer, is required for bedding, and is not paid for separately, but included in the price of the revetment mat.

Basis of Measurement: This work will be measured for payment in place and the area computed in square yards. The area for measurement will include the upper, sloped surface of the mat. The portion of the mat in trenches will not be measured for payment. No allowances will be made for overlaps.

Filter fabric will measured for payment according to Article 282.08.

Basis of Payment: This work will be paid for at the contract unit price per square yard for PRECAST BLOCK REVETMENT MAT.

Filter Fabric will be paid for according to Article 282.09.

PROPERTY MARKERS
Effective: July 1, 1994 Revised: January 30, 2008

This work shall consist of locating, protecting, preserving and relocating property markers, monuments or pins which are discovered and which will be disturbed in the normal course of construction. An Illinois Registered Land Surveyor will relocate the markers, monuments or pins to the new or relocated right-of-way line in such a location as to legally define the location of the new or reestablished property corner(s). The Contractor shall be required to furnish one copy of the final plat or plats to the State upon completion of the work.

The Surveyor shall place as a minimum a 36" x 3/4" round iron pin for the property marker. This work will be paid for at the contract unit price Each for PROPERTY MARKERS.

DETECTOR LOOP, SPECIAL
Effective: December 15, 2009 Revised: March 11, 2010

This item shall consist of replacing detector loops, furnishing, installing, and testing in accordance with Section 886 of the current "Standards Specifications for Road Bridge Construction".

This item shall include replacing any conduit stubs damaged during the surface grinding process. This shall also include any wire in conduit required to connect the loops.

Any 6'x20' and 6'x30' Detector Loops shall have a minimum of three turns of wire, any 6'x6' Detector Loops shall have a minimum of four turns of wire. Detector Loops will be measured for payment along the sawed slot in the pavement only. The cables, from the end of the saw cut to the splice in the handhole, shall not be measured for payment since it is considered to be included in the cost of the Detector Loop.

Existing conduit to handholes are to be used where possible. If new conduit, and or the drilling of handhole is necessary, this shall be considered included in the cost of the Detector Loop, Special.

Seven (7) days prior to any work that may affect the operation of the Detector Loops, and for signal timing adjustments to be made for the construction period and appropriate layout of Detector Loops for reinstallation. Notice shall be given to Scott Kullerstrand at the Illinois Department of Transportation, District 2 (815/284-5468).

This work will be paid for at the contract unit price per Foot for DETECTOR LOOP, SPECIAL.

ESTABLISHING AND REFERENCING LAND SECTION MARKERS
Effective: November 8, 1996 Revised: April 14, 2010

The Contractor shall monument or re-monument all Section Corners, Quarter Corners with their Reference Monuments, (and any lesser Corners which are in place including those which have been monumented by others and do not conform with the Department's procedures), that will be destroyed. The Section Corners will be monumented according to District Reference Marker Detail No. 63.4. It is required that an Illinois Professional Land Surveyor prepare a Department Monument Record Form which is in compliance with the Land Surveying Monuments Acts (765 ILCS 220/0.01 et seq.) for any designated Section Corner Monument or any Reference Monument that is disturbed. The Contractor shall secure the I.D.O.T. Monument Record Form (with I.D.O.T. logo) from the Department and furnish said form to the Illinois Professional Land Surveyor. Each Monument Record Plat shall note how the Section Corner Monument and all Reference Monuments were set, either flush with the ground, buried 28 inches, (if monuments are buried, four 3.5 foot by 5/8 inch rebars shall be placed around said monuments to make recovery an easier task), or in other cases what was done. A graphic illustration of physical landmarks and their relationship to the Monument Reference Markers shall be shown upon said Monument Record Plat. These Monument Record Plats shall be recorded by the Surveyor. Recorded copies will then be furnished to the Department by the Contractor.

The determination of those Section Corners which are to be re-monumented for this project will be made by said Department.

If any of the before described Section Corners have been previously monumented by Department standards and all Reference Monuments are in place, a signed and sealed letter from the Illinois Professional Land Surveyor shall be sent to this office affirming this fact. In case a Reference Monument has been destroyed, it will be reset and a new Monument Record Plat shall be recorded.

Any questions or deviations from these procedures shall be referred to the Plats and Plans Unit at 815/284-5370.

This work will be paid for at the contract unit price per Each for REFERENCING LAND SECTION MARKERS when the land section marker has been previously located. All work shall be done under the direction of a registered land surveyor of the State of Illinois.

Each item shall include the placement of four reference markers and a land section marker where applicable.

COMPLETION DATE PLUS WORKING DAYS
Effective: December 29, 2006 Revised: March 10, 2017

Revise Article 108.05(b) of the Standard Specifications to read:

Interim Completion Dates.
The Contractor shall complete all Stage 1 work as shown in the plans no later than 3:00 P.M. on Tuesday, November 20, 2018. The Stage 1 work includes, but is not limited to, reconstruction and widening of the eastbound and westbound I-74 mainline and ramp roadways south of the Avenue of the Cities in Moline to the south limit of Contract 64E26, reconstruction of 19th Street from 11th Avenue to the Avenue of the Cities and reconstruction of 12th Avenue to the limits shown in the plans, earthwork, drainage and pavement to the limits shown in the plans. Refer to Traffic Control for Road Closure (19th Street and 12th Avenue), in the Special Provision, Traffic Control Plan.

The Contractor shall complete all Stage 2 work as shown in the plans no later than 3:00 P.M. on Tuesday, November 26, 2019. The Stage 2 work includes, but is not limited to, completion of I-74 Westbound lanes and Ramps 7TH-A and AC-D, and parts of 19th Street north of 11th Avenue, roadway and bridges, retaining walls, earthwork, drainage and pavement to the limits shown in the plans. In order for work to be considered complete, the Westbound I-74 mainline and ramp roadways must be open to traffic with no lane closures or obstructions.

The Contractor shall complete all Winter Stage work as shown in the plans no later than 3:00 P.M. on Tuesday, March 31, 2020**.** The Winter Stage work includes, but is not limited to completion of crossover south of Avenue of the Cities prior to closing existing I-74 EB at the start of Stage 3.

The Contractor shall complete all work Stage 3 work as shown in the plans no later than 3:00 P.M. on Tuesday, November 24, 2020**.** The Stage 3 work includes, but is not limited to completion of all I-74 Eastbound lanes and Ramps 7TH-B, AC-B and AC-C, 19th Street and 12th Avenue, roadway and bridges, retaining walls, earthwork, drainage and pavement to the limits shown in the plans. In order for work to be considered complete, the Eastbound I-74 mainline and ramp roadways must be open to traffic with no lane closures or obstructions.

Completion Date plus Working Days.
The Contractor shall complete the project no later than 3:00 P.M. on Tuesday, November 24, 2020, except for erosion control items, punch list items and minor clean-up, for the contract work to be considered complete.

The Contractor will be allowed 30 working days after the Completion Date to complete erosion control items, punch list items, and minor clean-up.

GUARDRAIL REMOVAL
Effective: August 20, 1990 Revised: April 10, 2014

This work shall be done according to Section 632 of the Standard Specifications except that all removed guardrail will become the property of the Contractor.

This work will be paid for at the contract unit price per Foot for GUARDRAIL REMOVAL, measured from center-to-center of end posts.

MOWING
Effective: January 1, 2002 Revised: April 12, 2016

This work consists of mowing all Seeding Class 1A and Class 2A at the completion of the project or before winter shut down. The vegetation must be at least 6" long before mowing. The vegetation shall be mowed to obtain a height of not more than 3 inches. All debris must be cleared from the right-of-way immediately after the mowing.

This work will be paid for at the contract unit price per Acre for MOWING.

MOWING (SPECIAL)

Description. This work shall consist of mowing areas that are currently maintained by the Moline Park District throughout the entire construction period, at the discretion of the engineer. The vegetation must be at least 6" long before mowing and shall not be longer than 10" at any time. The vegetation shall be mowed to obtain a height of not more than 3 inches.

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

TEMPORARY PAVEMENT
Effective: October 17, 2007 Revised: July 20, 2016

This work shall consist of placing a Hot-Mix Asphalt Surface Course, Portland Cement Concrete Pavement or Continuously Reinforced Portland Cement Concrete Pavement and aggregate base to serve as temporary pavement at the locations shown on the plans. The choice of material to be used for this item is left to the Contractor to choose from the following options:

HOT-MIX ASPHALT OPTION

This work shall consist of placing and compacting 10 inches of Aggregate Subgrade Improvement and constructing 8 ¼ inches of HOT-MIX ASPHALT SURFACE COURSE and HOT-MIX ASPHALT BINDER COURSE to serve as temporary pavement at the location shown on the plans. The 6 ¼" binder thickness should be placed in 2 lifts. The surface thickness is 2".

Description: This work shall consist of designing, producing and constructing a HMA Surface Course on a prepared base, according to Sections 311, 406, 1030 and 1102 of the Standard Specifications, except as follows.

Materials: Surface Mixture SBS PG 70-28, IL 9.5, Mix E, N90 shall be used for the surface and IL 19.0 for the binder.

Required Field Tests: Density Acceptance at 95% - 102% of growth curve at the frequency indicated in Article 1030.05(d)(3).

All work and materials required to complete the work listed above shall be included in the contract unit cost per Square Yard for TEMPORARY PAVEMENT.

The pavement and subgrade shall be removed after the stage(s) it is needed is completed. Removal shall be paid for separately at the contract unit price per Square Yard for TEMPORARY PAVEMENT REMOVAL.

PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED) OPTION

This work shall consist of placing and compacting 10 inches of Aggregate Subgrade Improvement and constructing a 9 ¼ inch thick Portland Cement Concrete Pavement (Jointed) to serve as temporary pavement at the location shown on the plans. The minimum width shall be 3 feet. This work shall be completed according to Sections 311 and 420 of the Standard Specifications.

The Contractor shall saw transverse joints in the pavement according to the detail for Jointed PCC Pavement in Standard 420101, except that dowel bars are not required. These joints shall not be sealed.

All work as listed above, including tie bars, sawed joints and all other required materials shall be included in the contract unit price per Square Yard for TEMPORARY PAVEMENT.

The pavement and subgrade shall be removed after the stage(s) it is needed is completed. Removal shall be paid for separately at the contract unit price per Square Yard for TEMPORARY PAVEMENT REMOVAL.

CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT OPTION

This work shall consist of placing and compacting 10 inches of Aggregate Subgrade Improvement and constructing an 8 ½ inch thick Continuously Reinforced Portland Cement Concrete Pavement to serve as temporary pavement at the location shown on the plans. The minimum width shall be 3 feet. This work shall be completed according to Sections 311 and 421 of the Standard Specifications.

The Contractor shall saw transverse joints in the pavement, except that dowel bars are not required. These joints shall not be sealed.

All work as listed above, including tie bars, sawed joints and all other required materials shall be included in the contract unit price per Square Yard for TEMPORARY PAVEMENT.

The pavement and subgrade shall be removed after the stage(s) it is needed is completed. Removal shall be paid for separately at the contract unit price per Square Yard for TEMPORARY PAVEMENT REMOVAL.

GEOTECHNICAL REINFORCEMENT

Effective: November 30, 2010 Revised: April 10, 2014

This work consists of furnishing and installing an integrally-formed polypropylene geotechnical grid reinforcement material. The geogrid shall have an aperture, rib and junction cross section sufficient to permit significant mechanical interlock with the material being reinforced. There shall be a high continuity of tensile strength through all ribs and junctions of the grid material to reinforce the subbase or subgrade as shown on the plans and specifications.

MATERIAL CHARACTERISTICS	TEST METHOD	DATA
polymer type		polypropylene
carbon black content	ASTM D 4218	0.50% (min.)

DIMENSIONAL CHARACTERISTICS	TEST METHOD	UNIT	DATA
open area	CW 02215	%	75 (max.)
unit weight	ASTM D 5261	oz/yd2	5.0 (min.)

TECHNICAL CHARACTERISTICS	TEST METHOD	UNIT	DATA
junction efficiency	GRI-GG2	%	90 (min.)

The supplier should provide a certification that their product meets the above requirements.

The geotechnical reinforcement shall be placed as described herein or as shown on the cross sections.

Geogrid shall be delivered to the jobsite in such a manner as to facilitate handling and incorporation into the work without damage. Material shall be stored in such a manner as to prevent exposure to direct sunlight and damage by other construction activities.

Prior to the installation of the geogrid, the application surface shall be cleared of debris, sharp objects and trees. Tree stumps shall be cut to the level of the ground surface. If the stumps cannot be cut to the ground level, they shall be completely removed. In the case of subgrades, all wheel tracks or ruts in excess of 3 inches in depth shall be graded smooth or otherwise filled with soil to provide a reasonably smooth surface.

The geotechnical reinforcement shall be placed with the “roll length” parallel to the pavement. Fabric of insufficient width or length to fully cover the specified area shall be lapped a minimum of 24 inches. The geogrid should be secured in place.

Installation:

The granular blanket shall be constructed to the width and depth required on the plans. Unless otherwise specified, the material shall be back-dumped on the Geogrid in a sequence of operations beginning at the outer edges of the treatment area with subsequent placement towards the middle.

Placement of material on the Geogrid shall be accomplished by spreading dumped material off of previously placed material with a bulldozer blade or endloader, in such a manner as to prevent tearing or shoving of the Geogrid. Dumping of material directly on the Geogrid will only be permitted to establish an initial working platform. No construction equipment shall be allowed on the Geogrid prior to placement of the granular blanket. If the geogrid develops wrinkles or moves significantly, an alternative method of securing it shall be used.

Unless otherwise specified in the plans or Special Provisions, the granular material, shall be placed to the full required thickness and compacted.

Geogrid which is damaged during installation or subsequent placement of granular material, due to failure of the Contractor to comply with these provisions, shall be repaired or replaced at no additional cost to the Department, including costs of removal and replacement of the granular material.

Torn Geogrid may be patched in-place by cutting and placing a piece of the same Geogrid over the tear. The dimensions of the patch shall be at least 2 feet larger than the largest dimension of the tear and it shall be weighted or otherwise secured to prevent the granular material from causing lap separation.

Method of Measurement: Geotechnical Reinforcement will be measured in square yards for the surface area placed. The excavation, replacement and compaction of the granular layer shall be paid for separately.

Basis of Payment: This work will be measured in place and the area computed in square yards. The work will be paid for at the contract unit price per Square Yard for GEOTECHNICAL REINFORCEMENT.

HOT-MIX ASPHALT SURFACE COURSE, LEVEL BINDER, AND BINDER
Effective: June 15, 2010 Revised: June 23, 2014

The maximum allowed average bulk specific gravity for the approved mix design (Gmb) will be:

2.460 for Mixture C

2.470 for Mixture D

2.610 for Mixture E

2.710 for Mixture F

The maximum allowed average bulk specific gravity for the approved mix design (Gmb) for all other uses will be 2.470.

PCC AUTOMATIC BATCHING EQUIPMENT
Effective: January 1, 2015 Revised: April 12, 2016

Portland cement concrete provided shall be produced from batch plants that conform to the requirements of Article 1103.03 (a) and (b) of the Standard Specifications for Road and Bridge Construction. Semi-automatic batching will not be allowed.

Plants shall have computerized batching interfaced with a printer. Batch weights, aggregate mixtures, water added, amount of each admixture or additive, and percent variance from design shall be printed for each batch. Tickets shall state the actual water-cement ratio as batched, and the amount of water that can be added to the batch without exceeding the maximum water-cement ratio. Truck delivery tickets are still required as per Article 1020.11(a)(7) of the Standard Specifications.

PCC QC/QA ELECTRONIC REPORTS SUBMITTAL
Effective: January 1, 2015 Revised: April 12, 2016

The Contractor's QC personnel shall be responsible for electronically submitting BMPR MI654 "Concrete Air, Slump, and Quantity," BMPR MI655 "P.C. Concrete Strength," and BMPR MI504 "Aggregate Gradation" reports to the Department. The format for the electronic submittals shall be the QC/QA package reporting program, which will be provided by the Department. Microsoft Excel 2007 or newer and Microsoft Outlook is required for this program which shall be provided by the Contractor.

CONSTRUCTION PROGRESS SCHEDULE
Effective June 16, 2017

General.

A. Time is of the essence in this Contract. It may be necessary for the Contractor to work longer hours, use additional crews, and work during weekends in order to complete the work within the required time limit. The Contractor shall submit a Critical Path Method (CPM) Progress Schedule as described below for the Engineer's approval before the work can be started.

B. The Contractor will not be allowed any compensation for working longer hours or using extra shifts; and working on weekends or during Holidays; working during winter months, etc. to meet the specified Completion Date, except in cases of extra work approved by the Engineer that effects the controlling operation. In such cases where extra work is associated with a controlling operation, the contractor shall separate out the added costs of the extra work that keep the project on the Target Schedule when submitting extra work prices. If the contractor does not meet the specified Completion Date after this extra work is approved, the Contractor will reimburse the Contract Authority for the added costs paid on the extra work associated with keeping the project on schedule.

C. This work shall consist of preparing, revising and updating a detailed progress schedule based upon the Critical Path Method (CPM). This work shall also consist of performing time impact analysis of the progress schedule based upon the various revisions and updates as they occur.

D. The CPM progress schedule shall be used for coordination and monitoring of all work under the contract including all activities of subcontractors, vendors and suppliers. The CPM progress schedule shall include provisions for traffic control, staging, and other events to complete the contract work. This schedule shall be the Contractor's intended working schedule and shall be used to plan, organize and execute the work; record and report actual performance and progress; and forecast remaining work.

Submittal of a CPM Progress Schedule.

A. Submitting the Baseline CPM Progress Schedule.

The successful bidder for the project shall submit a baseline CPM progress schedule to the Contracts Engineer within 30 calendar days of the award of the contract.

B. Submittal Format

Any CPM progress schedule submittal – baseline, updated, revision or recovery – shall be in electronic form acceptable to the Engineer, as a pdf file including the complete CPM progress schedule and the current narrative report. In addition to the PDF submittal file specified, an electronic copy of the CPM progress schedule in the original software format shall be submitted for the Engineer's use in reviewing electronically.

C. Compliance with Intended Work.

Upon receipt of the CPM progress schedule, the schedule will be reviewed for compliance with the intended work and other requirements specified in the contract documents.

D. Review and Approval Process.

1. The Engineer will notify the Contractor in writing, within 14 calendar days after receiving any CPM progress schedule submittal (baseline, revision, update or recovery), if the schedule is approved or if any corrections or revisions are required. If corrections or revisions are required to the submitted CPM progress schedule, the Contractor shall submit the revised CPM progress schedule to the Engineer within 7 calendar days after receiving the Engineer's request for corrections or revisions.

2. Submittals that are required to be revised and resubmitted shall have the revisions clouded or annotated to designate revisions. Resubmittals made in accordance with this provision will have a review time as stated above. Resubmittals that are not in accordance with this provision will be allowed a review time of 30 calendar days.

3. If the Contractor fails to submit a revised baseline CPM progress schedule as stated above, the Contractor will not be allowed to begin work on site until an acceptable baseline CPM progress schedule has been submitted and approved. The Completion date(s) will not be changed, and the Department will not pay for any accelerated work required to make up time lost for this reason. When the baseline CPM progress schedule is approved it will be designated as the "Target Schedule" and shall only be changed as specified below.

Requirements for the CPM Progress Schedule.
The CPM progress schedule shall be developed using the latest edition of Primavera project management software, published by Primavera Systems, Inc. or similar software that is 100% compatible with the latest edition of Primavera project management software and approved by the Engineer. The CPM progress schedule submitted shall be a Gantt chart with a tabular data report for each activity and accompanied by a narrative report.

A. Format.
The electronic schedule format shall contain the following on each page printed:

1. Project Name
2. Template: Construction.
3. Type and edition of software
4. Planning Unit: Days (calendar or working).
5. Number/Version: Original or update number.
6. Start Date of contract work
7. Completion Date as specified in contract documents.
8. Project Title: Contract number.
9. Company Name: Contractor's name.
10. Submittal date.
11. Data date.
12. Page number.

B. Calendars for Completion Date Contracts.
The base calendar shall show the proposed working days of the week and the proposed number of work hours per day.

C. Schedule Development.

1. The detailed schedule shall incorporate the entire contract time. The construction time, as determined by the CPM progress schedule, for the entire contact or any milestone, shall not exceed the specified contract period. The minimum number of activities shown on the schedule shall represent the work incorporating the bid items whose aggregate contract value constitutes 80% of the total contract value. These bid items shall be determined by starting with the bid item with the largest individual contract value and adding subsequent bid item contract values in descending order until 80% of the contract value has been attained. Any additional activities required to complete the contract beyond 95% and any additional activities required to maintain the continuity of the schedule logic shall also be shown.

2. The schedule shall be limited exclusively to Finish-to-Start (FS) relationships. Start-to-Start (SS), Start-to-Finish (SF) or Finish-to-Finish (FF) relationships will not be allowed. Activity constraints shall not be used without the approval of the Engineer. Lead or lag duration between schedule activities should generally be avoided and any employed shall be brought to the attention of the Engineer in the narrative.

3. The Contractor shall take account in the schedule for any critical closure periods and limitations of operations specified in Article 107.09 of the Standard Specifications or the contract documents.

4. Any work item that depends on work in another contract that is included in the I-74 over the Mississippi River Corridor Project (I-74 Project) shall be scheduled in cooperation with the other Contractor. Likewise, any work item upon which work in another I-74 Project contract depends shall be scheduled in cooperation with the other Contractor. All such interdependent work items shall be identified on the CPM progress schedule. Approval of any submittal of the CPM progress schedule will be contingent upon interdependent work items being appropriately coordinated.

5. In cases where interdependent contracts are awarded at different times, parts of the CPM progress schedule of the first contract that include work that is interdependent with an adjacent project or contract that will be awarded later, will be given conditional approval based on the Engineer's judgment. The CPM progress schedule of the first contract shall be reviewed in conjunction with the CPM progress schedule of the second contract, at the time when the CPM Schedule of the second contract is being developed, and revised as necessary, based on cooperative effort between the Contractors. The revised CPM progress schedule shall be submitted to the Engineer for approval. CPM progress schedule updates and revisions throughout the duration of the contract shall be coordinated with the CPM progress schedules of all adjacent contracts with interdependent work.

6. The tables in Appendix A of these Special Provisions show interdependent work that must be coordinated between I-74 Projects and Contracts. Items may be added to these tables, subject to agreement of the other affected Contractor and subject to the approval of the Engineer, if such additions contribute to the efficient progress of the I-74 Project. If any interdependent work has been omitted from the tables in Appendix A, such omission does not release the Contractors from the responsibility of coordinating such work.

D. Schedule Presentation - Gantt chart.

1. The following shall be included for each activity in the graphic part of the schedule in Gantt chart format:

a. Activity Identification (ID) Numbers. The Contract shall utilize numerical designations to identify each activity. Numbering of activities shall be in increments of not less than ten digits.

b. A description of the work represented by the activity (maximum forty-five characters). The use of descriptions referring to a percentage of a multi-element item (i.e., construct deck 50%) shall not be used. Separate activities shall be included to represent different elements of multi-element items (i.e., forms, reinforcing, concrete, etc.). Multiple activities with the same work description shall include a location as part of the description.

c. Proposed activity duration shall be shown in whole days. The Contractor shall provide production rates to justify the activity duration. Schedule duration shall be contiguous and not interruptible.

d. The sequence and interdependence of activities required for the prosecution of the work. The schedule logic shall not be violated.

e. The critical path to milestone and contract completion. Only one controlling item shall be designated at any point in time on the schedule

2. Activities shall be broken down such that each activity encompasses a single operation or tightly-integrated operations in a single, contiguous and continuous area of the project, with no activity exceeding $200,000 without the consent of the Engineer.

3. Dates shall be included for the following:

a. Starting and completing the various stages of the work, including milestones identified in the contract document.

b. Placing material orders, delivery of materials and equipment.

c. Preparation, submittal and approval of all required submittals to the Contracting Authority

d. Procuring material and equipment furnished by I-74 Project supply contracts.

e. Interdependent activities performed by other contractors.

f. All work activities and field construction operations.

g. Equipment installation, testing and balancing.

4. Total Float shall be calculated as finish float. The schedule shall be calculated using retained logic. The Contractor shall not sequester float by calendar manipulations or extended duration. Float is not for the exclusive use or benefit of either the Department or the Contractor.

5. There shall be a legend with the CPM progress schedule defining all abbreviations, terms, or symbols used.

E. Schedule Presentation - Tabular Data Reports.

1. A tabular data report is required with each progress schedule submittal and may be printed on the same pages as the Gantt chart.

2. The heading of each tabular data report, if not printed on the same pages as the Gantt chart, shall include, but not be limited to, the project name, contract number, Contractor name, report (submittal) date, data date, report title and page number.

3. Each of the tabular reports shall contain the following minimum information for each activity:

a. Activity ID
b. Activity Description
c. Original Duration (calendar day/working day)
d. Remaining Duration (calendar day/working day)
e. Intended production rate
f. Early Start Date
g. Late Start Date
h. Early Finish Date
i. Late Finish Date
j. Percent Complete
k. Total Float
l. Calendar ID
m. Subcontractor identity if activity is performed by a subcontractor

F. Narrative Report.

The Contractor shall prepare a written narrative report to be included in each CPM progress schedule submittal.

1. Baseline Narrative.

The narrative report submitted with the baseline CPM progress schedule shall include the following information:

a. Description of the critical path.

b. Identification of potential problem areas.

c. Proposed solutions to potential problems.

d. Detailed description of the Contractors approach to weather days, including an estimated number of weather days for each month of the contract, and an explanation of how they are incorporated in the CPM Progress Schedule.

A weather day is defined as a day when adverse weather including rain, snow, wind, flood, extreme heat, and the results thereof, such as inaccessibility or non-workability of materials, do not allow productive work on the critical path, if that work would otherwise be performed by the Contractor on that day. Adverse weather days will not be considered justification for an extension of the contract time and thus must be planned for.

2. Update Narrative.
The narrative report submitted with each updated CPM progress schedule shall highlight the progress during the past update period. This written report must include the following information:

a. Summary of work accomplished during the past update period.

b. Contract milestone comparison chart, if applicable.

c. Analysis of critical path.

d. Analysis of time lost/gained during the update period.

e. Identification of problem areas.

f. Recommended solutions to current problems.

g. Actual number of weather days during the update period compared to the baseline estimate. Documentation of weather days is for information only, and shall not be considered as justification for an extension of the contract time.

3. Recovery or Revision Narrative.
The narrative report submitted with any Recovery or Revised CPM progress schedule shall explain the reason(s) for the changes and how the submitted changes address the reason(s). This written report must include the following information:

a. Summary reason(s) for the Recovery or Revised CPM progress schedule.

b. Contract milestone comparison chart, if applicable.

c. Analysis of critical path.

d. Summary of how the Recovery or Revised CPM progress schedule resolves the issues/reasons requiring the submittal.

Use of CPM Progress Schedule in Construction Operations.

A. No contract work shall be done without a CPM progress schedule approved by the Engineer. If the CPM progress schedule is approved, with parts of the CPM Progress Schedule conditionally approved, in accordance with Article .04, C of these Special Provisions, contract work may proceed.

B. If the Contractor deviates from the current approved CPM progress schedule by not following the logical sequence of the critical path, payment will be withheld for the bid items for the affected activities until the Contractor submits a revised CPM progress schedule and this schedule is approved by the Engineer.

C. Updates.
During the life of the project, the Contractor shall submit an updated CPM progress schedule monthly.

1. All updates shall be plotted against the Target Schedule. The Contractor shall not make any changes to the original duration, activity relationships, constraints or costs, and shall not add or delete activities, or alter the Target Schedule's logic when updating the schedule.

2. The updated information will include the original schedule detail and the following additional information:

a. Actual start dates
b. Actual finish dates
c. Activity percent completion
d. Remaining duration of activities in progress
e. Identified or highlighted critical activities

3. The Engineer shall withhold progress payments if the Contractor does not submit scheduled updates as required.

4. Upon receipt of the updated CPM progress schedule, the Engineer will review the schedule for conformance with the Contract Documents and degree of detail. The Engineer, within 14 calendar days after receipt of the updated CPM progress schedule and supporting documents, will approve or reject it with written comments. If the updated CPM progress schedule is rejected, the Contractor must submit a revised updated CPM progress schedule within seven calendar days after the date of rejection.

5. The updated progress schedule must accurately represent the Project's current status.

D. Revisions.

Revisions to the Target Schedule may be initiated by a proposal by the Contractor or by direction from the Engineer.

1. Contractor Changes to the Target Schedule.

The Contractor shall comply with the following requirements regarding proposed changes to the Target Schedule:

a. If the Contractor proposes to make any changes in the Target Schedule, the Contractor shall notify the Engineer in writing, stating the reasons for the change, identifying each changed activity (including duration and interrelationships between activities) and providing a submittal including compact discs and printed copies of the proposed revised schedule. Every effort must be made by the Contractor to retain the original Activity ID numbers.

b. The Engineer has the authority to approve or reject the proposed change(s) in the Target Schedule and shall do so in writing within 14 calendar days after receipt of the Contractor's submittal. If the Engineer approves the change in the Target Schedule, all future monthly updates will be plotted against the new Target Schedule.

c. If the Engineer approves a portion of the change to the Target Schedule, the Contractor shall submit a revised schedule incorporating such change(s) within seven calendar days after the partial approval along with a written description of the change(s) to the schedule.

2. Engineer Changes to the Target Schedule

a. The Engineer may direct the Contractor to revise the approved baseline CPM progress schedule. Reasons for such direction may include, are limited to the following: (1) changes in the work, (2) re-phasing of the Project or any phase, (3) a change in the duration of the Project or phase, and (4) acceleration of the Project or phase.

b. The Engineer will direct the Contractor to provide a revised CPM schedule in writing.

c. The Contractor shall submit the revised CPM progress schedule within ten calendar days of receipt of the Engineer's written direction.

d. The Engineer has the authority, in its sole discretion, to approve or reject the revised CPM progress schedule and will do so in writing within fourteen calendar days after receipt of the Contractor's submittal If the Engineer approves the revised CPM progress schedule, such schedule will be designated the new "Target Schedule".

e. If the Engineer approves a portion of the change to the Target Schedule, the Contractor shall submit a revised schedule incorporating such change(s) within seven calendar days after the partial approval along with a written description of the change(s) to the schedule.

E. Recovery.

1. The Contractor shall maintain an adequate work force and the necessary materials, supplies and equipment to meet the Target Schedule. In the event that the Contractor, in the judgment of the Engineer, is failing to meet the Target Schedule including any Contract milestones, the Engineer will direct the Contractor, in writing, to submit a recovery schedule.

2. The Contractor shall submit the recovery schedule within ten calendar days of receipt of the Engineer's written direction.

3. The recovery schedule shall set forth a plan to eliminate the schedule slippage (negative float). The plan must be specific to show the methods to achieve the recovery of time, i.e. increasing staffing, working overtime, weekend work, employing multiple shifts. All costs associated with implementing the recovery schedule shall be borne by the Contractor.

4. Upon receipt of the CPM recovery schedule, the Engineer will review the schedule for conformance with the Contract Documents and degree of detail. The Engineer will approve the schedule or reject it with written comments within fourteen (14) calendar days of receipt of the recovery schedule. If the Engineer approves the CPM recovery schedule, such schedule will be designated the new Target Schedule.

5. If the CPM recovery schedule is rejected, the Contractor must submit a revised CPM recovery schedule within seven calendar days of the date of rejection.

F. Acceptance or approval of any progress schedule by the Engineer shall not be construed to imply approval of any particular method of construction, sequence of construction, any implied or stated rate of production. Acceptance will not act as a waiver of the obligation of the Contractor to complete the work in accordance with the contract proposal, plans and specifications, modify any rights or obligations of the Department as set forth in the contract, nor imply any obligation of a third party. Acceptance shall not be construed to modify or amend the contract or the time limit(s) therein. Acceptance shall not relieve the Contractor of the responsibility for the accuracy of any of the information included on the schedule. Failure of the Contractor to include in the schedule any element of work required for the performance of the contract, any sequence of work required by the contract, or any known or anticipated condition affecting the work shall not excuse the Contractor from completing all work required within the time limit(s) specified in the contract notwithstanding acceptance of the schedule by the Engineer.

Basis of Payment.
This work will not be paid for separately, but shall be considered as included in the costs of the various items of work in the contract.

APPENDIX A – CONTRACT INTERDEPENDENCIES

Projects and Contracts in the I-74 over the Mississippi River Corridor Project Active in Pre-Stage

- Iowa Project (197): IM-NHS-074-1(197)5--03-82, River Bridge Approach Spans
- Iowa Project (198): IM-NHS-074-1(198)5--03-82, River Bridge Arch Spans
- Iowa Project (199): IM-NHS-074-1(199)5--03-82, Westbound Iowa Viaduct and Ramps
- Iowa Project (260): IM-NHS-074-1(260)1--03-82, Grading and Sanitary Sewer
- Illinois Contract 64C08: Work in Moline from the Mississippi River to 7th Avenue

Projects and Contracts in the I-74 over the Mississippi River Corridor Project Active in Stage 1

- Iowa Project (197): IM-NHS-074-1(197)5--03-82, River Bridge Approach Spans
- Iowa Project (198): IM-NHS-074-1(198)5--03-82, River Bridge Arch Spans
- Iowa Project (199): IM-NHS-074-1(199)5--03-82, Westbound Iowa Viaduct and Ramps
- Iowa Project (260): IM-NHS-074-1(260)1--03-82, Grading and Sanitary Sewer
- Iowa Project (205): IM-NHS-074-1(205)5--03-82, US 67 Ramp D Grading and Paving
- Iowa Project (208): IMN-074-1(208)5--0E-82, Light Pole Supply
- Iowa Project (209): IMN-074-1(209)5--0E-82, Luminaire Supply
- Illinois Contract 64C08: Work in Moline from the Mississippi River to 7th Avenue
- Illinois Contract 64E26: Work in Moline from 7th Avenue to south of Avenue of the Cities

Projects and Contracts in the I-74 over the Mississippi River Corridor Project Active in Stage 2

- Iowa Project (197): IM-NHS-074-1(197)5--03-82, River Bridge Approach Spans
- Iowa Project (198): IM-NHS-074-1(198)5--03-82, River Bridge Arch Spans
- Iowa Project (199): IM-NHS-074-1(199)5--03-82, Westbound Iowa Viaduct and Ramps
- Iowa Project (260): IM-NHS-074-1(260)1--03-82, Grading and Sanitary Sewer
- Iowa Project (206): IM-NHS-074-1(206)5--03-82, Mainline and Ramps Grading and Paving Iowa
- Iowa Project (219): IM-NHS-074-1(220)5--03-82, Mainline and Ramps Traffic Signs
- Iowa Project (208): IMN-074-1(208)5--0E-82, Light Pole Supply
- Iowa Project (209): IMN-074-1(209)5--0E-82, Luminaire Supply
- Iowa Project (235): IMN-074-1(235)5--0E-82, Aesthetic Lighting Supply
- Iowa Project (221): ITS-074-1(221)5--25-82, ITS Integration and Deployment
- Iowa Project (222): ITS-074-1(222)5--25-82, ITS Fiber Optics
- Illinois Contract 64C08: Work in Moline from the Mississippi River to 7th Avenue
- Illinois Contract 64E26: Work in Moline from 7th Avenue to south of Avenue of the Cities

Projects and Contracts in the I-74 over the Mississippi River Corridor Project Active in Stage 3

- Iowa Project (197): IM-NHS-074-1(197)5--03-82, River Bridge Approach Spans
- Iowa Project (198): IM-NHS-074-1(198)5--03-82, River Bridge Arch Spans
- Iowa Project (200): IM-NHS-074-1(200)5--03-82, Eastbound Iowa Viaduct and Ramps
- Iowa Project (255): IM-074-1(255)1--13-82, Letdown Structure for Bike Trail
- Iowa Project (206): IM-NHS-074-1(206)5--03-82, Mainline and Ramps Grading and Paving
- Iowa Project (219): IM-NHS-074-1(220)5--03-82, Mainline and Ramps Traffic Signs
- Iowa Project (207): IM-NHS-074-1(206)5--03-82, Local Roads Grading and Paving
- Iowa Project (220): IM-NHS-074-1(220)5--03-82, Local Roads Traffic Signs
- Iowa Project (208): IMN-074-1(208)5--0E-82, Light Pole Supply
- Iowa Project (209): IMN-074-1(209)5--0E-82, Luminaire Supply
- Iowa Project (235): IMN-074-1(235)5--0E-82, Aesthetic Lighting Supply
- Iowa Project (221): ITS-074-1(221)5--25-82, ITS Integration and Deployment
- Iowa Project (222): ITS-074-1(222)5--25-82, ITS Fiber Optics
- Illinois Contract 64C08: Work in Moline from the Mississippi River to 7th Avenue
- Illinois Contract 64E26: Work in Moline from 7th Avenue to south of Avenue of the Cities

Summary of Milestone Completion Dates

Pre-Stage Milestone Completion Date	Tuesday, November 21, 2017
Stage 1 Milestone Completion Date	Tuesday, November 20, 2018
Stage 2 Milestone Completion Date	Tuesday, November 26, 2019
Winter Stage Completion Date	Tuesday, March 31, 2020
Stage 3 Milestone Completion Date	Tuesday, November 24, 2020

Contract Start Through Pre-Stage

Contract 64C08 Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Contract 64C08 Work**
Complete plug fill removal and placement of embankment, including special rock fill for piles in abutment area; complete RWs 1, 2 and 16	(197)	(After 9 months settlement) Drive piles for WB and EB River Approach Abutments 1A and 1B (I-74 and Ramps RD-H and RD-G)

Pre-Stage Milestone Completion Date: November 21, 2017

Contract Start Through Stage 2

Contract 64C08 Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Contract 64C08 Work**
Remove existing WB IL Viaduct from Pier 23NB to S Abutment	64E26	Excavate and install ACGI at WB IL Viaduct S Abutment
Complete pile driving for WB IL Viaduct S Abutment	64E26	Construct MSE RW 05 (SN 081-6014), temporary wire face MSE wall at CL I-74 and backfill to elevation of bottom of WB IL Viaduct S Abutment
Complete WB IL Viaduct S Abutment	64E26	Complete MSE RW 05 (SN 081-6014), temp wire face MSE wall at CL I-74 and backfill for WB IL Viaduct S Abutment and approach slab
Complete WB River Bridge Approach Slabs	(197)	Construct barriers/parapets on WB Abutment wingwalls
Complete WB ITS infrastructure installation IL, River to 7th Ave	(222), (221)	Install Fiber Optics for WB, Deploy and Integrate ITS for WB
Complete WB IL Viaduct S approach slab footing	64E26	Construct WB Mainline pavement to N limit (joint with AB approach slab)

Stage 2 Milestone Completion Date: November 26, 2019

Contract Start Through Stage 3

Contract 64C08 Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Contract 64C08 Work**
Remove existing EB IL Viaduct from Pier 24SB to S Abutment	64E26	Excavate and install ACGI at EB IL Viaduct S Abutment
Complete pile driving for EB IL Viaduct S Abutment	64E26	Construct MSE RW 05 (SN 081-6014) and backfill to elevation of bottom of EB IL Viaduct S Abutment
Complete EB IL Viaduct S Abutment	64E26	Complete MSE RW 05 (SN 081-6014) and backfill for EB IL Viaduct S Abutment and approach slab
Complete EB River Bridge Approach Slabs	(197)	Construct barriers/parapets on EB Abutment wingwalls
Complete Identity Element Foundations in IL (5 locations)	(206)	Install Identity Elements in Moline
Complete EB ITS infrastructure installation IL, River to 7th Ave	(222), (221)	Install Fiber Optics for EB, Deploy and Integrate ITS for EB
Complete EB IL Viaduct S approach slab footing	64E26	Construct EB Mainline pavement to N limit (joint with 64C08 approach slab)

Stage 3 Milestone Completion Date: November 24, 2020

Contract Start Through Stage 1

Contract 64E26 Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Contract 64E26 Work**
Complete WB ITS infrastructure installation IL, Ave of the Cities to south project limit	(222), (221)	Install Fiber Optics; Deploy and Integrate ITS Ave of the Cities to south project limit

Stage 1 Milestone Completion Date: November 20, 2018

Contract Start Through Stage 2

Contract 64E26 Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Contract 64E26 Work**
Complete ACGI at WB IL Viaduct S Abutment	64C08	(After 2 weeks settlement) Drive piles for WB IL Viaduct S Abutment
Complete WB RW 05 (SN 081-6014), temp wire face MSE wall at CL I-74 and backfill for WB IL Viaduct S Abutment and approach slab	64C08	Construct WB IL Viaduct S Abutment
Complete WB ITS infrastructure installation IL, 7th Ave to S end	(222), (221)	Install Fiber Optics for WB, Deploy & Integrate ITS for WB
Complete WB Mainline pavement to N limit (joint with 64C08 approach slab)	64C08	Install preformed joint seal at S end of WB IL Viaduct S approach slab (at 64E26 mainline pavement)

Stage 2 Milestone Completion Date: November 26, 2019

Contract Start Through Stage 3

Contract 64E26 Work to be Completed	**Adjacent Contract / Project**	**Successor Work Dependent on Completed Contract 64E26 Work**
Complete ACGI at EB IL Viaduct S Abutment	64C08	(After 2 weeks settlement) Drive piles for EB IL Viaduct S Abutment
Construct MSE RW 05 (SN 081-6014) and backfill to elevation of bottom of EB IL Viaduct S Abutment	64C08	Construct EB IL Viaduct S Abutment
Complete Identity Element Foundations at Avenue of the Cities	206	Install Identity Elements in Moline
Complete EB ITS infrastructure installation IL, 7th Ave to S end	(222), (221)	Install Fiber Optics for EB, Deploy & Integrate ITS for EB
Complete EB Mainline pavement to N limit (joint with 64C08 approach slab)	64C08	Install preformed joint seal at S end of EB IL Viaduct S approach slab (at 64E26 mainline pavement)

Stage 3 Milestone Completion Date: November 24, 2020

Contract Start Through Stage 2

Project (197) Work to be Completed	Adjacent Contract / Project	Adjacent Successor Work Dependent on Completed Project (197) Work
Install floating silt curtain around Moline water supply intake and south of proposed river bridge spans 1-9	IL 64C08	Install storm sewer outlets into Mississippi River
Complete WB Pier 16	(199)	Set girders WB IA Viaduct span 16
Place upper portion of backwalls, WB Abutment, Units 1A and 1B	IL 64C08	Construct WB River Bridge mainline and Ramp RD-H remaining embankment and approach slabs in Moline
Complete WB deck concrete placement at Pier 12 (with blockout for modular expansion joint)	(198)	Install modular expansion joint at WB Pier 12, including concrete in blockout areas both sides.
Complete WB deck concrete placement at Pier 16 (with blockout for finger plate expansion joint)	(199)	Install finger plate expansion joint at WB Pier 16, including concrete in blockout areas both sides.
Complete ITS infrastructure installation on WB Approach Spans	(222), (221)	Install Fiber Optics for WB, Deploy and Integrate ITS for WB

Stage 2 Milestone Completion Date: November 26, 2019

Contract Start Through Stage 3

Project (197) Work to be Completed	Adjacent Contract / Project	Adjacent Successor Work Dependent on Completed Project (197) Work
Complete EB Pier 16	(200)	Set girders EB IA Viaduct span 16
Place upper portion of backwalls, EB Abutment 1, Units 1A and 1B	IL 64C08	Construct EB River Bridge mainline and Ramp RD-G) remaining embankment and approach slabs in Moline
Complete EB deck concrete placement at Pier 12 (with blockout for modular expansion joint)	(198)	Install modular expansion joint at EB Pier 12, including concrete in blockout areas both sides.
Complete EB deck concrete placement at Pier 16 (with blockout for finger plate expansion joint)	(200)	Install finger plate expansion joint at EB Pier 16, including concrete in blockout areas both sides.
Complete ITS infrastructure installation on EB Approach Spans	(222), (221)	Install Fiber Optics for EB, Deploy and Integrate ITS for EB

Stage 3 Milestone Completion Date: November 24, 2020

Contract Start Through Stage 2

Project (198) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Project (198) Work**
Complete WB arch erection, remove temp works from WB Piers 10, 11, 14 and 15	(197)	Construct columns and caps, WB Piers 10, 11, 14 and 15
Complete WB deck concrete placement at Pier 13 (with blockout for finger plate expansion joint)	(197)	Install finger plate expansion joint at WB Pier 13, including concrete in blockout areas both sides
Complete ITS infrastructure installation on WB Arch Span	(222), (221)	Install Fiber Optics for WB, Deploy and Integrate ITS for WB

Stage 2 Milestone Completion Date: November 26, 2019

Contract Start Through Stage 3

Project (198) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Project (198) Work**
Complete EB arch erection, remove temp works from EB Piers 10, 11, 14 and 15	(197)	Construct columns and caps, EB Piers 10, 11, 14 and 15
Complete EB deck concrete placement at Pier 13 (with blockout for finger plate expansion joint)	(197)	Install finger plate expansion joint at EB Pier 13, including concrete in blockout areas both sides
Complete ITS infrastructure installation on EB Arch Span	(222), (221)	Install Fiber Optics for EB, Deploy and Integrate ITS for EB

Stage 3 Milestone Completion Date: November 24, 2020

Contract Start Through Stage 1

Projects (199) and (260) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Work Dependent on Completed Project (199) or (260) Work**
Relocate part of existing sanitary sewer	(197)	Construct drilled shaft foundation for WB Pier 16

Stage 1 Milestone Completion Date: November 20, 2018

Contract Start Through Stage 2

Projects (199) and (260) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Work Dependent on Completed Project (199) or (260) Work**
Remove existing WB IA Viaduct north of Mississippi Blvd	(206)	Place embankment north of Mississippi Blvd for new WB Mainline pavement
Remove existing WB IA Viaduct from south of Gilbert St (Pier WB11) to S of Brown St	(200)	Construct EB IA Viaduct from Pier 17 to Pier 26 and US 67 Ramp C from Pier 21C to Abutment 23C
Complete ITS infrastructure installation on WB IA Viaduct	(222), (221)	Install Fiber Optics for WB, Deploy and Integrate ITS for WB

Stage 2 Milestone Completion Date: November 26, 2019

Contract Start Through Stage 3

Projects (200) and (255) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Project (200) or (255) Work**
Drive US 67 Ramp A North Abutment piles in MSE zone	(206)	Construct MSE Retaining Wall 165
Remove remaining existing WB IA Viaduct existing WB exit ramp to State Street, from north of the river to Gilbert St	(206)	Place embankment for Ramp US 67 Ramp C
Remove existing EB IA Viaduct north of Mississippi Blvd.	(206)	Place embankment north of Mississippi Blvd for EB IA Viaduct Abutment 32 and approach pavement
Complete ITS infrastructure installation on EB IA Viaduct	(222), (221)	Install Fiber Optics for EB, Deploy and Integrate ITS for EB

Stage 3 Milestone Completion Date: November 24, 2020

Contract Start Through Stage 1

Project (205) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Project (205) Work**
Complete pavement US 67 Ramp D between US 67 (Grant St) and Ramp D bridge	(199)	Construct bridge approach pavement, south of US 67 Ramp D bridge

Stage 1 Milestone Completion Date: November 20, 2018

Contract Start Through Stage 2

Project (206) or (219) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Contract (206) or (219) Work**
Complete pavement US 67 Ramp B north of bridge to previous construction	(199)	Construct bridge approach pavement, north of US 67 Ramp B Bridge
Complete pavement US 67 Ramp D north of bridge to mainline	(199)	Construct bridge approach pavement, north of US 67 Ramp D Bridge
Complete embankment north of Mississippi Blvd for WB IA Viaduct Abutment 32 and approach pavement	(199)	(After 14 days settlement) Drive piles for and construct WB IA Viaduct Abutment 32
Complete pavement I-74 WB north of IA Viaduct Abutment 32	(199)	Construct bridge approach pavement, north of WB IA Viaduct Abutment 32
Complete ITS WB infrastructure installation in Iowa to north project limit	(222), (221)	Install Fiber Optics for WB, Deploy and Integrate ITS for WB

Stage 2 Milestone Completion Date: November 26, 2019

Contract Start Through Stage 3

Project (206) or (219) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Contract (206) or (219) Work**
Complete MSE Retaining Wall 165 and embankment north of Mississippi Blvd for US 67 Ramp A North Abutment	(200)	Construct US 67 Ramp A North Abutment
Remove existing loop ramp and complete embankment south of Mississippi Blvd for US 67 Ramp A South Abutment	(200)	Construct US 67 Ramp A South Abutment
Complete US 67 Ramp A pavement, Mississippi Blvd to ramp bridge	(200)	Construct bridge approach pavement, north of US 67 Ramp A Bridge
Complete US 67 Ramp A pavement, south of ramp bridge to Grant St (US 67)	(200)	Construct bridge approach pavement, south of US 67 Ramp A Bridge
Complete embankment for US 67 Ramp C	(200)	(After 30 days settlement) Drive piles for and construct US 67 Ramp C Abutment 23C
Complete pavement US 67 Ramp C north of bridge to Grant St (US 67)	(200)	Construct bridge approach pavement, north of US 67 Ramp C Bridge
Complete embankment north of Mississippi Blvd for EB IA Viaduct Abutment 32 and approach pavement	(200)	(After 7 days settlement) Drive piles for and construct EB IA Viaduct Abutment 32
Complete pavement I-74 EB north of IA Viaduct Abut 32	(200)	Construct bridge approach pavement, north of EB IA Viaduct Abut 32
Complete ITS EB infrastructure installation in Iowa to north project limit	(222), (221)	Install Fiber Optics for EB, Deploy and Integrate ITS for EB

Stage 3 Milestone Completion Date: November 24, 2020

Contract Start Through Stage 1

Project (208) Work to be Completed	Adjacent Contract / Project	Adjacent Successor Work Dependent on Completed Project (208) Work
Provide light poles for 7th Ave south of I-74	64C08	Install light poles 7th Ave south of I-74
Provide light poles for IL I-74 median barrier from Sta 129 to south end, Ramp AC-A and part south of Ramps AC-B and AC-C	64E26	Install light poles IL I-74 median barrier from Sta 129 to south end, Ramp AC-A and part south of Ramps AC-B and AC-C

Stage 1 Milestone Completion Date: November 20, 2018

Contract Start Through Stage 2

Project (208) Work to be Completed	Adjacent Contract / Project	Adjacent Successor Work Dependent on Completed Project (208) Work
Provide light poles for WB IL viaduct (all spans), EB IL Viaduct Unit 1, Ramps RD-H, 6TH-D and 6TH-C, local roads east of I-74	64C08	Install light poles IL I-74 WB IL viaduct (all spans), EB IL Viaduct Unit 1, Ramps RD-H, 6TH-D and 6TH-C, local roads east of I-74
Provide light poles for IL I-74 WB from 7th Ave to Ave of the Cities (median barriers and bridges over 19th St, 12th Ave and 19th St SB), Ramps 7TH-A and AC-D	64E26	Install light poles IL I-74 WB from 7th Ave to Ave of the Cities (median barriers and bridges over 19th St, 12th Ave and 19th St SB), Ramps 7TH-A and AC-D
Provide light poles for Middle Road Ramp B	(206)	Install light poles Middle Road Ramp B
Provide light poles for WB River Bridge Approach Spans	(197)	Install light poles WB River Bridge Approach Spans
Provide light poles for WB River Bridge Arch Span	(198)	Install light poles WB River Bridge Arch Span
Provide light poles for WB IA Viaduct (all spans), US 67 Ramps B and D bridges	(199)	Install light poles WB IA Viaduct (all spans), US 67 Ramps B and D bridges
Provide light poles for US 67 Ramps B and D	(206)	Install light poles US 67 Ramps B and D

Stage 2 Milestone Completion Date: November 26, 2019

Contract Start Through Stage 3

Project (208) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Project (208) Work**
Provide light poles for IL I-74 EB plug fill RT barrier, Ramp RD-G, and River Dr west of I-74	64C08	Install light poles IL I-74 EB plug fill RT barrier, Ramp RD-G, and River Dr west of I-74
Provide light poles for IL I-74 median at plug fill after crossover is removed	64C08	Install light poles for IL I-74 median at plug fill after crossover is removed
Provide light poles for Ramps 7TH-B and remaining Ramps AC-C and AC-B	64E26	Install light poles Ramps 7TH-B and remaining Ramps AC-C and AC-B
Provide light poles for remaining IL I-74 median south of Ave of the Cities after crossover is removed	64E26	Install light poles for remaining IL I-74 median south of Ave of the Cities after crossover is removed
Provide light pole for US 67 Ramp A bridge	(200)	Install light pole US 67 Ramp A bridge
Provide light poles for US 67 Ramp A and Middle Rd Ramp C	(206)	Install light poles US 67 Ramp A and Middle Rd Ramp C
Provide light poles for US 67 Ramp C	(206)	Install light poles US 67 Ramp C
Provide light poles for IA I-74 median, Mississippi Blvd to Middle Rd south of Ave of the Cities after crossover is removed	(206)	Install light poles IA I-74 median, Mississippi Blvd to Middle Rd south of Ave of the Cities after crossover is removed
Provide light poles for EB River Bridge Approach Spans	(197)	Install light poles EB River Bridge Approach Spans
Provide light poles for EB River Bridge Arch Span	(198)	Install light poles EB River Bridge Arch Span
Provide light poles for EB IA Viaduct (all spans), US 67 Ramp C bridges	(199)	Install light poles EB IA Viaduct (all spans), US 67 Ramp C bridges

Stage 3 Milestone Completion Date: November 24, 2020

Contract Start Through Stage 1

Project (209) Work to be Completed	Adjacent Contract / Project	Adjacent Successor Work Dependent on Completed Project (209) Work
Provide luminaires for 7th Ave south of I-74; underdeck luminaires: WB over River Dr and Ramp 6TH-C, EB over River Dr	64C08	Install luminaires 7th Ave south of I-74; underdeck: WB over River Dr and Ramp 6TH-C, EB over River Dr
Provide luminaires for IL I-74 median barrier from Sta 129 to south end, Ramp AC-A and part south of Ramps AC-B and AC-C	64E26	Install luminaires IL I-74 median barrier from Sta 129 to south end, Ramp AC-A and part south of Ramps AC-B and AC-C
Provide luminaires for underdeck luminaires: US 67 Ramp B over Gilbert St	(199)	Install luminaires underdeck: US 67 Ramp B over Gilbert St

Stage 1 Milestone Completion Date: November 20, 2018

Contract Start Through Stage 2

Project (209) Work to be Completed	Adjacent Contract / Project	Adjacent Successor Work Dependent on Completed Project (209) Work
Provide luminaires for WB IL viaduct (all spans), EB IL Viaduct Unit 1, Ramps RD-H, 6TH-D and 6TH-C, local roads east of I-74; underdeck luminaires: WB over River Dr and Ramp 6TH-C; underdeck luminaires: WB over 6th Ave and 7th Ave	64C08	Install luminaires IL I-74 WB IL viaduct (all spans), EB IL Viaduct Unit 1, Ramps RD-H, 6TH-D and 6TH-C, local roads east of I-74; underdeck: WB over River Dr and Ramp 6TH-C; underdeck luminaires: WB over 6th Ave and 7th Ave
Provide luminaires for IL I-74 WB from 7th Ave to Ave of the Cities (median barriers and bridges over 19th St, 12th Ave and 19th St SB), Ramps 7TH-A and AC-D; WB underdeck luminaires Ave of the Cities	64E26	Install luminaires IL I-74 WB from 7th Ave to Ave of the Cities (median barriers and bridges over 19th St, 12th Ave and 19th St SB), Ramps 7TH-A and AC-D; WB underdeck Ave of the Cities
Provide luminaires for Middle Road Ramp B	(206)	Install luminaires Middle Road Ramp B
Provide luminaires for WB River Bridge Approach Spans	(197)	Install luminaires WB River Bridge Approach Spans
Provide luminaires for WB River Bridge Arch Span	(198)	Install luminaires WB River Bridge Arch Span
Provide luminaires for WB IA Viaduct (all spans), US 67 Ramps B and D bridges; underdeck luminaires: WB IA Viaduct over Gilbert St and over US 67 (Grant St)	(199)	Install luminaires WB IA Viaduct (all spans), US 67 Ramps B and D bridges; underdeck: WB IA Viaduct over Gilbert St and over US 67 (Grant St)
Provide luminaires for US 67 Ramps B and D	(206)	Install luminaires US 67 Ramps B and D

Stage 2 Milestone Completion Date: November 26, 2019

Contract Start Through Stage 3

Project (209) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Project (209) Work**
Provide luminaires for IL I-74 EB plug fill RT barrier, Ramp RD-G, and River Dr west of I-74; underdeck luminaires: EB over Ramp 6TH-C, 6th Ave and 7th Ave	64C08	Install luminaires IL I-74 EB plug fill RT barrier, Ramp RD-G, and River Dr west of I-74; underdeck: EB over Ramp 6TH-C, 6th Ave and 7th Ave
Provide luminaires for IL I-74 median at plug fill after crossover is removed	64C08	Install luminaires for IL I-74 median at plug fill after crossover is removed
Provide luminaires for Ramps 7TH-B and remaining Ramps AC-C and AC-B; EB underdeck luminaires Ave of the Cities	64E26	Install luminaires Ramps 7TH-B and remaining Ramps AC-C and AC-B; EB underdeck Ave of the Cities
Provide luminaires for remaining IL I-74 median south of Ave of the Cities after crossover is removed	64E26	Install luminaires for remaining IL I-74 median south of Ave of the Cities after crossover is removed
Provide luminaire for US 67 Ramp A bridge	(200)	Install luminaire US 67 Ramp A bridge
Provide luminaires for US 67 Ramp A and Middle Rd Ramp C	(206)	Install luminaires US 67 Ramp A and Middle Rd Ramp C
Provide luminaires for US 67 Ramp C	(206)	Install luminaires US 67 Ramp C
Provide luminaires for IA I-74 median, Mississippi Blvd to Middle Rd south of Ave of the Cities after crossover is removed	(206)	Install luminaires IA I-74 median, Mississippi Blvd to Middle Rd south of Ave of the Cities after crossover is removed
Provide luminaires for EB River Bridge Approach Spans	(197)	Install luminaires EB River Bridge Approach Spans
Provide luminaires for EB River Bridge Arch Span	(198)	Install luminaires EB River Bridge Arch Span
Provide luminaires for EB IA Viaduct (all spans), US 67 Ramp C bridges; underdeck luminaires: EB IA Viaduct over Gilbert St and over US 67 (Grant St), US 67 over Gilbert St	(199)	Install luminaires EB IA Viaduct (all spans), US 67 Ramp C bridges; underdeck luminaires: EB IA Viaduct over Gilbert St and over US 67 (Grant St), US 67 over Gilbert St

Stage 3 Milestone Completion Date: November 24, 2020

Contract Start Through Stage 2

Project (235) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Project (235) Work**
Provide aesthetic lighting material - WB IL Viaduct	64C08	Install aesthetic lighting on WB IL Viaduct piers
Provide aesthetic lighting material - WB Approach piers	(197)	Install aesthetic lighting on WB Approach piers
Provide aesthetic lighting material - WB Arch	(198)	Install aesthetic lighting on WB Arch
Provide aesthetic lighting material - WB IA Viaduct	(199)	Install aesthetic lighting on WB IA Viaduct piers

Stage 2 Milestone Completion Date: November 26, 2019

Contract Start Through Stage 3

Project (235) Work to be Completed	**Adjacent Contract / Project**	**Adjacent Successor Work Dependent on Completed Project (235) Work**
Provide aesthetic lighting material - EB IL Viaduct	64C08	Install aesthetic lighting on EB IL Viaduct piers
Provide aesthetic lighting material - EB Approach piers	(197)	Install aesthetic lighting on EB Approach piers
Provide aesthetic lighting material - EB Arch, Overlook and EB piers	(198)	Install aesthetic lighting on EB Arch, Overlook and EB piers
Provide aesthetic lighting material - EB IA Viaduct	(200)	Install aesthetic lighting on EB IA Viaduct piers

Stage 3 Milestone Completion Date: November 24, 2020

INCENTIVE/DISINCENTIVE
Effective: January 10, 2017

General. Because the lane closures on I-74 Eastbound and I-74 Westbound during Stage 1, the closure of I-74 Westbound during Stage 2, and the re-routing of I-74 Eastbound during Stage 3, incur daily costs to road users and to the Department, Incentive/Disincentive provisions have been established to encourage early completion of the Contractor's work at milestones for these stages, and to recoup costs to the Department should the Contractor fail to complete their work by the specified milestone completion dates.

Stage 1 Milestone.

a) Stage 1 Milestone Completion Date. The Contractor shall schedule his/her operations so as to complete Stage 1 critical work on or before Tuesday, November 20, 2018. The Contractor shall note that this completion date is based on an expedited work schedule.

Completion of Stage 1 critical work items, for the purposes of determining the calendar days calculated for incentive payment or disincentive assessment, shall be defined as follows:

1) All Stage 1 work identified in the contract documents for this particular contract has been completed. In order for work to be considered complete, the eastbound and westbound I-74 mainline and ramp roadways south of the Avenue of the Cities in Moline to the south limit of Contract 64E26 and 19th Street from 11th Avenue to the Avenue of the Cities must be open to traffic with no lane closures or obstructions.

2) The remaining work to be completed is confined to the areas outside the outside edges of shoulder of Eastbound or Westbound I-74 mainline and ramps. Such items may consist of minor work such as clean up or erosion control, and any erosion control work must be completed during the first available seeding period.

b) Disincentive for Failure to Complete the Work on Time: Should the Contractor fail to complete the Stage 1 critical work on or before the specified Stage 1 Milestone Completion Date, or within such extended time allowed by the Department, the Contractor shall be liable to the Department in the amount of SIX THOUSAND SIX HUNDRED DOLLARS ($6,600), not as a penalty but as liquidated and ascertained damages for each calendar day beyond the Stage 1 Milestone Completion Date or extended time as may be allowed. Such damages may be deducted by the Department from any monies due the Contractor.

   In fixing the damages as set out herein, the desire is to establish a certain mode of calculation for the work because the Department's actual loss, in the event of delay, cannot be predetermined, would be difficult of ascertainment, and a matter of argument and unprofitable litigation. This mode is an equitable rule for measurement of the Department's actual loss and fairly takes into account the loss of use of the roadway if the project is delayed in completion. The Department shall not be required to provide any actual loss to recover these liquidated damages provided herein, as these damages are very difficult to ascertain. Furthermore, no provision of this clause shall be construed as a penalty, as such is not the intention of the parties.

   A calendar day is every day on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

c) Incentive Payment Plan. The nature of this project is such that subsequent staging of work in the I-74 corridor cannot safely and efficiently commence until all westbound and eastbound bridge and roadway work from the Avenue of the Cities in Moline to the south limit of the contract is essentially complete. On this basis, the Contractor shall be entitled to an Incentive Payment for completing the Stage 1 critical work prior to the Stage 1 Milestone Completion Date.

   The Incentive Payment shall be paid at the rate of SIX THOUSAND SIX HUNDRED DOLLARS ($6,600) per calendar day for each day the Stage 1 critical work is completed prior to the Stage 1 Milestone Completion Date. The maximum payment under this incentive plan will be limited to 30 calendar days.

A calendar day is every day on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later. No payment will be paid for any day less than twenty-four hours.

Should the Contractor be delayed in the commencement, prosecution, or completion of the Stage 1 critical work for any reason, there will be no extension of the specified Stage 1 Milestone Completion Date for Stage 1 Incentive Payment calculation even though there may be granted an extension of time for completion of the work. No Stage 1 Incentive Payment will be made if the Contractor fails to complete the Stage 1 critical work before the specified Stage 1 Milestone Completion Date. Failure of the Contractor to complete all Stage 1 critical work and open all lanes of the eastbound and westbound roadways to traffic as required by the contract on or before the Stage 1 Milestone Completion Date shall release and discharge the State, the Department and all of its officers, agents, and employees from any and all claims and demands for the payment of any Stage 1 incentive amount or damages arising from the refusal to pay any Stage 1 incentive amount.

Stage 2 Milestone.

a) Stage 2 Milestone Completion Date. The Contractor shall schedule his/her operations so as to complete Stage 2 critical work on or before Tuesday, November 26, 2019. The Contractor shall note that this completion date is based on an expedited work schedule.

Completion of Stage 2 critical work items, for the purposes of determining the calendar days calculated for incentive payment or disincentive assessment, shall be defined as follows:

1) All Stage 2 work identified in the contract documents for this particular contract has been completed. In order for work to be considered complete, the Westbound I-74 mainline and ramp roadways (associated with Illinois Contract 64E26) must be open to traffic with no lane closures or obstructions.

2) The remaining work to be completed is confined to the areas outside the outside edge of shoulder of Westbound I-74 mainline and ramps. Such items may consist of minor work such as clean up or erosion control, and any erosion control work must be completed during the first available seeding period.

b) Disincentive for Failure to Complete the Work on Time: Should the Contractor fail to complete the Stage 2 critical work on or before the specified Stage 2 Milestone Completion Date, or within such extended time allowed by the Department, the Contractor shall be liable to the Department in the amount of SIX THOUSAND THREE HUNDRED DOLLARS (6,300), not as a penalty but as liquidated and ascertained damages for each calendar day beyond the Stage 2 Milestone Completion Date or extended time as may be allowed. Such damages may be deducted by the Department from any monies due the Contractor.

   In fixing the damages as set out herein, the desire is to establish a certain mode of calculation for the work because the Department's actual loss, in the event of delay, cannot be predetermined, would be difficult of ascertainment, and a matter of argument and unprofitable litigation. This mode is an equitable rule for measurement of the Department's actual loss and fairly takes into account the loss of use of the roadway if the project is delayed in completion. The Department shall not be required to provide any actual loss to recover these liquidated damages provided herein, as these damages are very difficult to ascertain. Furthermore, no provision of this clause shall be construed as a penalty, as such is not the intention of the parties.

   A calendar day is every day on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

c) Incentive Payment Plan. The nature of this project is such that the use of Westbound I-74 cannot be safely and efficiently used until all westbound bridge and roadway work is essentially complete. On this basis, the Contractor shall be entitled to an Incentive Payment for completing the Stage 2 critical work prior to the Stage 2 Milestone Completion Date.

   The Incentive Payment shall be paid at the rate of SIX THOUSAND THREE HUNDRED DOLLARS (6,300) per calendar day for each day the Stage 2 critical work is completed prior to the Stage 2 Milestone Completion Date. The maximum payment under this incentive plan will be limited to 30 calendar days.

A calendar day is every day on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later. No payment will be paid for any day less than twenty-four hours.

Should the Contractor be delayed in the commencement, prosecution, or completion of the Stage 2 critical work for any reason, there will be no extension of the specified Stage 2 Milestone Completion Date for Stage 2 Incentive Payment calculation even though there may be granted an extension of time for completion of the work. No Stage 2 Incentive Payment will be made if the Contractor fails to complete the Stage 2 critical work before the specified Stage 2 Milestone Completion Date. Failure of the Contractor to complete all Stage 2 critical work and open the westbound roadway to traffic as required by the contract on or before the Stage 2 Milestone Completion Date shall release and discharge the State, the Department and all of its officers, agents, and employees from any and all claims and demands for the payment of any Stage 2 incentive amount or damages arising from the refusal to pay any Stage 2 incentive amount.

Stage 3 Milestone.

a) Stage 3 Milestone Completion Date. The Contractor shall schedule his/her operations so as to complete Stage 3 critical work on or before Tuesday, November 24, 2020. The Contractor shall note that this completion date is based on an expedited work schedule.

Completion of Stage 3 critical work items, for the purposes of determining the calendar days calculated for incentive payment or disincentive assessment, shall be defined as follows:

1) All Stage 3 work identified in the contract documents for this particular contract has been completed. In order for work to be considered complete, the Eastbound I-74 mainline and ramp roadways (associated with Illinois Contract 64E26) must be open to traffic with no lane closures or obstructions.

2) The remaining work to be completed is confined to the areas outside the outside edge of shoulder of Eastbound I-74 mainline and ramps. Such items may consist of minor work such as clean up or erosion control, and any erosion control work must be completed during the first available seeding period.

b) Disincentive for Failure to Complete the Work on Time: Should the Contractor fail to complete the Stage 3 critical work on or before the specified Stage 3 Milestone Completion Date, or within such extended time allowed by the Department, the Contractor shall be liable to the Department in the amount of THIRTEEN THOUSAND SIX HUNDRED DOLLARS ($13,600), not as a penalty but as liquidated and ascertained damages for each calendar day beyond the Stage 3 Milestone Completion Date or extended time as may be allowed. Such damages may be deducted by the Department from any monies due the Contractor.

   In fixing the damages as set out herein, the desire is to establish a certain mode of calculation for the work because the Department's actual loss, in the event of delay, cannot be predetermined, would be difficult of ascertainment, and a matter of argument and unprofitable litigation. This mode is an equitable rule for measurement of the Department's actual loss and fairly takes into account the loss of use of the roadway if the project is delayed in completion. The Department shall not be required to provide any actual loss to recover these liquidated damages provided herein, as these damages are very difficult to ascertain. Furthermore, no provision of this clause shall be construed as a penalty, as such is not the intention of the parties.

   A calendar day is every day on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

c) Incentive Payment Plan. The nature of this project is such that the use of Eastbound I-74 cannot be safely and efficiently used until all eastbound bridge and roadway work is essentially complete. On this basis, the Contractor shall be entitled to an Incentive Payment for completing the Stage 3 critical work prior to the Stage 3 Milestone Completion Date.

   The Incentive Payment shall be paid at the rate of THIRTEEN THOUSAND SIX HUNDRED DOLLARS ($13,600) per calendar day for each day the Stage 3 critical work is completed prior to the Stage 3 Milestone Completion Date. The maximum payment under this incentive plan will be limited to 30 calendar days.

   A calendar day is every day on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later. No payment will be paid for any day less than twenty-four hours.

Should the Contractor be delayed in the commencement, prosecution, or completion of the Stage 3 critical work for any reason, there will be no extension of the specified Stage 3 Milestone Completion Date for Stage 3 Incentive Payment calculation even though there may be granted an extension of time for completion of the work. No Stage 3 Incentive Payment will be made if the Contractor fails to complete the Stage 3 critical work before the specified Stage 3 Milestone Completion Date. Failure of the Contractor to complete all Stage 3 critical work and open the eastbound roadway to traffic as required by the contract on or before the Stage 3 Milestone Completion Date shall release and discharge the State, the Department and all of its officers, agents, and employees from any and all claims and demands for the payment of any Stage 3 incentive amount or damages arising from the refusal to pay any Stage 3 incentive amount.

SHARED BONUS
Effective: January 10, 2017

General. The intent of the Shared Bonus Program is to compensate Contractors with interdependent work for the added cooperation required to schedule and complete such work. This cooperation is required for the roadway and bridges to open to traffic in a timely manner.

Stage 2 Milestone. Westbound I-74 cannot be opened to traffic until completion of the critical work in all the contracts listed below. In addition, there is an unusually high degree of interdependence among these contracts to complete their work. Therefore this Special Provision has been established such that a lump sum payment will be made, if and only if, all the Contactors for the contracts listed below complete their critical work on or before the Stage 2 Milestone Completion Date, as specified below.

Stage 2 Milestone Contracts. The following contracts must all complete their Stage 2 critical work on time in order for any Stage 2 Milestone Shared Bonus payments to be made:

- Iowa Project (197): IM-NHS-074-1(197)5--03-82, River Bridge Approach Spans.
- Iowa Project (198): IM-NHS-074-1(198)5--03-82, River Bridge Arch Spans.
- Iowa Project (199): IM-NHS-074-1(199)5--03-82, Westbound Iowa Viaduct and Ramps, and Iowa Project (260): IM-NHS-074-1(260)1--03-82, Grading and Sanitary Sewer.
- Iowa Project (206): IM-NHS-074-1(206)5--03-82, Mainline and Ramps Grading and Paving.
- Illinois Contract 64C08: Work in Moline from the Mississippi River to 7th Avenue.
- Illinois Contract 64E26: Work in Moline from 7th Avenue to south of Avenue of the Cities.

Note that the contract and project descriptors above are intended to identify the contract or project overall and are not complete descriptions of Stage 2 critical work. In general, work required to open Westbound I-74, mainline and ramps, to traffic must be completed on or before the Stage 2 Milestone Completion Date. Contract documents for each contract or project specify what work items are critical to complete for the Stage 2 Milestone.

Stage 2 Milestone Completion Date. The Contractor shall schedule his/her operations so as to complete Stage 2 critical work on or before Tuesday, November 26, 2019. The Contractor shall note that this completion date is based on an expedited work schedule.

Completion of Stage 2 critical work items, for the purposes of determining payment of Stage 2 Shared Bonus, shall be defined as follows:

a) Traffic must have complete use of the Westbound I-74 mainline and ramp roadways, including shoulders, with no delays or lane closures and no obstructions except for signs warning of construction work ahead.

b) The remaining work to be completed is confined to the areas outside the outside edge of shoulder of Westbound I-74 mainline and ramps.

c) Only minor work is left for completion such as clean up or erosion control, and the erosion control work is completed during the first available seeding period.

Stage 3 Milestone. Eastbound I-74 cannot be opened to traffic until completion of the critical work in all the contracts listed below. In addition, there is an unusually high degree of interdependence among these contracts to complete their work. Therefore this Special Provision has been established such that a lump sum payment will be made, if and only if, all the Contactors for the contracts listed below complete their critical work on or before the Stage 3 Milestone Completion Date, as specified below.

Stage 3 Milestone Contracts. The following contracts must all complete their Stage 3 critical work on time in order for any Stage 3 Milestone Shared Bonus payments to be made:

- Iowa Project (197): IM-NHS-074-1(197)5--03-82, River Bridge Approach Spans;
- Iowa Project (198): IM-NHS-074-1(198)5--03-82, River Bridge Arch Spans;
- Iowa Project (200): IM-NHS-074-1(200)5--03-82, Eastbound Iowa Viaduct and Ramps, and Iowa Project (255): IM-074-1(255)1--13-82, Letdown Structure for bike trail;
- Iowa Project (206): IM-NHS-074-1(206)5--03-82, Mainline and Ramps Grading and Paving.
- Illinois Contract 64C08: Work in Moline from the Mississippi River to 7th Avenue.
- Illinois Contract 64E26: Work in Moline from 7th Avenue to south of Avenue of the Cities.

Note that the contract and project descriptors above are intended to identify the contract or project overall and are not complete descriptions of Stage 3 critical work. In general, work required to open Eastbound I-74, mainline and ramps, to traffic must be completed on or before the Stage 3 Milestone Completion Date. Contract documents for each contract or project specify what work items are critical to complete for the Stage 3 Milestone.

Stage 3 Milestone Completion Date. The Contractor shall schedule his/her operations so as to complete Stage 3 critical work on or before Tuesday, November 24, 2020. The Contractor shall note that this completion date is based on an expedited work schedule.

Completion of Stage 3 critical work, for the purposes of determining the calendar days calculated for incentive payment or disincentive assessment, shall be defined as follows:

a) Traffic must have complete use of the Eastbound I-74 mainline and ramp roadways, including shoulders, with no delays or lane closures and no obstructions except for signs warning of construction work ahead.

b) The remaining work to be completed is confined to the areas outside the outside edge of shoulder of Eastbound I-74 mainline and ramps.

c) Only minor work is left for completion such as clean up or erosion control, and the erosion control work is completed during the first available seeing period.

Basis of Payment Stage 2 Shared Bonus. The nature of this project is such that the use of Westbound I-74 cannot be safely and efficiently used until all westbound bridge and roadway work in the I-74 over the Mississippi River Corridor Project is essentially complete. On this basis, the Contractor shall be entitled to a Stage 2 Shared Bonus payment if and only if the Stage 2 critical work of all the Stage 2 Milestone Contracts is complete prior to the Stage 2 Milestone Completion Date.

Should any Stage 2 Milestone Contractor be delayed in the commencement, prosecution, or completion of the work for any reason, there will be no extension of the specified Stage 2 Milestone Completion Date for Shared Bonus payment, even if there may be granted an extension of time for completion of the work. No Stage 2 Shared Bonus payment will be made if any of the Stage 2 Milestone Contractors fails to complete their Stage 2 critical work before the specified Stage 2 Milestone Completion Date. Failure of any of said Contractors to complete their Stage 2 critical work and open the roadway as required by the contract on or before the Stage 2 Milestone Completion Date, shall release and discharge the State, the Department and all of its officers, agents, and employees from any and all claims and demands for the payment of any Stage 2 Shared Bonus amount or damages arising from the refusal to pay any Stage 2 Shared Bonus amount.

The Stage 2 Milestone Shared Bonus payment, if applicable, shall be a lump sum payment of TWO HUNDRED EIGHTY-THREE THOUSAND DOLLARS ($283,000).

Basis of Payment Stage 3 Shared Bonus. The nature of this project is such that the use of Eastbound I-74 cannot be safely and efficiently used until all eastbound bridge and roadway work in the I-74 over the Mississippi River Corridor Project is essentially complete. On this basis, the Contractor shall be entitled to a Stage 3 Shared Bonus payment if and only if the Stage 3 critical work of all the Stage 3 Milestone Contracts is complete prior to the Stage 3 Milestone Completion Date.

Should any Stage 3 Milestone Contractor be delayed in the commencement, prosecution, or completion of the work for any reason, there will be no extension of the specified Stage 3 Milestone Completion Date for Shared Bonus payment, even if there may be granted an extension of time for completion of the work. No Stage 3 Shared Bonus payment will be made if any of the Stage 3 Milestone Contractors fails to complete their Stage 3 critical work before the specified Stage 3 Milestone Completion Date. Failure of any of said Contractors to complete their Stage 3 critical work and open the roadway as required by the contract on or before the Stage 3 Milestone Completion Date, shall release and discharge the State, the Department and all of its officers, agents, and employees from any and all claims and demands for the payment of any Stage 3 Shared Bonus amount or damages arising from the refusal to pay any Stage 3 Shared Bonus amount.

The Stage 3 Milestone Shared Bonus payment, if applicable, shall be a lump sum payment of THREE HUNDRED SIX THOUSAND DOLLARS ($306,000).

STORM SEWER WATER MAIN REQUIREMENT
Effective: June 12, 1997

Description: This work shall consist of furnishing and installing water main quality pipe at the locations shown on the plans.

Materials:

a) Ductile iron water main Class 52

Joints for Ductile Iron pipe shall be:

1. Mechanical Joints - AWWA C111 and C600
2. Push-On-Joints - AWWA C111 and C600

b) Polyvinyl Chloride (PVC) Class 12454B (PVC 1120) or
Class 12454C (PVC 1220).
Schedule 40 is required for 8" diameter and schedule 80 for larger sizes.

CONSTRUCTION REQUIREMENTS

The storm sewer water main shall be installed according to the applicable portions of Section 550 and 561 of the Standard Specifications and the Standard Specifications for Water and Sewer Main Construction. In case of conflict between the Standard Specifications, the Standard Specifications for Water and Sewer Main Construction in Illinois shall take precedence and shall govern.

No testing or disinfections of the newly laid storm sewer water main will be required. A water-tight connection is required between the storm sewer water main and the storm sewer.
Method of Measurement: Storm sewer water main of the various diameters will be measured for payment in feet, measured in place.

Basis of Payment: This work will be paid for at the contract unit price per Foot for STORM SEWER WATER MAIN REQUIREMENT, of the diameter specified.

SEEDING MOBILIZATION
Effective: May 9, 2000 Revised: August 23, 2013

The Contractor shall coordinate his work so no more than 10 acres are disturbed at a time. All work in this area shall be completed and the area seeded before additional areas are disturbed. Under no conditions shall the Contractor prolong final grading and shaping so the entire project can be permanently seeded at one time.

Wherever possible, permanent seeding and the permanent erosion control shall be installed. The ditch bottoms and backslopes shall not be disturbed again unless the seeding hasn't become established. If the foreslopes need to be regraded to the new shoulder, all work shall be confined to the foreslope and any damage to the ditch bottom, backslope, or permanent erosion control shall be repaired at no additional cost to the Department.

All permanent seeding, mulch, and the required fertilizer nutrients shall be completed and paid for in accordance with Sections 250 and 251 of the Standard Specifications, except that SEEDING MOBILIZATION will be paid for at the contract unit price per each. This will be paid each time the Engineer requires the Contractor to bring the equipment to the jobsite. If the equipment is already on the site, this will not be paid for again.

HOT-MIX ASPHALT SURFACE COURSE, CUT OFF DATE
Effective: December 8, 1998 Revised: October 17, 2007

Placement of Hot-Mix Asphalt Surface Course will not be permitted after October 15 unless approved, in writing, by the Resident Engineer.

IMPACT ATTENUATORS, TEMPORARY (NON-REDIRECTIVE)
Effective: June 1, 2006 Revised: July 21, 2015

This work shall consist of installing Temporary Impact Attenuators according to Section 706 and the following.

Temporary sand module systems that are not located on pavement or a hot-mix asphalt shoulder shall be placed on a 6” base. The base can be either hot-mix asphalt or concrete. The hot-mix asphalt base shall be constructed with incidental hot-mix asphalt surfacing according to Section 408 of the specifications book. The concrete base shall be constructed using class SI concrete.

The temporary impact attenuator and base shall be removed after the completion of work. The area under the base shall be restored to the original condition.

The cost of the base will be included in the contract unit price per Each for IMPACT ATTENUATORS, TEMPORARY (NON-REDIRECTIVE) of the test level specified.

ISLAND REMOVAL
Effective: October 10, 2006

This work shall consist of the removal and disposal of the islands as shown on the plans. This work shall be done in accordance with applicable portions of Section 440 of the Standard Specifications and shall include the removal of the concrete island surface, concrete curb & gutter, and excavation below the concrete to a depth of the bottom of the adjacent concrete pavement.

This work will be paid for at the contract unit price per Square Foot for ISLAND REMOVAL.

ENGINEER'S FIELD OFFICE TYPE A
Effective: January 1, 2012

Engineer's Field Office Type A shall be in accordance with Article 670.02 of the Standard Specifications:

Add (s) to the end of 670.02

(s) Cellular phone with a minimum of 500 anytime minutes per month for use by the site resident engineer/technician.

WORK ZONE PAVEMENT MARKING AND REMOVAL
Effective: December 29, 2008 Revised: April 12, 2016

This work shall consist of installing and removing temporary pavement marking according to Section 703 of the Standard Specifications and the following:

Paint pavement marking shall be used on the final wearing surface when the temporary pavement marking will conflict with the permanent pavement marking such as on tapers, crossovers and lane shifts.

All temporary paint on the final wearing surface shall be removed according to Article 1101.12 Water Blaster with Vacuum Recovery and the applicable portions of Sections 703 and 783 of the Standard Specifications and as described herein.

Add the following paragraph to Article 1101.12 of the Standard Specifications.

For the high pressure water spray, the pressure at the nozzle shall be approximately 25,000 psi with maximum flow rate of 15 gal/min. The nozzle shall be in close proximity to the pavement surface.

STATUS OF UTILITIES TO BE ADJUSTED
Effective: September 25, 2015

Name & Address of Utility	Type	Location	Estimated Date Relocation Complete
AT&T 2800 7th Street Moline, IL 61265	Telephone		
CENTURYLINK – Qwest Communications 3908 Utica Ridge Road Bettendorf, IA 52722	Telephone		
CITY OF MOLINE 3635 4th Avenue Moline, IL 61265	Water and Sewer		
MIDAMERICAN ENERGY COMPANY 2811 5th Avenue Rock Island, IL 61201	Electric		
MIDAMERICAN ENERGY 106 East Second Street Davenport, IA 52801	Electric - Transmission		
MIDAMERICAN ENERGY COMPANY 2811 5th Avenue Rock Island, IL 61201	Gas		
KONE INC 2266 US Highway 6 Coal Valley, IL 61240	Gas and Electric		
MEDIACOM 3900 26th Avenue Moline, IL 61265	CATV		
MCI World Com 2400 N. Glenville Dept. 41103/107 Richardson, TX 75082	Telephone		
WINDSTREAM 1815 S. Meyers Road, Suite 900 Oak Brook Terrace, IL 60181	Telephone		

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

The applicable portions of Article 105.07 of the Standard Specification shall apply except for the following: The Contractor shall be responsible to locate the vertical depths of the underground utilities which may interfere with construction operations. This work will not be measured or paid for separately, but shall be considered as included in the unit bid price for the item of construction involved.

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

EXISTING UTILITIES:

The Contractor shall familiarize himself with the locations of all utilities and structures that may be found in the vicinity of the construction. The Contractor shall conduct his operations to avoid damage to the above-mentioned utilities and structures. Should any damage occur due to the Contractor's negligence, repairs shall be made by the contractor at no additional cost to the Department.

The Contractor shall notify all utility owners of his construction schedule and shall coordinate construction operations with utility owners so that relocation of utility lines and structures may proceed in an orderly manner. Notification shall be in writing, with copies transmitted to the Engineer.

HOT-MIX ASPHALT MIXTURE IL-9.5FG (CBM)
Effective: July 1, 2005 Revised: December 28, 2010

Description. This work shall consist of constructing fine graded hot-mix asphalt (HMA) surface course or leveling binder with an IL-9.5FG mixture. Work shall be according to Sections 406, 407 and 1030 of the Standard Specifications, except as modified herein.

Materials. Revise Article 1003.03(c) of the Standard Specifications to read:

"(c) Gradation. The fine aggregate gradation for all HMA shall be FA 1, FA 2, FA 20, or FA 21. For mixture IL-9.5FG, the fine aggregate fraction shall consist of at least 67 percent manufactured sand meeting FA 20 gradation. The manufactured sand shall be stone sand, slag sand, steel slag sand, or combinations thereof."

Mixture Design. Add the following to the table in Article 1030.04(a)(1):

"High ESAL, MIXTURE COMPOSITION (% PASSING) [1/]		
Sieve Size	IL-9.5FG	
	min	max
1 1/2 in (37.5 mm)		
1 in. (25 mm)		
3/4 in. (19 mm)		
1/2 in. (12.5 mm)		100
3/8 in. (9.5 mm)	90	100
#4 (4.75 mm)	60[4/]	75[4/]
#8 (2.36 mm)	45[4/]	60[4/]
#16 (1.18 mm)	25	40
#30 (600 μm)	15	30
#50 (300 μm)	8	15
#100 (150 μm)	6	10
#200 (75 μm)	4	6.5
Ratio Dust/Asphalt Binder		1.0

4/ When used as level binder placed less than 1 in. (25 mm) thick, the min and max percent passing shall each be increased 5%.

Revise the table in Article 1030.04(b)(1) of the Standard Specifications to read:

"VOLUMETRIC REQUIREMENTS High ESAL					
	Voids in the Mineral Aggregate (VMA), % minimum				Voids Filled with Asphalt Binder (VFA), %
N_{design}	IL-25.0	IL-19.0	IL-12.5	IL-9.5	
50	12.0	13.0	14.0	15 [1/]	65 - 78
70					65 - 75 [2/]
90					
105					

1/ The VMA for IL-9.5FG shall be a minimum of 15.0 percent.
2/ The VFA range for IL-9.5FG shall be 65 - 78 percent."

Quality Control/Quality Assurance (QC/QA). Revise the second table in Article 1030.05(d)(4) to read:

DENSITY CONTROL LIMITS			
Mixture Composition		Parameter	Individual Test[3/]
IL-9.5FG	Lifts < 1.25 in. (32 mm)	N_{design} 50 - 105	91.0 – 97.0% [2/]
	Lifts ≥ 1.25 in. (32 mm)	N_{design} 50 - 105	93.0 – 97.0%
IL-9.5, IL-12.5		N_{design} ≥ 90	92.0 – 96.0 %
IL-9.5, IL-9.5L, IL-12.5		N_{design} < 90	92.5 – 97.4 %
IL-19.0, IL-25.0		N_{design} ≥ 90	93.0 – 96.0 %
IL-19.0, IL-19.0L, IL-25.0		N_{design} < 90	93.0 – 97.4 %
All Other		N_{design} = 30	93.0 [1/] - 97.4 %

1/ 92.0 % when placed as first lift on an unimproved subgrade.

2/ Density shall be determined by cores or by correlated, approved thin lift nuclear gauge.

3/ Bulk Specific Gravity and Density that are determined using coated samples must be in accordance with ASTM 1188-96.

CONSTRUCTION REQUIREMENTS

Leveling Binder. Revise the table and second paragraph of Article 406.05(c) of the Standard Specifications to read:

"Leveling Binder	
Nominal, Compacted, Leveling Binder Thickness, in. (mm)	Mixture Composition
≤ 1 1/4 (32)	IL-9.5, IL-9.5 FG, or IL-9.5L
> 1 1/4 to 2 (32 to 50)	IL-9.5, IL-9.5FG, IL-9.5L, or IL-12.5

The density requirements of Article 1030.05(d)(4) shall apply for leveling binder, machine method, when the nominal, compacted thickness is: 3/4 in. (19 mm) or greater for IL-9.5FG mixtures, 1 1/4 in. (32 mm) or greater for IL-9.5 and IL-9.5L mixtures, and 1 1/2 in. (38 mm) or greater for IL-12.5 mixtures."

Compaction. Revise Table 1 in Article 406.07(a) of the Standard Specifications to read:

"TABLE 1 - MINIMUM ROLLER REQUIREMENTS FOR HMA				
	Breakdown Roller (one of the following)	Intermediate Roller	Final Roller (one or more of the following)	Density Requirement
Level Binder: (When the density requirements of Article 406.05(c) do not apply.)	P 3/	- -	VS, P 3/, TB, TF, 3W	To the satisfaction of the Engineer.
Level Binder: (When placed at ≤ 1 ¼ (32 mm) and density requirements apply.)	TB, 3W	P 3/	VS, TB, TF	As specified in Articles: 1030.05(d)(3), (d)(4), and (d)(7).
Binder and Surface 1/ (When the density requirements of Article 406.05(c) apply.)	P 3/, TB, 3W	P 3/	VS, TB, TF	As specified in Articles: 1030.05(d)(3), (d)(4), and (d)(7).
Bridge Decks 2/	TB	- -	TF	As specified in Articles: 582.05 and 582.06.

1/ If the average delivery at the job site is 85 ton/hr (75 metric ton/hr) or less, any roller combination may be used provided it includes a steel wheeled roller and the required density and smoothness is obtained.

2/ One TB may be used for both breakdown and final rolling on bridge decks 300 ft (90 m) or less in length, except when the air temperature is less than 60 ºF (15 ºC).

3/ A vibratory roller (VD) may be used in lieu of the pneumatic-tired roller on mixtures containing polymer modified asphalt binder.

Basis of Payment. Add the following two paragraphs after the third paragraph of Article 406.14 of the Standard Specifications:

Mixture IL-9.5FG in which polymer modified asphalt binders are required will be paid for at the contract unit price per ton (metric ton) for POLYMERIZED LEVELING BINDER (MACHINE METHOD), N50.

TRAFFIC CONTROL SURVEILLANCE
Effective: January 1, 2011

Revise the first sentence of the first paragraph of Article 701.10 of the Standard Specifications to read:

"When open holes, broken pavement, trenches over 3 in. deep and 4 in. wide or other hazards are present within 8 ft. of the edge of an open lane, the Contractor shall furnish traffic control surveillance at all times, whether or not the Contractor is engaged in construction operations."

ABANDON AND FILL EXISTING STORM SEWER

DESCRIPTION. This work consists of filling storm sewers to be abandoned, as designated on the plans or as directed by the Engineer, with Controlled Low Strength Material (CLSM) meeting the requirements of Articles 593.02, 593.03, and 593.04 and Section 1019 of the Standard Specifications. Existing storm sewer end sections and associated pipe runners and grates at the end of the storm sewer to be filled should be removed unless otherwise indicated, and pipe ends shall be securely sealed as described in section 605.03.

MATERIALS. The CLSM shall meet the requirements of Section 1019 of the Standard Specifications

CONSTRUCTION REQUIREMENTS. The storm sewer pipe shall be plugged on both ends with Class SI concrete or brick and mortar. The plug shall be adequate to withstand the hydrostatic load created during the filling operation. If the plugs fail during construction, the Contractor shall be responsible for the cost of repairing the pipe plugs and filling the remainder of the pipe culvert.

Storm sewer end sections that are removed must be disposed of in accordance with article 605.05 of the Standard Specifications.

METHOD OF MEASUREMENT. ABANDON AND FILL EXISTING STORM SEWER will be measured in place and the length computed in feet. Storm sewer end sections that are removed at the end of the sewer sections will not be measured for payment.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per foot for ABANDON AND FILL EXISTING STORM SEWER.

AGGREGATE DITCH FOR FLEXIBLE DITCH LINING

DESCRIPTION. This work shall be constructed in accordance with Section 281 of the Standard Specifications, District Standard 21.4, and the details shown in the plans.

This work shall include providing riprap in the ditches at the locations and dimensions shown in the plans.

METHOD OF MEASUREMENT. This work will be measured for payment in place and the area in square yards of actual surface area.

BASIS OF PAYMENT. This work shall be paid for at the contract unit price Square Yard for STONE RIPRAP, CLASS A3 (SPECIAL).

CATCH BASIN, TYPE B (SPECIAL), TYPE 7 GRATE

This work shall be constructed in accordance with Section 602 of the Standard Specifications and State Standard 602006-04 with the following modifications: The Catch Basin will be built such that no sump is present. The bottom of proposed pipes shall be flush with the base of each catch basin.

BASIS OF PAYMENT This work shall be paid for at the contract unit price each for CATCH BASIN, TYPE B (SPECIAL), TYPE 7 GRATE.

CHAIN LINK FENCE, 4'

DESCRIPTION. This work consists of constructing chain link fence and accessories according to the requirements of Section 664 of the Standard Specifications, Highway Standard 664001-02, the Chain Link Fence Details as shown in the plans, and as specified herein.

MATERIALS. Materials shall meet the requirements of Articles 1006.26, 1006.27 and 1006.28 of the Standard Specifications and as specified herein.

Chain link fence fabric shall be galvanized according to AASHTO M 181, Type I, Class D or ASTM F 1345 with Class 2 mischmetal coating.

CONSTRUCTION REQUIREMENTS. Construct according to the requirements of Section 664 of the Standard Specifications and the Chain Link Fence Details as shown in the plans.

METHOD OF MEASUREMENT. CHAIN LINK FENCE, 4' will be measured for payment in feet, along the top of the fence from center to center of end posts. The fall protection D-bolts at the maskwalls and the anchor bolts for the fence posts installed on top of MSE wall coping as shown in the plans shall not be measured separately for payment but shall be included in the cost of CHAIN LINK FENCE, 4'.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per foot for CHAIN LINK FENCE, 4'.

CHAIN LINK FABRIC TYPE 1, 4'-0"

DESCRIPTION. This work shall consist of removal of the existing Chain Link Fabric and installation of new Chain Link Fabric and accessories in-kind such as new tension wire, stretcher bars, fabric ties and mounting hardware which shall conform to the requirements of Standard 664001 and Section 664 of the Standard Specifications.

The existing posts shall remain. The fabric is to be fastened to the existing posts and to the top and bottom tension wire in-kind.

BASIS OF PAYMENT. This item shall be paid for at the contract unit price per foot for CHAIN LINK FABRIC TYPE 1, 4'-0". Stretcher bars and fabric ties, and tension wire, top and bottom, terminal to terminal, shall also be considered included as part of the fabric and no additional compensation provided.

CONCRETE BARRIER, SINGLE FACE, 42 INCH HEIGHT (SPECIAL) AND CONCRETE BARRIER BASE (SPECIAL)

This work shall be done in accordance with Section 637 of the Standard Specifications except as herein modified.

DESCRIPTION. This work shall consist of constructing a 42" single face concrete barrier as shown on the roadway plans and roadway details.

CONSTRUCTION. Concrete barrier shall be constructed per the requirements of Section 637 and as shown in the details in the plans. Concrete barrier base is to be installed with the CONCRETE BARRIER SINGLE FACE, 42 INCH HEIGHT (SPECIAL). Locations of each installation are shown on the plans.

METHOD OF MEASUREMENT. CONCRETE BARRIER SINGLE FACE, 42 INCH HEIGHT (SPECIAL) will be measured for payment in feet in place, along the centerline of the barrier. Aggregate subgrade improvement required under the barrier installation, as shown in the roadway details, shall be included in the price of CONCRETE BARRIER SINGLE FACE, 42 INCH HEIGHT (SPECIAL).

BASIS OF PAYMENT. This work will be paid for at the contract unit price, per FOOT, for CONCRETE BARRIER SINGLE FACE, 42 INCH HEIGHT (SPECIAL). Concrete barrier base to be paid for at the contract unit price, per FOOT, for CONCRETE BARRIER BASE (SPECIAL).

CONCRETE BARRIER TRANSITION (SPECIAL) AND CONCRETE BARRIER BASE (SPECIAL)

This work shall be done in accordance with Section 637 of the Standard Specifications except as herein modified.

DESCRIPTION. This work shall consist of constructing a concrete barrier transition as shown on the roadway plans and roadway details.

CONSTRUCTION. Concrete barrier shall be constructed per the requirements of Section 637 and as shown in the details in the plans. Concrete barrier base is to be installed with the CONCRETE BARRIER TRANSITION (SPECIAL). Locations for each installation are shown on the plans.

METHOD OF MEASUREMENT. CONCRETE BARRIER TRANSITION (SPECIAL) will be measured for payment in feet in place, along the centerline of the installation.

BASIS OF PAYMENT. This work will be paid for at the contract unit price, per FOOT, for CONCRETE BARRIER TRANSITION (SPECIAL). Concrete barrier base to be paid for at the contract unit price, per FOOT, for CONCRETE BARRIER BASE (SPECIAL) or CONCRETE BARRIER BASE depending on the location. See plans for locations.

CONCRETE BARRIER, VARIABLE CROSS-SECTION 42” HEIGHT

DESCRIPTION. This work shall consist of constructing concrete barrier walls according to Section 638 of the Standard Specifications, Standard 637006, and the details provided in the plans.

METHOD OF MEASUREMENT. This work will be measured for payment in place and the length computed in feet.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per foot for CONCRETE BARRIER, VARIABLE CROSS-SECTION 42” HEIGHT of the dimensions specified in the plans.

CONCRETE FOUNDATION, TYPE E

This work shall consist installing a Concrete Foundation, Type E, of the diameter specified in the plans in accordance with Section 878 of the Standard Specifications for Road and Bridge Construction and State Standard 878001 with no exceptions.

The proposed location of the Concrete Foundation, Type E may be moved in the field to avoid conflicts at the approval of the Engineer. If foundation is moved to an area not within the removal limits shown on the plans, removal of the existing sidewalk or earth disturbance shall be completed in accordance with Section 895 of the Standard Specifications for Road and Bridge Construction and any applicable notes or Special Provisions provided in these construction documents.

BASIS OF PAYMENT. This work shall be paid for at the contract unit price per foot for Concrete Foundation, Type E, of the diameter specified.

CONCRETE GUTTER, TYPE A (SPECIAL)

This work shall be constructed in accordance with Section 606 of the Standard Specifications, State Standard 606001, the roadway detail shown in the plans, and with the limits shown on the plans. The thickness of the gutter on the front face shall match the thickness of the adjacent shoulder of
10 ½".

BASIS OF PAYMENT. This item will be paid for at the contract unit price per foot for CONCRETE GUTTER, TYPE A (SPECIAL).

CONCRETE MEDIAN (SPECIAL)

DESCRIPTION. This work shall consist of constructing islands in accordance with Section 606 of the Standard Specifications, District 2 Standard 4.1, as shown in the plans, and as directed by the Engineer.

This work shall include the construction of the combination curb and gutter, sidewalk, aggregate fill, concrete median surface, and solid concrete median.

BASIS OF PAYMENT. This item will be paid for at the contract unit price per square foot for CONCRETE MEDIAN (SPECIAL) and will be measured for payment from edge of pavement to edge of pavement.

CONCRETE MEDIAN, TYPE SB (SPECIAL)

This work shall consist of constructing solid medians in accordance with Section 606 of the Standard Specifications, as shown in the plans. Curb and gutter may be a different type on either side of the median and is to be formed according to the type shown in the plans.

BASIS OF PAYMENT. This item will be paid for at the contract unit price per square foot for CONCRETE MEDIAN, TYPE SB (SPECIAL) and will be measured for payment from edge of pavement to edge of pavement.

CONSTRUCTION LAYOUT (SPECIAL)
Effective: April 1, 2017

If the Contractor opts to utilize GPS equipment for Construction Layout, the Contractor shall be required to complete the following in addition to the requirements of the Recurring Special Provision Check Sheet #10 of the Standard Specifications and as directed by the Engineer.

1. Submit 3D drawings or show the Engineer the digital terrain model (or proof of some type) that the Contractor has generated all proposed information correctly for all parts of the job (mainline, ramps, side roads, entrances, etc.) before starting any grading, structures or paving work. This does not relieve the Contractor of responsibility of any possible errors made in the modeling.
2. The Contractor shall also submit a written QC/QA plan that they must follow to provide quality control on the actual layout and quality assurance checks of the layout during and after construction. This shall be submitted prior to the start of construction and shall meet the approval of the Engineer.
3. The Engineer may perform spot checks of the machine control grading results, surveying calculations, records, field procedures, and actual staking. If the Engineer determines the work is not being performed in a manner that will provide accurate results, the Engineer may order such work to be redone, to the requirements of the contract documents, at no additional cost to the Department.
4. The Contractor shall check and recalibrate their GPS rover system as needed.

5. The Contractor shall establish secondary control points at appropriate intervals and at locations along the length of the project and outside the project limits and/or where work is performed beyond the project limits as required at intervals not to exceed 1000 feet (300 m). Determine the horizontal position of these points using static GPS sessions or by traverse connection from the original baseline control points. Establish the elevation of these control points using differential leveling from the project benchmarks, forming closed loops. Provide a copy of all new control point information to the Engineer prior to construction activities. The Contractor is responsible for all errors resulting from their efforts. Correct all deficiencies at no additional cost to the Department.
6. The Contractor shall preserve all reference points and monuments that are established by the Engineer within the project limits. Any reference points that have not been preserved shall be reestablished at no additional cost to the Department.

Construction Layout Equipment

General. The Contractor shall furnish articles of survey equipment to be used by the Department for independent monitoring and verification of construction layout stakes, reference points, and any other horizontal and vertical control set by the Contractor. All equipment will be for the exclusive use of the Department throughout the duration of the contract and will be returned to the Contractor at the end of the contract.

Equipment. The equipment to be furnished by the Contractor shall consist of one precision GNSS rover and a secondary GPS handheld controller. The precision GNSS rover must meet or exceed the capabilities of, and be compatible with the Contractor's equipment and meet the approval of the Engineer. The secondary GPS handheld controller shall also meet or exceed the capabilities of, and be compatible with the Contractor's equipment and meet the approval of the Engineer. The equipment provided shall include all software, data and any additional equipment (base station, repeaters, etc.) necessary to find any point on the project in station, offset and elevation with precision. The Contractor will be required to supply the Department Windows-based software capable of downloading project data from the GPS handheld controller. The project data included in the equipment will be consistent with the data used by the Contractor for layout and grading. Any data revisions or software updates to the Contractor's equipment will also be applied to the Department's equipment by the Contractor.

The Contractor will be responsible for providing training for three members of the Department's staff on use of the equipment and software. The Contractor shall provide one person to the Engineer who will be able to answer any questions and offer any necessary technical support at any point of the project.

Basis of Payment. This work will be paid for at the contract lump sum price for CONSTRUCTION LAYOUT (SPECIAL). If the Contractor elects not to utilize GPS equipment for the use of construction layout, this will not be paid for.

CORRUGATED MEDIAN REMOVAL

This work shall consist of furnishing all labor, materials, and equipment necessary for removal of the existing concrete corrugated median as scheduled in the plans; in accordance with applicable portions of Section 440 of the Standard Specifications; and/or as directed by the Engineer.

Required saw cuts shall not be measured for payment.

This work shall be measured and paid for at the contract unit price per square foot for CORRUGATED MEDIAN REMOVAL.

ELECTRIC CABLE IN CONDUIT, NO. 6

This work shall be in accordance with the applicable Articles of Sections 807, 817, 873 and 1066 of the Standard Specifications with the following modifications:

When used as service cable, this work shall consist of furnishing and installing the electric cable between the traffic signal controller and the existing service installation including above ground galvanized steel conduit riser, conduit clamps, lag screws, and other miscellaneous items necessary to complete the connection to the existing service installation that meets the requirements of the electric utility and municipal electrical codes. The work described shall be considered included in the cost of the service electrical cable.

When used as a grounding wire, it shall connect all existing traffic signal posts, existing and proposed mast arm assemblies, existing and proposed light poles, handholes (lids, rings, frames – except advanced loop handholes), traffic signal cabinets, lighting controllers, and exposed metallic conduits.

The proposed ground wire shall be an insulated #6 XLP green copper conductor.

This wire shall be bonded to all items and their associated ground rods utilizing mechanical lugs and bolts. This wire may be made continuous by splicing in the adjacent handholes with compression lugs. Split bolts shall not be allowed.

The grounding wire shall be bonded to the grounded conductor at the service disconnect per the NEC.

The Contractor shall provide a sufficient length of cable to ground each existing handhole lid and frame. The length of wire required to ground each handhole will not be measured for payment, but shall be included in the unit bid price for this pay item.

The Contractor shall provide grounding bushings on all metallic service conduits in the controller bases. All clamps, hardware, and other materials required shall be included in the bid price.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, of the type specified (SERVICE or EQUIPMENT GROUNDING CONDUCTOR), NO. 6, and number of conductors specified.

ELECTRIC CABLE IN CONDUIT, LEAD-IN, NO. 16 1 PAIR

This work shall be in accordance with the applicable Articles of Sections 807, 817, 873 and 1066 of the Standard Specifications with the following modifications:

This cable shall be from the proposed advanced detector loops on Northbound 19th Street. The two through lane loops shall be connected to one Lead-In cable, and the left turn lane detector loop shall be connected to the other Lead-In cable.

The Lead-In cables shall span from the new handhole nearest the loops to the controller without splicing.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, LEAD-IN, NO. 16 1 PAIR.

ENVIRONMENTAL PROTECTION

DESCRIPTION. The work under this contract is located in an environmentally sensitive area within or near the Mississippi River (the River). The Contractor's work area shall be restricted to the minimum to construct the project and to accomplish related work. Contractor shall make every reasonable effort to execute the construction in a manner so as to minimize any adverse impact of the construction or work on fish, mussels, wildlife, or natural areas. The Contractor shall abide by all permit restrictions and conditions imposed by regulatory agencies.

Areas disturbed by excavation for construction of haul roads, docks and other permanent or temporary structures, shall be restored to original contours as noted in contract documents. Areas required for equipment movement, offices, stockpiling, service repairs, and storage shall be kept to a minimum and shall be restricted to the boundaries noted in the plans and contract documents.

WORK ZONE REQUIREMENTS.

A. The I-74 corridor project area crosses the Mississippi River which is an environmentally sensitive resource. All construction activity in the Mississippi River, along its riverbank, and within the area that drains into the Mississippi River should be considered work in an environmentally sensitive area. Work on the Illinois side of the river should be considered work in a particularly sensitive area.

B. Any construction related conditions deemed to be potentially damaging to environmentally sensitive resources by the Engineer shall be rectified immediately or construction will cease until such time as the condition is rectified. At the discretion of the Engineer, construction activities may resume once provisions to rectify the situation are made. The Contractor shall confine equipment and operations to the project right-of-way shown in the contract documents. These designated construction zones shall be protected with temporary sediment control measures in accordance with the details in the contract documents. No work shall commence on this contract until temporary erosion control and sediment control measures identified in the plans have been installed.

C. Any erosion control and sediment control measures implemented, on land or water, shall remain in place and maintained until construction in the area is completed.

D. No tributaries, oxbows or other backwater areas will be “cut off” or blocked from normal flow conditions. Recreational boat traffic closures may be necessary in the area of Sylvan Slough due to construction activities. The contractor is required to secure necessary permits and clearances for closure of any portion of the River.

E. Any sediment control measures implemented, on land or water, shall remain in place and maintained until construction in the area is completed. For areas on the river bank, sediment control measures shall remain in place and be maintained until the area has been stabilized with temporary or permanent seeding. All earthwork operations on shore will be carried out in such a manner to ensure no sediment runoff and soil erosion will enter the river.

F. Temporary sediment control measures removed or damaged due to construction activities or high water levels shall be replaced or repaired, where possible, within the emergency mobilization time of 8 hours or within standard mobilization time of 72 hours. If it is not possible to meet the designated time frames, sediment controls shall be replaced prior to recommencing work that would cause turbidity issues in the water.

G. The clearing of vegetation will be limited to that which is absolutely necessary for construction and operation of the project. All areas disturbed by construction activities and not covered with riprap shall be re-seeded with Class 4 native grass mix according to Section 250 of the Standard Specifications, unless otherwise specified in the contract documents. All re-vegetated areas shall be monitored to make certain they succeed.

H. Removal and replacement of any revetment stone placed as part of the project should yield a structure with no significant change in gradation. Any damaged stone shall be replaced with new stone to ensure proper gradation.

I. Any and all barges and other water craft used for construction activities, shall be inspected for the presence of zebra mussels prior to placing the barges into the Mississippi River. Barges shall be completely out of the water for 10 days with all compartments opened that could potentially contain water and therefore harbor adult, larval or juvenile zebra mussel. This will ensure proper drying of the barge(s) and reduction of potential infestation. If the barge is obtained from a local source, United States Fish and Wildlife Service, Illinois Department of Natural Resources and Iowa Department of Natural Resources staff must still be contacted to discuss previous locations at which the barge has been used.

J. The U.S. Army Corps of Engineers (USACE) shall be notified if temporary work is constructed and when it is removed from the river. All temporary construction required shall be removed from the River in its entirety once it is no longer needed for construction of the project.

K. Temporary construction in the River may include an appropriate combination of barges, temporary slips, temporary supports (falsework), and temporary cofferdams. **An elevated earthen/sand/rock work platform (causeway or equipment pad) shall not be used for any construction; fills in the River for temporary crossings, causeway, or equipment pad structures are not permitted.**

L. A plan for all temporary construction needed shall be submitted to and approved by the USACE and the Engineer prior to installation. The plan must include but is not limited to the location identified on an aerial photo, the dimensions, construction methods, duration of use and measures that will be used to control turbidity and/or sedimentation. The Contractor shall submit the plan for all temporary construction to the Engineer prior to commencing work. Once approved by the USACE and/or the Engineer, the Engineer will notify the Contractor of approval.

M. If dredging is needed to convey barges the discharge will not be placed back into the River. The USACE shall be notified of the location of dredging, amount to be dredged, and any Section 401 water quality testing required by the Iowa Department of Natural Resources prior to any discharge of dredged material. Should dredged or excavated material be deposited on the shore before being hauled away, silt fences, perimeter and slope sediment control devices, or low silt berms shall be required to limit the reentry of sediments into the river. In addition, the materials shall be placed in a confined area, not classified as a wetland.

N. Prior to commencement of hydraulic dredging, the applicant shall perform a modified elutriate test procedure to predict the effluent quality or the total concentration of contaminants in the effluent. This test simulates the processes occurring during confined disposal and provides information on the dissolved and particulate contaminant concentrations. Results of the elutriate test shall be forwarded to the Iowa Department of Natural Resources and the Illinois Environmental Protection Agency when available. Should test results prove unsatisfactory, the Iowa Department of Natural Resources or the Illinois Environmental Protection Agency may amend this Certification to assure that effluent water quality requirements are met. Please note that if mechanical dredging is performed, the testing will not be required.

O. Native materials removed from cofferdams may be replaced in the cofferdam. Other than replacing native materials, any fill materials introduced into the River must be clean (meaning less than 10% fines that would pass through a #200 sieve). Areas disturbed by dredging shall be backfilled with special revetment. Dredging and backfill is included in project IM-NHS-074-1(197)5--03-82 and project IM-NHS-074-1(198)5--03-82.

P. The Contractor shall remove any debris from the water or the river bed as soon as practicable during the same work day in order to prevent the accumulation of unsightly, deleterious, and /or potentially polluted materials, as directed by the Engineer. The Contractor shall also implement measures to prevent debris from falling into the river. Should debris enter the river, it shall be retrieved immediately. Debris will not be allowed to collect on the bottom of the river.

Q. No materials, including cleared and grubbed vegetation or construction debris, shall be disposed of in such a way that it could enter a wetland or waterway.

R. The contractor shall perform his work in such a way to ensure that no wet or dried concrete shall enter the River, any waterway or wetlands. If concrete does enter these areas the Contractor shall be solely responsible for any remediation necessary. Wash concrete trucks out in such a manner that wash water cannot enter the River, waterway, or wetlands. If a designated area is constructed or identified, that location shall be included in the temporary construction plans.

S. Care shall be taken to prevent materials spilled or stored on site from washing into any wetland or waterway as a result of cleanup activities, natural runoff, or flooding, and that, during construction, any materials, which are accidentally spilled into these areas, will be retrieved.

T. No fuels, lubricants, form oil, or similar products shall be stored in an area that has not been protected by a berm or other spill materials within the project area. All handling and storage of these materials must be done in such a manner as to comply with federal Spill Prevention Control and Countermeasure regulations and protect all water bodies from accidental spills and leaks.

U. The contractor shall perform his work in such a way as to prevent materials spilled or stored on site from washing into the River or any wetland or waterway as a result of cleanup activities, natural runoff, or flooding. If, during construction, any materials are accidentally spilled into these areas, the materials will be retrieved and/or remediated immediately.

V. Spill protection material (i.e., spill kit) shall be readily available at the project site, and on work barges, to contain and absorb accidental spills of fluids from construction equipment. Personnel trained in the implementation of the spill kit shall be readily available onsite to respond to accidental spills.

W. Open burning within the project limits is prohibited.

PROTECTED SPECIES

A. Sylvan Slough, downstream of the project area, has been identified by the US Fish and Wildlife service as an Essential Habitat Area for the federally endangered Higgins eye pearly mussels. In addition, Sylvan Slough is inhabited by two other federally endangered mussels, spectacle case mussel and sheepnose mussel. Please refer to Special Provision for Mussel Conservation for more information on protecting threatened and endangered species.

B. Attention is directed to the Migratory Bird Treaty Act (15 USC 703-711) 50 CFR Part 21 and 50 CFR Part 10 that protect migratory birds, their occupied nests, and their eggs from disturbance or destruction. Activities that are likely to result in disturbance or destruction of migratory birds include but are not limited to clearing and grubbing, as well as structure cleaning, painting, demolition or reconstruction where bird nests are present. To protect migratory birds, do not conduct construction activities where active nests are present between the dates April 1 and July 15 inclusive or until the birds have fledged and left the structure. If evidence of migratory bird nesting is discovered after beginning work or in the event that migratory bird nests become established, immediately stop work and notify the Engineer.

C. If during the course of construction, any discoveries of protected plant or animals are made in the project area, the Contractor should notify the Engineer immediately.

CLEAN WATER ACT COMPLIANCE.

A. A Clean Water Act Section 404 Permit has been obtained by the Contracting Authority that authorizes all construction-related activities affecting waters of the U.S. The 404 Permit contains numerous special conditions, all of which may not have been included in this Special Provision. Failure to follow the provisions of the 404 Permit or this Special Provision may result in enforcement actions being initiated by the USACE. Enforcement actions may include an order to immediately cease all construction activity and/or fines.

B. It will be the Contractor's responsibility to ensure that the day-to-day operations of the project comply with this Special Provision. The Engineer will be available throughout the project to offer guidance to the Contractor regarding compliance with this Special Provision and the Clean Water Act.

C. Included with the Clean Water Act Section 404 Permit are Section 401 Water Quality Certifications from Iowa Department of Natural Resources and the Illinois Environmental Protection Agency, which contain numerous special conditions that are included by reference in this Special Provision.

D. It is the goal of Iowa's and Illinois' Water Quality Standards that all uses of the Mississippi River be maintained and protected. The dredging will cease if the water quality standards of either the State of Iowa or the State of Illinois are violated.

BASIS OF PAYMENT. No separate payment will be made for costs incurred due to compliance with this Special Provision.

No additional time will be provided to the contract unless approved in writing by the Engineer.

FULL-ACTUATED CONTROLLER AND TYPE IV CABINET

This work shall be in accordance with Sections 857, 1073, and 1074 of the Standard Specifications except as modified herein.

The Contractor shall provide all labor, materials, and equipment required for the work described above. The cost of this work shall be included in the bid price for this pay item. There will be no additional compensation for this work.

The cabinet and controller shall be compatible with the existing Eagle closed loop system and Siemens remote monitoring software.

The traffic signal cabinet shall have a NEMA TS-2 back panel. The cabinet shall include a malfunction management unit to allow enhanced fault monitoring capabilities.

The malfunction management unit shall be equipped with the latest software and firmware revisions.

The traffic signal cabinet shall be equipped with a sixteen load switch back panel to accommodate future expansion.

The cabinet shall be equipped with a twenty-four fiber wall- mountable interconnect center and two six-fiber bulkheads. The cabinet and controller shall also be equipped with any and all other components necessary to provide for a complete and functional fiber optic telemetry.

The cabinet shall be equipped with toggle switch guards for all switches located on the door to prevent accidental switching. The cabinet shall include a high quality deluxe pleated filter.

The Contractor shall set up each cabinet in his or her shop for inspection by the Engineer. All phases that are utilized shall be hooked up to a light board to provide observation for each signal indication. The Engineer shall be notified when the setup is complete so that all pertinent timings may be entered into the each traffic signal controller. The facility shall be subject to a seven day burn-in period before installation will be allowed.

The Contractor shall ground and safety-bond the controller cabinet in accordance with NEC requirements.

After installing the cabinet in the field, prior to resuming normal signal operation, the Contractor shall test the cabinet by connecting a jumper to the cabinet field terminals to ensure that all conflicting signals will place the cabinet into conflict flash and to verify that the cabinet, controller, and malfunction management unit are operating correctly. The Contractor shall make arrangements with the local police agency to provide traffic control during the conflict test.

BASIS OF PAYMENT. This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND TYPE IV CABINET.

HANDHOLES

This work shall consist of furnishing the materials and constructing a handhole in accordance with the applicable Articles of Section 814 and 1088 of the Standard Specifications with the following modifications:

The lift ring for the cover shall consist of a solid closed ring of stainless steel at least 3/8 inch in diameter. The lift ring shall be attached to the cover by a loop of stainless steel at least 3/8 inch in diameter. The lift ring and loop shall be recessed in the cover.

The Contractor shall install heavy-duty, fully-galvanized hooks, with a minimum diameter of ½" in the proposed handhole. The Contractor shall submit this material to the Engineer prior to construction of the handholes.

The lid shall be marked with the legend "Traffic Signals".

Pre-cast handholes are not allowed.

All unsuitable materials shall be disposed of by the Contractor outside the job limits.

Existing handholes to be used in place may need to be modified to match finished grade. The cost of this is included in the cost of the signalization of the intersection.

BASIS OF PAYMENT**.** This work shall be paid for at the contract unit price per each for HANDHOLE or DOUBLE HANDHOLE. See plans for specific locations.

HANDHOLE TO BE ADJUSTED

This work shall be completed according to Section 814 of the Standard Specifications and as noted herein. The handhole located in the existing island in the northwest quadrant of the Avenue of the Cities intersection with southbound 19th Street will need to be adjusted to match the finished grade of the sidewalk/ramp. All work and materials necessary to achieve a functioning handhole at finished grade, including replacing the handhole if necessary, is included in this pay item.

Existing handholes to be used in place may require modification to be flush with the finished grade. This work shall be included within this pay item.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per each for HANDHOLE TO BE ADJUSTED.

HOT-MIX ASPHALT CURB (SPECIAL)

This work shall consist of constructing hot-mix asphalt curb at the locations shown in the staging plans. HOT-MIX ASPHALT CURB (SPECIAL) will be constructed to match the configuration of the adjacent parking lot edge and existing hot-mix asphalt curb.

This work shall be completed in accordance with Section 661 of the Standard Specifications and as noted herein.

A mechanical curb laying machine will not be required for construction of this curb.

Holes 1-1/2" diameter and 5" deep shall be drilled in the existing pavement at 5' centers. No. 4 reinforcement bars shall be grouted in the holes and end 2" below the top of curb height. A No. 4 reinforcement bar shall be installed longitudinally in the curb 2- ¾" from the top of curb height.

This work shall be paid for at the contract unit price per foot for HOT-MIX ASPHALT CURB (SPECIAL).

INTERCEPT EXISTING CONDUIT

The existing traffic signal conduit along Northbound 19th Street that carries the Lead-In cable for the advanced detection loops will need to be located and intercepted by the proposed handhole. The conduit should be cut so that it is within the handhole.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per each for INTERCEPT EXISTING CONDUIT.

JUNCTION BOX

DESCRIPTION. This work shall consist of furnishing all labor, materials, tools and equipment necessary to construct the junction box, together with the necessary cast iron frames and lids, conforming to the lines, grades, details and dimensions as shown on the plans or as directed by the Engineer. The work shall be done in accordance with the applicable portions of Sections 504, 508, and 602 of the Standard Specifications and AASHTO M 199, except the minimum wall thickness shall be 3 in. and the minimum compressive strength shall be 4500 psi at 28 days.

CONSTRUCTION REQUIREMENTS. Excavation shall be to the established bottom of the foundation as shown on the plans or as directed by the Engineer. The surface shall be firm and smooth. If soft or yielding material is encountered at this elevation, it shall be removed and backfilled with suitable material, thoroughly compacted in place. To permit proper compaction of the backfill material, the excavation shall be made to a horizontal distance extending 2 feet outside the footing of the structure. The cost for dewatering is included in the cost of Junction Box. After construction, the excavated volume not occupied by the finished structure shall be filled in accordance with the applicable portions of Section 602 of the Standard Specifications. Any excess material from excavation shall be disposed of as directed by the Engineer.

Shop drawings, complete with all details and related data for the junction box shall be submitted to the Engineer in accordance with the requirements of Article 1042.03(b) of the Standard Specifications before any fabrication is begun. Such submittal shall be prepared by an Illinois Licensed Structural Engineer. The Contractor shall design and detail the lifting devices.
The junction box shall be a precast, reinforced concrete unit of the size and shape as shown on the plans and as specified herein. The Contractor shall furnish and install the unit with openings in the sides to receive storm sewer pipes of the size, line, and grade indicated on the plans. Flexible pipe to junction box connectors shall be provided at all junction box penetrations. The connector shall be sized specifically for the type of pipe being used. Connector and connecting pipe installation shall be according to the recommendations of the connector manufacturer. Where feasible, the concrete fill at the base of the junction box shall be poured to provide drainage and eliminate standing water.

Connections to existing storm sewer shall be completed by removing the existing storm sewer to the first joint outside the working area required to construct the junction box wall and constructing a new sewer section according to Section 550 of the Standard Specifications of sufficient length to extend through the junction box wall. If the first joint is located outside of the temporary soil retention system, the retention system shall be adjusted at no additional cost to the Department.

The precast concrete junction box base shall be installed on a 3” thick sand cushion of FA1 or FA2 conforming to Article 1003.01 of the Standard Specifications.

METHOD OF MEASUREMENT. Junction Box constructed as shown in the plans, and in conformance with these Special Provisions will be measured for payment, in place, per lump sum. Inlet pipes and storm sewers embedded in the walls will be measured for payment as specified in Section 540 and Section 542 or in other applicable section of these Specifications.

BASIS OF PAYMENT. All labor, equipment and materials required to complete this item and the temporary soil retention system as specified herein shall be paid for at the contract unit price per L SUM for the JUNCTION BOX, NUMBER 1, JUNCTION BOX, NUMBER 2 and JUNCTION BOX, NUMBER 3.

LINEAR DELINEATOR PANELS, 6 INCH

A panel shall be placed 6 inches down from the top of the concrete barrier wall at reduced shoulders locations as shown in the Contract plans. These panels shall be white or yellow and have a maximum spacing of 24 inches apart from panel edge to panel edge and shall be centered horizontally.

Each panel shall not be less than 36 inches in length and 6.00 inches in width. The panels shall be constructed of cube-corner retroreflective material in standard highway colors permanently bonded to an aluminum substrate. The lateral edges of each panel shall be hemmed. The panel assembly shall have a repeating raised lateral ridge every 2.25 inches. Each ridge shall be 0.34 inches high with a 45° profile and a 0.28 inch radius top. Each panel shall be attached/adhered to the wall or guardrail as per the manufacturer's written instructions, specifications and/or recommendations except connections that require drilling and anchoring into the concrete barrier shall not be allowed. Cleaning of the protective coat (boiled linseed oil) on the surfaces of the concrete barrier shall be required per the adhesive manufacturer's written instructions. The cleaned surfaces shall receive a primer that is specifically recommended by the adhesive manufacturer. The panel product data sheets, material certifications, test results, and connection type and details shall be submitted to the Engineer for approval a minimum of 30 days prior to proposed use.

Daytime color requirements shall be determined from measurement of the retroreflective sheeting applied to aluminum test panels. Daytime color shall be measured instrumentally using a spectrophotometer employing annular 45/0 (or equivalent 0/45) illuminating and viewing geometry. Measurements shall be made in accordance with ASTM E1164 for ordinary colors or ASTM E2153 for fluorescent colors. Chromaticity coordinates shall be calculated for CIE Illuminant D65 and the CIE E2152 for fluorescent colors. 1931 (2o) Standard Colorimetric Observer in accordance with ASTM E308 for ordinary colors or ASTM for fluorescent colors.

Chromaticity Limits for White

	x	y	X	y	x	y	x	y	Limit Y (%) Min	Max
White	0.303	0.287	0.368	0.353	0.340	0.380	0.274	0.316	40	-

Chromaticity Limits for Yellow

	x	y	X	y	x	y	x	y	Total Luminance Factor Y (%) Min
Yellow	0.498	0.412	0.557	0.442	0.479	0.520	0.438	0.572	24

The manufacturer shall provide a certification letter that states the materials supplied to this Contract Number project meets the physical properties of this special provision and shall attach test results that demonstrate compliance. The manufacturer shall certify by letter that the adhesive and all recommended concrete surface preparation materials and instructions used to adhere the panels to the concrete and guardrail surfaces are specifically recommended for typical Illinois outdoor weather and highway related exposures.

The Resident Engineer will sample one panel at random per unique lot of component materials for acceptance testing by IDOT.

This work shall be paid for at the contract unit price per each for LINEAR DELINEATOR PANELS, 6 INCH.

MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION

The traffic signals at the intersections of Avenue of the Cities and Northbound and Southbound 19th Street shall be maintained during the construction to accommodate staging and replacement of detector loops.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per each for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION.

MANHOLES, WITH RESTRICTOR PLATE

Description. This work shall consist of constructing restrictor manholes in accordance with the applicable portions of Section 602 of the Standard Specifications, as detailed in the plans and as specified herein.

Prior to conducting any field adjustments due to unforeseen circumstances, the Contractor shall first get approval from the Engineer.
This work will be paid for at the contract unit price per each for MANHOLES, WITH RESTRICTOR PLATE of the diameter specified in the plans.

MILE POST MARKER ASSEMBLY (SPECIAL)

Description. This work shall consist of furnishing and installing mile post marker assemblies, including steel posts, angles, threaded anchor rods, sign panels and hardware mounted on concrete bridge and retaining wall parapets according to applicable portions of Sections 505, 584, 720 and 726 of the Standard Specifications, as shown on the plans, and as approved by the Engineer.

Materials. Materials shall be according to applicable portions of Articles 505.02, 584.02, 720.02 and 726.02 of the Standard Specifications and as shown on the plans.

CONSTRUCTION REQUIREMENTS: The Contractor shall verify the locations of parapet joints and railing posts in the field prior to installing the mile post marker assemblies. The mile post marker assemblies shall be installed as close as possible to the I-74 stations shown on the plans and according to the spacing requirements shown on the plans.

The steel post, post cap plate, and angle of the mile post marker assemblies shall be fabricated and inspected according to Articles 505.04 and 505.05 of the Standard Specifications.

All fabrication shall be completed in the shop before galvanizing. Cutting, punching, drilling or field welding is prohibited after galvanizing.

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

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

PEDESTRIAN PUSH BUTTON

This work shall be in accordance with Sections 888 and 1074 of the Standard Specifications except as modified herein.

All push buttons shall be parallel to the crosswalk and be a maximum of 10 inches from the edge of sidewalk. No additional compensation is allowed if an extender is needed to meet requirement.

BASIS OF PAYMENT. This work shall be paid for at the contract unit price each for PEDESTRIAN PUSH BUTTON.

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES

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

Qualifications: The term environmental firm shall mean an environmental firm with at least five (5) documented leaking underground storage tank (LUST) cleanups or that is pre-qualified in hazardous waste by the Department. Documentation includes but not limited to verifying remediation and special waste operations for sites contaminated with gasoline, diesel, or waste oil in accordance with all Federal, State, or local regulatory requirements and shall be provided to the Engineer for approval. The environmental firm selected shall not be a former or current consultant or have any ties with any of the properties contained within and/or adjacent to this construction project.

General: This Special Provision will likely require the Contractor to subcontract for the execution of certain activities.

All contaminated materials shall be managed as either “uncontaminated soil” or non-special waste. This work shall include monitoring and potential sampling, analytical testing, and management of a material contaminated by regulated substances. The Environmental Firm shall continuously monitor all soil excavation for worker protection and soil contamination. **Phase I Preliminary Engineering information is available through the District’s Environmental Studies Unit.** Soil samples or analysis without the approval of the Engineer will be at no additional cost to the Department. The lateral distance is measured from centerline and the farthest distance is the offset distance or construction limit whichever is less.

The Contractor shall manage any excavated soils and sediment within the following areas:

Site 1314V3-1 – IDOT ROW

- Station 277+30 to Station 278+40 (I-74 WB), 0 to 145' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 278+40 to Station 279+00 (I-74 WB), 0 to 145' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance with Article 669.09. COC sampling parameters: pH and manganese.

- Station 279+00 to Station 280+50 (I-74 WB), 0 to 145' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: iron and manganese.

- Station 280+50 to Station 282+00 (I-74 WB), 0 to 145' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 287+30 to Station 289+25 (I-74 WB), 25' to 140' (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 50+05 to Station 52+25 (19th Street), 0 to 100' RT and 0 to 100' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 291+40 to Station 293+60 (I-74 WB), 20' to 130' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 277+30 to Station 280+15, (I-74 EB), 0 to 125' RT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 281+50 to Station 282+95 (I-74 EB), 0 to 130' RT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameter: manganese.

- Station 284+40 to Station 286+00 (I-74 EB), 0 to 120' RT, 0 to 140' RT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(3) and shall be managed in accordance with Article 669.09. COC sampling parameters: benzo(a)pyrene and manganese.

- Station 286+00 to Station 287+30 (I-74 EB), 0 to 120' RT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(5) and shall be managed in accordance with Article 669.09. COC sampling parameters: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, carbazole, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, manganese, VOCs, pH.

- Station 48+50 to Station 50+05 (19th Street), 0 to 75' RT and 0 to 125' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance with Article 669.09. COC sampling parameters: pH and manganese.

- Station 289+80 to Station 291+40 (I-74 EB), 0 to 85' RT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance with Article 669.09. COC sampling parameters: pH and manganese.

- Station 291+40 to Station 292+85 (I-74 EB), 0 to 90' RT and 0 to 30' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance with Article 669.09. COC sampling parameters: pH and manganese.

- Station 292+85 to Station 293+95 (I-74 EB) 0 to 130' RT and 0 to 30' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 42+00 to Station 43+35 (19th Street), 0 to 75' RT and 0 to 35' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(5) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 43+35 to Station 45+05 (19th Street), 0 to 75' RT and 0 to 35' RT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance with Article 669.09. COC sampling parameters: pH, benzo(a)pyrene.

- Station 45+05 to Station 47+65 (19th Street), 0 to 100' RT and 0 to 60' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 87+30 to Station 89+40 (Ramp 7th-B), 0 to 85' RT and 0 to 50' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: lead and manganese.

- Station 89+40 to Station 92+90 (Ramp 7th-B), 0 to 45' RT and 0 to 75' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: lead and manganese.

- Station 55+50 to Station 56+50 (19th Street), 0 to 45' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance with Article 669.09. COC sampling parameters: pH and manganese.

- Station 311+00 to Station 312+75 (I-74 EB), 0 to 125' RT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 1960+85 to Station 1962+60 (Coaltown Road), 0 to 35' RT and 0 to 35' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 1962+60 to Station 1964+70 (Coaltown Road), 0 to 35' RT and 0 to 35' LT, (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

- Station 1964+70 to Station 1966+65 (Coaltown Road), 0 to 35' RT and 0 to 35' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance with Article 669.09. COC sampling parameters: lead and pH.

- Station 1966+65 to Station 1968+20 (Coaltown Road), 0 to 35' RT and 0 to 35' LT (ROW, PESA Site 1314V3-1, mile markers 0 to 2.5, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: lead and manganese.

Site 1314V3-66 – Scottish Right Masonic Center

- Station 39+05 to Station 40+35 (19th Street), 0 to 95' RT and 0 to 15' LT (Scottish Rite Masonic Center, PESA Site 1314V3-66, 1800 7th Avenue, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: lead and manganese.

Site 1314V3-67 – Vacant Land

- Station 77+50 to Station 79+10 (Ramp 7th-B), 0 to 75' RT (Vacant land, PESA Site 1314V3-67, 700 block of 19th Street, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: lead and manganese.

- Station 80+25 to Station 81+60 (Ramp 7th-B), 0 to 65' RT (Vacant land, PESA Site 1314V3-67, 700 block of 19th Street, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameter: manganese.

- Station 81+60 to Station 82+95 (Ramp 7th-B), 0 to 60' RT (Vacant land, PESA Site 1314V3-67, 700 block of 19th Street, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: lead and manganese.

- Station 82+95 to Station 84 +70 (Ramp 7th-B), 0 to 60' RT (Vacant land, PESA Site 1314V3-67, 700 block of 19th Street, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameter: manganese.

- Station 42+05 to Station 43+40 (19th Street), 35' to 100' LT (Vacant land, PESA Site 1314V3-67, 700 block of 19th Street, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameter: manganese.

Site 1314V3-74 – Residence

- Station 54+40 to Station 55+50 (19th Street), 0 to 70' LT (Residence, PESA Site 1314V3-74, 1904 11th Avenue, Moline): This material meets the criteria of Article 669.09(a)(2) and shall be managed in accordance with Article 669.09. COC sampling parameters: manganese.

Site 1314V3-75 – Residence

- Station 1100+75 to Station 1101+45 (11th Street), 0 to 30' RT (Residence, PESA Site 1314V3-75, 1906 11th Avenue, Moline): This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance with Article 669.09. COC sampling parameters: pH, lead, manganese.

REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT

This work shall be in accordance with Section 895 of the Standard Specifications except as modified herein.

The Contractor shall remove all wires pertaining to existing traffic signals, grounding, and loops at the intersection of 12th Avenue and 19th Street, with the exception of the service wires to the controller, and where noted on plans. The contractor shall remove all handholes, signal posts and poles and corresponding foundations, except where noted on the plans. The contractor shall also remove the existing Lead-In cable between the controller and the advanced detection loops for Northbound 19th Street. This work shall be included in the bid price for this pay item.

The Contractor shall dispose of all other items off of the right-of-way and reflect the salvage value of this equipment in the unit bid price for this pay item.

METHOD OF MEASUREMENT. All Traffic signal equipment removal including but not limited to handholes, signal posts, mast arms, concrete foundations, cable, and vehicle signal heads for a particular intersection will be paid for as each (per intersection) as REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT.

Existing handholes to be used in place may require modification to be flush with the finished grade. This shall be paid for under the HANDHOLE TO BE ADJUSTED pay item.

BASIS OF PAYMENT. The above work will be paid for at the contract unit price each (per intersection) for REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT and shall be payment in full for removing, disposing of, and transporting the equipment described above, complete. No additional compensation will be allowed.

REMOVE HIGH TENSION CABLE MEDIAN BARRIER AND REMOVE HIGH TENSION CABLE MEDIAN BARRIER TERMINAL

This work shall consist of the removal and disposal of in-place high tension cable median barrier and high tension cable median barrier terminal at locations shown in the plans and as directed by the Engineer.

CONSTRUCTION REQUIREMENTS
Removed cable, posts, and terminals shall become property of the Engineer. Removed posts, foundations and hardware may not be used and shall be properly disposed off-site.

METHOD OF MEASUREMENT. Remove High Tension Cable Median Barrier will be measured for payment in feet along the top cable. The terminal removal will be measured for payment for each terminal.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per FOOT for REMOVE HIGH TENSION CABLE MEDIAN BARRIER and per EACH for REMOVE HIGH TENSION CABLE MEDIAN BARRIER TERMINAL.

REMOVE IMPACT ATTENUATORS, NO SALVAGE

This work shall consist of removing existing impact attenuators at locations as specified in the Plans.

CONSTRUCTION REQUIREMENTS
When the Engineer determines the existing impact attenuators are no longer required, the installation shall be dismantled with all hardware becoming the property of the Contractor. All labor and materials required to complete this work, including, but not limited to, removal of the existing attenuator & base shall be included for payment under this item.

When impact attenuators have been anchored to the pavement, the anchor holes shall be repaired with rapid set mortar with only enough water to permit placement. Consolidation by rodding shall be used and the material shall be struck-off flush.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT. This work will be measured for payment at the contract unit price per each for REMOVE IMPACT ATTENUATORS, NO SALVAGE, where each is defined as one complete installation.

TEMPORARY INFORMATION SIGNING

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 no additional cost to the Department.

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.

TEMPORARY TRAFFIC SIGNAL TIMING

The temporary traffic signal timing shall be in accordance with the plan sheets or as directed by the engineer. Temporary traffic signal timing may change multiple times as traffic patterns or construction requires. The cost of covering and/or uncovering any traffic signal head lenses, is included in this pay item.

This work shall include possible retiming of existing traffic signals that will remain in operation during construction.

BASIS OF PAYMENT. The above work will be paid for at the contract unit price each (per intersection) for TEMPORARY TRAFFIC SIGNAL TIMING. No additional compensation will be allowed for timing changes.

UNINTERRUPTABLE POWER SUPPLY, STANDARD

The following models of Uninterruptable Power Supply are approved for use:

Alpha Novus XFM 1100
Techpower Development M-E XL 1000

The Contractor shall be responsible for providing Uninterruptable Power Supply that are sized appropriately for the intersection load. The total system load shall not exceed the manufacturer's specifications.

The Uninterruptable Power Supply for the proposed traffic signal cabinet shall be installed as follows:

- The UPS shall be fully integrated into the proposed traffic signal cabinet by the cabinet supplier at their facility prior to shipping the system to the Contractor

- The cabinet light, ventilation fans, heater strips, and service receptacle shall be wired to a separate circuit that will not be powered by the Uninterruptable Power Supply

- A hole of sufficient size for the cables will be drilled into the side of the cabinet to accommodate the Uninterruptable Power Supply cables and harnesses from the UPS cabinet. The hole shall be free of sharp edges and equipped with a plastic or rubber grommet.

- The manual by-pass switch shall be installed in the controller cabinet.

GENERAL REQUIREMENTS. The Uninterruptable Power Supply (UPS) shall include, but not be limited to the following: inverter/charger, power transfer relay, batteries, battery cabinet, a separate manually operated non-electronic bypass switch and all necessary hardware and interconnect wiring. The UPS shall provide reliable emergency power to a traffic signal in the event of a power failure or interruption. The transfer from utility power to battery power and vice versa shall not interfere with the normal operation of traffic controller, conflict monitor/malfunction management unit or any other peripheral devices within the traffic controller assembly.

The UPS shall provide power for full run-time operation for an “LED-only” intersection (all colors red, yellow, and green) or flashing mode operation for an intersection using Red LED’s. As the battery reserve capacity reaches 50%, the intersection shall automatically be placed in all-red flash. The UPS shall allow the controller to automatically resume normal operation after the power has been restored. The UPS shall log an alarm in the controller for each time it is activated.

All Uninterruptable Power Supply shall include four batteries.

The UPS shall be designed for outdoor applications, and shall meet the environmental requirements of, “NEMA Standards Publication No. TS 2 – Traffic Controller Assemblies,” or applicable successor NEMA specifications, except as modified herein.

The UPS shall conform to the following specifications:

OPERATION

The UPS shall be on line and provide voltage regulation and power conditioning when utilizing utility power.

The UPS shall provide a minimum two (2) hours of full run-time operation and four (4) hours all-red flash operation for an “LED-only” intersection (minimum 700W/1000VA active output capacity, with 80% minimum inverter efficiency).

The UPS shall be equipped with an integrated safety switch that will interrupt inverter output power in the event of a cabinet knockdown. The safety switch may be either internal to the inverter/charger is externally mounted inside of the UPS cabinet. The safety switch shall be designed to interrupt output power in the event that the charger/inverter is tilted more than twenty degrees on any axis. The switch shall be mechanically latching to ensure that power is not automatically restored to the UPS until the charger/inverter has been "reset". The switch shall also be resettable and reusable unless it has been physically damaged.

The maximum transfer time from loss of utility power to switchover to battery backed inverter power shall be 150 milliseconds.

The UPS shall provide the user with 4-sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) relay contact closures, available on a panel-mounted terminal block, rated at a minimum 120V/1A, and labeled so as to identify each contact. For typical configuration, see the plan detail sheet.

A first set of NO and NC contact closures shall be energized whenever the unit switches to battery power. Contact shall be labeled or marked “On Batt.”

The second set of NO and NC contact closures shall be energized whenever the battery approaches approximately 40% of remaining useful capacity. Contact shall be labeled or marked “Low Batt.”

The third set of NO and NC contact closures shall be energized two hours after the unit switches to battery power. Contact shall be labeled or marked “Timer.”

The fourth set of NO and NC contact closures shall be energized in the event of inverter/charger failure, battery failure or complete battery discharge. Contact shall be labeled or marked “UPS Fail or Status.”

A surge suppression unit shall be provided for the output power if available as an option by the UPS manufacturer.

Operating temperature for both the inverter/power transfer relay and manual bypass switch shall be -37 ○C to +74 ○C.

The Power Transfer Relay shall be rated at 240VAC/30AMPS minimum and Manual Bypass Switch shall be rated at 240VAC/20 amps, minimum.

The manual bypass switch shall be wired to provide power to the UPS when the switch is set to manual bypass.

The UPS shall use a temperature-compensated battery charging system. The charging system shall compensate over a range of 2.5 – 4.0 mV/○C per cell.

The temperature sensor shall be external to the inverter/charger unit. The temperature sensor shall come with 2 meters (6’6”) of wire.

Batteries shall not be recharged when battery temperature exceeds 50○C ± 3○C.

UPS shall bypass the utility line power whenever the utility line voltage is outside of the following voltage range: 100VAC to 130VAC (± 2VAC).

When utilizing battery power, the UPS output voltage shall be between 110 VAC and 125 VAC, pure sine wave output, ± 3% THD, 60Hz ± 3Hz.

UPS shall be compatible with Illinois DOT’s traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation.

When the utility line power has been restored at above 105 VAC ± 2 VAC for more than 30 seconds, the UPS shall dropout of battery backup mode and return to utility line mode.

When the utility line power has been restored at below 125VAC ± 2 VAC for more than 30 seconds, the UPS shall dropout of battery backup mode and return to utility line mode.

UPS shall be equipped to prevent a malfunction feedback to the cabinet or from feeding back to the utility service.

In the event of inverter/charger failure, battery failure or complete battery discharge, the power transfer relay shall revert to the NC state, where utility line power is reconnected to the cabinet. The UPS shall always revert back to utility line power and shall be designed to revert back to utility line power in the event of a UPS fault condition.

Recharge time for the battery, from “protective low-cutoff” to 80% or more of full battery charge capacity, shall not exceed twenty (20) hours.

When the intersection is in battery operation, the UPS shall bypass all internal cabinet lights, ventilation fans, heater strips, and service receptacles.

The manual bypass switch shall be wired to provide power to the UPS when the switch is set to manual bypass.

A blue LED indicator light shall be mounted on the front of the traffic signal cabinet or on the side of the UPS cabinet facing traffic and shall turn on to indicate when the cabinet power has been disrupted and the UPS is in operation. The light shall be a minimum 1" diameter, be viewable from the driving lanes, and shall be large enough and visible enough to be seen from 200 ft. away.

All 36 volt and 48 volt systems shall include an external component that monitors battery charging to ensure that every battery in the string is fully charged. The device shall compensate for the effects of adding a new battery to an existing battery system by ensuring that the charge voltage is spread equally across all batteries. All cables, harnesses, cards, and other components that are required to provide the functionality described above shall be included in the unit bid price for the Uninterruptable Power Supply. The following products are currently approved for use within District 4: Alpha Technologies: AlphaGuard with Charge Management Technology Module and Approved Equivalent

The UPS shall be equipped with an integrated safety switch that will interrupt inverter output power in the event of a cabinet knockdown. The safety switch may be either internal to the inverter/charger is externally mounted inside of the UPS cabinet. The safety switch shall be designed to interrupt output power in the event that the charger/inverter is tilted more than twenty degrees on any axis. The switch shall be mechanically latching to ensure that power is not automatically restored to the UPS until the charger/inverter has been "reset". The switch shall also be resettable and reusable unless it has been physically damaged.

MOUNTING AND CONFIGURATION

GENERAL

Inverter/Charger Unit shall be rack or shelf-mounted.

All interconnect wiring provided between Power Transfer Relay, Bypass Switch and Cabinet Terminal Service Block shall be no greater than two (2) meters (6'6") of #10 AWG wire.

Relay contact wiring provided for each set of NO/NC relay contact closure terminals shall be #18 AWG wire.

All necessary hardware for mounting (shelf angles, rack, etc) shall be included in the bid price of the UPS. The swing-trays shall be screwed to the Type IV or Type V NEMA cabinets using continuous stainless steel or aluminum piano hinge. All bolts/fasteners and washers shall meet the following requirements:

EXTERNAL BATTERY CABINET

The external cabinet shall be a rated NEMA Type 3R Cabinet.

Inverter/Charger and Power Transfer Relay shall be installed inside the external battery cabinet and the manually operated Bypass Switch shall be installed inside the existing Traffic Signal Cabinet.

Batteries shall be housed in the external cabinet which shall be NEMA Standard rated cabinet mounted to the side of the Type IV or Type V Cabinet (see plan sheets for details). This external battery cabinet shall conform to the IDOT Standard Specifications for traffic signal cabinets for the construction and finish of the cabinet.

The external battery cabinet shall mount to the Type IV or Type V NEMA Cabinet with a minimum of four (4) bolts.

The dimensions of the external battery cabinet shall be 25” (L) x 16” (W) x 41” (H) and installed in accordance with the plan sheet cabinet detail and this specification.

The cabinet shall include heater mats for each battery shelf and/or battery. If the UPS charger/inverter does not have facilities to accommodate heater mat connections, thermostatically controlled heater mats shall be provided with the system. The heater mat thermostat shall be a separate thermostat (from the ventilation fan thermostat) and be adjustable from 0°F to 32°F for heater mat turn-on.

A warning sticker shall be placed on the outside of the cabinet indicating that there is an Uninterruptable Power Supply inside the cabinet.

The external battery cabinet shall be ventilated through the use of louvered vents (2), filters, and one thermostatically controlled fan as per NEMA TS 2 Specifications. The cabinet shall include a cleanable or replaceable cabinet filter.

External battery cabinet fan shall be AC operated from the same line output of the Manual Bypass Switch that supplies power to the Type IV or Type V Cabinet.

The UPS with external battery cabinet shall come with all bolts, conduits and bushings, gaskets, shelves, and hardware needed for mounting. The external battery cabinet shall have a hinged door opening to the entire cabinet. The cabinet shall include a bottom constructed from the same material as the cabinet.

The external cabinet shall be equipped with a power receptacle to accommodate the inverter/charger. The receptacle shall be wired to the line output of the manual bypass switch.

MAINTENANCE, DISPLAYS, CONTROLS AND DIAGNOSTICS

The UPS shall include a display and /or meter to indicate current battery charge status and conditions.

The UPS shall have lightning surge protection compliant with IEEE/ANSI C.62.41.

The UPS shall be equipped with an integral system to prevent battery from destructive discharge and overcharge.

The UPS and batteries shall be easily replaced with all needed hardware and shall not require any special tools for installation.

The UPS shall be equipped with an RS-232 port.

The UPS shall include a resettable front-panel event counter display to indicate the number of times the UPS was activated and a front-panel hour meter to display the total number of hours the unit has operated on battery power.

Manufacturer shall include two (2) sets of equipment lists, operation and maintenance manuals, and board-level schematic and wiring diagrams of the UPS, and the battery data sheets. Manufacturer shall include any software needed to monitor, diagnose, and operate the UPS. The manufacturer shall include any required cables to connect to a laptop computer.

The UPS shall include a data cable for the serial connection to the RS232 port and diagnostic software if it is available as an option with the unit.

Two copies of the owner/maintenance manuals shall be provided with the UPS.

BATTERY SYSTEM

Individual batteries shall be 12V type and shall be easily replaced and commercially available off the shelf.

The batteries shall be premium gel type with a 5 year full replacement warranty.

Batteries used for UPS shall consist of a minimum of four (4) to eight (8) batteries with a cumulative minimum rated capacity of 240 amp-hours.

Batteries shall be deep cycle, completely sealed, silver alloy VRLA (Valve Regulated Lead Acid) requiring no maintenance with maximum run time.
Batteries shall be certified by the manufacturer to operate over a temperature range of – 40°C to +71°C.

The batteries shall be provided with appropriate interconnect wiring and corrosion-resistant mounting trays and/or brackets appropriate for the cabinet into which they will be installed.

Batteries shall indicate maximum recharge data and recharging cycles.

Battery interconnect wiring shall be via modular harness. Batteries shall be shipped with positive and negative terminals pre-wired with red and black cabling that terminates into a typical power-pole style connector. Harness shall be equipped with mating power-pole style connectors for batteries and a single, insulated plug-in style connection to inverter/charger unit. Harness shall allow batteries to be quickly and easily connected in any order and shall be keyed and wired to ensure proper polarity and circuit configuration.

Battery terminals shall be covered and insulated so as to prevent accidental shorting.

QUALITY ASSURANCE

UPS shall be manufactured in accordance with a manufacturer quality assurance (QA) program. The QA program shall include two types of quality assurance: (1) Design quality assurance and (2) Production quality assurance. The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of UPS units built to meet this specification and a documented process of how problems are to be resolved.

QA process and test results documentation shall be kept on file for a minimum period of seven years.

Uninterruptable Power Supply designs not satisfying design qualification testing and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or sold as conforming to this specification.

DESIGN QUALIFICATION TESTING

The manufacturer, or an independent testing lab hired by the manufacturer, shall perform design Qualification Testing on new UPS designs, and when a major design change has been implemented on an existing design. A major design change is defined as a design change (electrical or physical) which changes any of the performance characteristics of the system, or results in a different circuit configuration.

Burn In. The sample systems shall be energized for a minimum of 5 hours, with full load of 700 watts, at temperatures of +74°C and -37°C., excluding batteries, before performing any design qualification testing.

Any failure of the UPS, which renders the unit non-compliant with the specification after burn-in, shall be cause for rejection.

For Operational Testing, all specifications may be measured including, but not limited to:

Run time while in battery backup mode, at full load.

Proper operation of all relay contact closures (“On-Batt”, “Low-Batt”, “Timer” and “UPS-Fail”).

Inverter output voltage, frequency, harmonic distortion, and efficiency, when in battery backup mode.

All utility mode – battery backup mode transfer voltage levels. See UPS Spec 1.8, 1.11 and 1.12.

Power transfer time from loss of utility power to switchover to battery backed inverter power.

Backfeed voltage to utility when in battery backup mode.

IEEE/ANSI C.62.41 compliance.

Battery charging time.

Event counter and runtime meter accuracy.

PRODUCTION QUALITY CONTROL TESTING

Production Quality Control tests shall consist of all of the above listed tests and shall be performed on each new system prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. The manufacturer shall retain test results for seven years.

Each UPS shall be given a minimum 100-hour burn-in period to catch any premature failures.

Each system shall be visually inspected for any exterior physical damage or assembly anomalies. Any defects shall be cause for rejection.

WARRANTY

Manufacturers shall provide a minimum two (2) year factory-repair warranty for parts and labor on the UPS from date of acceptance by the State. Batteries shall be warranted for full replacement for five (5) years from date of purchase. The warranty shall be included in the total bid price of the UPS.

The Contractor shall furnish a warranty certificate for each Uninterruptable Power Supply that includes the equipment description and details, serial numbers, effective dates, and the details of the warranty regarding materials and labor. The warranty period shall begin on the date of installation and the warranty certificate shall reflect this date.

BASIS OF PAYMENT. The above work will be paid for at the contract unit price each for UNINTERRUPTABLE POWER SUPPLY, STANDARD.

WIDE AREA VIDEO DETECTION SYSTEM COMPLETE

GENERAL. This specification sets forth the minimum requirements for a system that detects vehicles on a roadway using only video images of vehicle traffic.

The system shall include software that detects vehicles in multiple lanes using only the video image. Detection zones shall be defined using only an on board video menu and a pointing device to place the zones on a video image. Up to 144 detection zones shall be available. A separate computer shall not be required to program the detection zones.

FUNCTIONAL CAPABILITIES. The video detection system shall be compatible with the controller and cabinet identified in these specifications. The VDP shall process video from up to six video sources simultaneously. The sources can be video cameras or S-VHS video tape players. The video shall be input to the VDP in RS170 format and shall be digitized and analyzed in real time. A separate microprocessor for each video input shall be used.

The VDP shall detect the presence of vehicles in up to 24 detection zones per camera. A detection zone shall be approximately the width and length of a car.

Detection zones shall be programmed via an on board menu displayed on a video monitor and a pointing device connected to the VDP. The menu shall facilitate placement of the detection zones quickly and easily. A separate computer shall not be required for programming detection zones.

The VDP shall store up to three different detection zone patterns. The VDP can switch to any one of the three different detection patterns within 1 second of user request via menu selection with the pointing device.

The VDP shall detect vehicles in real time as they travel across each detection zone.

The VDP shall accept new detection patterns when requested when the external computer uses the correct communications protocol for uploading detection patterns.

VEHICLE DETECTION. Up to 144 detection zones shall be supported and each detection zone can be sized to suit the site and the desired vehicle detection region.

Detection zones shall be capable of being Or'ed or ANDed together to indicate vehicle presence on a single detector output channel.

Placement of detection zones shall be done by using only a pointing device, and a graphical interface built into the VDP and displayed on a video monitor, to draw the detection zones on the video image from each video camera. No separate computer shall be required to program the detection zones.

Up to 3 detection zone patterns shall be saved for each camera within the VDP memory and this memory shall prevent loss during power outages.

The selection of detection zone pattern for current use shall be done through a menu. It shall be possible to activate a detection zone pattern from VDP memory and have that detection zone pattern available within 1 second of activation.

When a vehicle is detected crossing a detection zone, the corners of the detection zone will flash on the video overlay display to confirm the detection of the vehicle.

Detection shall be at least 98% accurate in good weather conditions, with slight degradation possible under adverse weather conditions (e.g. rain, snow, or fog) which reduce visibility. Detection accuracy is dependent upon camera placement, camera quality and detection zone location, and these accuracy levels do not include allowances for occlusion or poor video due to camera location or quality. See **Camera** section for recommended camera placement.

The VDP shall provide 32 channels of detection through either a NEMA TS1 port or a NEMA TS2 port.

The VDP shall provide dynamic zone reconfiguration (DZR). DZR enables normal operation of existing detection zones when one zone is being added or modified during the setup process. The VDP shall output a constant call on any detector channel corresponding to a zone being modified.

Detection zones shall be directional to reduce false detections from objects traveling in directions other than the desired direction of travel in the detection area.

Detection zone setup shall not require site specific information such as latitude and longitude to be entered into the system.

Detection zone setup shall not require temporal information such as date and time.

The VDP shall output a constant call for each enabled detector output channel if a loss of video signal occurs. The VDP shall output a constant call during the background of the learning period.

VDP HARDWARE. The VDP shall be housed in a durable metal enclosure suitable for shelf mounting or rack mounting in the specified traffic equipment cabinet.

The VDP shall be powered by 120 VAC 60 Hz single-phase power. Surge settings shall be set forth in NEMA specifications. Power consumptions shall not exceed 135 watts.

The VDP shall include ports for communications with a remote computer.

The VDP shall include ports for transmitting TS1 and TS2 detections to the specified traffic controller.

The front of the VDP shall include one video output. Any one of the video inputs shall be switch selectable for output on this connection via the pointing device at the VDP, or through software and a personal computer connected.

The VDP enclosure shall include provisions to be bonded to a good earth ground.

The front face of the VDP shall contain indications, such as LED displays, to enable the user to view real time detections for up to 8 detector output channels at a time.

A portable monitor shall be provided with the VDP.

CAMERA. The video cameras used for traffic detection shall be furnished by the VDP supplier and shall be qualified by the supplier to ensure proper system operation and be compatible with specified controller.

The camera shall produce a useable video image of the bodies of vehicles under all roadway lighting conditions, regardless of time of day. The minimum range of scene luminance over which the camera shall produce a useable video image shall be the minimum range from nighttime to daytime, but not less than the range of 0.1 lux to 10,000 lux.

The camera shall use a CCD sensing element and shall output monochrome video with resolution of not less than 380 lines vertical and 380 lines horizontal.

The camera shall include an electronic shutter control lens.

The camera shall include a variable focal length lens with variable focus that can be adjusted, without opening up the camera housing, to suit the site geometry. A single camera configuration shall be used for all approaches in order to minimize the setup time and spares required by the user.

The camera electronics shall include AGC to produce a satisfactorily image at night.
The camera shall be housed in a weather-tight sealed enclosure. The housing shall be field rotatable to allow proper alignment between the camera and the traveled road surface.

The camera enclosure shall be equipped with a sun shield. The sunshield shall include a provision for water diversion to prevent water from flowing in the cameras field of view.

The camera enclosure shall include a thermostatically controlled heater to assure proper operation of the lens shutter at low temperatures and prevent moisture condensation on the optical faceplate of the enclosure.

When mounted outdoors in the enclosure, the camera shall operate satisfactory in a temperature range from -34° C to +60° C and a humidity range from 0% RH to 100%RH.

The camera shall be powered by 120 VAC 60 HZ. Power consumption shall be 15 watts or less under all conditions.

Recommended camera placement shall be over the traveled way on which vehicles are to be detected. For optimum detection the camera should be centered above the traveled roadway. Camera placement and field of view (FOV) shall be unobstructed and as noted in the installation documentation provided by the supplier.

The camera enclosure shall be equipped with separate, weather-tight connections for power and video cables at the rear of the enclosure. These connections may also allow diagnostic testing and viewing of video at the camera while the camera is installed on a mast arm or pole using a lens adjustment module (LAM) supplied by the VDP supplier. Video and power shall not be connected within the same connector.

The video signal shall be fully isolated from the camera enclosure and power cabling.

INSTALLATION. The coax cable shall be a continuous unbroken run from the camera to the VDP. This cable shall be suitable for installation in conduit or overhead with appropriate span wire. The coaxial cable, BNC connector, and crimping tool shall be approved by the supplier of the video detection system, and the manufacturer's instructions must be followed to ensure proper connection.

The power cabling shall be 16 AWG three conductor cable. The cabling shall comply with the National Electric code, as well as local electric codes.

The video detection system shall be installed by supplier factory certified installers and as recommended by the supplier and documented in installation materials provided by the supplier.

Video cable and AWG cable shall not be paid for separately but shall be included in the cost of WIDE AREA VIDEO DETECTION SYSTEM COMPLETE.

WARRANTY. The supplier shall provide a limited warranty on the video detection system. See suppliers standard warranty included in the Terms and Conditions of Sale documentation.

During the warranty period, technical support shall be available from the supplier via telephone within 4 hours of the time the call is made by a user, and this support shall be available from factory-certified installers.

During the warranty period, updates to VDP software shall be available from the supplier without charge.
Before the end of the warranty period, an inspection shall be conducted to insure proper function.

MAINTENANCE AND SUPPORT. The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the video detection system. These parts shall be available for delivery within thirty days of placement of an acceptable order at the supplier's then current pricing and terms of sale for said parts.

The supplier shall maintain an ongoing program of technical support for the video detection system. This technical support shall be available via telephone, or via personnel sent to the installation site upon placement-of an acceptable order at the supplier's then current pricing and terms of sale for onsite technical support services.

Installation or training support shall be provided by a factory authorized representative.

All product documentation shall be written in the English language.

MEASUREMENT AND PAYMENT. This work will be measured and paid for at the contract unit price each for WIDE AREA VIDEO DETECTION SYSTEM COMPLETE.

HANDHOLE (SPECIAL)

Description. This work shall consist of furnishing and installing the special handholes at the locations shown in the plans.

Materials.

a. Supply handholes constructed of epoxy or polyester resin mortar with woven glass fiber reinforcement and an appropriate aggregate dimensioned as indicated in the Contract Documents.

b. Handhole materials shall not support combustion when tested in accordance with "Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position" ASTM D-635.

c. Water absorption shall not exceed two percent of the original weight of material under test conditions per "Standard Test Method for Water Absorption of Plastics" ASTM D-570.

d. The handhole shall be functional without failure throughout a temperature range of -50 to +170 deg. F.

e. The handhole walls shall not deflect more than 0.24 inches per foot of length of box when installed and subject to an ASTM C-857 TIER 22 load.

f. Handholes shall meet ANSI/SCTE 77 standards and be verified by a registered third party and stamped by a registered Professional Engineer.

g. Handhole lid strength shall be tested to 33,750 lbs (Tier 22).

h. Handhole lids shall be labeled as indicated in the plans or as directed by the Engineer.

i. The Engineer shall provide approval prior to use of any handholes satisfying the Contract Documents requirements for structural, physical, and chemical properties.

Test Stations.

a. Supply Rhino part TVTI780B-EM9125-0R or approved equivalent test stations at all Handhole (Special) handholes.

b. Test Stations shall be 78 inch triangular flexible orange plastic marker with 5 separate access terminals, isolation lever, and set screw to hold terminal concealment cap on.

c. Place custom warning decals on all sides, the Engineer shall provide prior approval of decals.

Labeling Requirement.

a. Place tags on each tracer wire at each termination point, and in every handhole, handhole (special), and test station.

b. Tags shall clearly identify the owner. Tags shall also clearly identify the bearing, distance, and end feature (handhole, cabinet, pole, etc.) for each run.

Construction.

a. Install the type and size of handholes at the locations indicated in the Contract Documents.

b. Construct all Handhole (Special) handholes as located by the Engineer.

c. Set handholes flush with the surface when constructing in a sidewalk or driveway. Set handholes approximately six (6) to twelve (12) inches below the finished surface of the surrounding ground when constructing in an earth embankment or non-paved surface.

d. Install course aggregate bedding to a depth of one (1) foot below the handhole.

e. Conduit shall enter the handhole from the bottom and extend conduit ends between four (4) and six (6) inches above the aggregate bedding.

f. Side penetrations of the handholes are not permitted.

g. Terminate each tracer wire run in test stations at Handhole (Special) locations.

h. Label all ground wires and tracer wires in test stations.

i. Install ground rods at all Handhole (Special) handholes as indicated in the Contract Documents.

j. Plug all open conduit ends within the handhole in a manner acceptable to the Engineer.

k. Handholes shall be effectively sealed to prevent the entry of rodents.

Basis of Payment. Measurement and payment for handhole shall be paid for at the contract unit price per each for the pay item HANDHOLE (SPECIAL).

Payment is full compensation for:

a. The furnishing and installation of all handholes,

b. Including all surface excavations, repair or restoration of any nearby areas, concrete, proper water/moisture drainage materials, all necessary electric grounding materials and installation,

c. Furnishing and installing all test stations at Handhole (Special) locations, and

d. Furnishing all materials, labor, equipment, and other incidental items necessary to meet the requirements of the Contract Documents.

REMOVE EXISTING ITS EQUIPMENT

Description. This work shall consist of removing existing ITS equipment and associated cabling at the locations indicated in the plans.

Items that may be removed include but are not limited to cables, wires, conduits, handholes, poles, cabinets, and relevant ITS equipment. Items designated to be salvaged shall be removed in such a manner as to avoid damage to said items. The Contractor shall stockpile and secure or deliver to the local DOT Maintenance Shop such salvaged items as directed by the Engineer.

The DOT plans to utilize the Statewide ITS Maintenance contract to remove all LED signs, wireless communications equipment, cameras, sensors, and relevant ITS cabinet equipment. The Contractor shall notify Scott Kullerstrand at 815-284-5468 or Scott.Kullerstrand@illinois.gov prior to construction to facilitate the removal of those items.

The Contractor shall coordinate the removal of the ITS devices with the DOT Statewide ITS Maintenance contract. The Contractor shall be required to salvage the automated gates, LED sign poles, pole mounted cabinets, and camera poles, and cabling to the DOT Maintenance Shop as directed by the Engineer.

Basis of Payment. This work will be paid for at the contract unit price per each for REMOVE EXISTING ITS EQUIPMENT.

REMOVE AND REPLACE EXISTING ITS EQUIPMENT

Description. This work shall consist of the relocation and reinstallation of the existing electrical cables servicing the existing Dynamic Message Sign (DMS) located south of 12th Ave as shown in the contract documents.

General.
The DOT plans to utilize the Statewide ITS Maintenance contract to remove the DMS panel and relevant ITS equipment. The Contractor shall notify Scott Kullerstrand at 815-284-5468 or Scott.Kullerstrand@illinois.gov at least 7 days prior to construction to facilitate the removal of those items. Once the DMS sign panel is removed, existing electrical cables shall be pulled back to existing handhole near the existing meter to facilitate the removal of the existing conduit. Once the new conduit path to the new DMS structure is complete, existing electrical cables shall be reinstalled in the new conduit and wired to the new ITS cabinet and DMS sign panel. Contractor shall leave sufficient slack in handholes as shown in the plans. The Contractor shall use care to not damage the electrical cables during removal or reinstallation. Any cables damaged during these operations shall be replaced by the Contractor at no expense to Illinois DOT. All wiring shall comply with the requirements of the NEC, the contract documents, local utilities, and all generally accepted standards and requirements.

Materials. Contractor shall supply all necessary materials and incidental items required to remove and reinstall the existing electrical cables.

Construction. Installations shall meet the construction requirements listed in Section 817.03 of the Standard Specifications for Road and Bridge Construction.

Contractor shall provide equipment to demonstrate to the Engineer that at no time will a pulling tension of 0.008 pound per circular mil (70 N/mm^2) of the cable be exceeded.

The use of graphite or petroleum lubricants will not be permitted for cable reinstallation.

Existing electrical cable shall be reinstalled in continuous runs and splicing shall not be permitted. Existing electrical cable may need to be trimmed down in size to match shorter run.

Basis of Payment. This work will be paid for at the contract unit price per each for REMOVE AND REPLACE EXISTING ITS EQUIPMENT.

EQUIPMENT CABINET

Description. This work shall be completed according to Section 857 of the Standard Specifications and as noted herein. This work shall consist of furnishing and installing Pole Mounted Cabinets and Pad Mounted Cabinets, in accordance with the plans and the manufacturer's recommendations. Pole Mounted Cabinets shall include confirming the required mounting and pole brackets per AASHTO loading at the pole locations. Pad Mounted Cabinets shall include confirming the required foundations. Cabinets shall include all necessary electric grounding materials, and installation. The work includes but is not limited to required submittals, unloading, storing, and all other miscellaneous work required for complete installation. All work shall conform to the Standard Specifications and Special Provisions.

General. Do not penetrate the top of any cabinets without prior authorization by the Engineer. All connections shall be watertight. Orient cabinets as directed by the Engineer. Contact the Engineer a minimum of one (1) week in advance of installation to arrange a field review prior to placing the cabinets or installing fiber into the cabinets.

Materials.

a. Supply device cabinets, clean-cut in design and appearance

b. Cabinets shall be dimensioned as identified in the Contract Documents and have a typical internal layout as identified in the detailed drawings.

c. Cabinets shall be corrosion resistant, UL-50 approved, NEMA Type 3R compliant, constructed of welded sheet aluminum with a minimum nominal thickness of one-eighth (0.125) inch.

d. Cabinets shall be complete with all required internal components, fully wired back panel, side mount DIN rails, terminal strips, and stainless steel hardware.

e. Cabinets shall include one (1) mounting shelf.

f. Cabinets shall meet the requirements of ASTM B-209 for 5052 H-32 aluminum sheet. The aluminum shall be smooth and the exterior shall be left in its unpainted natural color.

g. The cabinet structure shall be effectively sealed to prevent the entry of rain, dust, and dirt.

h. All exterior seams for cabinet and doors shall be continuously welded. All edges shall be filed to a radius of 1/32 inch minimum.

i. All pole mount cabinets shall be equipped with top and bottom mounting flanges and include pole mounting reinforcement/stiffener plates as part of the cabinet design. Mounting brackets shall be fabricated from .250” thick aluminum, 5052-H32, mill finish.

Cabinet Doors.

a. The cabinet door shall be sturdy, torsionally rigid, and attached by a continuous heavy duty gauge aluminum butt hinge utilizing a stainless steel hinge. The door shall substantially cover the full area of the front of the cabinet and have a stainless steel, pad-lockable handle.

b. The cabinet shall be hinged on the right side (as viewed from the front).

c. The cabinet door shall be provided with a door stop catch mechanism to hold the door open at three positions – 90 degrees, 120 degrees and 180 degrees, with plus or minus 10 degrees accuracy. Both the door and door stop mechanism shall be of sufficient strength to withstand a simulated wind load of five pounds per square foot of door area applied to both inside and outside surfaces.

d. A closed-cell neoprene gasket shall be provided to act as a permanent and weather resistant seal at the cabinet door facing. The gasket material shall be of a non-absorbent material and shall maintain its resiliency after long term exposure to the outdoor environment. The gasket shall have a minimum thickness of 1/3 inch. The gasket shall be located in a channel provided for this purpose either on the cabinet or on the door. An “L” bracket is acceptable in lieu of this channel if the gasket is fitted snugly against the bracket to insure a uniformly dust and weather resistant seal around the entire door facing.

e. Cabinet light (LED) with light bulb provided operated by door switch.

f. Each cabinet door shall be provided with a high quality, heavy duty tumbler-type lock. Two #2 keys for each tumbler lock shall be provided for each cabinet. All locks for the project shall be keyed identically to key pattern 9R46142 or as otherwise identified by the Engineer. Keys shall be given to the Engineer. Do not attach keys to the exterior of the cabinet at any time during storage or installation.

g. A heavy-duty clear plastic envelope shall be provided, securely attached to the inside wall of the cabinet or cabinet door, for stowing cabinet wiring diagrams and equipment manuals. Minimum dimensions shall be nine (9) inches wide by twelve (12) inches deep.

Power Panels, Connecting Cables and Wiring

a. Provide cabinets equipped and configured with internal power components as shown in the Contract Documents.

b. One (1) 3 pole service entrance terminal block with tin plated aluminum connectors, nickel plated steel screws, and a current rating up to 70 Amps.

c. One (1) 20 Amp single pole breaker (Main).

d. One (1) 15 Amp single pole breaker (Equipment)

e. One (1) 15 Amp single pole breaker (Auxiliary)

f. A 120/240 VAC surge protector with surge current at minimum of 100KA, nanosecond response time, and an operating temperature of -40°C to +85°C.

g. An auxiliary four (4) terminal electrical block rated for a maximum 250 VAC RMS maximum voltage and 20 Amps current

h. A 15 Amp GFCI receptacle in Ivory color

i. An 8 outlet Power Distribution Unit with built in surge suppressor (1800 Joules of surge/lightning protection) that includes a resettable circuit breaker and minimum cord length of 6 feet.

j. One (1) 7 TAP Ground Bar

k. One (1) 7 TAP Neutral Bar

l. All miscellaneous wiring, harnesses connectors and attachment hardware

m. All conductors used on the cabinet wiring shall be No. 14 AWG or larger with a minimum of 19 strands. Conductors shall conform to MIL SPEC MIL-W-168780, Type B or D. The insulation shall have a minimum thickness of 10 MILS. All wiring containing line voltage shall be a minimum size of No. 12 AWG.

Ventilation.

a. Furnish cabinets containing a suitably designed rain tight vent or vents that:

- Are equipped with suitable screens or dust filters, and
- Allow the release of excessive heat and/or any explosive gases which may enter the cabinet.

b. Ensure when filters are utilized, positive retainment is provided on all sides to prevent warpage and entry of foreign matter around the edges.

c. The filters shall be dry type, easily removed and replaced, and standard dimensions commercially available.

d. Vent Fans need to meet the following requirements:

- A thermostatically controlled vent fan is furnished to provide air circulation within the cabinet.
- The thermostat controlling the fan is manually adjustable to turn on between 90°F and 150°F (32°C and 66°C) with a differential of not more than 10°F (6°C) between automatic turn on and turn off.
- The fan is located with respect to the vent holes to direct the bulk of the air flow over the internal components within the cabinet.
- Ventilation fan shall be fused separately and wired after the main AC+ circuit breaker.

Grounding.

a. The cabinet internal ground shall consist of one or more ground bus-bars permanently affixed to the cabinet and connected to the grounding electrode.

b. Use bare stranded No. 6 AWG copper wire between bus-bars and between the bus-bar and grounding electrode.

c. Each copper ground bus-bar shall have a minimum of 20 connector points. Each connector point shall be capable of securing at least one (1) #6 AWG conductor.

d. AC neutral and equipment ground wiring shall return to bus-bars.

Pedestal.

a. Supply cabinet pedestals, clean-cut in design and appearance

b. Cabinet pedestals shall be dimensioned as identified in the Contract Documents.

c. Cabinet pedestals shall be corrosion resistant, UL-50 approved, NEMA Type 3R compliant, constructed of welded sheet aluminum with a minimum nominal thickness of one-eighth (0.125) inch.

d. Cabinet pedestals shall be complete with all stainless steel hardware.

e. Cabinet pedestals shall meet the requirements of ASTM B-209 for 5052 H-32 aluminum sheet. The aluminum shall be smooth and the exterior shall be left in its unpainted natural color.

f. The cabinet pedestal shall be effectively sealed to prevent the entry of rain, dust, and dirt.

g. All exterior seams for cabinet pedestals shall be continuously welded. All edges shall be filed to a radius of 1/32 inch minimum.

Cabinet Foundations.

a. All cabinet concrete foundations shall meet the requirements of Section 503 of the Standard Specifications and current supplements. Use Class SI concrete for cabinet footings and all other non-paving concrete construction.

Construction.

a. Install cabinets in accordance with the Contract Documents and the manufacturer's recommendations.

b. Do not penetrate the top of any cabinets without prior authorization by the Engineer.

c. Do not allow screws used for mounting shelves or other mounting purposes to protrude beyond the outside wall of the cabinet.

d. All connections shall be watertight.

e. Contact the Engineer a minimum of one (1) week in advance to arrange a field review prior to placing the cabinets.

Mounting.

a. Orient cabinets as shown in the Contract Documents unless otherwise directed by the Engineer.

b. Ensure sufficient clamps, nuts, hardware, etc., as required for the specified mounting type, are furnished with each cabinet.

c. Seal all conduit openings in the controller cabinet with a sealing compound that meets the following requirements:

    - Readily workable, soft plastic
    - Workable at temperatures as low as 30°F (-1°C), and
    - Does not melt or run at temperatures as high as 300°F (150°C).

d. Do not install the controller cabinet on preplaced caulking material on the concrete base or place caulking material around the base of the cabinet after installation.

Cabinet Foundations.

a. Install cabinet footings in accordance with the Contract Documents and the manufacturer's recommendations.

b. All cabinet footings shall include a full depth 4 feet concrete maintenance pad area that is cast and reinforced as a single unit with the cabinet footing.

c. Prepare and submit for Engineer approval, design plans and details for all cabinet footings at no additional cost to the Engineer. Such plans and details shall be sealed by a professional engineer licensed in the State of Illinois.

d. Contact the Engineer a minimum of one (1) week in advance to arrange a field review prior to placing the cabinet footing.

e. Notify the Engineer immediately if an obstruction conflicts with a footing. The Engineer is responsible for relocating or determining another effective means of supporting the structure to eliminate the conflict. Payment shall not be made for re-work or extra work as the result of an unauthorized relocation of a footing.

f. Construct all footings as located by the Engineer. Securely rest all footings on firm undisturbed ground and set level and to the proper elevation.

g. Form the upper portion of all concrete footings and for all instances where the excavation is irregular in shape to provide the proper dimensions. Forming materials shall be level and braced to avoid displacement, warping, or deflection from the specified pattern during construction and curing.

h. Install and secure anchor bolts, conduits, and reinforcement before concrete placement. Use a rigid template to position anchor bolts in accordance with the appropriate pattern. The center of the template and the center of the concrete base shall coincide unless otherwise directed by the Engineer.

i. Install a sufficient number of conduits sized as indicated in the Contract Documents. All conduits shall be located as indicated in the Contract Documents.

j. Place all concrete within ninety (90) minutes of batching and consolidate using a high-frequency vibrator during construction.

k. Modification of a footing after construction is not allowed.

l. Cover all anchor bolts to protect them against damage and to protect the public from possible injury until erecting poles.

m. Allow a minimum of seven (7) calendar days curing of concrete footings before setting cabinets.

n. Remove and reconstruct, at no additional cost to the Engineer, all footings improperly constructed or with improperly installed anchor bolts, conduit, or any other footing components as determined by the Engineer.

Basis of Payment. Measurement and payment for this work shall be paid for at the contract unit price per each for EQUIPMENT CABINET.

45 FT STEEL ITS POLE, BLACK PAINTED

Description. This work shall be completed according to Section 877 of the Standard Specifications and as noted herein. This work shall consist of all effort, apparatus, and materials to install the device poles on which ITS equipment will be mounted for the planned ITS system.

The ITS poles will be supplied through a separate contract. All ITS poles shall be a 45 feet tall, conventional type, tapered steel pole. All poles shall be either round, 12-sided, or 16-sided.

Materials. The Contractor shall supply all necessary materials required to install the steel, black painted pole furnished under separate contract. The Contractor shall contact Tony Taylor, 515-239-1902, TONY.TAYLOR@DOT.IOWA.GOV, to procure poles for installation. The Contractor shall notify Iowa DOT of their procurement of this contract upon execution.

Construction.

The Contractor shall erect poles and securely bolt to the foundation base plate such that the pole is vertically plumb.

The Contractor shall use leveling nuts on each anchor bolt installed below the pole flange. Adjust the pole's vertical position by adjusting both the upper and lower nuts. Nuts shall be tightened per the manufacturer's recommendation.

For bridge-mounted poles, the pole shall be set plumb on the foundation and fastened to the anchor bolts with self-locking nuts or double nuts (2 per anchor bolt) and washers. Flat washers shall be installed below and above the isolation washer. A 0.5" minimum isolation pad and a 0.5" minimum leveling plate shall be installed between the light pole base plate and the bottom nut (leveling nut) with a steel washer between the leveling nut and the leveling plate. The nuts shall be tightened in compliance with torque specifications recommended by the manufacturer of the isolation pad. See plans for attachment detail.

The space between the finished top of the foundation and the bottom of the base plate of the pole shall be enclosed with an expanded metal screen made of stainless steel. The mesh of the screen shall be 6.00 mm (0.250 inch) or less as approved by the Engineer. The screen shall be held in place with bands made of stainless steel. At least two bands shall be installed around the pole base plate. The bands shall be held tight by a ratchet-type device. Grouting shall not be used to enclose the above described space.

Method of Measurement & Basis of Payment. This work will be paid for at the contract unit price per each for 45FT STEEL ITS POLE, BLACK PAINTED.

MVDS CABLE, INSTALL ONLY

Description. This work shall consist of installing Microwave Vehicle Detection System (MVDS) cable at the locations shown in the plans.

Materials. The Contractor shall supply all necessary materials required to install the MVDS cable furnished under separate contract. The Contractor shall contact Tony Taylor, 515-239-1902, TONY.TAYLOR@DOT.IOWA.GOV, to procure cable for installation. The Contactor shall notify Iowa DOT of their procurement of this contract upon execution.

Construction. Installations shall meet the construction requirements listed in Section 817.03 of the Standard Specifications for Road and Bridge Construction.

Contractor shall provide equipment to demonstrate to the Engineer that at no time will a pulling tension of 0.008 pound per circular mil (70 N/mm^2) of the cable be exceeded.

The use of graphite or petroleum lubricants will not be permitted for cable installation.

MVDS cable shall be installed in continuous runs and splicing shall not be permitted.

To aid future MVDS device installation (by others), additional slack shall be installed at the locations shown in the plans.

Basis of Payment. This work will be paid for at the contract unit price per linear foot for installing MVDS COMM CABLE, INSTALL ONLY and MVDS POWER CABLE, INSTALL ONLY.

POWER CONNECTION TO EXISTING METER

Description. This work shall consist of connecting and wiring proposed electrical cables to an existing meter as shown in the Contract Documents.

Materials. Contractor shall supply all necessary materials and incidental items required to connect proposed electrical cables to an existing meter.

Power connections shall comply with the requirements of NEC, the Contract Documents and all generally accepted standards and requirements for the electrical components and power terminations in the individual power source.

Construction. Complete power connections in accordance with the contract documents and all NEC requirements.

Contractor shall coordinate installations in advance as noted on the Contract Documents.

Contractor shall provide all conduit, breaker enclosures, circuit breakers, wiring and accessories, neutral bars and accessories, ground bars and accessories, terminations and grounding in the power source.

Unless otherwise directed by the Engineer, the Contractor shall install the power connections as illustrated in the Contract Documents.

The Contractor is responsible for coordinating and scheduling all locally required inspections of electrical work prior to putting a location into service.

The Contractor shall coordinate with the Engineer and power provider to request that electrical service at a device location be initiated.

Basis of Payment. This work will be paid for at the contract unit price per each POWER CONNECTION TO EXISTING METER.

ROADWAY LUMINAIRE, SPECIAL (INSTALL ONLY)

Description. This work shall consist of receiving, assembling, and installing a Roadway Lighting Luminaire and lamp as shown on the plans. The work includes but is not limited to shop drawing submittals, unloading, storing, and all other miscellaneous work required for a complete installation. Included in this item is coordination with the Luminaire Supply Contractor for delivery and installation requirements. All work shall conform to Section 821 of the Standard Specifications as applicable and as specified herein.

General.

RELATED DOCUMENTS

Drawings and general provisions of the Contract.

DEFINITIONS

Luminaire Supply Contractor: Supplier of the Street Lighting Luminaire.

Contractor: The general contractor(s) awarded a highway construction contract, includes responsibility for street lighting luminaire installation.

Engineer: IDOT's designated representative.

Street Lighting Luminaire: LED luminaire to be installed on a light pole arm. Includes all electrical components required for a complete, fully functional luminaire.

WORK UNDER SEPARATE CONTRACT

Street Lighting Luminaires will be furnished and delivered by others.

Delivery, Storage, and Handling. The Contractor shall supply the Engineer with a required delivery schedule for the Street Lighting Luminaires within 6 weeks of contract award. The Contractor shall supply the delivery schedule to the Supply Contractor upon approval. It shall be the responsibility of the Contractor to coordinate delivery with the Supply Contractor.

a) Delivery should be coordinated as to minimize handling and on-site storage requirements. If required, storage at the project site shall be provided by the Contractor at no additional cost.

b) A minimum of 20 Luminaires per delivery is required.

c) The Luminaires shall be stored in such a manner as to prevent damage.

d) Obtain and follow the Manufacturer's recommendations for the handling and installation of the Luminaires.

Inspection and Acceptance. The Contractor shall examine and document the condition of the Luminaires, in the presence of the Engineer, before accepting delivery. The Contractor shall be held responsible for fully functional luminaires as well as any repairs or replacements required due to any change in condition caused by site handling, storage, and installation. All repairs are subject to approval by the Engineer. The Contractor shall:

a) Remove and replace damaged Luminaires if repairs do not comply with requirements.

b) Clean exposed surfaces of the Luminaires after installation to remove dirt, stains, and other markings.

c) Do not use cleaning materials or processes that could change the appearance of exposed finishes.

Installation

a) Install all components and accessories furnished with each luminaire including all electrical components. The materials related to pole wiring shall be furnished by the Contractor in accordance with Article 821.02 of the Standard Specifications.

b) Each luminaire shall be mounted as indicated and as required for permanent lighting installation.

Basis of Payment. This work will be paid for at the contract unit price per each for ROADWAY LUMINAIRE, SPECIAL (INSTALL ONLY), including all material, hardware, storage, and labor required for complete installation of the Street Lighting Luminaires, as shown on the contract plans and as specified herein.

ROADWAY LIGHT POLE, INSTALL ONLY

Description. This work shall consist of receiving and installing a light pole complete with arm(s) and all appurtenances required for a complete operating unit and installing it on a concrete foundation. The work includes but is not limited to shop drawing submittals, unloading, storing, and all other miscellaneous work required for a complete installation. Included in this item is coordination with the light pole Supply Contractor for delivery and installation requirements. All work shall conform to Section 830 of the Standard Specifications as applicable and as specified herein.

General

RELATED DOCUMENTS
Drawings and general provisions of the Contract.

DEFINITIONS

Supply Contractor:	Supplier of the Light Poles.
Contractor:	The general contractor(s) awarded a highway construction contract, includes responsibility for Light Pole installation.
Engineer:	IDOT's designated representative.
Light Pole:	Light Pole complete with arm(s), when specified, and all hardware and accessories required for a complete operating unit.

WORK UNDER SEPARATE CONTRACT
Light Poles will be furnished and delivered by others.

Delivery, Storage, and Handling. The Contractor shall supply the Engineer with a required delivery schedule for the light poles within 6 weeks of contract award. The contractor shall supply the delivery schedule to the Supply Contractor upon approval. It shall be the responsibility of the contractor to coordinate delivery with the Supply Contractor.

a) Delivery should be coordinated as to minimize handling and on-site storage requirements. If required, storage at the project site shall be provided by the Contractor.

b) A minimum of 10 Light Poles per delivery is required.

c) The light poles shall be stored in such a manner as to prevent staining, discoloration, or other damage.

d) Obtain and follow the Manufacturer's recommendations for the handling and installation of the Light Poles.

e) Inspection and Acceptance: The Contractor shall examine and document the condition of the Light Poles, in the presence of the Engineer, before accepting delivery. The Contractor shall be held responsible for fully functional light poles as well as for any repairs or replacements required due to any change in condition caused by site handling, storage and installation.

Installation. Each light pole shall be assembled and installed upon its foundation in accordance with Section 830 of the Standard Specifications and the manufacturer's recommendations.

Prior to installation, the pole and all its components shall be inspected by the contractor, with the help of the manufacturer's representative in the presence of the Engineer. Any parts found to be defective shall be repaired or replaced.

Light Pole Identification

Each light pole shall be labeled by the Contractor as indicated in the plans and in accordance with the provisions of Section 830 of the Standard Specifications to correspond to actual circuiting, and as designated by the Engineer. The materials for pole identification shall be furnished by the Contractor in accordance with the provisions of Article 1069.06 of the Standard Specifications.

Method of Measurement. The Light Pole will be measured by the unit “Each”, complete. All related apparatus, wiring and testing shall be included.

Basis of Payment. This work shall be paid for at the contract unit price each for ROADWAY LIGHT POLE, INSTALL ONLY, of the mounting height and arm length indicated.

UNDERPASS LUMINAIRE, (INSTALL ONLY)

Description

This work shall consist of receiving, assembling, and installing an Underpass Luminaire as shown on the plans. The work includes but is not limited to luminaire hanger assembly, shop drawing submittals, unloading, storing, and all other miscellaneous work required for a complete installation. Included in this item is coordination with the Luminaire Supply Contractor for delivery and installation requirements. All work shall conform to Section 821 of the Standard Specifications as applicable and as specified herein.

General

RELATED DOCUMENTS

Drawings and general provisions of the Contract.

DEFINITIONS

Luminaire Supply Contractor: Supplier of the Underpass Luminaires.

Contractor:	The general contractor(s) awarded a highway construction contract, includes responsibility for Underpass Luminaire installation.
Engineer:	IDOT's designated representative.
Underpass Luminaire:	LED underpass luminaire to be installed as shown on the contract plans. Includes all electrical components required for a complete, fully functional luminaire.

WORK UNDER SEPARATE CONTRACT

Underpass Luminaires will be furnished and delivered by others.

Delivery, Storage, and Handling

The Contractor shall supply the Engineer with a delivery schedule for the Underpass Luminaires within 6 weeks of contract award. The Contractor shall supply the delivery schedule to the Supply Contractor upon approval. It shall be the responsibility of the Contractor to coordinate delivery with the Supply Contractor.

a) Delivery should be coordinated as to minimize handling and on-site storage requirements. If required, storage at the project site shall be provided by the Contractor at no additional cost.

b) A minimum of 10 Luminaires per delivery is required.

c) The Luminaires shall be stored in such a manner as to prevent damage.

d) Obtain and follow the Manufacturer's recommendations for the handling installation of the Luminaires.

e) Inspection and Acceptance: The Contractor shall examine and document the condition of the Luminaires, in the presence of the Engineer, before accepting delivery. The Contractor shall be held responsible for fully functional luminaire as well as any repairs or replacements required due to any change in condition caused by site handling, storage and installation.

Installation
Install all components and accessories furnished with each luminaire including all electrical components.

a) Each luminaire shall be mounted as indicated and as required for permanent lighting installation.

Repair and Cleaning
All repairs are subject to approval by the Engineer. Remove and replace damaged Luminaires if repairs do not comply with requirements.

a) Clean exposed surfaces of the Luminaires after installation to remove dirt, stains, and other markings.

b) Do not use cleaning materials or processes that could change the appearance of exposed finishes.

Basis of Payment
This work will be paid for at the contract unit price per each for UNDERPASS LUMINAIRE, (INSTALL ONLY).

STEEL LUMINAIRE MAST ARM ASSEMBLY 15 FT.

Description: This work shall be performed in accordance with the Section 877 of the Standard Specifications and as detailed in the plans for a steel luminaire mast arm assembly mounted onto an existing traffic signal pole. The removal of the existing pole top tenon and installation of a pole top cap shall also be included in this work.

Materials: Materials shall be according to Article 1077.03 of the Standard Specifications and as follows.

The luminaire mast arm shall be hot dipped galvanized steel, truss style, with clamp type mounting brackets and 34” rise height. Rubber grommets shall be provided in the pole shaft to protect the wiring. A removable hot dipped galvanized steel pole cap shall be provided to enclose the top of the pole. The contractor shall verify the clamp diameters and mast arm rise height required for the existing pole prior to ordering. The estimated mounting height of the luminaire shall be 45’ to match the adjacent existing light poles along Avenue of the Cities.

INSTALLATION
The luminaire mast arm shall be installed according to Article 877.03 of the Standard Specifications and as follows.

The contractor shall field drill a 1.5" dia. hole in the existing pole for the luminaire wiring to enter the mast arm. The galvanized coating at the drilled hole shall be repaired according to ASTM A 780 and the manufacturer's recommendations to prevent corrosion of the newly exposed metal surfaces. A 1.25" I.D. rubber grommet shall be inserted into the hole to protect the wiring.

The existing top mounting bracket shall be removed and the pole top cap shall be secured over the top of the pole with set screws. The luminaire mast arm and associated luminaire shall be installed the same day as the removal of the existing multi-mount luminaire to prevent nighttime outages. The luminaire and associated pole wiring shall be paid for separately under ROADWAY LUMINAIRE, SPECIAL (INSTALL ONLY).

METHOD OF MEASUREMENT: This work will be measured for payment as each.

BASIS OF PAYMENT This work will be paid for at the contract unit price per each for STEEL LUMINAIRE MAST ARM ASSEMBLY 15 FT.

LIGHT POLE FOUNDATION, SPECIAL

Description This work shall consist of furnishing all labor and materials required to construct a foundation for a light pole, including the construction of the portion of median barrier and concrete barrier base that sits above the grade beam. All work and materials shall be per Section 836 of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction (SSRBC), adopted January 1, 2012 and the following provisions.

Add the following paragraphs to Article 836.02:

(f) Reinforcement bars shall comply with Section 508.

(g) Preformed Expansion Joint Fillers shall comply with Section 1051.

Replace the first paragraph of Article 836.03(a) with the following paragraphs:

(a) Drilled Shaft Foundations. Drilled shaft foundations shall be to the depth shown on the contract plans or as directed by the Engineer. Each foundation shall be constructed in accordance with the details shown in the contract plans unless directed otherwise by the Engineer. Drilled shaft foundations shall be constructed according to Section 516 and the following.

Add the following paragraphs to Article 836.03:

(c) Median Barrier Wall Foundations. The top portion of the foundation shall be integrated with a portion of the median barrier wall, as shown on the contract plans and as directed by the Engineer. The portion of the foundation above the drilled shafts shall be constructed according to the applicable portions of Section 503, except protective coat, when required, should be applied to the concrete barrier according to Article 420.18. Any required sheeting, cribbing or other associated work required to complete the foundation work shall be included. Reinforcement bars shall be installed per the applicable portion of Section 508. The length of the wall included shall be as shown on the contract plans.

The drilled shaft portion of the foundation shall be constructed in accordance of the requirements of Article 836.03(a).

A ground rod and connecting wire shall be installed in conjunction with each foundation as shown on the contract plans.

If detailed in the plans expansion couplings shall be used at the expansion joints at either end of the foundation. If no specific details are included in the contract plans, a PVC coupling shall be installed at each preformed expansion joint as shown on the contract plans.

(1) Finishing. The surface of the concrete barrier shall be finished according to Article 503.15, except all holes and honeycombs shall be patched immediately.

Method of Measurement. Light Pole Foundation, Special will be measured per each complete and in place.

Relocation of a foundation due to an obstruction and any shaft excavation to that point will not be measured for payment.

Excavation in rock will be measured for payment according to Article 502.12.

Basis of Payment. This work will be paid at the contract unit price per each for LIGHT POLE FOUNDATION, SPECIAL.

Excavation in rock will be paid for according to Article 502.13.

LIGHT POLE FOUNDATION, 30" DIAMETER, SPECIAL

Description. This work shall be performed in accordance with the Section 836 of the Standard Specifications and as detailed in the plans for a special foundation integral to a single face barrier wall. The rebar, anchor rods, grounding electrode, ground wire, and conduit within the foundation shall also be included in this work.

The foundation shall be according to the lighting structural plan details. The barrier base shall match the adjacent barrier base and lighting conduit shall be as shown on lighting plans.

METHOD OF MEASUREMENT. This work will be measured for payment as defined in Article 836.04 of the Standard Specifications.

BASIS OF PAYMENT. This work will be paid for at the contract unit price per foot for LIGHT POLE FOUNDATION, 30" DIAMETER, SPECIAL.

TEMPORARY LIGHTING SYSTEM

This work shall consist of providing a temporary lighting system (circuit feeds, aerial cables, wood poles, mounting brackets/arms, luminaires, and maintaining electrical continuity of lighting circuits) as needed within the project limits to maintain the illumination of I-74 and ramps. The Contractor shall provide all labor, material, and equipment necessary to furnish, install, maintain, and remove the temporary lighting system. This work shall also include the relocation of temporary lighting facilities as necessary to accommodate the various stages of construction and removal of all temporary lighting facilities at the completion of the project. All work shall be performed in accordance with the plans, Standard Specifications, and as directed herein.

The Contractor shall submit for the Engineer's approval, any modifications to the lighting design plan showing the proposed locations of all temporary wood poles for each stage of construction associated with each phase of the project. Any modifications by the Contractor to the lighting design shall meet the requirements of Department's BDE Design Manual, Chapter 56 and no wood poles shall be installed until the Contractor's revised lighting design plan is approved by the Engineer.

The Contractor shall not purchase temporary lighting facilities until the Contractor has submitted shop drawings and received the Engineer's approval to proceed. All temporary lighting facilities shall become property of the Contractor and shall be removed from the site at no additional cost. Any temporary lighting materials used by the Contractor which come from stock rather than being purchased new for this project shall require written approval by the Engineer.

The Contractor shall be responsible to maintain the temporary lighting system throughout the project and no additional compensation will be allowed for this work, no matter how many times temporary and/or permanent lighting facilities are relocated.

Dragging cable on the ground will not be permitted. Splices shall be rated for and designed to connect aluminum conductors to copper (or aluminum as applicable) conductors of the size range required. The cable shall be installed in one continuous length with no splices where possible. No underground splicing of cable will be permitted. The cable shall be carefully installed in trench or conduit as indicated on the plans and according to manufacturer's recommendations. The installation shall be inspected by the Engineer before it is backfilled.

For any long underground power feeds required, temporary direct burial power cable 600V secondary UD aluminum conductors with XLP insulation shall be used. The aluminum conductors shall meet ASTM B-230, B-231, B-609, and B-901. The cable insulation shall meet ICEA S-105-692 for XLP insulated conductors and UL Standard 854 for Type USE-2. Cables may be triplexed by the manufacturer to promote ease of installation with approval of the Engineer. The splices shall meet the applicable portions of Article 1066.06 of the Standard Specifications. The cable shall be installed directly from the reels on which the cable was shipped. Installation, after inspection by the Engineer, shall be backfilled according to Section 810. Plowing will not be allowed.

Cable splicing, luminaire fusing, and lighting protection shall be submitted for approval. All work required to keep the temporary lighting system operational shall at no additional cost to the Department. No lighting circuit or portion thereof shall be removed from nighttime operation without the approval of the Engineer.

An inspection and approval by the Engineer shall take place before the temporary lighting system or modified system is approved for operation. Any damage to the existing lighting units and their circuitry as a result of the Contractor's negligence shall be repaired or replaced at no cost to the Department. All burnouts shall be replaced on a next day basis and temporary wiring shall be installed as necessary to keep all lights functioning every night. Contractor shall furnish to the Engineer the names and phone numbers of two persons responsible for call-out work on the lighting system on a 24/7 basis.

The Contractor shall not be responsible for any utility charges for establishing a point of service from the power company at the location(s) shown on the plans. The Contractor shall be responsible for all costs associated with removal of the temporary electric service when the project is complete. The Contractor shall pay the energy costs until such time as the project is complete and accepted by IDOT. Any energy charges which the Contractor would like to present to the Department for reimbursement shall be properly metered, billed, and prorated by the Contractor at no cost to the Department. The Contractor shall be reimbursed for repair of accident damage according to Articles 105.13 and 107.30 of the Standard Specifications.

Basis of Payment: This work shall be paid for at the contract lump sum price for TEMPORARY LIGHTING SYSTEM.

ROCK FILL (Z0054400)

GENERAL. This work consists of constructing a layer of rock fill below mechanically stabilized earth retaining walls and drainage structures. The layer of rock fill is to be used where the theoretical top of leveling pad is above existing grade or where the proposed structure bears on unsuitable soils. When removal of unsuitable soils is shown on the plans, the rock fill limits and thickness shall be confirmed by the Engineer prior to excavating below the theoretical top of leveling pad or base of structure.

Materials shall meet the requirements of the following Articles of the Standard Specifications:

CA-6 ..... 1004.04
Rock fill 1005.01

All rock fill shall be well graded. The gradation of rock fill shall be selected based on layer thickness as shown below:

Less than or equal to 1 ft Gradations with a max size of 4 inches[a]
Greater than 1 ft ..... Primary Crusher Run
Greater than 3 ft ..... Primary Crusher Run or Quarry Run (18 inches max size)

[a] Gradations with a maximum size of 2 inches or smaller shall have less than 6% passing the No. 200 sieve.

Excavation shall be performed according to Section 502 of the Standard Specifications.

The method of rock fill placement shall be approved by the Engineer. Rock fill shall be capped with 4 to 6 inches of compacted CA-6 unless where groundwater may encroach the final construction limits of the rock fill, CA-7 shall be substituted in place of the CA-6.

BASIS OF PAYMENT. This work will be measured and paid for at the contract unit price per CU YD for ROCK FILL.

SLIPFORM PARAPET

The following shall be added to the end of Article 503.16(b) of the Standard Specifications.

(3) Slipforming parapets. Unless otherwise prohibited herein or on the plans, at the option of the Contractor, concrete parapets on bridge decks and anchorage slabs may be constructed by slipforming in lieu of the conventional forming methods. Slipforming will not be permitted for curved parapets on a radius of 1500 ft (457m) or less.

The slipform machine shall be self-propelled and have automatic horizontal and vertical grade control. For parapets up to 34 inches (864 mm) tall, the machine shall be equipped with a minimum of four (4) vibrators. For 42 inch (1.067m) tall parapets, the machine shall be equipped with a minimum of five (5) vibrators. The equipment shall be approved by the Engineer before use.

If the Contractor wishes to use the slipform parapet option for 42 inch (1.067 m) tall parapets he/she shall construct a test section in a temporary location to demonstrate his/her ability to construct the parapets without defect. The test section shall be constructed under similar anticipated weather conditions, using the same means and methods, equipment, operator, concrete plant, concrete mix design, and slump as proposed for the permanent slipform parapets.

The test section shall be at least 50 feet (15 meters) in length and shall be of the same cross section shown on the plans. The Contractor shall place all of the reinforcement embedded in the parapet shown on the plans. Upon completion of the test section, the Contractor shall saw cut the test section into 2 foot (600 mm) segments and separate the segments for inspection by the Engineer.

The test section shall demonstrate that the Contractor can slipform the parapets on this project without defects. The acceptance of the test section does not constitute acceptance of the slipform parapets in place.

The concrete mix design may combine two or more coarse aggregate sizes, consisting of CA-7, CA-11, CA-13, CA-14, and CA-16, provided a CA-7 or CA-11 is included in the blend in a proportion approved by the Engineer.

The slipform machine speed shall not exceed 3 ft (0.9 m) per minute. Any section of parapet placed with the slipform machine moving in excess of the maximum allowed speed will be rejected. Any time the speed of the machine drops below 0.5 ft (150 mm) per minute will be considered a stoppage of the slipforming operation, portions of parapet placed with three or more intermittent stoppages within any 15 ft (4.6 m) length will be rejected. The Contractor shall schedule concrete delivery to maintain a uniform delivery rate of concrete into the slipform machine. If delivery of concrete from the truck into the slipforming machine is interrupted by more than 15 minutes, the portion of the wall within the limits of the slipform machine will be rejected. Any portion of the parapet where the slipforming operation is interrupted or stopped within the 15 minute window may be subject to coring to verify acceptance.

The use of cast-in-place anchorage devices for attaching appurtenances and/or railings to the parapets will not be allowed in conjunction with slipforming of parapets. Alternate means for making these attachments shall be as detailed on the plans or as approved by the Engineer.

All reinforcement bar intersections within the parapet cross section shall be 100 percent tied utilizing saddle ties, wrap and saddle ties or figure eight ties to maintain rigidity during concrete placement. At pre-planned sawcut joints in the parapet, Glass Fiber Reinforced Polymer (GFRP) reinforcement shall be used to maintain the rigidity of the reinforcement cage across the proposed joints as detailed in the plans for the Slipformed Parapet Joint Details.

Glass Fiber Reinforced Polymer (GFRP) reinforcement shall be subject to approval by the Engineer. Other non-ferrous reinforcement may be proposed for use but shall be subject to approval by the Engineer. GFRP reinforcement shall be tied the same as stated in the previous paragraph.

The Contractor may propose supplemental reinforcement for stiffening to prevent movement of the reinforcement cage and/or for conduit support subject to approval by the Engineer.

Clearances for these bars shall be the same as shown for the required bars and these bars shall be epoxy coated. If the additional reinforcement is used, it shall be at no additional cost to the Department.

For projects with plan details specifying parapet joints spaced greater than 20 ft (6 m) apart, additional sawcut joints, spaced between 10 ft (3 m) and 20 ft (6 m), shall be placed as directed by the Engineer. The horizontal reinforcement extending through the proposed joints shall be precut to provide a minimum of 4 in. (100 mm) gap, centered over the joint, between rebar ends. The ends of the reinforcement shall be repaired according to Article 508.07.

After the slipform machine has been set to proper grade and prior to concrete placement, the clearance between the slipform machine inside faces and reinforcement bars shall be checked during a dry run by the Contractor in the presence of the Engineer. The dry run shall not begin until the entire reinforcing cage has been tied and the Engineer has verified and approved the placement and tying of the reinforcing bars. Any reinforcement bars found to be out of place by more than ½ in. (13 mm), or any dimensions between bars differing from the plans by more than ½ in. (13 mm) shall be re-tied to the plan dimensions.

During the dry run and in the presence of the Engineer, the Contractor shall check the clearance of the reinforcement bars from the inside faces of the slipform mold. In all locations, the Contractor shall ensure the reinforcement bars have the minimum cover distance shown on the plans. This dry run check shall be made for the full distance that is anticipated to be placed in the subsequent pour. Reinforcement bars found to have less than the minimum clearance shall be adjusted and the dry run will be performed again, at least in any locations that have been readjusted.

For parapets adjacent to the watertable, the Contractor shall, for the duration of the construction and curing of the parapet, provide and maintain an inspection platform along the back face of the parapet. The inspection platform shall be rigidly attached to the bridge superstructure and be of such design to allow ready movement of inspection personnel along the entire length of the bridge.

The aluminum cracker plates as detailed in the plans shall be securely tied in place and shall be coated or otherwise treated to minimize their potential reaction with wet concrete. In lieu of chamfer strips at horizontal and vertical edges, radii may be used. Prior to slipforming, the Contractor shall verify proper operation of the vibrators using a mechanical measuring device subject to approval by the Engineer.

The top portion of the joint shall be sawcut as specified in the plans. Sawing of the joints shall commence as soon as the concrete has hardened sufficiently to permit sawing without excessive raveling. All joints shall be sawed to the full thickness before uncontrolled shrinkage cracking takes place but no later than 8 hours after concrete placement. The sawcut shall be approximately 3/8 in. (10 mm) wide and shall be performed with a power circular concrete saw. The joints shall be sealed with an approved polyurethane sealant, conforming to ASTM C 920, Type S, Grade NS, Class 25, Use T, to a minimum depth of 1/2 in. (12 mm), with surface preparation and installation according to the manufacturer's written instructions. Cork, hemp or other compressible material may be used as a backer. The sawcut will not require chamfered edges.

Ends of the parapet shall be formed and the forms securely braced. When slipforming of parapets with cross sectional discontinuities such as light standards, junction boxes or other embedded appurtenances except for name plates, is allowed, the parapet shall be formed for a minimum distance of 4 ft (1.2 m) on each side of the discontinuity.

For acceptance and rejection purposes a parapet section shall be defined as the length of parapet between adjacent vertical parapet joints.

The maximum variance of actual to proposed longitudinal alignment shall not exceed ±3/4 in. (20 mm) with no more than 1/4 inch in 10 ft (6 mm in 3 m). Notwithstanding this tolerance, abrupt variance in actual alignment of 1/2 inch in 10 ft (13 mm in 3 m) will be cause for rejection of the parapet section.

In addition, all surfaces shall be checked with a 10 ft (3 m) straight edge furnished and used by the Contractor as the concrete is extruded from the slipform mold. Continued variations in the barrier surface exceeding 1/4 inch in 10 ft (6 mm in 3 m) will not be permitted and remedial action shall immediately be taken to correct the problem.

The use of equipment or methods which result in dimensions outside the tolerance limits shall be discontinued. Parapet sections having dimensions outside the tolerance limits will be rejected.

Any visible indication that less than specified cover of concrete over the reinforcing bars has been obtained, or of any cracking, tearing or honeycombing of the plastic concrete, or any location showing diagonal or horizontal cracking will be cause for rejection of the parapet section in which they are found.

The vertical surfaces at the base of the barrier within 3 in. (75 mm) of the deck surface shall be trowelled true after passage of the slipform machine. Hand finishing of minor sporadic surface defects may be allowed at the discretion of the Engineer. All surfaces of the parapet except the top shall receive a final vertical broom finish. Any deformations or bulges remaining after the initial set shall be removed by grinding after the concrete has hardened. Slipformed parapets shall be cured according to either Article 1020.13(a)(3) or Article 1020.13(a)(5). For either method, the concrete surface shall be covered within 30 minutes after it has been finished. The cotton mats or burlap covering shall be held in place with brackets or other method approved by the Engineer. The Contractor shall have the option to substitute linseed oil emulsion for protective coat and delay the start of wet curing during the period from April 16 through October 31. The linseed oil emulsion shall be applied according to Articles 1020.13 Notes-General 8/ and 1020.13(a)(4). The delay for wet curing shall not exceed 3 hours after application of the linseed oil emulsion.

A maximum of three random 4 in. (100 mm) diameter cores per 100 ft (30 m) of parapet shall be taken as directed by the Engineer, but no less than three random cores shall be taken for each parapet pour. At least two cores shall be located to intercept the top horizontal bar. Unless otherwise directed by the Engineer, coring shall be accomplished within 48 hours following each parapet pour. Separate parapets poured on the same date shall be considered separate pours. Random cores will not be measured for payment.

The Engineer will mark additional locations for cores where, in the sole opinion of the Engineer, the quality of the slipformed parapet is suspect.

The Engineer or his representative will be responsible for evaluation of the cores. Any cores showing voids of any size adjacent to the reinforcement bars, or showing voids not adjacent to reinforcement bars of 1/4 square inch (160 square millimeters) in area or more, or showing signs of segregation, or showing signs of cracking shall be considered failures and the parapet section from which it was taken will be rejected. Parapets with less than 1 ½ inches of concrete cover over the reinforcement shall be rejected.

Rejected parapet sections shall be removed and replaced for the full depth cross-section of the parapet except that concrete covers between 1 inch and 1 ½ inches may be open to remedial action subject to the approval of the Engineer. Such action could entail up to and including removal and replacement.

The minimum length of parapet removed and replaced shall be 3 ft (1 m). Additional cores may be required to determine the longitudinal extent of removal and replacement if it cannot be determined and agreed upon by other means (i.e. visual, sounding, non-destructive testing, etc.).

Any parapet section with more than one half of its length rejected or with remaining segments less than 10 ft (3 m) in length shall be removed and replaced in its entirety.

If reinforcement bars are damaged during the removal and replacement, additional removal and replacement shall be done, as necessary, to ensure minimum splice length of replacement bars. Any damage to epoxy coating of bars shall be repaired according to Article 508.04.

All core holes will be filled with a non-shrink grout meeting the requirements of Section 1024.

Basis of Payment. When the Contractor, at his/her option, constructs the parapet using slipforming methods, no adjustment in the quantities for Concrete Superstructures and Reinforcement Bars, Epoxy Coated to accommodate this option will be allowed. Compensation under the contract bid items for Concrete Superstructures and Reinforcement Bars, Epoxy Coated shall cover the cost of all work required for the construction of the parapet and any test section(s) required, and for any additional costs of work or materials associated with slipforming methods.

STEEL RAILING (SPECIAL)

GENERAL. Work shall be according to the applicable portions of Section 509 of the Standard Specifications except as modified herein.

DESCRIPTION. This work shall consist of furnishing and erecting steel railings according to the details and locations shown in the plans. The steel railings shall be in accordance with the details shown in the Plans.

METHOD OF MEASUREMENT. This work will be measured for payment in place in feet. The length measured will be the overall length along the top longitudinal railing member through all posts and gaps.

BASIS OF PAYMENT**.** This work will be paid for at the contract unit price per foot for STEEL RAILING (SPECIAL).

CLEANING AND PAINTING STRUCTURAL STEEL
Effective: March 19, 2013

DESCRIPTION. The material and construction requirements that apply to cleaning and painting new structural steel shall be according to the applicable portion of Sections 506 of the Standard Specifications except as modified herein. The three coat paint system(s) shall be the system as specified on the plans and as defined herein.

MATERIALS. When a fluoropolymer top coat is specified it shall only be applied to the surfaces designated on the plans. The top coat shall be one of the following listed below except that the paint shall be from the same manufacturer supplying the primer and intermediate coat.

Manufacturer	**Product**	**DFT(mils)**
Carboline	Carboxane 950	2 – 3
Sherwin Williams	Fluorokem Fluoropolymer Urethane	2 – 3
PPG Industries	Coraflon ADS	1.5 – 2

Batch testing of fluoropolymer top coats will not be required, but shall be approved based on manufacturer's certification. 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. A color sample shall be submitted to the Engineer for approval prior to ordering material.

PILING

This Special Provision amends the following provisions of the Standard Specifications for Road and Bridge Construction.

512.10 Driving Equipment. Revise the first, second and third paragraphs of Article 512.10(a) to read as follows:

(a) Hammers. Piles shall be driven with an impact hammer such as a drop, steam/air, hydraulic, or diesel. The driving system selected by the Contractor shall not result in damage to the pile. The impact hammer shall be capable of being operated at an energy which will maintain a pile penetration rate between 1 and 10 blows per 1 in. (25 mm) when the nominal driven bearing of the pile approaches the nominal required bearing in soil for the end-of-driving condition described in Article 512.14. To avoid potential damage to steel piles driven to rock, the impact hammer shall operate at an energy corresponding to a pile penetration rate between 4 and 20 blows per 1 in. (25 mm) as the pile nears and develops the nominal required bearing in rock.

For hammer selection purposes, the minimum and maximum hammer energy necessary to achieve these penetrations may be estimated as follows.

Soil	Rock
$E \geq \frac{32.9\ R_N}{F_{eff}}$ (English)	$E \geq \frac{28.6\ R_N}{F_{eff}}$ (English)
$E \leq \frac{65.8\ R_N}{F_{eff}}$ (English)	$E \leq \frac{41.1\ R_N}{F_{eff}}$ (English)
$E \geq \frac{10.0\ R_N}{F_{eff}}$ (metric)	$E \geq \frac{8.7\ R_N}{F_{eff}}$ (metric)
$E \leq \frac{20.0\ R_N}{F_{eff}}$ (metric)	$E \leq \frac{12.5\ R_N}{F_{eff}}$ (metric)

Where:

R_N = Nominal required bearing in kips (kN)
E = Energy developed by the hammer per blow in ft-lb (J)
F_{eff} = Hammer efficiency factor according to Article 512.14.

The above hammer options, hammer energy range, and pile penetration rates shall be applicable unless noted otherwise in the construction documents.

512.11 Penetration of Piles. Revise Article 512.11 to read as follows:

Piles shall be installed to a penetration that satisfies all of the following.

(a) The nominal driven bearing, as determined by the formula in Article 512.14, is not less than the nominal required bearing shown on the plans except as permitted below for piles driven to rock.

(b) The pile tip elevation is at or below the minimum tip elevation shown on the plans. In cases where no minimum tip elevation is provided, the piles shall be driven to a penetration of at least 10 ft (3 m) below the bottom of footing or below undisturbed earth, whichever is greater.

Except as required to satisfy minimum tip elevations required in 512.11(b) above, piles not bearing on rock are not required to be driven more than one additional foot (300 mm) after the nominal driven bearing equals or exceeds the nominal required bearing; more than three additional inches (75 mm) after the nominal driven bearing exceeds 110 percent of the nominal required bearing; or more than one additional inch (25 mm) after the nominal driven bearing exceeds 150 percent of the nominal required bearing. For piles driven to rock, pile driving shall be stopped, independent of the nominal driven bearing predicted by the formula in Article 512.14, when the minimum penetration rate is ¼ in. over 5 blows (or equivalently a maximum penetration rate of 20 blows per 1 in. for no more than 5 blows). When piles not bearing or rock fail to achieve nominal driven bearings in excess of the nominal required bearing after driving the full furnished lengths, but are within 85 percent of nominal required bearing, these piles shall be left for a minimum of 24 hours to allow for soil setup and retesting before splicing and driving additional length. After the waiting period has passed, the pile shall be redriven to check the gain in nominal driven bearing upon soil setup. The soil setup nominal driven bearing shall be based on the number of redriving blows necessary to drive the pile an additional 2 in. (75 mm) using a hammer that has been warmed up by applying at least 20 blows to another pile. Within the additional 2 in., the redriving data should be carefully observed and the bearing determined for each ½ in. of pile penetration. In addition to the pile penetration rate, field inspectors are encouraged to carefully monitor the hammer energy during the redrive as increased driving resistance from soil setup may result in greater rebound of the hammer ram and developed hammer energy than experienced during the initial pile driving procedure. The soil setup nominal driven bearing may be taken as the largest value recorded at the ½ in. increments. These piles will be accepted if they exhibit a nominal driven bearing larger than nominal required bearing. In addition, piles within a group, and adjacent to a retested pile that has achieved the nominal required bearing within the additional 2 in. of pile penetration, may be accepted provided the piles exhibited driving behavior similar to the retested pile prior to the setup period. Acceptance of such piles shall be subject to approval of the Engineer and shall require that a minimum of 20 percent of the piles within the group, and no fewer than 2, be retested and achieve the nominal required bearing within the additional 2 in. of pile penetration. Locations of the retested piles should be uniformly scattered across the pile group.

When piles have been driven in excess of the indicated estimated pile length and are not within 85 percent of the nominal required bearing, piles should not be driven longer than the soil setup pile length indicated in the plans. When piles have been driven to this length, they shall be left for a minimum of 48 hours and redriven to check the gain in nominal driven bearing due to soil setup using the above procedure. The Bureau of Bridges and Structures should be contacted for further disposition when piles have not achieved the nominal required bearing upon redrive.

The above mentioned waiting periods for redriving piles to check for gain in nominal driven bearing due to soil setup are minimums and some soil types may exhibit greater soil setup with increased waiting period. When feasible, longer waiting periods that are a function of the soil type at the pile location are encouraged. The following waiting periods are recommended prior to redriving piles to try and maximize the gain in nominal driven bearing due to soil setup:

Recommended Waiting Periods for Redrive Based on Soil Type

Clean Sands	= 1 day
Silty Sands	= 2 days
Sandy Silts	= 4 days
Silts and Clays	= 8 days

512.14 Determination of Nominal Driven Bearing. Revise the first paragraph of Article 512.14 to read as follows:

The nominal driven bearing of each pile shall be determined by the WSDOT formula as follows.

$$R_{NDB} = \frac{6.6\ C_s\ F_{eff}\ E\ Ln\ (10N_b)}{1000} \quad \text{(English)}$$

$$R_{NDB} = \frac{21.7\ C_s\ F_{eff}\ E\ Ln\ (10N_b)}{1000} \quad \text{(metric)}$$

Where:

R_{NDB} = Nominal driven bearing of the pile in kips (kN)
C_s = Soil setup correction factor
- 1.0 for EOD data
- 0.8 for BOR data

N_b = Number of hammer blows per inch (25 mm) of pile penetration
E = Energy developed by the hammer per blow in ft lb (J)
F_{eff} = Hammer efficiency factor taken as:
- 0.55 for air/steam hammers
- 0.47 for open-ended diesel hammers and steel piles or metal shell piles
- 0.37 for open-ended diesel hammers and concrete or timber piles
- 0.35 for closed-ended diesel hammers
- 0.28 for drop hammers

End-of-driving (EOD) data refers to the information that is collected and analyzed during the initial pile installation procedure. Beginning-of-redrive (BOR) data refers to the redriving information that is collected and analyzed when the pile is driven less than 2 in. following a waiting period to check the gain in nominal driven bearing due to soil setup. When redriving piles, a significant reduction in R_{NDB} is often observed as the pile penetration exceeds 2 in. If the pile does not achieve the required nominal driven bearing within the 2 in. of additional penetration during the redrive, the nominal driven bearing of the pile shall continue to be determined using the WSDOT formula and soil setup correction factor for EOD data after the pile has been driven 4 additional inches.

Per Article 512.10, the hammer chosen by the contractor is required to be capable of developing the nominal required bearing capacity of piles bearing in soil at EOD at an N_b between 1 and 10. When evaluating R_{NDB} of piles bearing in soil for the same hammer using the WSDOT formula and BOR data, the permissible range of N_b is between 1 and 20.

As an alternative to the WSDOT formula, qualified personnel may analyze BOR data using the Wave Equation Analysis of Piles (WEAP) software program. When performing WEAP of BOR data using the Department's geotechnical pile design procedure, piles will only be required to achieve a nominal driven bearing equal to 85% of nominal required bearing indicated in the contract plans.

512.15 Test Piles. Revise the third paragraph of Article 512.15 to read as follows:

Test piles not bearing on rock shall be driven to a nominal driven bearing ten percent greater than the nominal required bearing shown on the plans. The Engineer may stop the driving of any test pile not bearing on rock at tip penetrations exceeding 10 ft (3 m) beyond the estimated length to check for pile setup according to Article 512.11. After any retesting, the Contractor shall recommence test pile driving, providing piling, splices, and any retests until the nominal driven bearing during driving reaches ten percent more than the nominal required bearing or the Engineer stops the driving due to having sufficient data to provide the itemized list of furnished lengths. Test piles bearing on rock shall be driven to the nominal required bearing shown on the plans except pile driving shall be stopped when the pile penetration rate satisfies the criteria indicated in Article 512.11.

1006.05 Metal Piling and Steel Casing. Replace 1006.05(a) and (b) with the following:

(a) Metal Shell Piling. Metal shell piling shall be according to ASTM A 252, Grade 3 except the minimum yield strength shall be 50,000 psi (345,000 kPa).

(b) Steel Piling. Steel piling shall be according to AASHTO M 270, Grade 50 (M 270M, Grade 345).

MECHANICALLY STABILIZED EARTH RETAINING WALLS
Effective: February 3, 1999 Revised: April 18, 2014

The following shall be used in the place of Article 522 in the Standard Specifications for Road and Bridge Construction, adopted April 1, 2016.

Description. This work shall consist of preparing the design, furnishing the materials, and constructing the mechanically stabilized earth (MSE) retaining wall to the lines, grades and dimensions shown in the contract plans and as directed by the Engineer.

General. The MSE wall consists of a concrete leveling pad, precast concrete face panels, a soil reinforcing system, select fill and concrete coping (when specified). The soil reinforcement shall have sufficient strength, quantity, and pullout resistance, beyond the failure surface within the select fill, as required by design. The material, fabrication, and construction shall comply with this Special Provision and the requirements specified by the supplier of the wall system selected by the Contractor for use on the project.

The MSE retaining wall shall be one of the pre-approved MSE wall systems found on the Prequalified Structural Systems portion of the IDOT website.

Pre-approval of the wall system does not include material acceptance at the jobsite.

Submittals. The wall system supplier shall submit complete design calculations and shop drawings to the Engineer according to Article 1042.03(b) of the Standard Specifications no later than 90 days prior to beginning construction of the wall. No work or ordering of materials for the structure shall be done by the Contractor until the submittal has been approved in writing by the Engineer. All submittals shall be sealed by an Illinois Licensed Structural Engineer and shall include all details, dimensions, quantities and cross sections necessary to construct the wall and shall include, but not be limited to, the following items:

(a) Plan, elevation and cross section sheet(s) for each wall showing the following:

(1) A plan view of the wall indicating the offsets from the construction centerline to the face of the wall at all changes in horizontal alignment. The plan view shall show the limits of soil reinforcement and stations where changes in length and/or size of reinforcement occur. The centerline shall be shown for all drainage structures or pipes behind or passing through and/or under the wall.

(2) An elevation view of the wall indicating the elevations of the top of the panels. These elevations shall be at or above the top of exposed panel line shown on the contract plans. This view shall show the elevations of the top of the leveling pads, all steps in the leveling pads and the finished grade line. Each panel type, the number, size and length of soil reinforcement connected to the panel shall be designated. The equivalent uniform applied service (unfactored) nominal bearing pressure shall be shown for each designed wall section.

(3) A listing of the summary of quantities shall be provided on the elevation sheet of each wall.

(4) Typical cross section(s) showing the limits of the reinforced select fill volume included within the wall system, soil reinforcement, embankment material placed behind the select fill, precast face panels, and their relationship to the right-of-way limits, excavation cut slopes, existing ground conditions and the finished grade line.

(5) All general notes required for constructing the wall.

(b) All details for the concrete leveling pads, including the steps, shall be shown. The top of the leveling pad shall be located at or below the theoretical top of the leveling pad line shown on the contract plans. The theoretical top of leveling pad line shall be 3.5 ft. (1.1 m) below finished grade line at the front face of the wall, unless otherwise shown on the plans.

(c) Where concrete coping or barrier is specified, the panels shall extend up into the coping or barrier as shown in the plans. The top of the panels may be level or sloped to satisfy the top of exposed panel line shown on the contract plans. Cast-in-place concrete will not be an acceptable replacement for panel areas below the top of exposed panel line. As an alternative to cast in place coping, the Contractor may substitute a precast coping, the details of which must be included in the shop drawings and approved by the Engineer.

(d) All panel types shall be detailed. The details shall show all dimensions necessary to cast and construct each type of panel, all reinforcing steel in the panel, and the location of soil reinforcement connection devices embedded in the panels. These panel embed devices shall not be in contact with the panel reinforcement steel.

(e) All details of the wall panels and soil reinforcement placement around all appurtenances located behind, on top of, or passing through the soil reinforced wall volume such as parapets with anchorage slabs, coping, foundations, and utilities etc. shall be clearly indicated. Any modifications to the design of these appurtenances to accommodate a particular system shall also be submitted.

(f) When specified on the contract plans, all details of architectural panel treatment, including color, texture and form liners shall be shown.

(g) The details for the connection between concrete panels, embed devices, and soil reinforcement shall be shown.

(h) When pile sleeves are specified, the pile sleeve material, shape, and wall thickness shall be submitted to the Engineer for approval. It shall have adequate strength to withstand the select fill pressures without collapse until after completion of the wall settlement. The annulus between the pile and the sleeve shall be as small as possible while still allowing it to be filled with loose dry sand after wall erection.

The initial submittal shall include three sets of shop drawings and one set of calculations. One set of drawings will be returned to the Contractor with any corrections indicated. After approval, the Contractor shall furnish the Engineer with ten (10) sets of corrected plan prints for distribution by the Department. No work or ordering of materials for the structure shall be done until the submittal has been approved by the Engineer.

Materials. The MSE walls shall conform to the supplier's standards as previously approved by the Department, and the following:

(a) The soil reinforcing system, which includes the soil reinforcement, and all connection devices, shall be according to the following:

(1) Inextensible Soil Reinforcement. Steel reinforcement shall be according ASTM A 572 Grade 65 (450), ASTM A1064, ASTM A 1011 or ASTM A 463 Grade 50 (345). The steel reinforcement shall be either epoxy coated, aluminized Type 2, or galvanized. Epoxy coatings shall be according to Article 1006.10(a)(2), except the minimum thickness of epoxy coating shall be 18 mils (457 microns). No bend test will be required. Aluminized Type 2-100 shall be according to ASTM A 463. Galvanizing shall be according to AASHTO M 111 or ASTM A 653 with touch up of damage according to ASTM A 780.

(2) Extensible Soil Reinforcement. Geosynthetic reinforcement shall be monolithically fabricated from virgin high density polyethylene (HDPE) or high tenacity polyester (HTPET) resins having the following properties verified by mill certifications:

Property for Geosynthetic Reinforcement	Value	Test
Minimum Tensile Strength	**	ASTM D 6637

** as specified in the approved design calculations and shown on the shop drawings.

Property for HDPE	Value	Test
Melt Flow Rate (g/cm)	0.060 – 0.150	ASTM D 1238, Procedure B
Density (g/cu m)	0.941 – 0.965	ASTM D 792
Carbon Black	2% (min)	ASTM D 4218

Property for HTPET	Value	Test
Carboxyl End Group (max) (mmol/kg)	<30	GRI-GG7
Molecular Weight (Mn)	>25,000	GRI-GG8

(3) Panel Embed/Connection Devices. Panel embeds and connection devices shall be according to the following.

a. Metallic panel embed/connection devices and connection hardware shall be galvanized according to AASHTO M 232 and shall be according to the following.

Mesh and Loop Embeds	ASTM A1064 or ASTM A 706 Grade 60 (420)
Tie Strip Embeds	AASHTO M 270/M 270M Grade 50 (345) or ASTM A 1011 HSLAS Grade 50 (345) Class 2

b. Non metallic panel embed/connection devices typically used with geosynthetic soil reinforcement shall be manufactured from virgin or recycled polyvinyl chloride having the following properties:

Property for Polyvinyl Chloride	Value	Test
Heat Deflection Temperature (°F)	155 - 164	ASTM D 1896
Notched IZOD 1/8 inch @ 73°F (ft-lb/in)	4 – 12	ASTM D 256
Coefficient of Linear Exp. (in/in/°F)	3.5 – 4.5	ASTM D 696
Hardness, Shore D	79	ASTM D 2240

Property for Polypropylene	Value	Test
Melt Flow Rate (g/cm)	0.060 – 0.150	ASTM D 1238, Procedure B
Density (g/cu m)	0.88 – 0.92	ASTM D 792

(b) The select fill, defined as the material placed in the reinforced volume behind the wall, shall be according to Sections 1003 and 1004 of the Standard Specifications and the following:

(1) Select Fill Gradation. Either a coarse aggregate or a fine aggregate may be used. For coarse aggregate, gradations CA 6 thru CA 16 may be used. If an epoxy coated reinforcing is used, the coarse aggregate gradations shall be limited to CA 12 thru CA 16. For fine aggregate, gradations FA 1, FA 2, or FA 20 may be used.

(2) Select Fill Quality. The coarse or fine aggregate shall have a maximum sodium sulfate (Na_2SO_4) loss of 15 percent according to Illinois Modified AASHTO T 104.

(3) Select Fill Internal Friction Angle. The effective internal friction angle for the coarse or fine aggregate shall be a minimum 34 degrees according to AASHTO T 236 on samples compacted to 95 percent density according to Illinois Modified AASHTO T 99. The AASHTO T 296 test with pore pressure measurement may be used in lieu of AASHTO T 236. If the vendor's design uses a friction angle higher than 34 degrees, as indicated on the approved shop drawings, this higher value shall be taken as the minimum required.

(4) Select Fill and Steel Reinforcing. When steel reinforcing is used, the select fill shall meet the following requirements.

a. The pH shall be 5.0 to 10.0 according to Illinois Modified AASHTO T 289.
b. The resistivity according to Illinois Modified AASHTO T 288 shall be greater than 3000 ohm centimeters for epoxy coated and galvanized reinforcement, and 1500 ohm centimeters for Aluminized Type 2. However, the resistivity requirement is not applicable to CA 7, CA 8, CA 11, CA 13, CA 14, CA 15, and CA 16.
c. The chlorides shall be less than 100 parts per million according to Illinois Modified AASHTO T 291 or ASTM D 4327. For either test, the sample shall be prepared according to Illinois Modified AASHTO T 291.
d. The sulfates shall be less than 200 parts per million according to Illinois Modified AASHTO T 290 or ASTM D 4327. For either test, the sample shall be prepared according to Illinois Modified AASHTO T 290.
e. The organic content shall be a maximum 1.0 percent according to Illinois Modified AASHTO T 267.

(5) Select Fill and Geosynthetic Reinforcing. When geosynthetic reinforcing is used, the select fill pH shall be 4.5 to 9.0 according to Illinois Modified AASHTO T 289.

(6) Test Frequency. Prior to start of construction, the Contractor shall provide internal friction angle and pH test results, to show the select fill material meets the specification requirements. In addition, resistivity, chlorides, sulfates, and organic content test results will be required if steel reinforcing is used. The laboratory performing the Illinois Modified AASHTO T 288 test shall be approved by the Department according to the current Bureau of Materials and Physical Research Policy Memorandum "Minimum Laboratory Requirements for Resistivity Testing". All test results shall not be older than 12 months. In addition, a sample of select fill material will be obtained for testing and approval by the Department. Thereafter, the minimum frequency of sampling and testing by the department at the jobsite will be one per 40,000 tons (36,300 metric tons) of select fill material. Testing to verify the internal friction angle will be required when the wall design utilizes a minimum effective internal friction angle greater than 34 degrees, or when crushed coarse aggregate is not used.

(c) The embankment material behind the select fill shall be according to Section 202 and/or Section 204. An embankment unit weight of 120 lbs/cubic foot (1921 kg/cubic meter) and an effective friction angle of 30 degrees shall be used in the wall system design, unless otherwise indicated on the plans.

(d) The geosynthetic filter material used across the panel joints shall be either a non-woven needle punch polyester or polypropylene or a woven monofilament polypropylene with a minimum width of 12 in. (300 mm) and a minimum non-sewn lap of 6 in. (150 mm) where necessary.

(e) The bearing pads shall be rubber, neoprene, polyvinyl chloride, or polyethylene of the type and grade as recommended by the wall supplier.

(f) All precast panels shall be manufactured with Class PC concrete according to Section 504, Article 1042.02, Article 1042.03, and the following requirements:

(1) The minimum panel thickness shall be 5 1/2 in. (140 mm).

(2) The minimum reinforcement bar cover shall be 1 1/2 in. (38 mm).

(3) The panels shall have a ship lap or tongue and groove system of overlapping joints between panels designed to conceal joints and bearing pads.

(4) The panel reinforcement shall be according to Article 1006.10(a)(2) or 1006.10(b)(1) except the welded wire fabric shall be epoxy coated according to ASTM A884.

(5) All dimensions shall be within 3/16 in. (5 mm).

(6) Angular distortion with regard to the height of the panel shall not exceed 0.2 inches in 5 ft (5 mm in 1.5 m).

(7) Surface defects on formed surfaces measured on a length of 5 ft. (1.5 m) shall not be more than 0.1 in. (2.5 mm).

(8) The panel embed/connection devices shall be cast into the facing panels with a tolerance not to exceed 1 in. (25 mm) from the locations specified on the approved shop drawings.

Unless specified otherwise, concrete surfaces exposed to view in the completed wall shall be finished according to Article 503.15(a). The back face of the panel shall be roughly screeded to eliminate open pockets of aggregate and surface distortions in excess of 1/4 in. (6 mm).

Design Criteria. The design shall be according to the appropriate AASHTO Design Specifications noted on the plans for Mechanically Stabilized Earth Walls except as modified herein. The wall supplier shall be responsible for all internal stability aspects of the wall design and shall supply the Department with computations for each designed wall section. The analyses of settlement, bearing capacity and overall slope stability will be the responsibility of the Department.

External loads, such as those applied through structure foundations, from traffic or railroads, slope surcharge etc., shall be accounted for in the internal stability design. The presence of all appurtenances behind, in front of, mounted upon, or passing through the wall volume such as drainage structures, utilities, structure foundation elements or other items shall be accounted for in the internal stability design of the wall.

The design of the soil reinforcing system shall be according to the applicable AASHTO or AASHTO LRFD Design Specifications for “Inextensible” steel or “Extensible” geosynthetic reinforcement criteria. The reduced section of the soil reinforcing system shall be sized to allowable stress levels at the end of a 75 year design life.

Steel soil reinforcing systems shall be protected by one of the following; epoxy coating, galvanizing or aluminizing. The design life for epoxy and aluminizing shall be assumed to be 16 years. The corrosion protection for the balance of the 75 year total design life shall be provided using a sacrificial steel thickness computed for all exposed surfaces according to the applicable AASHTO or AASHTO LRFD Design Specifications.

Geosynthetic soil reinforcing systems shall be designed to account for the strength reduction due to long-term creep, chemical and biological degradation, as well as installation damage.

To prevent out of plane panel rotations, the soil reinforcement shall be connected to the standard panels in at least two different elevations, vertically spaced no more than 30 in. (760 mm) apart.

The panel embed/soil reinforcement connection capacity shall be determined according to the applicable AASHTO or AASHTO LRFD Design Specifications.

The factor of safety for pullout resistance in the select fill shall not be less than 1.5, based on the pullout resistance at 1/2 in. (13 mm) deformation. Typical design procedures and details, once accepted by the Department, shall be followed. All wall system changes shall be submitted in advance to the Department for approval.

For aesthetic considerations and differential settlement concerns, the panels shall be erected in such a pattern that the horizontal panel joint line is discontinuous at every other panel. This shall be accomplished by alternating standard height and half height panel placement along the leveling pad. Panels above the lowest level shall be standard size except as required to satisfy the top of exposed panel line shown on the contract plans.

At locations where the plans specify a change of panel alignment creating an included angle of 150 degrees or less, precast corner joint elements will be required. This element shall separate the adjacent panels by creating a vertical joint secured by means of separate soil reinforcement.

Isolation or slip joints, which are similar to corner joints in design and function, may be required to assist in differential settlements at locations indicated on the plans or as recommended by the wall supplier. Wall panels with areas greater than 30 sq. ft. (2.8 sq. m) may require additional slip joints to account for differential settlements. The maximum standard panel area shall not exceed 60 sq. ft. (5.6 sq. m).

Construction. The Contractor shall obtain technical assistance from the supplier during wall erection to demonstrate proper construction procedures and shall include any costs related to this technical assistance in the unit price bid for this item.

The foundation soils supporting the structure shall be graded for a width equal to or exceeding the length of the soil reinforcement. Prior to wall construction, the foundation shall be compacted with a smooth wheel vibratory roller. Any foundation soils found to be unsuitable shall be removed and replaced, as directed by the Engineer, and shall be paid for separately according to Section 202.

When structure excavation is necessary, it shall be made and paid for according to Section 502 except that the horizontal limits for structure excavation shall be from the rear limits of the soil reinforcement to a vertical plane 2 ft. (600 mm) from the finished face of the wall. The depth shall be from the top of the original ground surface to the top of the leveling pad. The additional excavation necessary to place the concrete leveling pad will not be measured for payment but shall be included in this work.

The concrete leveling pads shall have a minimum thickness of 6 in. (150 mm) and shall be placed according to Section 503.

As select fill material is placed behind a panel, the panel shall be maintained in its proper inclined position according to the supplier specifications and as approved by the Engineer. Vertical tolerances and horizontal alignment tolerances shall not exceed 3/4 in. (19 mm) when measured along a 10 ft. (3 m) straight edge. The maximum allowable offset in any panel joint shall be 3/4 in. (19 mm). The overall vertical tolerance of the wall, (plumbness from top to bottom) shall not exceed 1/2 in. per 10 ft. (13 mm per 3 m) of wall height. The precast face panels shall be erected to insure that they are located within 1 in. (25 mm) from the contract plan offset at any location to insure proper wall location at the top of the wall. Failure to meet this tolerance may cause the Engineer to require the Contractor to disassemble and re-erect the affected portions of the wall. A 3/4 in. (19 mm) joint separation shall be provided between all adjacent face panels to prevent direct concrete to concrete contact. This gap shall be maintained by the use of bearing pads and/or alignment pins.

The back of all panel joints shall be covered by a geotextile filter material attached to the panels with a suitable adhesive. No adhesive will be allowed directly over the joints.

The select fill and embankment placement shall closely follow the erection of each lift of panels. At each soil reinforcement level, the fill material should be roughly leveled and compacted before placing and attaching the soil reinforcing system. The soil reinforcement and the maximum lift thickness shall be placed according to the supplier's recommended procedures except, the lifts for select fill shall not exceed 10 in. (255 mm) loose measurement or as approved by the Engineer. Embankment shall be constructed according to Section 205.

At the end of each day's operations, the Contractor shall shape the last level of select fill to permit runoff of rainwater away from the wall face. Select fill shall be compacted according to the project specifications for embankment except the minimum required compaction shall be 95 percent of maximum density as determined by Illinois Modified AASHTO T 99. Select fill compaction shall be accomplished without disturbance or distortion of soil reinforcing system and panels. Compaction in a strip 3 ft. (1 m) wide adjacent to the backside of the panels shall be achieved using a minimum of 3 passes of a light weight mechanical tamper, roller or vibratory system. The Engineer will perform one density test per 5000 cu yd (3800 cu m) and not less than one test per 2 ft (0.6 m) of lift.

Method of Measurement. Mechanically Stabilized Earth Retaining Wall will be measured for payment in square feet (square meters). The MSE retaining wall will be measured from the top of exposed panel line to the theoretical top of leveling pad line for the length of the wall as shown on the contract plans.

Basis of Payment. This work, including placement of the select fill within the soil reinforced wall volume shown on the approved shop drawings, precast face panels, soil reinforcing system, concrete leveling pad and accessories will be paid for at the contract unit price per square foot (square meter) for MECHANICALLY STABILIZED EARTH RETAINING WALL.

Concrete coping when specified on the contract plans will be included for payment in this work. Other concrete appurtenances such as anchorage slabs, parapets, abutment caps, etc. will not be included in this work, but will be paid for as specified elsewhere in this contract, unless otherwise noted on the plans.

Excavation necessary to place the select fill for the MSE wall shall be paid for as STRUCTURE EXCAVATION and/or ROCK EXCAVATION FOR STRUCTURES as applicable, according to Section 502.

Fill placed within the foot print of the reinforced soil mass, above the top layer of soil reinforcement and below the bottom of the subgrade or top soil, shall be included in the cost of the MSE wall.

Embankment placed outside of the select fill volume will be measured and paid for according to Sections 202 and/or 204 as applicable.

TEMPORARY MECHANICALLY STABILIZED EARTH RETAINING WALLS
Effective: January 6, 2003 Revised: April 18, 2014

Description. This work shall consist of preparing the design, furnishing the materials, and constructing the temporary mechanically stabilized earth (TMSE) retaining wall to the lines, grades and dimensions shown in the contract plans and as directed by the Engineer.

General. The TMSE retaining wall shall consist of a sacrificial fascia, a soil reinforcing system and select fill. The soil reinforcement shall have sufficient strength, quantity, and pullout resistance, beyond the failure surface within the select fill, as required by design. The material, fabrication, and construction shall comply with this Special Provision and the requirements specified by the supplier of the wall system selected by the Contractor for use on the project.

The Contractor may select the TMSE retaining wall system from one of the pre-approved TMSE wall systems found on the Prequalified Structural Systems portion of the IDOT website. As an alternate the Contractor may submit a proposed equal system for full review and approval. The Contractor shall allow a minimum of 30 days for review and approval of the proposed system by the Department:

Pre-approval of the wall system does not include material acceptance at the jobsite.

Submittals. The wall system supplier shall submit complete design calculations and shop drawings for the TMSE retaining wall system to the Engineer no later than 45 days prior to beginning construction of the wall. No work or ordering of materials for the structure shall be done by the Contractor until the submittal has been approved in writing by the Engineer. All shop drawing submittals shall be sealed by an Illinois Licensed Structural Engineer and shall include all details, dimensions, quantities and cross sections necessary to construct the wall and shall include, but not be limited to the following items:

(a) Plan, elevation and cross section sheet(s) for each wall showing the following:

(1) A plan view of the wall indicating the offsets from the construction centerline to the face of the wall at all changes in horizontal alignment. The plan view shall show the limits of soil reinforcement and stations where changes in length and/or size of reinforcement occur. The centerline shall be shown for all drainage structures or pipes behind or passing through and/or under the wall.

(2) An elevation view of the wall indicating the elevations of the top of the sacrificial fascia. These elevations shall be at or above the top of sacrificial fascia line shown on the contract plans. This view shall show the elevations of the bottom of the sacrificial fascia, all steps in the base of the wall and the finished grade line. Each sacrificial fascia type, the number, size and length of soil reinforcement connected to the sacrificial fascia shall be designated. The equivalent uniform applied service (unfactored) nominal bearing pressure shall be shown for each designed wall section.

(3) A listing of the summary of quantities shall be provided on the elevation sheet of each wall.

(4) Typical cross section(s) showing the limits of the reinforced select fill volume included within the wall system, soil reinforcement, embankment material placed behind the select fill, sacrificial fascia, and their relationship to the right-of-way limits, excavation cut slopes, existing ground conditions and the finished grade line.

(5) All general notes required for constructing the wall.

(b) The bottom of the sacrificial fascia shall be located at or below the theoretical bottom of sacrificial fascia line shown on the contract plans. The theoretical bottom of sacrificial fascia line shall be 1.5 ft. (450 mm) below finished grade line at the front face of the wall, unless otherwise shown on the plans.

(c) All details of the sacrificial fascia and soil reinforcement placement around all appurtenances located behind, on top of, or passing through the soil reinforced wall volume such as parapets with anchorage slabs, foundations, and utilities etc. shall be clearly indicated. Any modifications to the design of these appurtenances to accommodate a particular system shall also be submitted for approval.

(d) The details for the connection between the sacrificial fascia, and soil reinforcement shall be shown.

The initial submittal shall include three sets of TMSE retaining wall shop drawings and one set of calculations. One set of drawings will be returned to the Contractor with any corrections indicated. After approval, the Contractor shall furnish the Engineer with eight sets of corrected plan prints for distribution by the Department. No work or ordering of materials for the structure shall be done until the submittal has been approved by the Engineer.

Materials. The TMSE retaining walls shall conform to the supplier's standards as previously approved by the Department, and the following:

(a) The soil reinforcing system, which includes the soil reinforcement facing and all connection devices, shall be according to the following:
   (1) Inextensible Soil Reinforcement. Steel reinforcement shall be according ASTM A 572 Grade 65 (450), ASTM A1064, ASTM A 1011 or ASTM A 463 Grade 50 (345).

   (2) Extensible Soil Reinforcement. Geosynthetic reinforcement shall be monolithically fabricated from virgin high density polyethylene (HDPE) or high tenacity polyester (HTPET) resins having the following properties verified by mill certifications:

Property for Geosynthetic Reinforcement	Value	Test
Minimum Tensile Strength	**	ASTM D 6637

** as specified in the approved design calculations and shown on the shop drawings.

Property for HDPE	Value	Test
Melt Flow Rate (g/cm)	0.060 – 0.150	ASTM D 1238, Procedure B
Density (g/cu m)	0.941 – 0.965	ASTM D 792
Carbon Black	2% (min)	ASTM D 4218

Property for HTPET	Value	Test
Carboxyl End Group (CEG Max) (mmol/kg)	<30	GRI-GG7
Molecular Weight (M_n)	>25,000	GRI-GG8

(3) Facing and Connection Devices.

Mesh facing and Loop Facing Connectors	ASTM A1064 or ASTM A706 Grade 60 (420)
Tie Strip Facing Connectors	AASHTO M 270/M 270M Grade 50 (345)

Sacrificial fascia and connection devices used with geosynthetic soil reinforcement shall be manufactured from virgin or recycled polyvinyl chloride having the following properties:

Property for polyvinyl chloride	Value	Test
Heat Deflection Temperature (°F)	155 - 164	ASTM D 1896
Notched IZOD 1/8 inch @ 73°F (ft-lb/in)	4 – 12	ASTM D 256
Coefficient of Linear Exp. (in/in/°F)	3.5 – 4.5	ASTM D 696
Hardness, Shore D	79	ASTM D 2240

Property for polypropylene	Value	Test
Melt Flow Rate (g/cm)	0.060 – 0.150	ASTM D 1238, Procedure B
Density (g/cu cm)	0.88 – 0.92	ASTM D 792

(b) The select fill, defined as the material placed in the reinforced volume behind the wall, shall be according to Sections 1003 and 1004 of the Standard Specifications and the following:

(1) Select Fill Gradation. Either a coarse aggregate or a fine aggregate may be used. For coarse aggregate, gradations CA 6 thru CA 16 may be used. If geosynthetic reinforcing is used, the coarse aggregate gradations shall be limited to CA 12 thru CA 16. For fine aggregate, gradations FA 1, FA 2, or FA 20 may be used.

(2) Select Fill Quality. The coarse or fine aggregate shall have a maximum sodium sulfate (Na_2SO_4) loss of 15 percent according to Illinois Modified AASHTO T 104.

(3) Select Fill Internal Friction Angle. The effective internal friction angle for the coarse or fine aggregate shall be a minimum 34 degrees according to AASHTO T 236 on samples compacted to 95 percent density according to Illinois Modified AASHTO T 99. The AASHTO T 296 test with pore pressure measurement may be used in lieu of AASHTO T 236. If the vendor's design uses a friction angle higher than 34 degrees, as indicated on the approved shop drawings, this higher value shall be taken as the minimum required.

(4) Test Frequency. Prior to start of construction, the Contractor shall provide an internal friction angle test results to show the select fill material meets the specification requirement. This test result shall be no more than 12 months old. In addition, a sample of select fill material will be obtained for testing and approval by the Department. Thereafter, the minimum frequency of sampling and testing by the department at the jobsite will be one per 40,000 tons (36,300 metric tons) of select fill material. Testing to verify the internal friction angle will be required when the wall design utilizes a minimum effective internal friction angle greater than 34 degrees, or when crushed coarse aggregate is not used.

(c) The sacrificial fascia may consist of a wire mesh, geosynthetic fabric, geosynthetic reinforcement or other suitable material capable of retaining the select fill and transmitting the applied loading to the soil reinforcement. Wire mesh shall be fabricated from cold drawn steel conforming to AASHTO M32 (M32M) and shall be shop fabricated according to AASHTO M55 (M55M). The geosynthetic fabric shall be either a non-woven needle punch polyester or polypropylene or a woven monofilament polypropylene with a minimum non-sewn lap of 12 in. (300 mm) where necessary.

(d) The embankment material behind the select fill shall be according to Section 202 and/or Section 204. An embankment unit weight of 120 lbs/cubic foot (1921 kg/cubic meter) and an effective friction angle of 30 degrees shall be used in the wall system design, unless otherwise indicated on the plans.

Design Criteria. The design shall be according to the applicable portions of the AASHTO Design Specifications for Mechanically Stabilized Earth Walls, except as modified herein. The wall supplier shall be responsible for all internal stability aspects of the wall design and shall supply the Department with computations for each designed wall section. The analyses of settlement, bearing capacity and overall slope stability will be the responsibility of the Department.

External loads, such as those applied through structure foundations, from traffic or railroads, slope surcharge etc., shall be accounted for in the internal stability design. The presence of all appurtenances behind, in front of, mounted upon, or passing through the wall volume such as drainage structures, utilities, structure foundation elements or other items shall be accounted for in the internal stability design of the wall.

The design of the soil reinforcing system shall be according to the applicable AASHTO Design Specifications for “Inextensible” steel or “Extensible” geosynthetic reinforcement criteria. The reduced section of the soil reinforcing system shall be sized to allowable stress levels at the end of a 3 year design life.

For steel soil reinforcement, the Corrosion protection for the 3 year design life shall be provided using a sacrificial steel thickness computed for all exposed surfaces according to the applicable AASHTO Design Specifications.

Geosynthetic soil reinforcing systems shall be designed to account for the strength reduction due to long-term creep, chemical and biological degradation, as well as installation damage.

The factor of safety for pullout resistance in the select fill shall not be less than 1.5, based on the pullout resistance at 1/2 inch (13 mm) deformation. Typical design procedures and details, once accepted by the Department, shall be followed. All wall system changes shall be submitted in advance to the Department for approval.

The sacrificial fascia and its connection to the soil reinforcement shall be sized for a minimum design life of 3 years.

All soil reinforcement elements shall be directly connected to the sacrificial fascia and shall have an allowable pullout capacity, from the sacrificial fascia, based on the maximum tensile loading occurring in the soil reinforcement. The soil reinforcements maximum vertical center to center spacing shall be 20 in. (500 mm) and in the horizontal direction, the clear distance between the edge of one soil reinforcement to the next must not exceed 30 in. (760 mm).

Construction. The Contractor shall obtain technical assistance from the supplier during wall erection to demonstrate proper construction procedures and shall include any costs related to this technical assistance in the unit price bid for this item.

The foundation soils supporting the structure shall be graded for a width equal to or exceeding the length of the soil reinforcement. Prior to wall construction, the foundation shall be compacted with a smooth wheel vibratory roller. Any foundation soils found to be unsuitable shall be removed and replaced, as directed by the Engineer, and shall be paid for separately according to Section 202.

As select fill material is placed behind a sacrificial fascia element, the sacrificial fascia element shall be maintained in its proper inclined position according to the supplier specifications and as approved by the Engineer. The sacrificial fascia shall be erected to insure that it is located within 3 in. (75 mm) from the nominal contract plan offset at any location.

The select fill and embankment placement shall closely follow the erection of each lift of sacrificial fascia. At each soil reinforcement level, the fill material should be roughly leveled and compacted before placing and attaching the soil reinforcing system. The soil reinforcement and the maximum lift thickness shall be placed according to the supplier's recommended procedures except, the lifts for select fill shall not exceed 10 in. (255 mm) loose measurement or as approved by the Engineer.

If a fine aggregate is used for the select fill, the maximum lift thickness placed within the zone 3 ft (1 m) behind the sacrificial fascia shall be reduced to 5 in. (125 mm). As an alternative, a coarse aggregate can be used for this zone without a reduced lift thickness.

Embankment shall be constructed according to Section 205.

At the end of each day's operations, the Contractor shall shape the last level of select fill to permit runoff of rainwater away from the wall face. Select fill shall be compacted according to the project specifications for embankment except the minimum required compaction shall be 95 percent of maximum density as determined by Illinois Modified AASHTO T 99. Select fill compaction shall be accomplished without disturbance or distortion of soil reinforcing system and sacrificial fascia. Compaction in a strip 3 ft. (1 m) wide adjacent to the backside of the sacrificial fascia shall be achieved using a minimum of 3 passes of a light weight mechanical tamper, roller or vibratory system. The Engineer will perform one density test per 5000 cu yd (3800 cu m) and not less than one test per 2 ft (0.6 m) of lift.

Method of Measurement. Temporary Mechanically Stabilized Earth Retaining Wall will be measured for payment in square feet (square meters). The wall will be measured from the top of exposed sacrificial fascia line to the theoretical bottom of sacrificial fascia line for the length of the wall as shown on the contract plans.

Basis of Payment. This work, including placement of the select fill within the soil reinforced wall volume shown on the approved shop drawings, sacrificial fascia, soil reinforcing system, and accessories will be paid for at the contract unit price per square foot (square meter) for TEMPORARY MECHANICALLY STABILIZED EARTH RETAINING WALL.

Concrete appurtenances such as anchorage slabs, parapets, abutment caps, etc. will not be included in this work, but will be paid for as specified elsewhere in this contract, unless otherwise noted on the plans.

All excavation necessary to construct the TMSE wall shall be paid for as STRUCTURE EXCAVATION according to Section 502.

Embankment placed outside of the select fill volume will be measured and paid for according to Section 202 and/or 204 as applicable.

HEAT OF HYDRATION CONTROL FOR CONCRETE STRUCTURES
Effective May 17, 2011

Description. This work shall consist of controlling the heat of hydration for concrete structures when the least dimension for a substructure concrete pour exceeds 5.0 ft (1.5 m). This work shall be according to Section 1020 and the following.

(a) Temperature Restrictions. The maximum temperature of the concrete after placement shall not exceed 150° F (66° C). The maximum temperature differential between the internal concrete core and concrete 2 to 3 in. (50 to 75 mm) from the exposed surface shall not exceed 35° F (19 ° C). The Contractor shall perform temperature monitoring to ensure compliance with the temperature restrictions.

(b) Thermal Control Plan. The Contractor shall provide a thermal control plan a minimum of 28 calendar days prior to concrete placement for review by the Engineer. Acceptance of the thermal control plan by the Engineer shall not preclude the Contractor from specification compliance, and from preventing cracks in the concrete. At a minimum, the thermal control plan shall provide detailed information on the following requested items and shall comply with the specific specifications indicated for each item.

(1) Concrete mix design(s) to be used. Also any grout mix design if post-cooling with embedded pipe.

The mix design requirements in Articles 1020.04 and 1020.05 shall be revised to include the following additional requirements to control the heat of hydration.

a. The concrete mixture shall be uniformly graded and preference for larger size aggregate shall be used in the mix design. The use of CA 3 or CA 5, per Article 1020.04, will not be permitted when the nominal maximum aggregate size exceeds two-thirds the clear distance between parallel reinforcement bars, or between the reinforcement bar and the form. Nominal maximum aggregate size is defined as the largest sieve which retains any of the aggregate sample particles. Article 1004.02(d)(2), when applicable, and information in the “Portland Cement Concrete Level III Technician Course – Manual of Instructions for Design of Concrete Mixtures“ shall be used to develop the uniformly graded mixture.

b. The following shall apply to all concrete except Class DS concrete or when self-consolidating concrete is desired. For Central-Mixed concrete, the Contractor shall have the option to develop a mixture with a minimum of 520 lbs/cu yd (309 kg/cu m) of cement and finely divided minerals summed together. For Truck-Mixed or Shrink-Mixed concrete, the Contractor shall have the option to develop a mixture with a minimum of 550 lbs/cu yd (326 kg/cu m) of cement and finely divided minerals summed together. A water-reducing or high range water-reducing admixture shall be used in the Central-Mixed, Truck-Mixed or Shrink-Mixed concrete mixture. For any mixture to be placed underwater, the minimum cement and finely divided minerals shall be 550 lbs/cu yd (326 kg/cu m) for Central-Mixed concrete, and 580 lbs/cu yd (344 kg/cu m) for Truck-Mixed or Shrink-Mixed concrete.

For Class DS concrete, CA 11 may be used. If CA 11 is used, the Contractor shall have the option to develop a mixture with a minimum cement and finely divided minerals of 605 lbs/cu yd (360 kg/cu m) summed together. If CA 11 is used and either Class DS concrete is placed underwater or a self-consolidating concrete mixture is desired, the Contractor shall have the option to develop a mixture with a minimum cement and finely divided minerals of 635 lbs/cu yd (375 kg/cu m) summed together.

c. The minimum portland cement content in the mixture shall be 375 lbs/cu yd (222 kg/cu m). When the total of organic processing additions, inorganic processing additions, and limestone addition exceed 5.0 percent in the cement, the minimum portland cement content in the mixture shall be 400 lbs/cu yd (237 kg/cu m). However, the minimum portland cement may be reduced to as low as 330 lbs/cu yd (196 kg/cu m) if the concrete has adequate freeze/thaw durability. The Contractor shall provide freeze/thaw test results according to AASHTO T 161 Procedure A or B, and the relative dynamic modulus of elasticity of the mix design shall be a minimum of 80 percent. Freeze/thaw testing will not be required for concrete that will not be exposed to freezing and thawing conditions as determined by the Engineer.

d. The maximum cement replacement with fly ash shall be 40.0 percent. The maximum cement replacement with ground granulated blast-furnace slag shall be 65.0 percent. When cement replacement with ground granulated blast-furnace slag exceeds 35.0 percent, only Grade 100 shall be used.

e. The mixture may contain a maximum of two finely divided minerals. The finely divided mineral in portland-pozzolan cement or portland blast-furnace slag cement shall count toward the total number of finely divided minerals allowed. The finely divided minerals shall constitute a maximum of 65.0 percent of the total cement plus finely divided minerals. The fly ash portion shall not exceed 40.0 percent. The ground granulated blast-furnace slag portion shall not exceed 65.0 percent. The microsilica or high-reactivity metakaolin portion used together or separately shall not exceed 5.0 percent.

f. The time to obtain the specified strength may be increased to a maximum 56 days, provided curing is extended to a minimum of 14 days.

The minimum grout strength for filling embedded pipe shall be as specified for the concrete, and testing shall be according to AASHTO T 106.

(2) The selected mathematical method for evaluating heat of hydration thermal effects, which shall include the calculated adiabatic temperature rise, calculated maximum concrete temperature, and calculated maximum temperature differential between the internal concrete core and concrete 2 to 3 in. (50 to 75 mm) from the exposed surface. The time when the maximum concrete temperature and maximum temperature differential will occur is required if the time frame will be more than seven days.

Acceptable mathematical methods include ACI 207.2R “Report on Thermal and Volume Change Effects on Cracking of Mass Concrete” as well as other proprietary methods. The Contractor shall perform heat of hydration testing on the cement and finely divided minerals to be used in the concrete mixture. The test shall be according to ASTM C 186 or other applicable test methods, and the result for heat shall be used in the equation to calculate adiabatic temperature rise.

The Contractor has the option to propose a higher maximum temperature differential between the internal concrete core and concrete 2 to 3 in. (50 to 75 mm) from the exposed surface, but the proposed value shall not exceed 50° F (28° C). In addition, based on strength gain of the concrete, multiple maximum temperature differentials at different times may be proposed. The proposed value shall be justified through a mathematical method.

(3) Proposed maximum concrete temperature or temperature range prior to placement.

Article 1020.14 shall apply except a minimum 40° F (4° C) concrete temperature will be permitted.

(4) Pre-cooling, post-cooling, and surface insulation methods that will be used to ensure the concrete will comply with the specified maximum temperature and specified or proposed temperature differential. For reinforcement that extends beyond the limits of the pour, the Contractor shall indicate if the reinforcement is required to be covered with insulation.

Refer to ACI 207.4R "Cooling and Insulating Systems for Mass Concrete" for acceptable methods that will be permitted. A copy of the ACI document shall be provided to the Engineer at the construction site. If embedded pipe is used for post-cooling, the material shall be polyvinyl chloride or polyethylene. The embedded pipe system shall be properly supported, and the Contractor shall subsequently inspect glued joints to ensure they are able to withstand free falling concrete. The embedded pipe system shall be leak tested after inspection of the glued joints, and prior to concrete placement. The leak test shall be performed at maximum service pressure or higher for a minimum of 15 minutes. All leaks shall be repaired. The embedded pipe cooling water may be from natural sources such as streams and rivers, but shall be filtered to prevent system stoppages. When the embedded pipe is no longer needed, the surface connections to the pipe shall be removed to a depth of 4 in. (100 mm) below the surface of the concrete. The remaining pipe shall be completely filled with grout. The 4 in. (100 mm) deep concrete hole shall be filled with nonshrink grout. Form and insulation removal shall be done in a manner to prevent cracking and ensure the maximum temperature differential is maintained. Insulation shall be in good condition as determined by the Engineer and properly attached.

(5) Dimensions of each concrete pour, location of construction joints, placement operations, pour pattern, lift heights, and time delays between lifts.

Refer to ACI 207.1R "Guide to Mass Concrete" for acceptable placement operations that will be permitted. A copy of the ACI document shall be provided to the Engineer at the construction site.

(6) Type of temperature monitoring system, the number of temperature sensors, and location of sensors.

A minimum of two independent temperature monitoring systems and corresponding sensors shall be used.

The temperature monitoring system shall have a minimum temperature range of 32° F (0° C) to 212° F (100° C), an accuracy of ± 2° F (±1° C), and be able to automatically record temperatures without external power. Temperature monitoring shall begin once the sensor is encased in concrete, and with a maximum interval of one hour. Temperature monitoring may be discontinued after the maximum concrete temperature has been reached, post-cooling is no longer required, and the maximum temperature differential between the internal concrete core and the ambient air temperature does not exceed 35° F (19 ° C). The Contractor has the option to select a higher maximum temperature differential, but the proposed value shall not exceed 50° F (28° C). The proposed value shall be justified through a mathematical method.

As a minimum, a temperature sensor shall be located at the theoretical hottest portion of the concrete, normally the geometric center, and at the exterior face that will provide the maximum temperature differential. At the exterior face, the sensor shall be located 2 to 3 in. (50 to 75 mm) from the surface of the concrete. Sensors shall also be located a minimum of 1 in.(25 mm) away from reinforcement, and equidistant between cooling pipes if either applies. A sensor will also be required to measure ambient air temperature. The entrant/exit cooling water temperature for embedded pipe shall also be monitored.

Temperature monitoring results shall be provided to the Engineer a minimum of once each day and whenever requested by the Engineer. The report may be electronic or hard copy. The report shall indicate the location of each sensor, the temperature recorded, and the time recorded. The report shall be for all sensors and shall include ambient air temperature and entrant/exit cooling water temperatures. The temperature data in the report may be provided in tabular or graphical format, and the report shall indicate any corrective actions during the monitoring period. At the completion of the monitoring period, the Contractor shall provide the Engineer a final report that includes all temperature data and corrective actions.

(7) Indicate contingency operations to be used if the maximum temperature or temperature differential of the concrete is reached after placement.

(c) Temperature Restriction Violations. If the maximum temperature of the concrete after placement exceeds 150° F (66° C), but is less than 158° F (70° C), the concrete will be accepted if no cracking or other unacceptable defects are identified. If cracking or unacceptable defects are identified, Article 105.03 shall apply. If the concrete temperature exceeds 158° F (70° C), Article 105.03 shall apply.

If a temperature differential between the internal concrete core and concrete 2 to 3 in. (50 to 75 mm) from the exposed surface exceeds the specified or proposed maximum value allowed, the concrete will be accepted if no cracking or other unacceptable defects are identified. If unacceptable defects are identified, Article 105.03 shall apply.

When the maximum 150° F (66° C) concrete temperature or the maximum allowed temperature differential is violated, the Contractor shall implement corrective action prior to the next pour. In addition, the Engineer reserves the right to request a new thermal control plan for acceptance before the Contractor is allowed to pour again.

(d) Inspection and Repair of Cracks. The Engineer will inspect the concrete for cracks after the temperature monitoring is discontinued, and the Contractor shall provide access for the Engineer to do the inspection. A crack may require repair by the Contractor as determined by the Engineer. The Contractor shall be responsible for the repair of all cracks. Protective coat or a concrete sealer shall be applied to a crack less than 0.007 in. (0.18 mm) in width. A crack that is 0.007 in. (0.18 mm) or greater shall be pressure injected with epoxy according to Section 590.

Basis of Payment. This work shall not be paid for separately, but shall be included in the unit price per cubic yard (cubic meter) for CONCRETE STRUCTURES as appropriate.

NOISE ABATEMENT WALL, STRUCTURE MOUNTED

Description: This work shall consist of furnishing design calculations, shop drawings, materials and labor to construct a crash worthy noise abatement wall, mounted on a structure (noise wall), as shown on the plans and required by this specification.

General: This specification covers the minimum certification requirements of a crash worthy noise wall for use on bridges and structures.

The specification provides minimum performance criteria for quality, reliability, longevity and safety.

This specification was developed based on the design criteria for the suggested product Acrylite Soundstop TL4 System. Please see the source section of the specification for contact information for Evonik and Armtec, suppliers of this specific wall system.

Test Standards:

ASTM Standards:

A 36 – Standard Specification for Carbon Structural Steel

A 153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications

A449 - Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use

A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

A 500 – Standard Specification for Steel Structural Tubing in Rounds and Shapes

A 709 – Standard Specification for Structural Steel Shapes, Plates and Bars

D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position

D 638 – Test Method for Tensile Properties of Plastic

D 648 – Test Method for Deflection Temperature of Plastics Under Flexural Load

D 785 – Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials

D 790 – Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

D 1003 – Test Methods for Haze and Luminous Transmittance of Transparent Plastics

D 1929 – Test Method for Ignition Properties of Plastics

D 2843 – Test Method for Density of Smoke from Burning or Decomposition of Plastics

E 313 – Standard Practice for Calculating Yellowness and Whiteness Indices from Instrumentally Measured Color Coordinates

E 90 – Standard Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions

E 413 - Standard Classification for Determination of Sound Transmission Class

E 1996-97/02 – Standard Test Method for the performance of exterior windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes

G21 – Standard Practice for Determining Resistance of Synthetic Polymer Materials to Fungi

G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

NCHRP Report 350 – National Cooperative Highway Research Program report relating to roadside safety criteria and validation.

Other Standards

ANSI Standard Z97.1 – Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test

EN 1794-1 – Test for Resistance Against Damage by Stone Projectiles

EN 1794-2 – Test Method for Resistance to Brushwood Fire

EN 1794-2 – Secondary Safety: Danger from Falling Debris

ISO 9001:2008 – Quality Management System (Certification)

ISO 14001:2004 & RC 14001:2008 – Environmental Management System and Responsible Care (Certification)

Submittals: Prior to beginning the work, the Contractor will submit manufacturer's samples of product, certified test data, and shop drawings of framing and connection details for approval. Shop drawings shall be provided by the supplier, detailing all relevant aspects of sheet installation and connection details.

The Contractor shall prepare a noise wall design submittal and submit to the Engineer; the Department's Bureau of Bridges and Structures will review the submittal for approval. The noise walls shall be designed and constructed based on the alignment and elevations shown on the plans, with no omissions or gaps.

Complete design calculations for wall panels, posts, and all connections and shop drawings shall be submitted to the Engineer for review and approval no later than 90 days prior to beginning construction of the wall. The time required for the preparation and review of these submittals shall be charged to the allowable contract time. Delays caused by untimely submittals or insufficient data will not be considered justifications for any time extensions. No additional compensation will be made for any additional material, equipment or other items found necessary to comply with the project specifications as a result of the Engineer's review. The Contractor will be required to submit the necessary shop drawings. All submittals shall be signed and sealed by a Structural Engineer licensed in Illinois. Design calculations signed by the Structural Engineer shall be prepared for all applicable loading except for collision requirements, which will be met by meeting all the crash testing requirements detailed in this specification. The submittals shall include, but not be limited to, the following items:

Submittals shall include all details, dimensions, quantities and cross sections necessary for the construction of the noise walls and will include but not be limited to:

(1) A plan view of the wall indicating the stations and offsets for all required beginning, ending, and kink points. Each panel and post shall be numbered and any changes in type or size shall be noted. The locations of expansion joints, lighting, signing, and curb cuts shall also be shown.

(2) An elevation view of the wall, indicating the elevations of the framing members and panels as well as the elevations of the bottom of the panels. Each post and framing member size and length and panel type and size shall be designated. Clearance from centerline of post to nearest parapet joint shall be shown.

(3) A typical cross section(s) that shows the panel, posts and framing members, and connections.

(4) All general notes required for constructing the wall.

(5) Tops of the panels shall extend to the top of wall elevations shown on the contract plans.

(6) All panel types shall be detailed. The details shall show panel orientation, all dimensions necessary to fabricate each type of panel and location of post or framing member connection hardware as well as lifting devices.

(7) All architectural panel treatment, including color, texture and patterns shall be shown.

(8) The details for the connection between panels and posts as well as their connection to the structure shall be shown.

(9) Manufacturer recommended installation requirements, a sequence of construction and a detailed bill of materials shall be included.

(10) The design of the structure mounted noise walls that will interface with ground mounted noise walls shall be coordinated with the ground mounted noise wall supplier. The length of panel at the interface shall be detailed so that the overall wall geometry can be met. All applicable loads that the structure mounted noise wall may impart to the ground mounted noise wall shall be clearly outlined in the structure mounted noise wall calculations and coordinated with the ground mounted noise wall supplier, so that the ground mounted noise wall foundation will be designed to resist these loads.

The Contractor shall deliver to the Engineer samples as outlined in the plans. The samples must be made at the same plant that will be making the product for the noise walls under this contract and be representative of those which will be tested per this specification.

The initial submittal shall include three (3) sets of shop drawings and calculations. One set of drawings will be returned to the Contractor with any corrections indicated. The Contractor shall do no work or ordering of materials for the structure until the Engineer has approved the submittal.

Noise Barrier System Requirements

Qualification: The noise barrier system shall comply with all requirements of this specification. Manufacturers/suppliers shall have a minimum 5 year history of providing products that meet this specification.

General Requirements: The manufacturer shall provide facilities and qualified personnel to perform all specification tests and maintain an acceptable quality control program. An acceptable program is one that meets the requirements of QS 9000 and ISO 9002. To ensure total quality, all manufacturers shall provide proof of compliance for the production of noise barrier panels.

Manufacturers must have a minimum 5 year history of producing noise barrier assemblies for highway noise barriers.

Collision Requirements: The System shall be capable of sustaining one collision up to the level specified in the NCHRP 350, Test Level 4 without being separated from the bridge railing or structure to which it has been properly attached under this specification.

Certification of Crash Worthiness: The vendor shall provide a letter from a certified crash test facility indicating a physical crash test was conducted on the system and recommending acceptance by the Federal Highway Administration (FHWA.) The vendor shall be able to provide visual evidence of such crash test upon the request of the Department.

Structural Requirements: The incremental total weight of the system as installed shall not exceed 325 pounds per lineal foot.

The design wind loading shall be as specified on the plans but not less than 35 pounds per square foot.

Attachment Requirements: The system shall be attached to an approved crash-worthy concrete barrier with a minimum height of 32 inches. Attachment to the barrier and ground mounted noise wall will be designed for all specified design loads as specified herein, according to the AASHTO Guide Specification for Structural Design of Sound Barriers, 2002 and the current edition of the AASTHO LRFD Bridge Design Specifications. This includes the noise barrier self-weight (dead load) transverse wind load of 35 psf and AASHTO TL-4 vehicular impact load.

Epoxied anchor rods shall be embedded a minimum of 7.5 inches into the concrete barrier following manufacturer’s installation instructions. Chemical adhesive resin systems shall meet the requirements of the Section 1027 of the Department’s Standard Specifications for Road and Bridge Construction (SSRBC). Anchor assemblies shall be located and designed to miss standard parapet reinforcement shown on bridge plans.

Materials:

All components of the system shall meet the requirements of this specification.

Noise Barrier Panel:

1) Color and finish: The noise barrier panel color, finish, and aesthetic design shall be as shown on the plans. The paint color for structural steel components shall be as shown on the plans.

2) Dimensions: Dimensions of the noise barrier panel shall be specified by the applicable drawings. Unless otherwise specified, the tolerance on length and width dimensions for the panel shall be –0, +0.125".

Height of the system will be specified in applicable project plans.

3) Performance Characteristics: The noise barrier panel shall meet the performance requirements of Table 1 when tested in accordance with the associated ASTM method.

TABLE 1. Performance Requirements

PROPERTY	REQUIREMENT	ASTM Method
Tensile Strength	> 9,250 psi	D 638
Flexural Modulus	> 445,000 psi	D 790
Rockwell Hardness	> M-90	D 785
STC	27 dBA Minimum	E 90 / E 413

4) Flammability: The noise barrier panel shall meet the flammability requirements of Table 2 when tested in accordance with the associated test method.

Table 2. Flammability Requirements

PROPERTY	REQUIREMENT	Test Method
Resistance to brush fire	Class 2	EN 1794-2
Horizontal burn rate	< 2.5 in/min	ASTM D 635
Smoke density	< 50%	ASTM D 2843
Self Ignition	> 650°F	ASTM D 1929

5) Fragment Retention Following Vehicle Collision: Noise barrier panels that are installed in proximity to the travel lanes may be exposed to damage due to vehicle collision. In order to provide for the safety of the transportation system, such noise barrier panels will have the capability to contain fragments in the event that the panel is broken during the collision.

   The noise barrier panel shall be secured in such a way that the fragments do not fall when they are deformed or broken.

After an impact of 53k inch pounds (6 kJ) in accordance with the test method below, those fragments that are released from the noise barrier panel shall meet the following requirements:

Pieces of test specimen that are released shall be no larger than 4.0 in^2 (25cm^2) and shall weigh no more than 0.22 lbs (0.10 kg)

Pieces of test specimen that are released shall be no longer than 6 in (15cm)

Rigid pieces or the test specimen that are released shall have no angle of less than 15° and shall weigh no more than 0.22 lbs (0.10 kg)

No pieces shall weigh more than 0.88 lbs (0.40 kg)

These criteria shall only apply for one collision incident.

Test Method: The noise barrier panel shall be tested by either EN 1794-2 Annex B, "Secondary Safety: Danger of Falling Debris" or the following test method.

The method of testing is to cause a heavy mass to strike normally to the center or the most sensitive point of the test specimen so that the specimen is destroyed or pushed out of the holding structure.

A pendulum shall produce the impact. The impactor shall swing on 2 wires fixed on 2 points above the structure holding the test sample as shown in Figure 2. In order to reach the impact energy of 53 kips (6.0 kJ), the height of the fall of the impactor shall be 5 ft (1.5 m), corresponding to a speed of 12.2 mph (19.5 km/h). The radius of the pendulum shall be a minimum of 13 ft (4 m).

Impactor: The impactor consists of a rotational symmetrical full steel double cone with the dimensions shown if Figure A-1 and a weight of 880 lbs (400 kg).

Test Specimen: The test specimen shall be assembled in the supporting structure in the way intended by the manufacturer. Elements or systems with integrated or attached restraint systems shall be tested as complete assemblies.

6) Impact Resistance: In order to withstand impacts of stones thrown up from the road surface the noise barrier panel shall meet the requirements of EN 1794-1, Appendix C.

7) Glazing Requirements: The noise barrier panel shall comply with the requirements of ANSI Z97.1 as a safety glazing material.

8) Resistance to Roadside Chemicals: The noise barrier panel shall be resistant to standard de-ice chemicals such as: calcium chloride, magnesium chloride, potassium acetate, calcium/magnesium acetate and sodium acetate.

   Supplier shall show documentation of the chemical resistance properties of the panels. Panels should be able to withstand direct exposure to the chemical for a period of not less that 24 hours. Panels should be exposed to the chemicals at 100 percent (undiluted) strength.

9) Wildlife Protection: When the specified panel is transparent, the product shall provide for protection against birds inadvertently striking the panels in flight.

   The Supplier shall show documentation of the effectiveness of the means for wildlife protection. This shall be a test report or testimonial from an independent authority including but not limited to a Department or Ministry of Transportation, testing facility or other entity deemed acceptable.

10) Acoustical Requirements: Panels will provide a noise insertion loss or STC, of no less than 27 dBA when tested under test method ASTM E90. The vendor shall supply a test report from a certified test laboratory.

Structural Steel: All components, except bolts and corner cables, shall be cleaned and painted per Section 506 of the SSRBC. The paint system and color of the finish coat shall be as specified on the plans. Bolts shall be galvanized in accordance with ASTM A 153.

Steel components shall conform to Section 505 of the SSRBC and the following:

Bolts and washers: ASTM A 325, A 307, A193 Grade B7, or A449
I beam, plate, flat stock, channel and angles: A36
Tube: A 500 Gr. B

Welding: Welding materials shall be in accordance with the American Welding Society (AWS), structural welding code, D1.1. Welders will be certified in accordance with AWS D1.1.

Source: Materials will be supplied by one of the following or an approved equal meeting all the requirements of this specification:

Evonik Cyro LLC, 299 Jefferson Road, Parsippany, NJ 07054, 1-800-631-5384

Armtec, 8270 Greensboro Drive, Suite 810, McLean, VA 22102, 1-866-801-0999, erichumphries@armtec.com

Construction: Install the noise wall in accordance with manufacturers' recommendations or as directed by the engineer.

Method of Measurement. Structure mounted noise abatement walls will be measured in square feet from the top of barrier to the top of the noise abatement panel the length of the wall as shown on the contract plans.

Basis of Payment. This work will be paid for at the contract unit price per square foot for NOISE ABATEMENT WALL, STRUCTURE MOUNTED

NOISE ABATEMENT WALL, GROUND MOUNTED

This work shall consist of furnishing the design, shop drawings, materials, post anchorage, and construction of ground mounted noise abatement walls, (noise walls) according to these special provisions, the contract plans and and/or as directed by the Engineer.

General. The noise walls shall consist of panels spanning between vertical posts supported by concrete foundations (ground mounted) as shown on the plans. The design, material, fabrication and construction shall comply with this Special Provision, the Contract Plans and the requirements specified by the noise wall supplier selected by the Contractor for use on this project. The noise walls shall have no omissions or gaps except as detailed.

The Contractor shall verify the locations for proposed ground mounted wall for conflicts and realign or redesign the wall to avoid any conflicts. The Contractor shall inform the Engineer in writing of any conflicts before realigning or redesigning the wall.

Post spacing shall be 15 feet. Contractor to coordinate with utility owners to avoid existing and proposed underground utilities and storm sewers.

Wall components shall be fabricated and erected to produce a precast concrete reflective noise wall system and/or an absorptive noise reduction system at the locations indicated herein. The noise reduction system shall satisfy the acoustical requirements stated in these special provisions. Wooden walls will not be allowed as substitutes.
All appurtenances behind, in front of, under, over, mounted upon, or passing through, such as drainage structures, highway signage, utilities, and storm sewers shall be accounted for in design of the wall.

Submittals. The Contractor shall prepare a wall and foundation design submittal and submit to the Engineer; the Department's Bureau of Bridges and Structures will review the submittal for approval. The noise walls shall be designed and constructed based on the alignment and elevations shown on the plans, with no omissions or gaps and as directed by the engineer.

Complete design calculations for wall panels, posts, foundations, and all connections and shop drawings shall be submitted to the Engineer for review and approval no later than 90 days prior to beginning construction of the wall. The time required for the preparation and review of these submittals shall be charged to the allowable contract time. Delays caused by untimely submittals or insufficient data will not be considered justifications for any time extensions. No additional compensation will be made for any additional material, equipment or other items found necessary to comply with the project specifications as a result of the Engineer's review. The Contractor will be required to submit the necessary shop drawings. All submittals shall be signed and sealed by a Structural Engineer licensed in Illinois and include, but not be limited to, the following items:

Submittals shall include all details, dimensions, quantities and cross sections necessary for the construction of the noise walls and will include but not be limited to:

(1) A plan view of the wall indicating the stations and offsets required to locate the drilled shaft foundations. The proposed foundation diameter(s) and spacing(s) shall be indicated with all changes to the horizontal alignment shown. Each panel and post shall be numbered and any changes in type or size shall be noted. The centerline of any utilities passing under the wall and locations of expansion joints, lighting, signing, curb cuts, and drainage structures shall also be shown.

(2) An elevation view of the wall, indicating the elevations of the top of the posts and panels as well as the elevations of the bottom of the panels, tops of the shaft foundations, all steps in wall system, the finished grade line, and vertical clearances to existing utilities and storm sewers. Each post size and length, panel type and size, and foundation depth shall be designated.

(3) A typical cross section(s) that shows the panel, post, foundation, and the elevation relationship between existing ground conditions and the finished grade as well as slopes adjacent to the wall.

(4) All general notes required for constructing the wall.

(5) All details for the steps in the bottom of panels shall be shown. The bottom of the panels shall be located at or below the theoretical bottom of panel line shown on the contract plans. The theoretical bottom of panel line is assumed to be 8 in below the finished grade line at front face of the wall, unless otherwise shown on the contract plans.

(6) Tops of the panels shall extend to the top of wall elevations shown on the contract plans. All panel tops shall be cast and placed horizontally with any changes in elevation accomplished by stepping adjacent panel sections at posts, as shown in the plans.

(7) All panel types shall be detailed. The details shall show panel orientation, all dimensions necessary to cast and fabricate each type of panel, the reinforcing steel, and location of post or foundation connection hardware as well as lifting devices embedded in the panels and posts. The Noise Reduction Coefficient (NRC) of each panel of the absorptive face (if applicable) shall be noted.

(8) All post types shall be detailed. The details shall show all dimensions necessary to cast and/or fabricate each type of post, the reinforcing steel, connecting plates, and anchorage details. Post spacing for walls shall be 15 feet.

(9) Details of wall panels with appurtenances attached to or passing through the wall, as shown on the contract plans, such as utilities, framed openings, drainage structures, signs, etc. shall be shown. Any modifications to the design or location of these appurtenances to accommodate a particular system shall also be submitted.

(10) All architectural panel treatment, including color, texture and form liner patterns shall be shown. All joints shall be placed horizontal and have 3/4 inch beveled edges. All panels equal to or less than 13 ft tall shall be a single panel. Panels taller than 13 ft shall not contain a joint thru the Type I form liner (wave pattern).

(11) The details for the connection between panels and posts as well as their connection to the foundation, independent beam, and/or retaining wall parapet shall be shown. Foundation details including details showing the dimensions, reinforcement and post anchorage system for the drilled shaft foundations shall be shown.

(12) Testing, certifications and reports from independent laboratories showing that the panel's sound Transmission Loss (TL) and NRC for the panel and post deflection satisfy the criteria shown in the design criteria section of this specification. The testing for the flame spread, smoke density and freeze-thaw/salt scaling requirements described in the materials section of this specification shall also be submitted.

(13) Manufacturer recommended installation requirements, a sequence of construction and a detailed bill of materials shall be included.

(14) The location, size, and type of the posts and foundations that will interface with structure mounted noise walls shall be coordinated with the structure mounted noise wall supplier.

The Contractor shall deliver to the Department samples as outlined in the plans. The samples must be made at the same plant that will be making the product for the noise walls under this contract and be representative of those which will be tested per this specification. Once the sample is approved, a batch shall be designated by batch number and date and will remain the standard for the entire project.

The Contractor shall submit site access plans showing access and limits of the work areas for the installation of the wall. Any required traffic controls shall be according to the requirements in the special provision for TRAFFIC CONTROL PLAN.

The initial submittal shall include three (3) sets of shop drawings and calculations. One set of drawings will be returned to the Contractor with any corrections indicated. The Contractor shall do no work or ordering of materials for the structure until the Engineer has approved the submittal.

Design Criteria. The wall system shall be designed to withstand wind pressure, applied perpendicular to the panels in either direction, according to the AASHTO Guide Specifications for Structural Design of Sound Barriers, 1989 and interims. The concrete and steel components shall be designed according to the AASHTO Standard Specifications for Highway Bridges with a design life of 35 years unless otherwise noted. The wall system shall be designed to withstand active earth pressure and live load surcharge. The contractor shall be responsible for the structural adequacy of the panels, posts, foundations and connections as well as overall wall overturning stability. Prestressed and/or post tensioned panel concepts will not be permitted.

The design wind loading shall be as specified on the plans but not less than 35 psf when located on retaining walls or traffic barriers. This loading can be reduced to 25 psf for ground mounted noise walls where it is located more than a distance equal to the height of the wall away from the edge of pavement. When a noise wall is also required to support earth pressures, the service design active earth pressure shall be based on an equivalent fluid pressure of 40 pounds per cubic foot and a live load surcharge pressure equal to not less than 2 feet of earth pressure. The earth pressure fill height shall be defined by the proposed grade line elevation and the theoretical bottom of panel line.

Reinforcement of the concrete foundation shafts shall consist of a minimum of 8-#5 vertical bars symmetrically placed and tied with #3 ties at 6 in. centers. An additional tie shall be provided at the top and bottom of the foundation. As an alternative to the ties, a #3 spiral at a 6 in. pitch with an additional 1 1/2 turns at the top and bottom of the foundation or an equivalent 4 x 4 – W12.3 x W7.4 welded wire fabric may be substituted. The post shall be connected to the foundation by embedding the post inside the concrete foundation shaft. Embedded posts shall extend into the foundation shafts a minimum of 80 percent of the shaft length. The posts may alternatively be mounted to the foundation shafts with base plates and anchor bolts as required by design. The minimum number of anchor bolts per post shall be 4-1 in. diameter bolts with a minimum embedment of 18 inches.

The material and construction of the foundations (drilled shafts) for ground mounted noise walls shall be according to Section 516 except that the payment for the drilled shaft and reinforcement will be included with the payment for the NOISE ABATEMENT WALL, GROUND MOUNTED.

The shaft foundation dimensions shall be determined using Broms method of analysis. Soil borings from prior soil investigations are shown in the plans. The design shall utilize a factor of safety of 2.0, applied to the soil shear strength if cohesive or the unit weight if granular, and account for the effects of a sloping ground surface and water table indicated in the soil borings on the plans. The following should be assumed for the foundation design:

Effective unit weight	70 pcf
Internal friction angle	30 degrees
Cohesion intercept	0 ksf

The post spacing shall be 15 feet center to center. The maximum allowable panel deflection shall be no more than the panel length (L) divided by 240 (L/240). The vertical posts shall have a maximum deflection of (H/180) where H is the height of the post above the foundation. A lateral load report shall be submitted to the Engineer indicating that the above noted design lateral loads can be applied to the panels and/or posts without exceeding noted deflection tolerance. The test shall apply lateral loads to the panel simulating uniform wind pressure.

The design shall account for the presence of all appurtenances mounted on or passing through the wall such as drainage structures, existing or proposed utilities and other items.

Corrugations, ribs or battens on the panel must be oriented vertically when erected. The panels shall be designed to prevent entrapment and ponding of water. The walls shall not have openings allowing the perching or nesting of birds or the collection of dirt, debris or water.
The walls shall not have handholds or grips promoting climbing of the walls. Any bolts or fasteners used to connect material to the supporting panel, posts, or foundations shall be recessed or embedded in concrete, hidden from view and weather exposure. No external mechanical fastening devices such as frames or clips shall be used for these connections. The post to foundation connection shall utilize a corrosion protection system that is designed to last 75 years.

The noise abatement material shall be designed to achieve a sound TL equal to or greater than 20 dB in all one-third octave bands from 100 hertz to 5000 hertz, inclusive, when tested according to ASTM E-90. The sound absorptive material shall have a minimum NRC as indicated in Table 1.

Table 1

Noise Wall No.	From	To	Noise Wall Side	NRC*	Comments
8	64+09.31	77+19.73	Expressway	Reflective	
	64+09.31	77+19.73	Residential	Absorptive-0.65	
10	2065+20.64	2070+89.83	Local Road	Reflective	
	2065+20.64	2070+89.83	Residential	Absorptive-0.65	

* For the side of the wall specified as reflective, no minimum NRC is required.

The NRC shall be determined per ASTM E795, tested according to ASTM C423 (mounting type A). The ratio of noise absorptive material on the panel surface to total wall area (including posts) shall be greater than 90 percent. NRC testing shall be performed on coated samples, utilizing the stain that will be applied for color.

Materials. Noise wall materials shall conform to the supplier's standards, AASHTO Specifications for noise walls and the following:

(a) Reinforcement bars shall satisfy ASTM A706 Grade 60. Welded wire fabric shall be according to AASHTO M 55.

(b) Anchor bolts shall conform to ASTM F1554 Grade 55 or 105.

(c) The precast elements shall be according to applicable portions of Section 1042 (Exception: Coarse Aggregate shall meet the requirements of Article 1004.02(f)). Additionally, dry cast concrete element will not be permitted. Wooden or steel materials will not be allowed as substitutes for the panels.

(d) For sound absorptive panels, the manufacturer shall provide test information from an independent lab that the panels are durable. This information shall be either a freeze/thaw test according to AASHTO T 161 (ASTM C 666) Procedure A or B, or it shall be a salt scaling test according to ASTM C 672.

For the freeze/thaw test, a minimum of three specimens shall have been tested. The maximum weight (mass) loss after 300 cycles shall be 7.0 percent. The panel shall have no cracks, delamination (applies to composite material panel), or other excessive physical distress upon completion of the test.

For the salt scaling test, the test method shall be modified as outlined in Appendix D of the Guidelines for Evaluating the Performance of Highway Sound Barriers by the Highway Innovative Technology Evaluation Center (HITEC), A Service Center of the Civil Engineering Research Foundation, CERF REPORT: HITEC 96-04, Product 24 (October 1996). The maximum weight (mass) loss after 50 cycles using a 3 percent sodium chloride solution shall be 0.2 psf. The panel shall have no cracks, delamination (applies to composite material panel), or other excessive physical distress upon completion of the test.

For sound reflective panels, evidence of durability by one of the two previously mentioned tests is required for all materials except Class PC concrete.

(e) The manufacturer for the noise abatement wall shall provide their quality control plan for testing the product, and test results shall be provided upon request by the Engineer. Manufacturers on the Approved List of Certified Precast Concrete Producers who are approved for noise abatement walls will be considered in compliance with this requirement.

(f) Steel plates and posts shall conform to AASHTO M 270 Grade 36 or 50. All portions of the post shall be galvanized according to AASHTO M111 and ASTM A385. Steel bolts, nuts, washers and anchor bolts shall be galvanized according to AASHTO M232. The portion of steel posts exposed to view shall then be painted with a paint system in the shop according to the special provision for Surface Preparation and Painting of Galvanized Steel Traffic Structures. The cost for Surface Preparation and Painting of Galvanized Steel Traffic Structures shall be included in the contract unit price for NOISE ABATEMENT WALL, GROUND MOUNTED. The color of the paint system shall closely match the panels. Ground steel posts according to section 806 of the standard specifications if posts are within 10 feet horizontally of the overhead electrical line.

(g) Lifting inserts cast into the panels shall be hot dipped galvanized.

(h) Non shrink grout shall be according to Article 1024.

(i) The color of both sides of the panels, posts and other visible elements shall that of conventional concrete. Contractor shall ensure the concrete mix design used produces a color that is uniform for all panels and posts.

(j) The architectural finish shall be as specified on the plans.

(k) With the exception of the steel and Portland cement concrete elements of the wall, all materials shall be tested for flame spread and smoke density developed according to ASTM E84. The material must exhibit a flame-spread index less than 10 and a smoke density developed value of 10 or less.

Fabrication. All precast units shall be manufactured according to Section 504 and the following requirements and tolerances with respect to the dimensions shown on the approved shop drawings.

(a) The minimum reinforcement bar cover shall be 1 1/2 in.

(b) All reinforcement shall be epoxy coated

(c) Panel dimensions shall be within 1/4 in.

(d) All hardware embedded in panels or posts shall be within 1/4 in.

(e) Angular distortion with regard to panel squareness, defined as the difference between the two diagonals, shall not exceed 1/2 in.

(f) Surface defects on formed surfaces measured on a length of 5 ft shall not be more than 0.10 in.

(g) Posts shall be installed plumb to within 1/2 in of vertical for every 15 ft of height and to within 1/2 in of the station and offset indicated on the approved shop drawings.

(h) Drilled shaft foundations shall be placed within 2 in of the station and offset indicated on the approved shop drawings.

(i) Panel reinforcement and lifting devices shall be set in place to the dimension and tolerances shown on the plans and these special provisions prior to casting.

The date of manufacture, the production lot number, and the piece-mark shall be clearly noted on each panel.

Absorptive material shall be permanently attached to their supporting elements and no external mechanical fastening systems such as frames or clips shall be used. Any bolts or fasteners used shall be recessed or embedded below the surface.

Any chipping, cracks, honeycomb, or other defects, to be allowed, shall be within acceptable standards for precast concrete products according to Section 1042.

Construction. The Contractor shall obtain technical assistance from the supplier during wall erection to demonstrate proper construction procedures and shall include any costs related to this technical assistance in the contract unit price for NOISE ABATEMENT WALL, GROUND MOUNTED. The instructions provided by the wall supplier are guidelines and do not relieve the contractor of the responsibility to adhere to contract requirements.

It is recommended that all bottom panels be installed for a length of wall prior to placing top panels. After bottom panels are in-place, finish grading can be accomplished with heavy equipment by reaching over the in-place panels.

Site excavations and/or fill construction shall be completed to plan elevations and profiles prior to the start of wall foundation construction. All underground utility or drainage structure installation shall be completed prior to foundation installation. The ground elevations as shown on the plans and the approved noise wall shop drawings shall be verified by the contractor and discrepancies corrected prior to material fabrication. Buried utilities shall be marked to verify proper clearance from the drilled foundations. The Contractor should consider overhead obstruction such as electric and telephone wires prior to wall erection.

If the soils encountered during drilling of the foundations are not representative of the information shown on the soil borings in the contract plans, the Engineer shall be notified to evaluate the required foundation modifications. The shaft foundation will normally require additional length, which may be paid separately under Article 104.03. All drilled shaft excavations shall be filled with concrete within 6 hours of their initiation. The concrete for the drilled shaft foundations shall be placed against undisturbed, in-place soils. The concrete at the top of the shaft shall be shaped to provide the panels on each side of the post adequate bearing area and correct elevation per the approved shop drawings.

The panels shall be delivered to the project site in full truckload quantities. They may be off-loaded individually or by forklift with a solid steel plate spanning between the forks. Providing uniform, fully distributed bearing support to the underside of the panels. Units shall be shipped, handled and stored in such a manner as to minimize the danger of staining, chipping, spalling, development of cracks, fractures, and excessive bending stresses. Panels shall be stored and shipped in bundles, on edge. Any touch up and repair is at no additional cost to the Department and shall be carried out according to the manufacturer's recommendations or as directed by the Engineer.

Method of Measurement. Ground mounted noise abatement walls will be measured in square feet from the top of wall elevation to the theoretical bottom of panel line for the length of the wall as shown on the contract plans.

Basis of Payment. This work will be paid for at the contract unit price per square foot for NOISE ABATEMENT WALL, GROUND MOUNTED.

TEMPORARY SHORING AND CRIBBING
Effective: July 16, 1992 Revised: October 17, 2011

Description: This item shall consist of furnishing all material, equipment and labor to support the effected beam(s) during the substructure repairs as shown on the plans, as herein specified and as directed by the Engineer.

Construction Requirements: The Contractor shall submit details and calculations, prepared and sealed by an Illinois Licensed Structural Engineer, of the support system he/she proposes to use for approval of the Engineer prior to ordering of material and implementation. Such approval shall in no way relieve the Contractor of responsibility for the safety of the structure. The supports used shall be such that vertical adjustments may be made in order to maintain the existing beam profile. Prior to starting substructure repairs, the temporary supports shall be used to place an upward reaction on the effected beams designated in the plans, equal to but not larger than the dead load reactions given in the plans, thus relieving the superstructure dead load reaction from the substructure unit to be repaired. It is not the intention to raise the effected beams. As the vertical load is incrementally increased to the specified load, if vertical movement is detected the load shall not be increased further.

Additionally, if the work is to be completed under stage construction without traffic directly over the beams being shored then the Temporary Shoring and Cribbing shall be designed to carry the Dead Load plus 1/2 (Live Load + Imp) plus Lateral Load as shown in the plans. If work is to be completed with traffic directly over the beams being shored then the Temporary Shoring and Cribbing shall be designed to carry the Dead Load plus full (Live Load + Imp) plus Lateral Load as shown in the plans.

Basis of Payment: The work specified herein, as shown on the plans and as directed by the Engineer, shall be paid for at the contract unit price each for TEMPORARY SHORING AND CRIBBING for each beam support location required.

GEOTECHNICAL INVESTIGATION LABORATORY DATA

Description. The following data was collected during preliminary engineering and is attached herein for the Contractor's information.

Data included is in reference to the following structures which require Aggregate Column Ground Improvements:

SN 081-6014 – Retaining Wall 05
SN 081-6015 – Retaining Wall 06
SN 081-6017 – Retaining Wall 11
SN 081-6020 – Retaining Wall 13

DRAINAGE SYSTEM
Effective: June 10, 1994 Revised: June 24, 2015

Description. This work shall consist of furnishing and installing a bridge drainage system as shown on the plans, including all piping, fittings, support brackets, inserts, bolts, and splash blocks when specified.

Material. The pipe and fittings shall be reinforced fiberglass according to ASTM D 2996 RTRP with a 30,000 psi (207 MPa) minimum short-time rupture strength hoop tensile stress. The reinforced fiberglass shall also have an apparent stiffness factor at 5 percent deflection exceeding 200 cu in.-lbf/sq. in. (22.6 cu mm-kPa) and a minimum wall thickness of 0.10 in. (2.54 mm). The adhesive for joining pipe and fittings shall be as recommended by the manufacturer. All pipe supports and associated hardware shall be hot dip galvanized according to AASHTO M 232 (M 232M). The fiberglass pipe and fittings furnished shall be pigmented through out, or have a resin-rich pigmented exterior coat, specifically designed for overcoating fiberglass, as recommended by the manufacturer. The color shall be as specified by the Engineer. The resin in either case shall have an ultraviolet absorber designed to prevent ultraviolet degradation. The ultraviolet protection shall be designed to withstand a minimum of 2,500 hours of accelerated weathering when tested in conformance with the requirements in ASTM Designation: G 154. Lamps shall be UV-8 (313 nm wavelength). The resting cycle shall be 4 hours of ultraviolet exposure at 140°F (60°C), and then 4 hours of condensate exposure at 120°F (49°C). After testing, the surface of the pipe shall exhibit no fiber exposure, crazing, or checking, and only a slight chalking or color change. The supplier shall certify the material supplied meets or exceeds these requirements.

Design. The drainage system shall be designed as an open system with allowances for the differential expansion and contraction expected between the superstructure and the substructure to which the drainage system is attached.

Installation. All connections of pipes and fittings shown on the plans to facilitate future removal for maintenance cleanout or flushing shall be made with a threaded, gasketed coupler or a bolted gasketed flange system. Adhesive bonded joints will be permitted for runs of pipe between such connections. The end run connection shall feature a minimum nominal 6 in. (150 mm) female threaded fiberglass outlet. Straight runs may utilize a 45 degree reducing saddle bonded to the pipe. The female outlet shall be filled with a male threaded PVC plug.

Runs of pipe shall be supported at spacings not exceeding those recommended by the manufacturer of the pipe. Supports that have point contact or narrow supporting areas shall be avoided. Standard slings, clamps, clevis hangers and shoe supports designed for use with steel pipe may be used. A minimum strap width for hangers shall be 1 1/2 in. (40 mm) for all pipe under 12 in. (300 mm) in diameter and 2 in. (50 mm) for diameters 12 in. (300 mm) or greater. Straps shall have 120 degrees of contact with the pipe. Pipes supported on less than 120 degrees of contact shall have a split fiberglass pipe protective sleeve bonded in place with adhesive.

All reinforced fiberglass pipe, fittings, and expansion joints shall be handled and installed according to guidelines and procedures recommended by the manufacturer or supplier of the material.

Basis of Payment. This work will be paid for at the contract lump sum price for DRAINAGE SYSTEM.

HIGH LOAD MULTI-ROTATIONAL BEARINGS
Effective: October 13, 1988 Revised: April 1, 2016

Description. This work shall consist of furnishing and installing High Load Multi-Rotational type bearing assemblies at the locations shown on the plans.

High Load Multi-Rotational (HLMR) bearings shall be one of the following at the Contractors option unless otherwise noted on the plans:

a) Pot Bearings. These bearings shall be manufactured so that the rotational capability is provided by an assembly having a rubber disc of proper thickness, confined in a manner so it behaves like a fluid. The disc shall be installed, with a snug fit, into a steel cylinder and confined by a tight fitting piston. The outside diameter of the piston shall be no more than 0.03 in. (750 microns) less than the inside diameter of the cylinder at the interface level of the piston and rubber disc. The sides of the piston shall be beveled. PTFE sheets, or silicone grease shall be utilized to facilitate rotation of the rubber disc. Suitable brass sealing rings shall be provided to prevent any extrusion between piston and cylinder.

b) Shear Inhibited Disc Type Bearing. The Structural Element shall be restricted from shear by the pin and ring design and need not be completely confined as with the Pot Bearing design. The disc shall be a molded monolithic Polyether Urethane compound.

These bearings shall be further subdivided into one or more of the following types:

1) Fixed. These allow rotation in any direction but are fixed against translation.

2) Guided Expansion. These allow rotation in any direction but translation only in limited directions.

3) Non-Guided Expansion. These allow rotation and translation in any direction.

The HLMR bearings shall be of the type specified and designed for the loads shown on the plans. The design of the top and bottom bearing plates are based on detail assumptions which are not applicable to all suppliers and may require modifications depending on the supplier chosen by the Contractor. The overall depth dimension for the HLMR bearings shall be as specified on the plans. The horizontal dimensions shall be limited to the available bearing seat area. Any modifications required to accommodate the bearings chosen shall be submitted to the Engineer for approval prior to ordering materials. Modifications required shall be made at no additional cost to the State. Inverted pot bearing configurations will not be permitted.

The Contractor shall comply with all manufacturer’s material, fabrication and installation requirements specified.

All bearings shall be supplied by prequalified manufacturers. The Department will maintain a list of prequalified manufacturers.

Submittals. Shop drawings shall be submitted to the Engineer for approval according to Article 105.04 of the Standard Specifications. In addition the Contractor shall furnish certified copies of the bearing manufacturer's test reports on the physical properties of the component materials for the bearings to be furnished and a certification by the bearing manufacturer stating the bearing assemblies furnished conform to all the requirements shown on the plans and as herein specified. Submittals with insufficient test data and supporting certifications will be rejected.

Materials. The materials for the HLMR bearing assemblies shall be according to the following:

(a) Elastomeric Materials. The rubber disc for Pot bearings shall be according to Article 1083.02(a) of the Standard Specifications.

(b) Polytetrafluoroethylene (PTFE) Material. The PTFE material shall be according to Article 1083.02(b) of the Standard Specifications.

(c) Stainless Steel Sheets: The stainless steel sheets shall be of the thickness specified and shall be according to Article 1083.02(c).

(d) Structural Steel. All structural steel used in the bearing assemblies shall be according to AASHTO M 270, Grade 50 (M 270M Grade 345), unless otherwise specified.

(e) Threaded studs. The threaded stud, when required, shall conform to the requirements of Article 1083.02(d)(4) of the Standard Specifications.

(f) Polyether Urethane for Disc bearings shall be according to all of the following requirements:

PHYSICAL PROPERTY	ASTM TEST METHOD	REQUIREMENTS	
Hardness, Type D durometer	D 2240	45 Min	65 Max
Tensile Stress, psi (kPa) At 100% elongation, min	D 412	1500 psi (10,350 kPa)	2300 psi (15,900 kPa)
Tensile Stress, psi (kPa) At 200% elongation, min	D 412	2800 psi (19,300 kPa)	4000 psi (27,600 kPa)
Tensile Strength, psi (kPa), min	D 412	4000 psi (27,600 kPa)	6000 psi (41,400 kPa)
Ultimate Elongation, %, min	D 412	350	220
Compression Set 22 hr. at 158 °F (70 °C), Method B %, max	D 395	40	40

The physical properties for a durometer hardness between the minimum and maximum values shown above shall be determined by straight line interpolation.

Design. The fabricator shall design the HLMR bearings according to the appropriate AASHTO Design Specifications noted on the bridge plans.

Fabrication. The bearings shall be complete factory-produced assemblies. They shall provide for rotation in all directions and for sliding, when specified, in directions as indicated on the plans. All bearings shall be furnished as a complete unit from one manufacturing source. All material used in the manufacture shall be new and unused with no reclaimed material incorporated into the finished assembly.

The translation capability for both guided and non-guided expansion bearings shall be provided by means of a polished stainless steel sliding plate that bears on a PTFE sheet bonded and recessed to the top surface of the piston or disc. The sliding element of expansion bearings shall be restrained against movement in the fixed direction by exterior guide bars capable of resisting the horizontal forces or 20 percent of the vertical design load on the bearing applied in any direction, whichever is greater. The sliding surfaces of the guide bar shall be of PTFE sheet and stainless steel. Guiding off of the fixed base, or any extension of the base, will not be permitted.

Structural steel bearing plates shall be fabricated according to Article 505.04(l) of the Standard Specifications. Prior to shipment the exposed edges and other exposed portions of the structural steel bearing plates shall be cleaned and given a corrosion protection coating as specified on the plans and according to the applicable Special Provisions and Articles 506.03 and 506.04 of the Standard Specifications. During cleaning and coating the stainless steel, PTFE sheet and neoprene shall be protected from abrasion and coating material.

PTFE sheets shall be bonded to steel under factory controlled conditions using heat and pressure for the time required to set the epoxy adhesive used. The PTFE sheet shall be free from bubbles and the sliding surface shall be burnished to an absolutely smooth surface.

The steel piston and the steel cylinder for pot bearings shall each be machined from a solid piece of steel. The steel base cylinder shall be either integrally machined, recessed into with a snug fit, or continuously welded to its bottom steel bearing plate.

Packaging. Each HLMR bearing assembly shall be fully assembled at the manufacturing plant and delivered to the construction site as complete units. The assemblies shall be packaged, crated or wrapped so the assemblies will not be damaged during handling, transporting and shipping. The bearings shall be held together with removable restraints so sliding surfaces are not damaged.

Centerlines shall be marked on both top and base plates for alignment in the field. The bearings shall be shipped in moisture-proof and dust-proof covers.

Performance Testing. The following performance tests are required. All tests shall be performed by the manufacturer prior to shipment. Where lot testing is permitted, a lot size shall be the number of bearings per type on the project but not to exceed 25 bearings per type.

Dimension Check. Each bearing shall be checked dimensionally to verify all bearing components are within tolerances. Failure to satisfy any dimensional tolerance shall be grounds for rejecting the bearing component or the entire bearing assembly.

Clearance Test. This test shall be performed on one bearing per lot. The bearing selected for this test shall be the one with the least amount of clearance based on the dimension check. The bearing assembly shall be loaded to its service limit state rated capacity at its full design rotation but not less than 0.02 radians to verify the required clearances exist. This test shall be performed twice for each bearing with the rotation oriented longitudinally with the bridge once in each direction. Any visual signs of rubbing or binding shall be grounds for rejection of the lot.

Proof Load Test. This test shall be performed on one bearing per lot. The bearing assembly shall be load tested to 150 percent of the service limit state rated capacity at a rotation of 0.02 radians. The load shall be maintained for 5 minutes, removed then reapplied for 5 minutes. If the load drops below the required value during either application, the test shall be restarted from the beginning. This test shall be performed twice for each bearing with the rotation oriented longitudinally with the bridge once in each direction.

The bearing shall be visually examined both during the test and upon disassembly after the test. Any resultant visual defects include, but are not limited to:

1. Extruded or deformed elastomer, polyether urethane, or PTFE.
2. Insufficient clearances such as evidence of metal to metal contact between the pot wall and the top plate.
3. Damaged components such as cracked steel, damaged seal rings, or damaged limiting rings.
4. Bond failure.

If any of the above items are found it shall be grounds for rejection of the lot.

Sliding Friction Test. For expansion bearings, this test shall be performed on one bearing per lot. The sliding surfaces shall be thoroughly cleaned with a degreasing solvent. No lubrication other than that specified for the bearing shall be used. The bearing shall be loaded to its service limit state rated capacity for 1 hour prior to and throughout the duration of the sliding test. At least 12 cycles of plus and minus sliding with an amplitude equaling the smaller of the design displacement and 1 inch (25 mm) shall then be applied. The average sliding speed shall be between 0.1 inch and 1.0 inches (2.5 mm and 25 mm) per minute. The sliding friction coefficient shall be computed for each direction of each cycle and its mean and standard deviation shall be computed for the sixth through twelfth cycles.

The friction coefficient for the first movement and the mean plus two standard deviations for the sixth through twelfth cycles shall not exceed the design value used. In addition, the mean value for the sixth through twelfth cycles shall not exceed 2/3 of the design value used. Failure of either of these shall result in rejection of the lot.

The bearing shall also be visually examined both during and after the testing, any resultant defects, such as bond failure, physical destruction, or cold flow of the PTFE shall also be cause for rejection of the lot.

The Contractor shall furnish to the Department a notarized certification from the bearing manufacturer stating the HLMR bearings have been performance tested as specified. The Contractor shall also furnish to the Engineer of Tests at the Bureau of Materials and Physical Research (126 East Ash Springfield, IL 62704) a purchase order prior to fabrication. The purchase order shall contain, as a minimum, the quantity and size of each type of bearing furnished. The Department reserves the right to perform any of the specified tests on one or more of the furnished bearings. If the tested bearing shows failure it shall be replaced and the remaining bearings shall be similarly tested for acceptance at the Contractor's expense.

When directed by the Engineer, the manufacturer shall furnish an additional bearing assembly and/or random samples of component materials used in the bearings, for testing by the Department, according to Article 1083.04 of the Standard Specifications.

Installation. The HLMR bearings shall be erected according to Article 521.05 of the Standard Specifications.

Exposed edges and other exposed portions of the structural steel plates shall be field painted as specified for Structural Steel.

Basis of Payment. This work will be paid for at the contract unit price each for HIGH LOAD MULTI-ROTATIONAL BEARINGS, FIXED; HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION; or HIGH LOAD MULTI-ROTATIONAL BEARINGS, NON-GUIDED EXPANSION of the load rating specified.

When the fabrication and erection of HLMR bearings is accomplished under separate contracts, the applicable requirements of Article 505.09 shall apply.

Fabricated HLMR bearings and other materials complying with the requirements of this item, furnished and accepted, will be paid for at the contract unit price each for FURNISHING HIGH LOAD MULTI-ROTATIONAL BEARINGS, FIXED, FURNISHING HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION or FURNISHING HIGH LOAD MULTI-ROTATIONAL BEARINGS, NON-GUIDED EXPANSION of the load rating specified.

Storage and care of fabricated HLMR bearings and other materials complying with the requirements of this item by the Fabrication Contractor beyond the specified storage period, will be paid for at the contract unit price per calendar day for STORAGE OF HIGH LOAD MULTI-ROTATIONAL BEARINGS if a pay item is provided for in the contract, or will be paid for according to Article 109.04 if a pay item is not provided in the contract.

HLMR bearings and other materials fabricated under this item erected according to the requirements of the specifications, and accepted, will be paid for at the contract unit price each for ERECTING HIGH LOAD MULTI-ROTATIONAL BEARINGS, FIXED, ERECTING HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION or ERECTING HIGH LOAD MULTI-ROTATIONAL BEARINGS, NON-GUIDED EXPANSION of the load rating specified.

PIPE UNDERDRAINS FOR STRUCTURES
Effective: May 17, 2000 Revised: January 22, 2010

Description. This work shall consist of furnishing and installing a pipe underdrain system as shown on the plans, as specified herein, and as directed by the Engineer.

Materials. Materials shall meet the requirements as set forth below:

The perforated pipe underdrain shall be according to Article 601.02 of the Standard Specifications. Outlet pipes or pipes connecting to a separate storm sewer system shall not be perforated.

The drainage aggregate shall be a combination of one or more of the following gradations, FA1, FA2, CA5, CA7, CA8, CA11, or CA13 thru 16, according to Sections 1003 and 1004 of the Standard Specifications.

The fabric surrounding the drainage aggregate shall be Geotechnical Fabric for French Drains according to Article 1080.05 of the Standard Specifications.

Construction Requirements. All work shall be according to the applicable requirements of Section 601 of the Standard Specifications except as modified below.

The pipe underdrains shall consist of a perforated pipe drain situated at the bottom of an area of drainage aggregate wrapped completely in geotechnical fabric and shall be installed to the lines and gradients as shown on the plans.

Method of Measurement. Pipe Underdrains for Structures shall be measured for payment in feet (meters), in place. Measurement shall be along the centerline of the pipe underdrains. All connectors, outlet pipes, elbows, and all other miscellaneous items shall be included in the measurement. Concrete headwalls shall be included in the cost of Pipe Underdrains for Structures, but shall not be included in the measurement for payment.

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for PIPE UNDERDRAINS FOR STRUCTURES of the diameter specified. Furnishing and installation of the drainage aggregate, geotechnical fabric, forming holes in structural elements and any excavation required, will not be paid for separately, but shall be included in the cost of the pipe underdrains for structures.

STRUCTURAL REPAIR OF CONCRETE
Effective: March 15, 2006 Revised: April 1, 2016

Description. This work shall consist of structurally repairing concrete.

Materials. Materials shall be according to the following.

Item	Article/Section
(a) Portland Cement Concrete (Note 1)	1020
(b) R1 or R2 Concrete (Note 2)	
(c) Normal Weight Concrete (Notes 3 and 4)	
(d) Shotcrete (High Performance) (Notes 5 and 6)	
(e) Reinforcement Bars	1006.10
(f) Anchor Bolts	1006.09
(g) Water	1002
(h) Curing Compound	1022.01
(i) Cotton Mats	1022.02
(j) Protective Coat	1023.01
(k) Epoxy (Note 7)	1025
(l) Mechanical Bar Splicers	508.06(c)

Note 1. The concrete shall be Class SI, except the cement factor shall be a minimum 6.65 cwt/cu yd (395 kg/cu m), the coarse aggregate shall be a CA 16, and the strength shall be a minimum 4000 psi (27,500 kPa) compressive or 675 psi (4650 kPa) flexural at 14 days. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump, but a cement factor reduction according to Article 1020.05(b)(8) is prohibited. A self-consolidating concrete mixture is also acceptable per Article 1020.04, except the mix design requirements of this note regarding the cement factor, coarse aggregate, strength, and cement factor reduction shall apply.

Note 2. The R1 or R2 concrete shall be from the Department's approved list of Packaged, Dry, Rapid Hardening, Cementitious Materials for Concrete Repairs. The R1 or R2 concrete shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump, and a retarder may be required to allow time to perform the required field tests. The admixtures shall be per the manufacturer's recommendation, and the Department's approved list of Concrete Admixtures shall not apply.

Note 3. The "high slump" packaged concrete mixture shall be from the Department's approved list of Packaged, Dry, Formed, Concrete Repair Mixtures. The materials and preparation of aggregate shall be according to ASTM C 387. The cement factor shall be 6.65 cwt/cu yd (395 kg/cu m) minimum to 7.05 cwt/cu yd (418 kg/cu m) maximum. Cement replacement with fly ash or ground granulated blast-furnace slag shall be according to Section 1020. The "high slump" packaged concrete mixture shall have a water soluble chloride ion content of less than 0.40 lb/cu yd (0.24 kg/cu m). The test shall be performed according to ASTM C 1218, and the "high slump" packaged concrete mixture shall have an age of 28 to 42 days at the time of test. The ASTM C 1218 test shall be performed by an independent lab a minimum of once every two years, and the test results shall be provided to the Department. The coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm). The packaged concrete mixture shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump. The admixture shall be per the manufacturer's recommendation, and the Department's approved list of Concrete Admixtures shall not apply. A maximum slump of 10 in. (250 mm) may be permitted if no segregation is observed by the Engineer in a laboratory or field evaluation.

Note 4 The "self-consolidating concrete" packaged concrete mixture shall be from the Department's approved list of Packaged, Dry, Formed, Concrete Repair Mixtures. The materials and preparation of aggregate shall be according to ASTM C 387. The cement factor shall be 6.65 cwt/cu yd (395 kg/cu m) minimum to 7.05 cwt/cu yd (418 kg/cu m) maximum. Cement replacement with fly ash or ground granulated blast-furnace slag shall be according to Section 1020. The "self-consolidating concrete" packaged concrete mixture shall have a water soluble chloride ion content of less than 0.40 lb/cu yd (0.24 kg/cu m). The test shall be performed according to ASTM C 1218, and the "self-consolidating concrete" packaged concrete mixture shall have an age of 28 to 42 days at the time of test. The ASTM C 1218 test shall be performed by an independent lab a minimum of once every two years, and the test results shall be provided to the Department. The concrete mixture should be uniformly graded, and the coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm). The fine aggregate proportion shall be a maximum 50 percent by weight (mass) of the total aggregate used. The packaged concrete mixture shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. The admixtures used to produce self-consolidating concrete shall be per the manufacturer's recommendation, and the Department's approved list of Concrete Admixtures shall not apply. The packaged concrete mixture shall meet the self-consolidating requirements of Article 1020.04.

Note 5. Packaged shotcrete that includes aggregate shall be from the Department's approved list of Packaged High Performance Shotcrete, and independent laboratory test results showing the product meets Department specifications will be required. The product shall be a packaged, pre-blended, and dry combination of materials, for the wet-mix shotcrete method according to ASTM C 1480. A non-chloride accelerator may be used according to the shotcrete manufacturer's recommendations. The shotcrete shall be Type FA or CA, Grade FR, and Class I. The fibers shall be Type III synthetic according to ASTM C 1116.

The packaged shotcrete shall have a water soluble chloride ion content of less than 0.40 lb/cu yd (0.24 kg/cu m). The test shall be performed according to ASTM C 1218, and the hardened shotcrete shall have an age of 28 to 42 days at the time of test. The ASTM C 1218 test shall be performed by an independent lab a minimum of once every two years, and the test results shall be provided to the Department.

Each individual aggregate used in the packaged shotcrete shall have either a maximum ASTM C 1260 expansion of 0.16 percent or a maximum ASTM C 1293 expansion of 0.040 percent. However, the ASTM C 1260 value may be increased to 0.27 percent for each individual aggregate if the cement total equivalent alkali content (Na_2O + 0.658K_2O) does not exceed 0.60 percent. As an alternative to these requirements, ASTM C 1567 testing which shows the packaged shotcrete has a maximum expansion of 0.16 percent may be submitted. The ASTM C 1260, C 1293, or C 1567 test shall be performed a minimum of once every two years.

The 7 and 28 day compressive strength requirements in ASTM C 1480 shall not apply. Instead the shotcrete shall obtain a minimum compressive strength of 4000 psi (27,500 kPa) at 14 days.

The packaged shotcrete shall be limited to the following proportions:

The portland cement and finely divided minerals shall be 6.05 cwt/cu yd (360 kg/cu m) to 8.50 cwt/cu yd (505 kg/cu m) for Type FA and 6.05 cwt/cu yd (360 kg/cu. m) to 7.50 cwt/cu yd (445 kg/cu m) for Type CA. The portland cement shall not be below 4.70 cwt/cu yd (279 kg/cu m) for Type FA or CA.

The finely divided mineral(s) shall constitute a maximum of 35 percent of the total cement plus finely divided mineral(s).

Class F fly ash is optional and the maximum shall be 20 percent by weight (mass) of cement.

Class C fly ash is optional and the maximum shall be 25 percent by weight (mass) of cement.

Ground granulated blast-furnace slag is optional and the maximum shall be 30 percent by weight (mass) of cement.

Microsilica is required and shall be a minimum of 5 percent by weight (mass) of cement, and a maximum of 10 percent. As an alternative to microsilica, high-reactivity metakaolin may be used at a minimum of 5 percent by weight (mass) of cement, and a maximum of 10 percent.

Fly ash shall not be used in combination with ground granulated blast-furnace slag. Class F fly ash shall not be used in combination with Class C fly ash. Microsilica shall not be used in combination with high-reactivity metakaolin. A finely divided mineral shall not be used in combination with a blended hydraulic cement, except for microsilica or high-reactivity metakaolin.

The water/cement ratio as defined in Article 1020.06 shall be a maximum of 0.42.

The air content as shot shall be 4.0 – 8.0 percent.

Note 6 Packaged shotcrete that does not include pre-blended aggregate shall be from the Department's approved list of Packaged High Performance Shotcrete, and independent laboratory test results showing the product meets Department specifications will be required. The shotcrete shall be according to Note 5, except the added aggregate shall be according to Articles 1003.02 and 1004.02 in addition to each individual aggregate meeting the maximum expansion requirements of Note 5. The aggregate gradation shall be according to the manufacturer. The shotcrete shall be batched and mixed with added aggregate according to the manufacturer.

Note 7. In addition ASTM C 881, Type IV, Grade 2 or 3, Class A, B, or C may be used.

Equipment. Equipment shall be according to Article 503.03 and the following.

Chipping Hammer – The chipping hammer for removing concrete shall be a light-duty pneumatic or electric tool with a 15 lb. (7 kg) maximum class or less.

Blast Cleaning Equipment – Blast cleaning equipment for concrete surface preparation shall be the abrasive type, and the equipment shall have oil traps.

Hydrodemolition Equipment – Hydrodemolition equipment for removing concrete shall be calibrated, and shall use water according to Section 1002.

High Performance Shotcrete Equipment – The batching, mixing, pumping, hose, nozzle, and auxiliary equipment shall be for the wet-mix shotcrete method, and shall meet the requirements of ACI 506R.

Construction Requirements

General. The repair methods shall be either formed concrete repair or shotcrete. The repair method shall be selected by the Contractor with the following rules.

(a) Rule 1. For formed concrete repair, a subsequent patch to repair the placement point after initial concrete placement will not be allowed. As an example, this may occur in a vertical location located at the top of the repair.

(b) Rule 2. Formed concrete repair shall not be used for overhead applications.

(c) Rule 3. If formed concrete repair is used for locations that have reinforcement with less than 0.75 in. (19 mm) of concrete cover, the concrete mixture shall contain fly ash or ground granulated blast-furnace slag at the maximum cement replacement allowed.

(d) Rule 4. Shotcrete shall not be used for any repair greater than 6 in. (150 mm) in depth, except in horizontal applications, where the shotcrete may be placed from above in one lift.

(e) Rule 5. Shotcrete shall not be used for column repairs greater than 4 in. (100 mm) in depth, unless the shotcrete mixture contains 3/8 in. (9.5 mm) aggregate.

Temporary Shoring or Cribbing. When a temporary shoring or cribbing support system is required, the Contractor shall provide details and computations, prepared and sealed by an Illinois licensed Structural Engineer, to the Department for review and approval. When ever possible the support system shall be installed prior to starting the associated concrete removal. If no system is specified, but during the course of removal the need for temporary shoring or cribbing becomes apparent or is directed by the Engineer due to a structural concern, the Contractor shall not proceed with any further removal work until an appropriate and approved support system is installed.

Concrete Removal. The Contractor shall provide ladders or other appropriate equipment for the Engineer to mark the removal areas. Repair configurations will be kept simple, and squared corners will be preferred. The repair perimeter shall be sawed a depth of 1/2 in. (13 mm) or less, as required to avoid cutting the reinforcement. Any cut reinforcement shall be repaired or replaced at the expense of the Contractor. If the concrete is broken or removed beyond the limits of the initial saw cut, the new repair perimeter shall be recut. The areas to be repaired shall have all loose, unsound concrete removed completely by the use of chipping hammers, hydrodemolition equipment, or other methods approved by the Engineer. The concrete removal shall extend along the reinforcement bar until the reinforcement is free of bond inhibiting corrosion. Reinforcement bar with 50 percent or more exposed shall be undercut to a depth of 3/4 in. (19 mm) or the diameter of the reinforcement bar, whichever is greater.

If sound concrete is encountered before existing reinforcement bars are exposed, further removal of concrete shall not be performed unless the minimum repair depth is not met.

The repair depth shall be a minimum of 1 in. (25 mm). The substrate profile shall be ± 1/16 in. (± 1.5 mm). The perimeter of the repair area shall have a vertical face.

If a repair is located at the ground line, any excavation required below the ground line to complete the repair shall be included in this work.

The Contractor shall have a maximum of 14 calendar days to complete each repair location with concrete or shotcrete, once concrete removal has started for the repair.

The Engineer shall be notified of concrete removal that exceeds 6 in. (150 mm) in depth, one fourth the cross section of a structural member, more than half the vertical column reinforcement is exposed in a cross section, more than 6 consecutive reinforcement bars are exposed in any direction, within 1.5 in. (38 mm) of a bearing area, or other structural concern. Excessive deterioration or removal may require further evaluation of the structure or installation of temporary shoring and cribbing support system.

Surface Preparation. Prior to placing the concrete or shotcrete, the Contractor shall prepare the repair area and exposed reinforcement by blast cleaning. The blast cleaning shall provide a surface that is free of oil, dirt, and loose material.

If a succeeding layer of shotcrete is to be applied, the initial shotcrete surface and remaining exposed reinforcement shall be free of curing compound, oil, dirt, loose material, rebound (i.e. shotcrete material leaner than the original mixture which ricochets off the receiving surface), and overspray. Preparation may be by lightly brushing or blast cleaning if the previous shotcrete surface is less than 36 hours old. If more than 36 hours old, the surface shall be prepared by blast cleaning.

The repair area and perimeter vertical face shall have a rough surface. Care shall be taken to ensure the sawcut face is roughened by blast cleaning. Just prior to concrete or shotcrete placement, saturate the repair area with water to a saturated surface-dry condition. Any standing water shall be removed.

Concrete or shotcrete placement shall be done within 3 calendar days of the surface preparation or the repair area shall be prepared again.

Reinforcement. Exposed reinforcement bars shall be cleaned of concrete and corrosion by blast cleaning. After cleaning, all exposed reinforcement shall be carefully evaluated to determine if replacement or additional reinforcement bars are required.

Reinforcing bars that have been cut or have lost 25 percent or more of their original cross sectional area shall be supplemented by new in kind reinforcement bars. New bars shall be lapped a minimum of 32 bar diameters to existing bars. A mechanical bar splicer shall be used when it is not feasible to provide the minimum bar lap. No welding of bars shall be performed.

Intersecting reinforcement bars shall be tightly secured to each other using 0.006 in. (1.6 mm) or heavier gauge tie wire, and shall be adequately supported to minimize movement during concrete placement or application of shotcrete.

For reinforcement bar locations with less than 0.75 in. (19 mm) of cover, protective coat shall be applied to the completed repair. The application of the protective coat shall be according to Article 503.19, 2nd paragraph, except blast cleaning shall be performed to remove curing compound.

The Contractor shall anchor the new concrete to the existing concrete with 3/4 in. (19 mm) diameter hook bolts for all repair areas where the depth of concrete removal is greater than 8 in. (205 mm) and there is no existing reinforcement extending into the repair area. The hook bolts shall be spaced at 15 in. (380 mm) maximum centers both vertically and horizontally, and shall be a minimum of 12 in. (305 mm) away from the perimeter of the repair. The hook bolts shall be installed according to Section 584.

Repair Methods. All repair areas shall be inspected and approved by the Engineer prior to placement of the concrete or application of the shotcrete.

(a) Formed Concrete Repair. Falsework shall be according to Article 503.05. Forms shall be according to Article 503.06. Formwork shall provide a smooth and uniform concrete finish, and shall approximately match the existing concrete structure. Formwork shall be mortar tight and closely fitted where they adjoin the existing concrete surface to prevent leakage. Air vents may be provided to reduce voids and improve surface appearance. The Contractor may use exterior mechanical vibration, as approved by the Engineer, to release air pockets that may be entrapped.

The concrete for formed concrete repair shall be a Class SI Concrete, or a packaged R1 or R2 Concrete with coarse aggregate added, or a packaged Normal Weight Concrete at the Contractor's option. The concrete shall be placed and consolidated according to Article 503.07. The concrete shall not be placed when frost is present on the surface of the repair area, or the surface temperature of the repair area is less than 40 °F (4 °C). All repaired members shall be restored as close as practicable to their original dimensions.

Curing shall be done according to Article 1020.13.

If temperatures below 45°F (7°C) are forecast during the curing period, protection methods shall be used. Protection Method I according to Article 1020.13(d)(1), or Protection Method II according to Article 1020.13(d)(2) shall be used during the curing period.

The surfaces of the completed repair shall be finished according to Article 503.15.

(b) Shotcrete. Shotcrete shall be tested by the Engineer for air content according to Illinois Modified AASHTO T 152. The sample shall be obtained from the discharge end of the nozzle by shooting a pile large enough to scoop a representative amount for filling the air meter measuring bowl. Shotcrete shall not be shot directly into the measuring bowl for testing.

For compressive strength of shotcrete, a 18 x 18 x 3.5 in. (457 x 457 x 89 mm) test panel shall be shot by the Contractor for testing by the Engineer. A steel form test panel shall have a minimum thickness of 3/16 in. (5 mm) for the bottom and sides. A wood form test panel shall have a minimum 3/4 in. (19 mm) thick bottom, and a minimum 1.5 in. (38 mm) thickness for the sides. The test panel shall be cured according to Article 1020.13 (a) (3) or (5) while stored at the jobsite and during delivery to the laboratory. After delivery to the laboratory for testing, curing and testing shall be according to ASTM C 1140.

The method of alignment control (i.e. ground wires, guide strips, depth gages, depth probes, and formwork) to ensure the specified shotcrete thickness and reinforcing bar cover is obtained shall be according to ACI 506R. Ground wires shall be removed after completion of cutting operations. Guide strips and formwork shall be of dimensions and a configuration that do not prevent proper application of shotcrete. Metal depth gauges shall be cut 1/4 in. (6 mm) below the finished surface. All repaired members shall be restored as close as practicable to their original dimensions.

For air temperature limits when applying shotcrete in cold weather, the first paragraph of Article 1020.14(b) shall apply. For hot weather, shotcrete shall not be applied when the air temperature is greater than 90°F (32°C). The applied shotcrete shall have a minimum temperature of 50°F (10°C) and a maximum temperature of 90°F (32°C). The shotcrete shall not be applied during periods of rain unless protective covers or enclosures are installed. The shotcrete shall not be applied when frost is present on the surface of the repair area, or the surface temperature of the repair area is less than 40°F (4°C). If necessary, lighting shall be provided to provide a clear view of the shooting area.

The shotcrete shall be applied according to ACI 506R, and shall be done in a manner that does not result in cold joints, laminations, sandy areas, voids, sags, or separations. In addition, the shotcrete shall be applied in a manner that results in maximum densification of the shotcrete. Shotcrete which is identified as being unacceptable while still plastic shall be removed and re-applied.

The nozzle shall normally be at a distance of 2 to 5 ft. (0.6 to 1.5 m) from the receiving surface, and shall be oriented at right angles to the receiving surface. Exceptions to this requirement will be permitted to fill corners, encase large diameter reinforcing bars, or as approved by the Engineer. For any exception, the nozzle shall never be oriented more than 45 degrees from the surface. Care shall be taken to keep the front face of the reinforcement bar clean during shooting operations. Shotcrete shall be built up from behind the reinforcement bar. Accumulations of rebound and overspray shall be continuously removed prior to application of new shotcrete. Rebound material shall not be incorporated in the work.

Whenever possible, shotcrete shall be applied to the full thickness in a single layer. The maximum thickness shall be according to Rules 4 and 5 under Construction Requirements, General. When two or more layers are required, the minimum number shall be used and shall be done in a manner without sagging or separation. A flash coat (i.e. a thin layer of up to 1/4 in. (6 mm) applied shotcrete) may be used as the final lift for overhead applications.

Prior to application of a succeeding layer of shotcrete, the initial layer of shotcrete shall be prepared according to the surface preparation and reinforcement bar cleaning requirements. Upon completion of the surface preparation and reinforcement bar treatment, water shall be applied according to the surface preparation requirements unless the surface is moist. The second layer of shotcrete shall then be applied within 30 minutes.

Shotcrete shall be cut back to line and grade using trowels, cutting rods, screeds or other suitable devices. The shotcrete shall be allowed to stiffen sufficiently before cutting. Cutting shall not cause cracks or delaminations in the shotcrete. For depressions, cut material may be used for small areas. Rebound material shall not be incorporated in the work. For the final finish, a wood float shall be used to approximately match the existing concrete texture. A manufacturer approved finishing aid may be used. Water shall not be used as a finishing aid. All repaired members shall be restored as close as practicable to their original dimensions.

Contractor operations for curing shall be continuous with shotcrete placement and finishing operations. Curing shall be accomplished using wetted cotton mats, membrane curing, or a combination of both. Cotton mats shall be applied according to Article 1020.13(a)(5) except the exposed layer of shotcrete shall be covered within 10 minutes after finishing, and wet curing shall begin immediately. Curing compound shall be applied according to Article 1020.13(a)(4), except the curing compound shall be applied as soon as the shotcrete has hardened sufficiently to prevent marring the surface, and each of the two separate applications shall be applied in opposite directions to ensure coverage. The curing compound shall be according to Article 1022.01. Note 5 of the Index Table in Article 1020.13 shall apply to the membrane curing method.

When a shotcrete layer is to be covered by a succeeding shotcrete layer within 36 hours, the repair area shall be protected with intermittent hand fogging, or wet curing with either burlap or cotton mats shall begin within 10 minutes. Intermittent hand fogging may be used only for the first hour. Thereafter, wet curing with burlap or cotton mats shall be used until the succeeding shotcrete layer is applied. Intermittent hand fogging may be extended to the first hour and a half if the succeeding shotcrete layer is applied by the end of this time.

The curing period shall be for 7 days, except when there is a succeeding layer of shotcrete. In this instance, the initial shotcrete layer shall be cured until the surface preparation and reinforcement bar treatment is started.

If temperatures below 45°F (7°C) are forecast during the curing period, protection methods shall be used. Protection Method I according to Article 1020.13(d)(1), or Protection Method II according to Article 1020.13(d)(2) shall be used during the curing period

Inspection of Completed Work. The Contractor shall provide ladders or other appropriate equipment for the Engineer to inspect the repaired areas. After curing but no sooner than 28 days after placement of concrete or shooting of shotcrete, the repair shall be examined for conformance with original dimensions, cracks, voids, and delaminations. Sounding for delaminations will be done with a hammer or by other methods determined by the Engineer.

The acceptable tolerance for conformance of a repaired area shall be within 1/4 in. (6 mm) of the original dimensions. A repaired area not in dimensional conformance or with delaminations shall be removed and replaced.

A repaired area with cracks or voids shall be considered as nonconforming. Exceeding one or more of the following crack and void criteria shall be cause for removal and replacement of a repaired area.

1. The presence of a single surface crack greater than 0.01 in. (0.25 mm) in width and greater than 12 in. (300 mm) in length.

2. The presence of two or more surface cracks greater than 0.01 in. (0.25 mm) in width that total greater than 24 in. (600 mm) in length.

3. The presence of map cracking in one or more regions totaling 15 percent or more of the gross surface area of the repair.

4. The presence of two or more surface voids with least dimension 3/4 in. (19 mm) each.

A repaired area with cracks or voids that do not exceed any of the above criteria may remain in place, as determined by the Engineer.

If a nonconforming repair is allowed to remain in place, cracks greater than 0.007 in. (0.2 mm) in width shall be repaired with epoxy according to Section 590. For cracks less than or equal to 0.007 in. (0.2 mm) in width, the epoxy may be applied to the surface of the crack. Voids shall be repaired according to Article 503.15.

Publications and Personnel Requirements. The Contractor shall provide a current copy of ACI 506R to the Engineer a minimum of one week prior to start of construction.

The shotcrete personnel who perform the work shall have current American Concrete Institute (ACI) nozzlemen certification for vertical wet and overhead wet applications, except one individual may be in training. This individual shall be adequately supervised by a certified ACI nozzlemen as determined by the Engineer. A copy of the nozzlemen certificate(s) shall be given to the Engineer.

Method of Measurement. This work will be measured for payment in place and the area computed in square feet (square meters). For a repair at a corner, both sides will be measured.

Basis of Payment. This work will be paid for at the contract unit price per square foot (square meter) for STRUCTURAL REPAIR OF CONCRETE (DEPTH GREATER THAN 5 IN. (125 MM), STRUCTURAL REPAIR OF CONCRETE (DEPTH EQUAL TO OR LESS THAN 5 IN. (125 MM).

When not specified to be paid for elsewhere, the work to design, install, and remove the temporary shoring and cribbing will be paid for according to Article 109.04.

With the exception of reinforcement damaged by the Contractor during removal, the furnishing and installation of supplemental reinforcement bars, mechanical bar splicers, hook bolts, and protective coat will be paid according to Article 109.04.

AGGREGATE COLUMN GROUND IMPROVEMENT
Effective: January 15, 2009 Revised: October 15, 2011

Description. This work shall consist of furnishing design calculations, shop drawings, materials, and labor necessary to construct aggregate column ground improvements, over the approximate horizontal limits below the footing, wall, or embankment as specified on the contract plans, or as modified by the Contractor's approved design.

Submittals. No later than thirty (30) days prior to beginning work, the Contractor shall submit to the Engineer for approval the following information:

(a) Evidence of the selected subcontractor's successful installation of their aggregate column system on five projects under similar site conditions using the same installation technique. The documentation to be submitted shall include a description of the project, aggregate column installation technique, soil conditions and name and phone number of contracting authority.
(b) Evidence that the proposed project superintendent for the ground improvement installation has a minimum of three years of method specific experience.
(c) Shop Drawings sealed by an Illinois Licensed Professional Engineer showing aggregate column horizontal limits, locations, pattern, spacing, diameters, top and bottom elevations, and identification numbers. If an aggregate drainage layer is specified on the plans or a working platform proposed by the Contractor, the thickness, aggregate gradation, and plan dimensions shall be shown in addition to any other details needed to describe the work.
(d) A description of the equipment, installation technique and construction procedures to be used, including a plan to address any water or spoils.
(e) The source and gradation of the aggregate proposed for the aggregate columns.
(f) Design computations, sealed by an Illinois Licensed Professional Engineer, demonstrating the proposed ground improvement plan satisfies the minimum global stability, settlement, and bearing capacity performance requirements stated in the Contract Plans and those contained in this Special Provision.
(g) The proposed verification program methods to monitor and verify the aggregate column installation is satisfying the design and performance requirements. Also required is a sample of the daily report form to be used by the Contractor to documents the adequacy of that day's work.

Materials. The aggregate used in the columns shall be Class A quality crushed stone or crushed concrete satisfying the requirements of Section 1004 of the standard specifications. The aggregate for any drainage layer specified in the plans shall be a combination of one or more of the following gradations, FA1, FA2, CA5, CA7, CA8, CA11, or CA13 thru 15, according to Sections 1003 and 1004 of the Standard Specifications. Any fine or coarse aggregate requested by the Contractor to be used as either a drainage layer or working platform shall be approved by the Engineer.

Design Criteria. The subcontractor selected shall provide an aggregate column ground improvement plan with shop drawings, and design computations, using an Allowable Stress Design that meets the performance requirements shown on the Contract Plans. These requirements normally include the global stability factor of safety, tolerable settlement amounts at various times and in the case of walls or structure footings, the equivalent uniform service bearing pressure applied at various locations and the factor of safety required. In the absence of performance requirements shown on the plans, the following Allowable Stress minimum performance requirements shall be used:

(a) A factor of safety of 1.5 against global slope stability failure.

(b) A factor of safety of 2.5 against equivalent uniform service bearing pressure failure.

(c) Total settlement not to exceed 4 inches (100 mm) and settlement after completing wall or pavement construction not to exceed 1 inch (25 mm).

The design shall use short term strength parameters for the soil, obtained from the soil boring logs and any geotechnical laboratory testing data provided in the Contract Plans and specifications for stability and bearing capacity analyses. Settlement shall be assessed using appropriate soil parameters. Any additional subsurface information needed to design the aggregate columns shall be the responsibility of the Contractor.

The aggregate column ground improvement design need not consider seismic loadings unless otherwise required as part of the performance requirements shown on the plans.

Construction. The construction procedures shall be determined by the aggregate column installer and submitted for approval with the shop drawings. The following are the minimum requirements that the Contactor will be expected to follow unless otherwise approved in the shop drawings submittal.

(a) The site shall be graded as needed for proper installation of the aggregate column system. Any grading and excavation below the improvement limits shown on the plans shall be incidental to aggregate column installation.
(b) Any granular base drainage layer or working platform shall be considered incidental to the improvement. Contractor requested drainage layers or working platforms will only be allowed if approved as part of the shop drawings.
(c) The aggregate column material shall be placed in a manner that allows measurement of the tonnage or quantity of aggregate placed down the hole.
(d) Columns shall be installed in a sequence that will minimize ground heave. Any heaving shall be re-compacted or excavated as directed by the Engineer prior to wall or embankment construction and be considered incidental to aggregate column improvement.
(e) The Contractor shall provide a full-time qualified representative to verify all installation procedures and provide the verification program.
(f) Disposal of any spoils generated shall be according to Article 202.03.
(g) If an obstruction is encountered that cannot be penetrated with reasonable effort, the Contractor shall construct the element from the depth of obstruction to its design top elevation. Depending on the depth of the completed column, column location, and design requirements, the Engineer may require the construction of a replacement aggregate column at an adjacent location. Construction of additional columns will be considered extra work and paid for according to Article 109.04.

(a) Specific Requirements for Vibrator Compacted Aggregate Columns:

i. Vibrator compacted aggregate columns shall be constructed with a down-hole vibrator, probe and follower tubes of sufficient size to install the columns to the diameter and bottom elevation(s) shown on the approved shop drawings. Pre-boring is permitted if approved as part of the shop drawing submittal.

ii. The probe and follower tubes shall have visible markings at regular increments to enable measurement of penetration and re-penetration depths.

iii. Provide methods for supplying to the tip of the probe a sufficient quantity of air or water to widen the probe hole to allow adequate space for aggregate placement around the probe.

iv. The vibrator shall be withdrawn in 12 to 36 inch (300 to 900 mm) increments, to allow placement of the aggregate.

v. Lift thickness shall not exceed 4 ft (1.2 m). After penetration to the treatment depth, slowly retrieve the vibrator in 12 to 18 inch (300 to 450 mm) increments to allow aggregate placement.

vi. Compact the aggregate in each lift by re-penetrating it as needed with the vibrating probe to densify and force the aggregate radially into the surrounding soil. Re-penetrate the aggregate in each increment a sufficient number of times to construct the columns as specified in the approved shop drawings and to meet the verification program requirements.

(b) Specific Requirements for Tamper Compacted (Rammed) Aggregate Columns:

i. Tamper compacted (rammed) aggregate columns shall be installed by either drilling or displacement methods, capable of constructing columns to the diameters and bottom elevation(s) shown on the approved shop drawings.

ii. If temporary casing is needed to limit the sloughing of subsurface soils, the casing should be inserted to at least 2 ft (600 mm) beyond any sloughing strata. Upon extraction, the bottom of the casing shall be maintained at not more than 2 feet (600 mm) above the level of aggregate.

iii. Aggregate placement shall closely follow the excavation of each column. The aggregate shall be placed in 1 to 2 ft (300 to 600 mm) thick lifts. Each lift should be rammed with a high-energy impact tamper as specified in the approved shop drawings and to meet the verification program requirements.

Construction Tolerances. The aggregate columns shall be constructed to the following tolerances:

(a) The horizontal limits and center of each constructed aggregate column shall be within 8 inches (190 mm) of the location specified on the approved the shop drawings.
(b) The axis of the constructed aggregate columns shall not be inclined more than 1.67 percent from vertical.
(c) The installed diameter of any aggregate column shall not be more than 10 percent below the effective diameter indicated on the approved shop drawings.
(d) The average effective diameter of any group of 50 consecutively installed aggregate columns shall not be less than the effective diameter indicated on approved shop drawings.
(e) The top of the aggregate column ground improvement shall be located within 8 inches (200 mm) of the top elevation shown on the approved shop drawings. When supporting MSE walls, the top elevation may need to be adjusted to the base of the MSE reinforced mass elevation as shown on the approved MSE shop drawings.
(f) Except where obstructions, hard or very dense soils are encountered, the aggregate column shall be advanced to at least the treatment depth elevation shown on the approved in the Shop Drawings.

Any aggregate column installation not meeting the above stated tolerances, or otherwise deemed unsatisfactory by the Engineer, may require installation of a replacement aggregate column(s) at the discretion of the Engineer and at the Contractor's expense. The Contractor shall submit to the Engineer revised plans and procedures to bring installations in those areas into tolerance.

Verification Program. The Contractor shall develop and maintain a monitoring and documentation procedure during the installation of all aggregate columns to verify they satisfy the design and performance requirements. The Contractor shall provide qualified personnel to continuously observe and record the required data. The program shall include, as a minimum, the following:

(a) Quality control procedures to allow verification that each aggregate column is being installed according to the designer's specifications and the requirements in this Special Provision. This will typically include observations of items such as electrical current or hydraulic pressure, number of high-energy impact tamps, aggregate quantity, etc. that must be obtained to achieve the performance requirements.

(b) Monitoring methods to evaluate the performance of the global aggregate column improvement system after construction of the overlying embankment or wall. This will typically include installation of settlement plates and may also include monitoring points, inclinometers, piezometers or other instrumentation.

(c) Proposed means and methods for verification that the installed aggregate columns meet the strength and/or stiffness criteria required by the design. This may include modulus or load tests on individual elements and/or groups, soil borings, and other methods.

(d) A daily report form shall be completed by the Contactor and provided to the Engineer to document the work performed each day and the adequacy of each aggregate column. The form shall be signed by the Contractor's qualified personnel and include as a minimum the following:

i. Aggregate columns installed (identified by location number).
ii. Date constructed.
iii. Elevation of top and bottom of each aggregate column.
iv. Average lift thickness.
v. Results of quality control testing such as average power consumption or tamping energy obtained during aggregate column installation.
vi. Jetting pressure (air or water) if applicable.
vii. Description of soil and groundwater conditions.
viii. Details of obstructions, delays and any unusual issues.
ix. Amount of water used per aggregate column if applicable.
x. Estimated weight or volume of aggregate backfill placed in each column.
xi. Average installed diameter of each column.

Basis of Payment. This work will be paid at the contract Lump Sum price for AGGREGATE COLUMN GROUND IMPROVEMENT. Any temporary casing, excavation, disposal of water or spoils, drainage layers or working platforms will not be paid for separately, but shall be considered to be included with this work.

BRIDGE DECK CONSTRUCTION
Effective: October 22, 2013 Revised: December 21, 2016

When Diamond Grinding of Bridge Sections is specified, hand finishing of the deck surface shall be limited to areas not finished by the finishing machine and to address surface corrections according to Article 503.16(a)(2). Hand finishing shall be limited as previously stated solely for the purpose of facilitating a more timely application of the curing protection. In addition the requirements of 503.16(a)(3)a. and 503.16(a)(4) will be waived.

Revise the Second Paragraph of Article 503.06(b) to read as follows.

"When the Contractor uses cantilever forming brackets on exterior beams or girders, additional requirements shall be as follows."

Revise Article 503.06(b)(1) to read as follows.

"(1) Bracket Placement. The spacing of brackets shall be per the manufacturer's published design specifications for the size of the overhang and the construction loads anticipated. The resulting force of the leg brace of the cantilever bracket shall bear on the web within 6 inches (150 mm) of the bottom flange of the beam or girder."

Revise Article 503.06(b)(2) to read as follows.

"(2) Beam Ties. The top flange of exterior steel beams or girders supporting the cantilever forming brackets shall be tied to the bottom flange of the next interior beam. The top flange of exterior concrete beams supporting the cantilever forming brackets shall be tied to the top flange of the next interior beam. The ties shall be spaced at 4 ft (1.2 m) centers. Permanent cross frames on steel girders may be considered a tie. Ties shall be a minimum of 1/2 inch (13 mm) diameter threaded rod with an adjusting mechanism for drawing the tie taut. The ties shall utilize hanger brackets or clips which hook onto the flange of steel beams. No welding will be permitted to the structural steel or stud shear connectors, or to reinforcement bars of concrete beams, for the installation of the tie bar system. After installation of the ties and blocking, the tie shall be drawn taut until the tie does not vary from a straight line from beam to beam. The tie system shall be approved by the Engineer."

Revise Article 503.06(b)(3) to read as follows.

"(3) Beam Blocks. Suitable beam blocks of 4 in x 4 in (100 x 100 mm) timbers or metal structural shapes of equivalent strength or better, acceptable to the Engineer, shall be wedged between the webs of the two beams tied together, within 6 inches (150 mm) of the bottom flange at each location where they are tied. When it is not feasible to have the resulting force from the leg brace of the cantilever brackets transmitted to the web within 6 inches (150 mm) of the bottom flange, then additional blocking shall be placed at each bracket to transmit the resulting force to within 6 inches (150 mm) of the bottom flange of the next interior beam or girder."

Delete the last paragraph of Article 503.06(b).

ADJUSTING FRAMES AND GRATES (BDE)
Effective: April 1, 2017

Add the following to Article 602.02 of the Standard Specifications:

"(s) High Density Expanded Polystyrene Adjusting Rings with Polyurea Coating (Note 4) 1043.04
(t) Expanded Polypropylene (EPP) Adjusting Rings (Note 5) 1043.05

Note 4. High density expanded polystyrene adjusting rings with polyurea coating shall meet the design load requirements of AASHTO HS20/25. The rings may be used to adjust the frames and grates of drainage and utility structures up to a maximum of 6 in. (150 mm). They shall be installed and sealed underneath the frames according to the manufacturer's specifications.

Note 5. Riser rings fabricated from EPP may be used to adjust the frames and grates of drainage and utility structures up to a maximum of 6 in. (150 mm). An adhesive meeting ASTM C 920, Type S, Grade N5, Class 25 shall be used with EPP adjustment rings. The top ring of the adjustment stack shall be a finish ring with grooves on the lower surface and flat upper surface. The joints between all manhole adjustment rings and the frame and cover shall be sealed using the approved adhesive. In lieu of the use of an adhesive, an internal or external mechanical frame-chimney seal may be used for watertight installation. EPP adjustment rings shall not be used with heat shrinkable infiltration barriers."

Add the following to Section 1043 of the Standard Specifications:

"**1043.04 High Density Expanded Polystyrene Adjusting Rings with Polyurea Coating.** High density expanded polystyrene adjustment rings with polyurea coating shall be designed and tested to meet or exceed an HS25 wheel load according to the AASHTO Standard Specifications for Highway Bridges (AASHTO M306 HS-25). The raw material suppliers shall provide certifications of quality or testing using the following ASTM standards, and upon request, certify that only virgin material was used in the manufacturing of the expanded polystyrene rings.

Physical Property	Test Standard	Value	
		3.0 lb/cu ft	4.5 lb/cu ft
Compression Resistance at 10% deformation at 5% deformation at 2% deformation	ASTM D 1621	 50 - 70 45 - 60 15 - 20	 70 - 90 60 - 80 20 - 40
Flexural Strength	ASTM D 790	90 - 120	130 - 200
Water Absorption	ASTM D 570	2.0%	1.7%
Coefficient of Linear Expansion	ASTM D 696	2.70E-06 in./in./ºF	2.80E-06 in./in./ºF
Sheer Strength	ASTM D 732	55	80
Tensile Strength	ASTM D 1623	70 - 90	130 - 140
Water Vapor Transmission	ASTM C 355	0.82 – 0.86 perm – in.	

High density expanded polystyrene adjustment rings with polyurea coating shall have no void areas, cracks, or tears. The actual diameter or length shall not vary more than 0.125 in. (3 mm) from the specified diameter or length. Variations in height are limited to ± 0.063 in. (± 1.6 mm). Variations shall not exceed 0.25 in. (6 mm) from flat (dish, bow, or convoluting edge) or 0.125 in. (3 mm) for bulges or dips in the surface.

1043.05 Expanded Polypropylene (EPP) Adjusting Rings. The EPP adjusting rings shall be manufactured using a high compression molding process to produce a minimum finished density of 7.5 lb/cu ft (120 g/l). The EPP rings shall be made of materials meeting ASTM D 3575 and ASTM D 4819-13. The grade adjustments shall be designed and tested according to the AASHTO Standard Specifications for Highway Bridges (AASHTO M 306 HS-25).

Grade rings shall contain upper and lower keyways (tongue and groove) for proper vertical alignment and sealing. The top ring, for use directly beneath the cast iron frame, shall have keyways (grooves) on the lower surface with a flat upper surface.

Adhesive or sealant used for watertight installation of the manhole grade adjustment rings shall meet ASTM C 920, Type S, Grade NS, Class 25, Uses NT, T, M, G, A, and O.

EPP adjustment rings shall have no void areas, cracks, or tears. The actual diameter or length shall not vary more than 0.125 in. (3 mm) from the specified diameter or length. Variations in height are limited to ± 0.063 in. (± 1.6 mm). Variations shall not exceed 0.25 in. (6 mm) from flat (dish, bow, or convoluting edge) or 0.125 in. (3 mm) for bulges or dips in the surface."

AGGREGATE SUBGRADE IMPROVEMENT (BDE)
Effective: April 1, 2012 Revised: April 1, 2016

Add the following Section to the Standard Specifications:

"**SECTION 303. AGGREGATE SUBGRADE IMPROVEMENT**

303.01 Description. This work shall consist of constructing an aggregate subgrade improvement.

303.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Coarse Aggregate	1004.07
(b) Reclaimed Asphalt Pavement (RAP) (Notes 1, 2, and 3)	1031

Note 1. Crushed RAP, from either full depth or single lift removal, may be mechanically blended with aggregate gradations CS 01, CS 02, and RR 01 but shall not exceed 40 percent of the total product. The top size of the RAP shall be less than 4 in. (100 mm) and well graded.

Note 2. RAP having 100 percent passing the 1 1/2 in. (37.5 mm) sieve and being well graded, may be used as capping aggregate in the top 3 in. (75 mm) when aggregate gradations CS 01, CS 02, or RR 01 are used in lower lifts.

Note 3. The RAP used for aggregate subgrade improvement shall be according to the current Bureau of Materials and Physical Research Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications".

303.03 Equipment. The vibratory machine shall be according to Article 1101.01, or as approved by the Engineer.

303.04 Soil Preparation. The stability of the soil shall be according to the Department's Subgrade Stability Manual for the aggregate thickness specified.

303.05 Placing Aggregate. The maximum nominal lift thickness of aggregate gradations CA 02, CA 06, or CA 10 shall be 12 in. (300 mm). The maximum nominal lift thickness of aggregate gradations CS 01, CS 02, and RR 01 shall be 24 in. (600 mm).

303.06 Capping Aggregate. The top surface of the aggregate subgrade shall consist of a minimum 3 in. (75 mm) of aggregate gradations CA 06 or CA 10. When the contract specifies that a granular subbase is to be placed on the aggregate subgrade improvement, the 3 in. (75 mm) of capping aggregate shall be the same gradation and may be placed with the underlying aggregate subgrade improvement material.

303.07 Compaction. All aggregate lifts shall be compacted to the satisfaction of the Engineer. If the moisture content of the material is such that compaction cannot be obtained, sufficient water shall be added so that satisfactory compaction can be obtained.

303.08 Finishing and Maintenance of Aggregate Subgrade Improvement. The aggregate subgrade improvement shall be finished to the lines, grades, and cross sections shown on the plans, or as directed by the Engineer. The aggregate subgrade improvement shall be maintained in a smooth and compacted condition.

303.09 Method of Measurement. This work will be measured for payment according to Article 311.08.

303.10 Basis of Payment. This work will be paid for at the contract unit price per cubic yard (cubic meter) or ton (metric ton) for AGGREGATE SUBGRADE IMPROVEMENT or at the contract unit price per square yard (square meter) for AGGREGATE SUBGRADE IMPROVEMENT, of the thickness specified."

Add the following to Section 1004 of the Standard Specifications:

"**1004.07 Coarse Aggregate for Aggregate Subgrade Improvement.** The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate shall be crushed gravel, crushed stone, or crushed concrete. In applications where greater than 24 in. (600 mm) of subgrade material is required, gravel may be used below the first 12 in (300 mm) of subgrade.

(b) Quality. The coarse aggregate shall consist of sound durable particles reasonably free of deleterious materials.

(c) Gradation.

(1) The coarse aggregate gradation for total subgrade thickness less than or equal to 12 in. (300 mm) shall be CA 2, CA 6, CA 10, or CS 01.

The coarse aggregate gradation for total subgrade thickness more than 12 in. (300 mm) shall be CS 01 or CS 02 as shown below or RR 01 according to Article 1005.01(c).

	COARSE AGGREGATE SUBGRADE GRADATIONS				
Grad No.	Sieve Size and Percent Passing				
	8"	6"	4"	2"	#4
CS 01	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20
CS 02		100	80 ± 10	25 ± 15	

	COARSE AGGREGATE SUBGRADE GRADATIONS (Metric)				
Grad No.	Sieve Size and Percent Passing				
	200 mm	150 mm	100 mm	50 mm	4.75 mm
CS 01	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20
CS 02		100	80 ± 10	25 ± 15	

(2) The 3 in. (75 mm) capping aggregate shall be gradation CA 6 or CA 10."

BUTT JOINTS (BDE)
Effective: July 1, 2016

Add the following to Article 406.08 of the Standard Specifications.

"(c) Temporary Plastic Ramps. Temporary plastic ramps shall be made of high density polyethylene meeting the properties listed below. Temporary plastic ramps shall only be used on roadways with permanent posted speeds of 55 mph or less. The ramps shall have a minimum taper rate of 1:30 (V:H). The leading edge of the plastic ramp shall have a maximum thickness of 1/4 in. (6 mm) and the trailing edge shall match the height of the adjacent pavement ± 1/4 in. (± 6 mm).

The ramp will be accepted by certification. The Contractor shall furnish a certification from the manufacturer stating the temporary plastic ramp meets the following requirements.

Physical Property	Test Method	Requirement
Melt Index	ASTM D 1238	8.2 g/10 minutes
Density	ASTM D 1505	0.965 g/cc
Tensile Strength @ Break	ASTM D 638	2223 psi (15 MPa)
Tensile Strength @ Yield	ASTM D 638	4110 psi (28 MPa)
Elongation @ Yield 1/, percent	ASTM D 638	7.3 min.
Durometer Hardness, Shore D	ASTM D 2240	65
Heat Deflection Temperature, 66 psi	ASTM D 648	176 ºF (80 ºC)
Low Temperature Brittleness, F_{50}	ASTM D 746	<-105 ºF (<-76 ºC)

1/ Crosshead speed -2 in./minute

The temporary plastic ramps shall be installed according to the manufacturer's specifications and fastened with anchors meeting the manufacturer's recommendations. Temporary plastic ramps that fail to stay in place or create a traffic hazard shall be replaced immediately with temporary HMA ramps at the Contractor's expense."

COMPENSABLE DELAY COSTS (BDE)
Effective: June 2, 2017

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 working day contracts the payment will be made according to Article 109.04. For completion date contracts, an adjustment will be determined as follows.

Extended Traffic Control occurs between April 1 and November 30:

ETCP Adjustment ($) = TE x (%/100 x CUP / OCT)

Extended Traffic Control occurs between December 1 and March 31:

ETCP Adjustment ($) = TE x 1.5 (%/100 x CUP / OCT)

Where: TE = Duration of approved time extension in calendar days.
% = Percent maintenance for the traffic control, % (see table below).
CUP = Contract unit price for the traffic control pay item in place during the delay.
OCT = Original contract time in calendar days.

Original Contract Amount	Percent Maintenance
Up to $2,000,000	65%
$2,000,000 to $10,000,000	75%
$10,000,000 to $20,000,000	85%
Over $20,000,000	90%

When an ETCP 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."

CONCRETE MIX DESIGN – DEPARTMENT PROVIDED (BDE)
Effective: January 1, 2012 Revised: April 1, 2016

For the concrete mix design requirements in Article 1020.05(a) of the Standard Specifications, the Contractor has the option to request the Engineer determine mix design material proportions for Class PV, PP, RR, BS, DS, SC, and SI concrete. A single mix design for each class of concrete will be provided. Acceptance by the Contractor to use the mix design developed by the Engineer shall not relieve the Contractor from meeting specification requirements.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)
Effective: September 1, 2000 Revised: July 2, 2016

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 that 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 that 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 that, in the absence of unlawful discrimination, and in an arena of fair and open competition, DBE companies can be expected to perform **15.00**% 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 that enough DBE participation has been obtained to meet the goal or,

(b) The bidder documents that 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 required prior to the award of the contract and the failure of the low bidder to comply will render the bid not responsive.

In order to assure the timely award of the contract, the low bidder shall submit:

(a) The bidder shall submit a DBE Utilization Plan on completed Department forms SBE 2025 and 2026.

(1) The final Utilization Plan must be submitted within five calendar days after the date of the letting in accordance with subsection (a)(2) of Bidding Procedures herein.

(2) To meet the five day requirement, the bidder may send the Utilization Plan electronically by scanning and sending to **DOT.DBE.UP@illinois.gov** or faxing to (217) 785-1524. The subject line must include the bid Item Number and the Letting date. The Utilization Plan should be sent as one .pdf file, rather than multiple files and emails for the same Item Number. It is the responsibility of the bidder to obtain confirmation of email or fax delivery.

Alternatively, the Utilization Plan may be sent by certified mail or delivery service within the five calendar day period. If a question arises concerning the mailing date of a Utilization Plan, the mailing date will be established by the U.S. Postal Service postmark on the certified mail receipt from the U.S. Postal Service or the receipt issued by a delivery service when the Utilization Plan is received by the Department. It is the responsibility of the bidder to ensure the postmark or receipt date is affixed within the five days if the bidder intends to rely upon mailing or delivery to satisfy the submission day requirement. The Utilization Plan is to be submitted to:

Illinois Department of Transportation
Bureau of Small Business Enterprises
Contract Compliance Section
2300 South Dirksen Parkway, Room 319
Springfield, Illinois 62764

The Department will not accept a Utilization Plan if it does not meet the five day submittal requirement and the bid will be declared not responsive. In the event the bid is declared not responsive due to a failure to submit a Utilization Plan or failure to comply with the bidding procedures set forth herein, 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. The Department reserves the right to invite any other bidder to submit a Utilization Plan at any time for award consideration.

(b) The Utilization Plan shall indicate that the bidder either has obtained sufficient DBE participation commitments to meet the contract goal or has not obtained enough DBE participation commitments in spite of a good faith effort to meet the goal. The Utilization Plan shall further provide the name, telephone number, and telefax number of a responsible official of the bidder designated for purposes of notification of Utilization Plan approval or disapproval under the procedures of this Special Provision.

(c) The Utilization Plan shall include a DBE Participation Commitment Statement, Department form SBE 2025, for each DBE proposed for the performance of work to achieve the contract goal. For bidding purposes, submission of the completed SBE 2025 forms, signed by the DBEs and scanned or faxed to the bidder will be acceptable as long as the original is available and provided upon request. All elements of information indicated on the said form shall be provided, including but not limited to the following:

(1) The names and addresses of DBE firms that will participate in the contract;

(2) A description, including pay item numbers, of the work each DBE will perform;

(3) The dollar amount of the participation of each DBE firm participating. The dollar amount of participation for identified work shall specifically state the quantity, unit price, and total subcontract price for the work to be completed by the DBE. If partial pay items are to be performed by the DBE, indicate the portion of each item, a unit price where appropriate and the subcontract price amount;

(4) DBE Participation Commitment Statements, form SBE 2025, signed by the bidder and each participating DBE firm documenting the commitment to use the DBE subcontractors whose participation is submitted to meet the contract goal;

(5) If the bidder is a joint venture comprised of DBE companies and non-DBE companies, the Utilization Plan must also include a clear identification of the portion of the work to be performed by the DBE partner(s); and,

(6) If the contract goal is not met, evidence of good faith efforts; 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.

GOOD FAITH EFFORT PROCEDURES. The contract will not be awarded until the Utilization Plan submitted by the apparent successful bidder is approved. All information submitted by the bidder must be complete, accurate and adequately document that enough DBE participation has been obtained or document that 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. The Utilization Plan will not be approved by the Department if the Utilization Plan does not document sufficient DBE participation to meet the contract goal unless the apparent successful bidder documented in the Utilization Plan that it made a good faith effort to meet the goal. This means that 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 that 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 prime 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 subsection (c)(6) of 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 that the apparent successful 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 that it is otherwise eligible for award. If the Department determines that 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 shall include a statement of reasons for the 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 in order to cure the deficiency.

(c) The bidder may request administrative reconsideration of a determination adverse to the bidder within the five working days after the receipt of the notification date of the determination by delivering the request to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764 (Telefax: (217) 785-1524). Deposit of the request in the United States mail on or before the fifth business day shall not be deemed delivery. The determination shall become final if a request is not made and delivered. 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 forwarded to the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person in order 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 consideration, 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 prime 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 submitted to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764. Telephone number (217) 785-4611. Telefax number (217) 785-1524.

(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, than a new Request for Approval of Subcontractor shall not be required. However, the Contractor must document efforts to assure that 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 DBE subcontracts to IDOT 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) That 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) That the DBE is aware that 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) That 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 prime contractor;

(3) The listed DBE subcontractor fails or refuses to meet the prime 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) You have determined that the listed DBE subcontractor is not a responsible contractor;

(7) The listed DBE subcontractor voluntarily withdraws from the projects and provides to you written notice 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 prime Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the prime Contractor can self-perform the work for which the DBE contractor was engaged or so that the prime 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 shall provide a written determination to the Contractor stating whether or not good faith efforts have been demonstrated.

(f) PAYMENT RECORDS. The Contractor shall maintain a record of payments for work performed to the DBE participants. The records shall be made available to the Department for inspection upon request. 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 thirty 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 that 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 my 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.

DOWEL BAR INSERTER (BDE)
Effective: January 1, 2017

Add the following to Article 420.03 of the Standard Specifications.

"(l) Mechanical Dowel Bar Inserter ..... 1103.20"

Revise Article 420.05(c) of the Standard Specifications to read:

"(c) Transverse Contraction Joints. Transverse contraction joints shall consist of planes of weakness created by sawing grooves in the surface of the pavement and shall include load transfer devices consisting of dowel bars. Transverse contraction joints shall be according to the following."

Revise Article 420.05(c)(2) of the Standard Specifications to read:

"(2) Dowel Bars. Dowel Bars shall be installed parallel to the centerline of the pavement and parallel to the proposed pavement surface. Installation shall be according to one of the following methods.

a. Dowel Bar Assemblies. The assembly shall act as a rigid unit with each component securely held in position relative to the other members of the assembly. The entire assembly shall be held securely in place by means of nails which shall penetrate the stabilized subbase. At least ten nails shall be used for each 10, 11, or 12 ft (3, 3.3, or 3.6 m) section of assembly.

Metal stakes shall be used instead of nails, with soil or granular subbase. The stakes shall loop over or attach to the top parallel spacer bar of the assembly and penetrate the subgrade or subbase at least 12 in. (300 mm).

At the location of each dowel bar assembly, the subgrade or subbase shall be reshaped and re-tamped when necessary.

Prior to placing concrete, any deviation of the dowel bars from the correct horizontal or vertical alignment (horizontal skew or vertical tilt) greater than 3/8 in. in 12 in (9 mm in 300 mm) shall be corrected and a light coating of oil shall be uniformly applied to all dowel bars.

Care shall be exercised in depositing the concrete at the dowel bar assemblies so the horizontal and vertical alignment will be retained.

b. Dowel Bar Insertion. The dowel bars may be placed in the pavement slab with a mechanical dowel bar inserter (DBI) attached to a formless paver for pavements ≥ 7.0 in. (175 mm) in thickness. A light coating of oil shall be uniformly applied to all dowel bars.

The DBI shall insert the dowel bars with vibration into the plastic concrete after the concrete has been struck off and consolidated without deformation of the slab. After the bars have been inserted, the concrete shall be refinished and no voids shall exist around the dowel bars. The forward movement of the paver shall not be interrupted by the inserting of the dowel bars.

The location of each row of dowel bars shall be marked in a manner to facilitate where to insert the bars, and where to saw the transverse joint.

1. Placement Tolerances for Dowel Bars. The DBI shall place the dowel bars in the concrete pavement within the following tolerances.

(a.) Longitudinal Translation (Mislocation). Longitudinal translation (mislocation) shall be defined as the position of the center of the dowel bar along the longitudinal axis, in relation to the sawed joint.

The quality control tolerance for longitudinal translation shall not exceed 2.0 in (50 mm). If this tolerance is exceeded, adjustments shall be made to the paving operation.

Any joint having two or more dowel bars with an embedment length less than 4.0 in. (100 mm) within 12 in. (300 mm) of the same wheelpath will be considered unacceptable. Any joint having an average dowel bar embedment length less than 5.25 in. (130 mm) will also be considered unacceptable. Embedment length shall be defined as the length of dowel bar embedded on the short side of the sawed joint. An unacceptable joint shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

(b.) Horizontal Translation (Mislocation). Horizontal translation (mislocation) shall be defined as the difference in the actual dowel bar location parallel to the longitudinal or edge joint from its theoretical position as shown on the plans.

The quality control tolerance for horizontal translation shall not exceed 2.0 in. (50 mm). If this tolerance is exceeded, adjustments shall be made to the paving operation.

Any joint having a dowel bar with a translation greater than 4.0 in. (100 mm) will be considered unacceptable, but may remain in place unless the Engineer determines the joint will not function. If the joint is unable to remain in place, the joint shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

(c.) Vertical Translation (Mislocation). Vertical translation (mislocation) shall be defined as the difference in the vertical position of the dowel bar relative to the theoretical midpoint of the slab.

The quality control tolerance for vertical translation shall be as shown in the following table. If these tolerances are exceeded, adjustments shall be made to the paving operation.

Pavement Thickness	Dowel Bar Diameter	Vertical Translation Tolerance Above Midpoint	Vertical Translation Tolerance Below Midpoint
≥7 in. to <8 in. (≥175 mm to <200 mm)	1.25 in. (31 mm)	0.25 in. (6 mm)	0.5 in. (13 mm)
≥8 in. to <9 in. (≥200 mm to <225 mm)	1.50 in. (38 mm)	0.25 in. (6 mm)	0.5 in. (13 mm)
≥9 in. to <10 in. (≥225 mm to <250 mm)	1.50 in. (38 mm)	0.75 in. (19 mm)	0.75 in. (19 mm)
≥10 in. (≥250 mm)	1.50 in. (38 mm)	0.75 in. (19 mm)	1.0 in. (25 mm)

Any joint having a dowel bar with top concrete cover less than T/3, where T is slab thickness, will be considered unacceptable. Any joint having 2 or more dowel bars with bottom concrete cover less than 2.0 in. (50 mm) will also be considered unacceptable. An unacceptable joint shall be replaced with a minimum of 6 ft (1.8 m) of pavement according to Section 442 for Class B patches.

(d.) Vertical Tilt or Horizontal Skew (Misalignment). Vertical tilt or horizontal skew (misalignment) shall be defined as the difference in position of the dowel bar ends with respect to each other. Vertical tilt is measured in the vertical axis whereas horizontal skew is measured in the horizontal axis. Misalignment shall be measured in terms of a joint score. The joint score shall be defined as the degree of misalignment evaluated for a single transverse joint for each lane of pavement. The joint score shall be determined as follows:

$$Joint\ Score = \left(1 + \left(\frac{x}{x-n}\right)\sum_{i=1}^{x} W_i\right)$$

where:

W_i = weighting factor (Table 1) for dowel *i*
x = number of dowels in a single joint
n = number of dowels excluded from the joint score calculation due to measurement interference

Single Dowel Misalignment – The degree of misalignment applicable to a single dowel bar, calculated as:

$$Single\ Dowel\ Misalignment = \sqrt{(Horizontal\ Skew)^2 + (Vertical\ Tilt)^2}$$

Table 1. Weighting Factors in Joint Score Determination

Single Dowel Bar Misalignment (SDM)	W, Weighting Factor
SDM ≤ 0.6 in. (15 mm)	0
0.6 in. (15 mm) < SDM ≤ 0.8 in. (20 mm)	2
0.8 in. (20 mm) < SDM ≤ 1 in. (25 mm)	4
1 in. (25 mm) < SDM ≤ 1.5 in. (38 mm)	5
1.5 in. (38 mm) < SDM	10

The quality control tolerance for vertical tilt or horizontal skew shall not exceed 0.6 in. (15 mm). If the tolerance is exceeded for either one, adjustments shall be made to the paving operation.

Any joint having a dowel bar with a vertical tilt or horizontal skew greater than 1.5 in. (38 mm) shall be cut. If more than one dowel bar is required to be cut in the joint, the joint will be considered unacceptable and shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

Single dowel bar misalignment shall be controlled to provide the joint scores shown in the following table.

Number of Dowel Bars in the Joint	Maximum Joint Score
< 5	4
≥ 5 but ≤ 9	8
> 9	12

A joint score greater than the specified maximum will be considered locked. Three consecutive joints with a score greater than the specified maximum total score will all be considered unacceptable.

Three consecutive locked joints shall be corrected by selecting one joint and cutting a dowel bar. Preference shall be given to cutting a dowel bar within the middle 2.5 ft (0.8 m) of the pavement lane to avoid the wheelpaths. If none of the three locked joints will have a joint score less than or equal to the specified maximum after selecting one dowel bar to cut, one of the joints shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

(e.) For unacceptable work, the Contractor may propose alternative repairs for consideration by the Engineer.

2. Testing of Dowel Bar Placement. The placement of the dowel bars shall be tested within 24 hours of paving with a calibrated MIT Scan-2 device according to "Use of Magnetic Tomography Technology to Evaluate Dowel Placement" (Publication No. FHWA-IF-06-006) by the Federal Highway Administration.

A trained operator shall perform the testing, and all testing shall be performed in the presence of the Engineer. The device shall be calibrated to the type and size dowel bar used in the work according to the manufacturer's instructions. Calibration documentation shall be provided to the Engineer prior to construction. The device shall be recalibrated and/or validate readings as required by the Engineer. The device may be utilized as a process control and make necessary adjustments to ensure the dowel bars are placed in the correct location.

(a.) Test Section. Prior to start of production paving, a test section consisting of 30 transverse joints shall be constructed. The test section may be performed on the actual pavement, but production paving shall not begin until an acceptable test section has been constructed. The test section will be considered acceptable when all of the following are met:

(1.) 90 percent of the dowel bars meet the quality control tolerance for longitudinal, horizontal, or vertical translation (mislocation);

(2.) 90 percent of the dowel bars meet the quality control tolerance for vertical tilt or horizontal skew deviation (misalignment); and

(3.) none of the joints are considered unacceptable prior to a corrective measure for mislocation or misalignment.

If the test section fails, another test section consisting of 30 joints shall be constructed.

The test section requirement may be waived by the Engineer if the Contractor has constructed an acceptable test section and successfully used the DBI on a Department contract within the same calendar year.

(b.) Production Paving. After the test section is approved, production paving may begin. The mislocation and misalignment of each dowel bar for the first ten joints constructed, and every tenth joint thereafter, shall be tested.

If two consecutive days of paving result in 5 percent or more of the joints on each day being unacceptable prior to a corrective measure, production paving shall be discontinued and a new test section shall be constructed.

If any joint is found to be unacceptable prior to a corrective measure, testing of additional joints on each side of the unacceptable joint shall be performed until acceptable joints are found.

(c.) Test Report. Test reports shall be provided to the Engineer within two working days of completing each day's testing. The test report shall include the following.

(1.) Contract number, placement date, county-route-section, direction of traffic, scan date, Contractor, and name of individual performing the tests.

(2.) Provide the standard report generated from the on-board printer of the imaging technology used for every dowel and joint measured.

(3.) For every dowel measured, provide the joint identification number, lane number and station, dowel bar number or x-location, direction of testing and reference joint location/edge location, longitudinal translation, horizontal translation, vertical translation, vertical tilt, and horizontal skew.

(4.) Identify each dowel bar with a maximum longitudinal, horizontal, or vertical translation that has been exceeded. Identify each dowel bar with a maximum vertical tilt or horizontal skew deviation that has been exceeded.

(5.) Joint Score Details: Provide the joint identification number, lane number, station, and calculated joint score for each joint.

(6.) Locked Joint Identification: Identify each joint with a joint score > 12.

(d.) Exclusions. Exclude the following from dowel bar mislocation and misalignment measurements.

(1.) Transverse construction joints (headers).

(2.) Dowel bars within 24 in. (610 mm) of metallic manholes, inlets, metallic castings, or other nearby or underlying steel reinforced objects.

(3.) The outside dowel bar when tie bars are installed with mechanical equipment in fresh concrete. For tie bar installations involving preformed or drilled holes, installation shall be performed after testing with the MIT Scan-2 device.

(4.) Joints located directly under high voltage power lines.

(5.) Subject to the approval of the Engineer, any other contributors to magnetic interference.

(e.) Deficiency Deduction. When the Contractor has cut 25 dowel bars to correct unacceptable joints, the Contractor shall be liable and shall pay to the Department a deficiency deduction of $500.00 for the cost of the bars. Thereafter, an additional deficiency deduction of $20.00 for each additional bar cut will be assessed."

Add the following to Section 1103 of the Standard Specifications.

"**1103.20 Mechanical Dowel Bar Inserter.** The mechanical dowel bar inserter (DBI) shall be self-contained and supported on the formless paver with the ability to move separately from the paver. The DBI shall be equipped with insertion forks along with any other devices necessary for finishing the concrete the full width of the pavement. The insertion forks shall have the ability to vibrate at a minimum frequency of 3000 VPM."

GROOVING FOR RECESSED PAVEMENT MARKINGS (BDE)
Effective: November 1, 2012 Revised: August 1, 2014

Description. This work shall consist of grooving the pavement surface in preparation for the application of recessed pavement markings.

Equipment. Equipment shall be according to the following.

(a) Pavement Marking Tape Installations: The grooving equipment shall have a free-floating saw blade cutting head equipped with gang-stacked diamond saw blades. The diamond saw blades shall be of uniform wear and shall produce a smooth textured surface. Any ridges in the groove shall have a maximum height of 15 mils (0.38 mm).

(b) Liquid and Thermoplastic Pavement Marking Installations: The grooving equipment shall be equipped with either a free-floating saw blade cutting head or a free-floating grinder cutting head configuration with diamond or carbide tipped cutters and shall produce an irregular textured surface.

CONSTRUCTION REQUIREMENTS

General. The Contractor shall supply the Engineer with a copy of the pavement marking material manufacturer's recommendations for constructing a groove.

Pavement Grooving Methods. The grooves for recessed pavement markings shall be constructed using the following methods.

(a) Wet Cutting Head Operation. When water is required or used to cool the cutting head, the groove shall be flushed with high pressure water immediately following the cut to avoid build up and hardening of slurry in the groove. The pavement surface shall be allowed to dry for a minimum of 24 hours prior to the final cleaning of the groove and application of the pavement marking material.

(b) Dry Cutting Head Operation. When used on HMA pavements, the groove shall be vacuumed or cleaned by blasting with high-pressure air to remove loose aggregate, debris, and dust generated during the cutting operation. When used on PCC pavements, the groove shall be flushed with high pressure water or shot blasted to remove any PCC particles that may have become destabilized during the grooving process. If high pressure water is used, the pavement surface shall be allowed to dry for a minimum of 24 hours prior to the final cleaning of the groove and application of the pavement marking material.

Pavement Grooving. Grooving shall not cause ravels, aggregate fractures, spalling or disturbance of the joints to the underlying surface of the pavement. Grooves shall be cut into the pavement prior to the application of the pavement marking material. Grooves shall be cut such that the width is 1 in. (25 mm) greater than the width of the pavement marking line as specified on the plans. Grooves for letters and symbols shall be cut in a square or rectangular shape so that the entire marking will fit within the limits of the grooved area. The position of the edge of the grooves shall be a minimum of 4 in. (100 mm) from the edge of all longitudinal joints. The depth of the groove shall not be less than the manufacturer's recommendations for the pavement marking material specified, but shall be installed to a minimum depth of 110 mils (2.79 mm) and a maximum depth of 200 mils (5.08 mm) for pavement marking tapes thermoplastic markings and a minimum depth of 40 mils (1.02 mm) and a maximum depth of 80 mils (2.03 mm) for liquid markings. The cutting head shall be operated at the appropriate speed in order to prevent undulation of the cutting head and grooving at an inconsistent depth.

At the start of grooving operations, a 50 ft (16.7 m) test section shall be installed and depth measurements shall be made at 10 ft (3.3 m) intervals within the test section. The individual depth measurements shall be within the allowable ranges according to this Article. If it is determined the test section has not been grooved at the appropriate depth or texture, adjustments shall be made to the cutting head and another 50 ft (16.7 m) test section shall be installed and checked. This process shall continue until the test section meets the requirements of this Article.

For new HMA pavements, grooves shall not be installed within 14 days of the placement of the final course of pavement.

Final Cleaning. Immediately prior to the application of the pavement marking material or primer sealer, the groove shall be cleaned with high-pressure air blast.

Method of Measurement. This work will be measured for payment in place, in feet (meter) for the groove width specified.

Grooving for letter, numbers and symbols will be measured in square feet (square meters).

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for GROOVING FOR RECESSED PAVEMENT MARKING of the groove width specified, and per square foot (square meter) for GROOVING FOR RECESSED PAVEMENT MARKING, LETTERS AND SYMBOLS.

The following shall only apply when preformed plastic pavement markings are to be recessed:

Add the following paragraph after the first paragraph of Article 780.07 of the Standard Specifications.

"The markings shall be capable of being applied in a grooved slot on new and existing portland cement concrete and HMA surfaces, by means of a pressure-sensitive, precoated adhesive, or liquid contact cement which shall be applied at the time of installation. A primer sealer shall be applied with a roller and shall cover and seal the entire bottom of the groove. The primer sealer shall be recommended by the manufacturer of the pavement marking material and shall be compatible with the material being used. The Contractor shall install the markings in the groove as soon as possible after the primer sealer cures according to the manufacturer's recommendations. The markings placed in the groove shall be rolled and tamped into the groove with a roller or tamper cart cut to fit the groove and loaded with or weighing at least 200 lb (90kg). Vehicle tires shall not be used for tamping. The Contractor shall roll and tamp the material with a minimum of 6 passes to prevent easy removal or peeling."

HOT-MIX ASPHALT - DENSITY TESTING OF LONGITUDINAL JOINTS (BDE)
Effective: January 1, 2010 Revised: April 1, 2016

Description. This work shall consist of testing the density of longitudinal joints as part of the quality control/quality assurance (QC/QA) of hot-mix asphalt (HMA). Work shall be according to Section 1030 of the Standard Specifications except as follows.

Quality Control/Quality Assurance (QC/QA). Delete the second and third sentence of the third paragraph of Article 1030.05(d)(3) of the Standard Specifications.

Add the following paragraphs to the end of Article 1030.05(d)(3) of the Standard Specifications:

"Longitudinal joint density testing shall be performed at each random density test location. Longitudinal joint testing shall be located at a distance equal to the lift thickness or a minimum of 4 in. (100 mm), from each pavement edge. (i.e. for a 5 in. (125 mm) lift the near edge of the density gauge or core barrel shall be within 5 in. (125 mm) from the edge of pavement.) Longitudinal joint density testing shall be performed using either a correlated nuclear gauge or cores.

a. Confined Edge. Each confined edge density shall be represented by a one-minute nuclear density reading or a core density and shall be included in the average of density readings or core densities taken across the mat which represents the Individual Test.

b. Unconfined Edge. Each unconfined edge joint density shall be represented by an average of three one-minute density readings or a single core density at the given density test location and shall meet the density requirements specified herein. The three one-minute readings shall be spaced 10 ft (3 m) apart longitudinally along the unconfined pavement edge and centered at the random density test location."

Revise the Density Control Limits table in Article 1030.05(d)(4) of the Standard Specifications to read:

"Mixture Composition	Parameter	Individual Test (includes confined edges)	Unconfined Edge Joint Density Minimum
IL-4.75	Ndesign = 50	93.0 – 97.4% [1/]	91.0%
IL-9.5	Ndesign = 90	92.0 – 96.0%	90.0%
IL-9.5,IL-9.5L	Ndesign < 90	92.5 – 97.4%	90.0%
IL-19.0	Ndesign = 90	93.0 – 96.0%	90.0%
IL-19.0, IL-19.0L	Ndesign < 90	93.0 [2/]– 97.4%	90.0%
SMA	Ndesign = 50 & 80	93.5 – 97.4%	91.0%"

HOT-MIX ASPHALT – TACK COAT (BDE)
Effective: November 1, 2016

Revise Article 1032.06(a) of the Standard Specifications to read:

"(a) Anionic Emulsified Asphalt. Anionic emulsified asphalts shall be according to AASHTO M 140. SS-1h emulsions used as a tack coat shall have the cement mixing test waived."

MAST ARM ASSEMBLY AND POLE (BDE)
Effective: July 1, 2016

Revise Article 1077.03(a)(1) of the Standard Specifications to read:

"(1) Loading. The mast arm assembly and pole, and combination mast arm assembly and pole shall be designed for the loading shown on the Highway Standards or elsewhere on the plans, whichever is greater. The design shall be according to AASHTO "LRFD Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 2015 Edition. However, the arm-to-pole connection for tapered signal and luminaire arms shall be according to the "fillet welded, ring stiffened box connection" detail as shown in Figure C5.6.7-2. The mast arm and pole shall be designed assuming the ADT > 10,000, Risk Category Typical, and Fatigue Category I Natural Wind Gust only."

PAVEMENT MARKING REMOVAL (BDE)
Effective: July 1, 2016

Revise Article 783.02 of the Standard Specifications to read:

"**783.02 Equipment.** Equipment shall be according to the following.

Item	Article/Section
(a) Grinders (Note 1)	
(b) Water Blaster with Vacuum Recovery	1101.12

Note 1. Grinding equipment shall be approved by the Engineer."

Revise the first paragraph of Article 783.03 of the Standard Specifications to read:

"**783.03 Removal of Conflicting Markings.** Existing pavement markings that conflict with revised traffic patterns shall be removed. If darkness or inclement weather prohibits the removal operations, such operations shall be resumed the next morning or when weather permits. In the event of removal equipment failure, such equipment shall be repaired, replaced, or leased so removal operations can be resumed within 24 hours."

Revise the first and second sentences of the first paragraph of Article 783.03(a) of the Standard Specifications to read:

> "The existing pavement markings shall be removed by the method specified and in a manner that does not materially damage the surface or texture of the pavement or surfacing. Small particles of tightly adhering existing markings may remain in place, if in the opinion of the Engineer, complete removal of the small particles will result in pavement surface damage."

Revise the first paragraph of Article 783.04 of the Standard Specifications to read:

"**783.04 Cleaning.** The roadway surface shall be cleaned of debris or any other deleterious material by the use of compressed air or water blast."

Revise the first paragraph of Article 783.06 of the Standard Specifications to read:

"**783.06 Basis of Payment.** This work will be paid for at the contract unit price per each for RAISED REFLECTIVE PAVEMENT MARKER REMOVAL, or at the contract unit price per square foot (square meter) for PAVEMENT MARKING REMOVAL – GRINDING and/or PAVEMENT MARKING REMOVAL – WATER BLASTING."

Delete Article 1101.13 from the Standard Specifications.

PORTABLE CHANGEABLE MESSAGE SIGNS (BDE)
Effective: November 1, 2016 Revised: April 1, 2017

Revise the second paragraph of Article 701.20(h) of the Standard Specifications to read:

"For all other portable changeable message signs, this work will be paid for at the contract unit price per calendar day for each sign as CHANGEABLE MESSAGE SIGN."

Revise this second sentence of the first paragraph of Article 1106.02(i) of the Standard Specifications to read:

"The message panel shall be a minimum of 7 ft (2.1 m) above the edge of pavement in urban areas and a minimum of 5 ft (1.5 m) above the edge of pavement in rural areas, present a level appearance, and be capable of displaying up to eight characters in each of three lines at a time."

PORTLAND CEMENT CONCRETE BRIDGE DECK CURING (BDE)
Effective: April 1, 2015 Revised: January 1, 2017

Revise the following two entries in the table in Article 1020.13 of the Standard Specifications to read:

"INDEX TABLE OF CURING AND PROTECTION OF CONCRETE CONSTRUCTION			
TYPE OF CONSTRUCTION	CURING METHODS	CURING PERIOD DAYS	LOW AIR TEMPERATURE PROTECTION METHODS
Superstructure (Approach Slab)	1020.13(a)(5)(6) [19/]	3	1020.13(d)(1)(2) [17/]
Deck	1020.13(a)(5)(6) [19/]	7	1020.13(d)(1)(2) [17/]

Add the following footnote to the end of the Index Table of Curing and Protection of Concrete Construction in Article 1020.13 of the Standard Specifications:

"19/ The cellulose polyethylene or synthetic fiber with polymer polyethylene blanket method shall not be used on latex modified concrete."

Revise Article 1020.13(a)(5) of the Standard Specifications to read:

"(5) Wetted Cotton Mat Method. After the surface of concrete has been textured or finished, it shall be covered immediately with dry or damp cotton mats. Cotton mats in poor condition will not be allowed. The cotton mats shall be placed in a manner which will not create indentations greater than 1/4 in. (6 mm) in the concrete surface. Minor marring of the surface is tolerable and is secondary to the importance of timely curing. The cotton mats shall then be wetted immediately and thoroughly soaked with a gentle spray of water. Thereafter, the cotton mats shall be covered with white polyethylene sheeting or burlap-polyethylene blankets. The cotton mats shall be kept saturated with water.

a. Bridge Decks. For bridge decks, a foot bridge shall be used to place and wet the cotton mats. The cotton mats shall be maintained in a wetted condition until the concrete has hardened sufficiently to place soaker hoses without indentations to the concrete surface. The soaker hoses shall be placed on top of the cotton mats at a maximum 4 ft (1.2 m) spacing. The cotton mats shall be kept wet with a continuous supply of water for the remainder of the curing period. Other continuous wetting systems may be used if approved by the Engineer.

For areas inaccessible to the cotton mats, curing shall be according to Article 1020.13(a)(3)."

Add the following to Article 1020.13(a) of the Standard Specifications.

"(6) Cellulose Polyethylene Blanket Method and Synthetic Fiber with Polymer Polyethylene Blanket Method. After the surface of concrete has been textured or finished, it shall be covered immediately with a cellulose polyethylene or synthetic fiber with polymer polyethylene blanket. Damaged blankets will not be allowed. The blankets shall be installed with the white perforated polyethylene side facing up. Adjoining blankets shall overlap a minimum of 8 in. (200 mm). Any air bubbles trapped during placement shall be removed. The blankets shall then be wetted immediately and thoroughly soaked with a gentle spray of water. Thereafter, the blankets shall be kept saturated with water. For bridge decks, the blankets shall be placed and kept wet according to Article 1020.13(a)(5)a."

Revise the first paragraph of Article 1022.03 of the Standard Specifications to read:

"**1022.03 Waterproof Paper Blankets, White Polyethylene Sheeting, Burlap-Polyethylene Blankets, Cellulose Polyethylene Blankets, and Synthetic Fiber with Polymer Polyethylene Blankets.** These materials shall be white and according to ASTM C 171, except moisture loss test specimens shall be made according to Illinois Modified AASHTO T 155.

The cellulose polyethylene blanket shall consist of a white polyethylene sheeting with cellulose fiber backing and shall be limited to single use only. The cellulose polyethylene blankets shall be delivered to the jobsite unused and in the manufacturer's unopened packaging until ready for installation. Each roll shall be clearly labeled with product name, manufacturer, and manufacturer's certification of compliance with ASTM C 171.

The synthetic fiber with polymer polyethylene blanket shall consist of a white polyethylene sheeting with absorbent synthetic fibers and super absorbent polymer backing, and shall be limited to single use only. The synthetic fiber with polymer polyethylene blankets shall be delivered to the jobsite unused and in the manufacturer's unopened packaging until ready for installation. Each roll shall be clearly labeled on the product with product name, manufacturer, and manufacturer's certification of compliance with ASTM C 171."

PORTLAND CEMENT CONCRETE SIDEWALK (BDE)
Effective: August 1, 2017

Revise the first paragraph of Article 424.12 of the Standard Specifications to read:

"**424.12 Method of Measurement.** This work will be measured for payment in place and the area computed in square feet (square meters). Curb ramps, including side curbs and side flares, will be measured for payment as sidewalk. No deduction will be made for detectable warnings located within the ramp."

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."

RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES (BDE)
Effective: November 1, 2012 Revise: April 1, 2016

Revise Section 1031 of the Standard Specifications to read:

"**SECTION 1031. RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES**

1031.01 Description. Reclaimed asphalt pavement and reclaimed asphalt shingles shall be according to the following.

(a) Reclaimed Asphalt Pavement (RAP). RAP is the material produced by cold milling or crushing an existing hot-mix asphalt (HMA) pavement. The Contractor shall supply written documentation that the RAP originated from routes or airfields under federal, state, or local agency jurisdiction.

(b) Reclaimed Asphalt Shingles (RAS). Reclaimed asphalt shingles (RAS). RAS is from the processing and grinding of preconsumer or post-consumer shingles. RAS shall be a clean and uniform material with a maximum of 0.5 percent unacceptable material, as defined in Bureau of Materials and Physical Research Policy Memorandum, "Reclaimed Asphalt Shingle (RAS) Sources", by weight of RAS. All RAS used shall come from a Bureau of Materials and Physical Research approved processing facility where it shall be ground and processed to 100 percent passing the 3/8 in. (9.5 mm) sieve and 93 percent passing the #4 (4.75 mm) sieve based on a dry shake gradation. RAS shall be uniform in gradation and asphalt binder content and shall meet the testing requirements specified herein. In addition, RAS shall meet the following Type 1 or Type 2 requirements.

(1) Type 1. Type 1 RAS shall be processed, preconsumer asphalt shingles salvaged from the manufacture of residential asphalt roofing shingles.

(2) Type 2. Type 2 RAS shall be processed post-consumer shingles only, salvaged from residential, or four unit or less dwellings not subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP).

1031.02 Stockpiles. RAP and RAS stockpiles shall be according to the following.

(a) RAP Stockpiles. The Contractor shall construct individual, sealed RAP stockpiles meeting one of the following definitions. No additional RAP shall be added to the pile after the pile has been sealed. Stockpiles shall be sufficiently separated to prevent intermingling at the base. Stockpiles shall be identified by signs indicating the type as listed below (i.e. “Homogeneous Surface”).

Prior to milling, the Contractor shall request the District provide documentation on the quality of the RAP to clarify the appropriate stockpile.

(1) Fractionated RAP (FRAP). FRAP shall consist of RAP from Class I, HMA (High and Low ESAL) mixtures. The coarse aggregate in FRAP shall be crushed aggregate and may represent more than one aggregate type and/or quality, but shall be at least C quality. All FRAP shall be fractionated prior to testing by screening into a minimum of two size fractions with the separation occurring on or between the #4 (4.75 mm) and 1/2 in. (12.5 mm) sieves. Agglomerations shall be minimized such that 100 percent of the RAP shall pass the sieve size specified below for the mix into which the FRAP will be incorporated.

Mixture FRAP will be used in:	Sieve Size that 100 % of FRAP Shall Pass
IL-19.0	1 1/2 in. (40 mm)
IL-9.5	3/4 in. (20 mm)
IL-4.75	1/2 in. (13 mm)

(2) Homogeneous. Homogeneous RAP stockpiles shall consist of RAP from Class I, HMA (High and Low ESAL) mixtures and represent: 1) the same aggregate quality, but shall be at least C quality; 2) the same type of crushed aggregate (either crushed natural aggregate, ACBF slag, or steel slag); 3) similar gradation; and 4) similar asphalt binder content. If approved by the Engineer, combined single pass surface/binder millings may be considered “homogeneous” with a quality rating dictated by the lowest coarse aggregate quality present in the mixture.

(3) Conglomerate. Conglomerate RAP stockpiles shall consist of RAP from Class I, HMA (High and Low ESAL) mixtures. The coarse aggregate in this RAP shall be crushed aggregate and may represent more than one aggregate type and/or quality, but shall be at least C quality. This RAP may have an inconsistent gradation and/or asphalt binder content prior to processing. All conglomerate RAP shall be processed prior to testing by crushing to where all RAP shall pass the 5/8 in. (16 mm) or smaller screen. Conglomerate RAP stockpiles shall not contain steel slag.

(4) Non-Quality. RAP stockpiles that do not meet the requirements of the stockpile categories listed above shall be classified as “Non-Quality”.

RAP/FRAP containing contaminants, such as earth, brick, sand, concrete, sheet asphalt, bituminous surface treatment (i.e. chip seal), pavement fabric, joint sealants, etc., will be unacceptable unless the contaminants are removed to the satisfaction of the Engineer. Sheet asphalt shall be stockpiled separately.

(b) RAS Stockpiles. Type 1 and Type 2 RAS shall be stockpiled separately and shall not be intermingled. Each stockpile shall be signed indicating what type of RAS is present.

Unless otherwise specified by the Engineer, mechanically blending manufactured sand (FM 20 or FM 22) up to an equal weight of RAS with the processed RAS will be permitted to improve workability. The sand shall be “B Quality” or better from an approved Aggregate Gradation Control System source. The sand shall be accounted for in the mix design and during HMA production.

Records identifying the shingle processing facility supplying the RAS, RAS type, and lot number shall be maintained by project contract number and kept for a minimum of three years.

1031.03 Testing. RAP/FRAP and RAS testing shall be according to the following.

(a) RAP/FRAP Testing. When used in HMA, the RAP/FRAP shall be sampled and tested either during or after stockpiling.

(1) During Stockpiling. For testing during stockpiling, washed extraction samples shall be run at the minimum frequency of one sample per 500 tons (450 metric tons) for the first 2000 tons (1800 metric tons) and one sample per 2000 tons (1800 metric tons) thereafter. A minimum of five tests shall be required for stockpiles less than 4000 tons (3600 metric tons).

(2) After Stockpiling. For testing after stockpiling, the Contractor shall submit a plan for approval to the District proposing a satisfactory method of sampling and testing the RAP/FRAP pile either in-situ or by restockpiling. The sampling plan shall meet the minimum frequency required above and detail the procedure used to obtain representative samples throughout the pile for testing.

Each sample shall be split to obtain two equal samples of test sample size. One of the two test samples from the final split shall be labeled and stored for Department use. The Contractor shall extract the other test sample according to Department procedure. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

(b) RAS Testing. RAS or RAS blended with manufactured sand shall be sampled and tested during stockpiling according to Bureau of Materials and Physical Research Policy Memorandum, “Reclaimed Asphalt Shingle (RAS) Source”.

Samples shall be collected during stockpiling at the minimum frequency of one sample per 200 tons (180 metric tons) for the first 1000 tons (900 metric tons) and one sample per 250 tons (225 metric tons) thereafter. A minimum of five samples are required for stockpiles less than 1000 tons (900 metric tons). Once a ≤ 1000 ton (900 metric ton), five-sample/test stockpile has been established it shall be sealed. Additional incoming RAS or RAS blended with manufactured sand shall be stockpiled in a separate working pile as designated in the Quality Control plan and only added to the sealed stockpile when the test results of the working pile are complete and are found to meet the tolerances specified herein for the original sealed RAS stockpile.

Before testing, each sample shall be split to obtain two test samples. One of the two test samples from the final split shall be labeled and stored for Department use. The Contractor shall perform a washed extraction and test for unacceptable materials on the other test sample according to Department procedures. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

If the sampling and testing was performed at the shingle processing facility in accordance with the QC Plan, the Contractor shall obtain and make available all of the test results from start of the initial stockpile.

1031.04 Evaluation of Tests. Evaluation of test results shall be according to the following.

(a) Evaluation of RAP/FRAP Test Results. All of the extraction results shall be compiled and averaged for asphalt binder content and gradation, and when applicable G_{mm}. Individual extraction test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	FRAP/Homogeneous/ Conglomerate
1 in. (25 mm)	
1/2 in. (12.5 mm)	± 8 %
No. 4 (4.75 mm)	± 6 %
No. 8 (2.36 mm)	± 5 %
No. 16 (1.18 mm)	
No. 30 (600 µm)	± 5 %
No. 200 (75 µm)	± 2.0 %
Asphalt Binder	± 0.4 % 1/
G_{mm}	± 0.03

1/ The tolerance for FRAP shall be ± 0.3 %.

If more than 20 percent of the individual sieves and/or asphalt binder content tests are out of the above tolerances, the RAP/FRAP shall not be used in HMA unless the RAP/FRAP representing the failing tests is removed from the stockpile. All test data and acceptance ranges shall be sent to the District for evaluation.

With the approval of the Engineer, the ignition oven may be substituted for extractions according to the ITP, “Calibration of the Ignition Oven for the Purpose of Characterizing Reclaimed Asphalt Pavement (RAP)”.

(b) Evaluation of RAS and RAS Blended with Manufactured Sand Test Results. All of the test results, with the exception of percent unacceptable materials, shall be compiled and averaged for asphalt binder content and gradation. Individual test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	RAS
No. 8 (2.36 mm)	± 5 %
No. 16 (1.18 mm)	± 5 %
No. 30 (600 µm)	± 4 %
No. 200 (75 µm)	± 2.0 %
Asphalt Binder Content	± 1.5 %

If more than 20 percent of the individual sieves and/or asphalt binder content tests are out of the above tolerances, or if the percent unacceptable material exceeds 0.5 percent by weight of material retained on the # 4 (4.75 mm) sieve, the RAS or RAS blend shall not be used in Department projects. All test data and acceptance ranges shall be sent to the District for evaluation.

1031.05 Quality Designation of Aggregate in RAP/FRAP.

(a) RAP. The aggregate quality of the RAP for homogeneous and conglomerate stockpiles shall be set by the lowest quality of coarse aggregate in the RAP stockpile and are designated as follows.

(1) RAP from Class I, Superpave/HMA (High ESAL), or (Low ESAL) IL-9.5L surface mixtures are designated as containing Class B quality coarse aggregate.

(2) RAP from Class I binder, Superpave/HMA (High ESAL) binder, or (Low ESAL) IL-19.0L binder mixtures are designated as containing Class C quality coarse aggregate.

(b) FRAP. If the Engineer has documentation of the quality of the FRAP aggregate, the Contractor shall use the assigned quality provided by the Engineer.

If the quality is not known, the quality shall be determined as follows. Coarse and fine FRAP stockpiles containing plus #4 (4.75 mm) sieve coarse aggregate shall have a maximum tonnage of 5000 tons (4500 metric tons). The Contractor shall obtain a representative sample witnessed by the Engineer. The sample shall be a minimum of 50 lb (25 kg). The sample shall be extracted according to Illinois Modified AASHTO T 164 by a consultant laboratory prequalified by the Department for the specified testing. The consultant laboratory shall submit the test results along with the recovered aggregate to the District Office. The cost for this testing shall be paid by the Contractor. The District will forward the sample to the Bureau of Materials and Physical Research Aggregate Lab for MicroDeval Testing, according to ITP 327. A maximum loss of 15.0 percent will be applied for all HMA applications.

1031.06 Use of RAP/FRAP and/or RAS in HMA. The use of RAP/FRAP and/or RAS shall be the Contractor's option when constructing HMA in all contracts.

(a) RAP/FRAP. The use of RAP/FRAP in HMA shall be as follows.

(1) Coarse Aggregate Size. The coarse aggregate in all RAP shall be equal to or less than the nominal maximum size requirement for the HMA mixture to be produced.

(2) Steel Slag Stockpiles. Homogeneous RAP stockpiles containing steel slag will be approved for use in all HMA (High ESAL and Low ESAL) Surface and Binder Mixture applications.

(3) Use in HMA Surface Mixtures (High and Low ESAL). RAP/FRAP stockpiles for use in HMA surface mixtures (High and Low ESAL) shall be FRAP or homogeneous in which the coarse aggregate is Class B quality or better. RAP/FRAP from Conglomerate stockpiles shall be considered equivalent to limestone for frictional considerations. Known frictional contributions from plus #4 (4.75 mm) homogeneous RAP and FRAP stockpiles will be accounted for in meeting frictional requirements in the specified mixture.

(4) Use in HMA Binder Mixtures (High and Low ESAL), HMA Base Course, and HMA Base Course Widening. RAP/FRAP stockpiles for use in HMA binder mixtures (High and Low ESAL), HMA base course, and HMA base course widening shall be FRAP, homogeneous, or conglomerate, in which the coarse aggregate is Class C quality or better.

(5) Use in Shoulders and Subbase. RAP/FRAP stockpiles for use in HMA shoulders and stabilized subbase (HMA) shall be FRAP, homogeneous, or conglomerate.

(6) When the Contractor chooses the RAP option, the percentage of RAP shall not exceed the amounts indicated in Article 1031.06(c)(1) below for a given Ndesign.

(b) RAS. RAS meeting Type 1 or Type 2 requirements will be permitted in all HMA applications as specified herein.

(c) RAP/FRAP and/or RAS Usage Limits. Type 1 or Type 2 RAS may be used alone or in conjunction with RAP or FRAP in HMA mixtures up to a maximum of 5.0 percent by weight of the total mix.

(1) RAP/RAS. When RAP is used alone or RAP is used in conjunction with RAS, the percentage of virgin asphalt binder replacement shall not exceed the amounts listed

(2) in the Max RAP/RAS ABR table listed below for the given Ndesign.

RAP/RAS Maximum Asphalt Binder Replacement (ABR) Percentage

HMA Mixtures 1/, 2/	RAP/RAS Maximum ABR %		
Ndesign	Binder/Leveling Binder	Surface	Polymer Modified
30	30	30	10
50	25	15	10
70	15	10	10
90	10	10	10

1/ For Low ESAL HMA shoulder and stabilized subbase, the RAP/RAS ABR shall not exceed 50 percent of the mixture.

2/ When RAP/RAS ABR exceeds 20 percent, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28). If warm mix asphalt (WMA) technology is utilized and production temperatures do not exceed 275 °F (135 °C), the high and low virgin asphalt binder grades shall each be reduced by one grade when RAP/RAS ABR exceeds 25 percent (i.e. 26 percent RAP/RAS ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28).

(2) FRAP/RAS. When FRAP is used alone or FRAP is used in conjunction with RAS, the percentage of virgin asphalt binder replacement shall not exceed the amounts listed in the FRAP/RAS table listed below for the given Ndesign.

FRAP/RAS Maximum Asphalt Binder Replacement (ABR) Percentage

HMA Mixtures 1/, 2/	FRAP/RAS Maximum ABR %		
Ndesign	Binder/Leveling Binder	Surface	Polymer Modified 3/, 4/
30	50	40	10
50	40	35	10
70	40	30	10
90	40	30	10

1/ For Low ESAL HMA shoulder and stabilized subbase, the FRAP/RAS ABR shall not exceed 50 percent of the mixture.

2/ When FRAP/RAS ABR exceeds 20 percent for all mixes, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28). If warm mix asphalt (WMA) technology is utilized and production temperatures do not exceed 275 °F (135 °C), the high and low virgin asphalt binder grades shall each be reduced by one grade when FRAP/RAS ABR exceeds 25 percent (i.e. 26 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28).

3/ For SMA the FRAP/RAS ABR shall not exceed 20 percent.

4/ For IL-4.75 mix the FRAP/RAS ABR shall not exceed 30 percent.

1031.07 HMA Mix Designs. At the Contractor's option, HMA mixtures may be constructed utilizing RAP/FRAP and/or RAS material meeting the detailed requirements specified herein.

(a) RAP/FRAP and/or RAS. RAP/FRAP and/or RAS mix designs shall be submitted for verification. If additional RAP/FRAP and/or RAS stockpiles are tested and found that no more than 20 percent of the results, as defined under "Testing" herein, are outside of the control tolerances set for the original RAP/FRAP and/or RAS stockpile and HMA mix design, and meets all of the requirements herein, the additional RAP/FRAP and/or RAS stockpiles may be used in the original mix design at the percent previously verified.

(b) RAS. Type 1 and Type 2 RAS are not interchangeable in a mix design. A RAS stone bulk specific gravity (Gsb) of 2.300 shall be used for mix design purposes.

1031.08 HMA Production. HMA production utilizing RAP/FRAP and/or RAS shall be as follows.

(a) RAP/FRAP. The coarse aggregate in all RAP/FRAP used shall be equal to or less than the nominal maximum size requirement for the HMA mixture being produced.

To remove or reduce agglomerated material, a scalping screen, gator, crushing unit, or comparable sizing device approved by the Engineer shall be used in the RAP feed system to remove or reduce oversized material. If material passing the sizing device adversely affects the mix production or quality of the mix, the sizing device shall be set at a size specified by the Engineer.

If the RAP/FRAP control tolerances or QC/QA test results require corrective action, the Contractor shall cease production of the mixture containing RAP/FRAP and either switch to the virgin aggregate design or submit a new RAP/FRAP design.

(b) RAS. RAS shall be incorporated into the HMA mixture either by a separate weight depletion system or by using the RAP weigh belt. Either feed system shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes. The portion of RAS shall be controlled accurately to within ± 0.5 percent of the amount of RAS utilized. When using the weight depletion system, flow indicators or sensing devices shall be provided and interlocked with the plant controls such that the mixture production is halted when RAS flow is interrupted.

(c) RAP/FRAP and/or RAS. HMA plants utilizing RAP/FRAP and/or RAS shall be capable of automatically recording and printing the following information.

(1) Dryer Drum Plants.

a. Date, month, year, and time to the nearest minute for each print.

b. HMA mix number assigned by the Department.

c. Accumulated weight of dry aggregate (combined or individual) in tons (metric tons) to the nearest 0.1 ton (0.1 metric ton).

d. Accumulated dry weight of RAP/FRAP/RAS in tons (metric tons) to the nearest 0.1 ton (0.1 metric ton).

e. Accumulated mineral filler in revolutions, tons (metric tons), etc. to the nearest 0.1 unit.

f. Accumulated asphalt binder in gallons (liters), tons (metric tons), etc. to the nearest 0.1 unit.

g. Residual asphalt binder in the RAP/FRAP material as a percent of the total mix to the nearest 0.1 percent.

h. Aggregate and RAP/FRAP moisture compensators in percent as set on the control panel. (Required when accumulated or individual aggregate and RAP/FRAP are printed in wet condition.)

(2) Batch Plants.

a. Date, month, year, and time to the nearest minute for each print.

b. HMA mix number assigned by the Department.

c. Individual virgin aggregate hot bin batch weights to the nearest pound (kilogram).

d. Mineral filler weight to the nearest pound (kilogram).

e. RAP/FRAP/RAS weight to the nearest pound (kilogram).

f. Virgin asphalt binder weight to the nearest pound (kilogram).

g. Residual asphalt binder in the RAP/FRAP/RAS material as a percent of the total mix to the nearest 0.1 percent.

The printouts shall be maintained in a file at the plant for a minimum of one year or as directed by the Engineer and shall be made available upon request. The printing system will be inspected by the Engineer prior to production and verified at the beginning of each construction season thereafter.

1031.09 RAP in Aggregate Surface Course and Aggregate Wedge Shoulders, Type B. The use of RAP in aggregate surface course (temporary access entrances only) and aggregate wedge shoulders, Type B shall be as follows.

(a) Stockpiles and Testing. RAP stockpiles may be any of those listed in Article 1031.02, except "Non-Quality" and "FRAP". The testing requirements of Article 1031.03 shall not apply. RAP used shall be according to the current Bureau of Materials and Physical Research Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications".

(b) Gradation. One hundred percent of the RAP material shall pass the 1 1/2 in. (37.5 mm) sieve. The RAP material shall be reasonably well graded from coarse to fine. RAP material that is gap-graded or single sized will not be accepted."

SPEED DISPLAY TRAILER (BDE)
Effective: April 2, 2014 Revised: January 1, 2017

Revise the third paragraph of Article 701.11 of the Standard Specifications to read:

"When not being utilized to inform and direct traffic, sign trailers, speed display trailers, arrow boards, and portable changeable message boards shall be treated as nonoperating equipment."

Add the following to Article 701.15 of the Standard Specifications:

"(m) Speed Display Trailer. A speed display trailer is used to enhance safety of the traveling public and workers in work zones by alerting drivers of their speed, thus deterring them from driving above the posted work zone speed limit."

Add the following to Article 701.20 of the Standard Specifications:

"(k) When speed display trailers are shown on the Standard, this work will not be paid for separately but shall be considered as included in the cost of the Standard.

For all other speed display trailers, this work will be paid for at the contract unit price per calendar month or fraction thereof for each trailer as SPEED DISPLAY TRAILER."

Add the following to Article 1106.02 of the Standard Specifications:

"(o) Speed Display Trailer. The speed display trailer shall consist of a LED speed indicator display with self-contained, one-direction radar mounted on an orange see-through trailer. The height of the display and radar shall be such that it will function and be visible when located behind concrete barrier.

The speed measurement shall be by radar and provide a minimum detection distance of 1000 ft (300 m). The radar shall have an accuracy of ±1 mile per hour.

The speed indicator display shall face approaching traffic and shall have a sign legend of "YOUR SPEED" immediately above or below the speed display. The sign letters shall be between 5 and 8 in. (125 and 200 mm) in height. The digital speed display shall show two digits (00 to 99) in mph. The color of the changeable message legend shall be a yellow legend on a black background. The minimum height of the numerals shall be 18 in. (450 mm), and the nominal legibility distance shall be at least 750 ft (250 m).

The speed indicator display shall be equipped with a violation alert that flashes the displayed detected speed when the work zone posted speed limit is exceeded. The speed indicator shall have a maximum speed cutoff. On roadway facilities with a normal posted speed limit greater than or equal to 45 mph, the detected speeds of vehicles traveling more than 25 mph over the work zone speed limit shall not be displayed. On facilities with normal posted speed limit of less than 45 mph, the detected speeds of vehicles traveling more than 15 mph over the work zone speeds limit shall not be displayed. On any roadway facility if detected speeds are less than 25 mph, they shall not be displayed. The display shall include automatic dimming for nighttime operation.

The speed indicator measurement and display functions shall be equipped with the power supply capable of providing 24 hours of uninterrupted service."

STEEL PLATE BEAM GUARDRAIL (BDE)
Effective: January 1, 2017

Revise Article 630.02 of the Standard Specifications to read:

"**630.02 Materials.** Materials shall be according to the following.

Item	Article/Section
(a) Steel Plate Beam Guardrail	1006.25
(b) Wood Posts and Wood Block	1007.01, 1007.02, 1007.06
(c) Steel Posts, Blockouts, Restraints and Wire Rope for Guardrail	1006.23
(d) Preservative Treatment	1007.12
(e) Reinforcement Bars	1006.10
(f) Plastic Blockouts (Note 1)	
(g) Chemical Adhesive Resin System	1027.01
(h) Controlled Low-Strength Material (CLSM)	1019

Note 1. Plastic blockouts may be used in lieu of wood blockouts for steel plate beam guardrail. The plastic blockouts shall be the minimum dimensions shown on the plans and shall be on the Department's qualified product list."

Revise Article 630.05 of the Standard Specifications to read:

"**630.05 Posts.** Posts shall be as follows.

(a) Wood Posts. Wood posts and blocks shall be treated. The posts and blocks shall be cut to the proper dimensions before treatment. No cutting of the posts or blocks will be permitted after treatment. Posts shall be erected according to Article 634.05.

(b) Steel Posts. Steel posts may be driven by hand or mechanical methods provided they are protected by a suitable driving cap and the earth around the posts compacted, if necessary, after driving. When steel posts are driven to incorrect alignment or grade, they shall be removed and set according to Article 634.05.

When it is necessary to shorten the posts in the field, the lower portion shall be cut off in a manner to provide a smooth cut with minimum damage to the galvanizing. Cut areas shall be repaired according to the requirements of AASHTO M 36."

Revise Article 630.06 of the Standard Specifications to read:

"**630.06 Shoulder Stabilization at Guardrail.** Shoulder stabilization shall be constructed at the locations of steel plate beam guardrail installation according to the details shown on the plans. On new construction projects, the material used in the shoulder stabilization shall be the same as that used in the adjacent paved shoulder. On shoulder resurfacing projects, the material used in the shoulder stabilization shall be the same as that used for the shoulder resurfacing.

When portland cement concrete is used, shoulder stabilization shall be constructed according to the applicable portions of Section 483. The shoulder stabilization shall be constructed simultaneously with the adjacent portland cement concrete shoulder. Guardrail posts shall be driven through leaveouts or holes cored in the completed shoulder stabilization. The void around each post shall be backfilled with earth or aggregate and capped with hot-mix asphalt (HMA) or CLSM.

When HMA is used, shoulder stabilization shall be constructed according to the applicable portions of Section 482. On new construction, the shoulder stabilization shall be constructed simultaneously with the HMA shoulder. On shoulder resurfacing projects, the portion of the shoulder stabilization below the surface of the existing paved shoulder shall be placed and compacted separately. The guardrail posts shall be driven through holes cored in the completed shoulder stabilization. The void around each post shall be backfilled with earth or aggregate and capped with HMA or CLSM.

When driving guardrail posts through existing shoulders, shoulder stabilization, or other paved areas, the posts shall be driven through cored holes. The void around each post shall be backfilled with earth or aggregate and capped with HMA or CLSM."

Revise Article 630.08 of the Standard Specifications to read:

"**630.08 Basis of Payment.** This work will be paid for at the contract unit price per foot (meter) for NON-BLOCKED STEEL PLATE BEAM GUARDRAIL; STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT (1.83 M) POSTS; STEEL PLATE BEAM GUARDRAIL, TYPE A, 9 FOOT (2.74 M) POSTS; STEEL PLATE BEAM GUARDRAIL, TYPE B, 6 FOOT (1.83 M) POSTS; STEEL PLATE BEAM GUARDRAIL, TYPE B, 9 FOOT (2.74 M) POSTS; or STEEL PLATE BEAM GUARDRAIL, TYPE D, 6 FOOT (1.83 M) POSTS.

When end sections are specified, they will not be paid for as a separate item, but shall be considered as included in the unit price for steel plate beam guardrail.

Steel plate beam guardrail mounted on existing culverts will be paid for at the contract unit price per foot (meter) for STRONG POST GUARDRAIL ATTACHED TO CULVERT or WEAK POST GUARDRAIL ATTACHED TO CULVERT, of the case specified.

Portland cement concrete shoulder stabilization at guardrail will be paid for according to Article 483.10.

HMA shoulder stabilization at guardrail will be paid for according to Article 482.08.

Excavation in rock will be paid for according to Article 502.13.

Steel plate beam guardrail incorporating long-span spacing will be paid for at the contract unit price per foot (meter) for LONG-SPAN GUARDRAIL OVER CULVERT, 12 FT 6 IN (3.8 M) SPAN; LONG-SPAN GUARDRAIL OVER CULVERT, 18 FT 9 IN (5.7 M) SPAN; or LONG-SPAN GUARDRAIL OVER CULVERT, 25 FT (7.6 M) SPAN.

Steel plate beam guardrail incorporating treated timber at the back side of the post will be paid for at the contract unit price per foot (meter) for BACK SIDE PROTECTION OF GUARDRAIL."

TEMPORARY PAVEMENT MARKING (BDE)
Effective: April 1, 2012 Revised: April 1, 2017

Revise Article 703.02 of the Standard Specifications to read:

"**703.02 Materials.** Materials shall be according to the following.

(a) Pavement Marking Tape, Type I and Type III 1095.06
(b) Paint Pavement Markings 1095.02
(c) Pavement Marking Tape, Type IV ..... 1095.11"

Revise the second paragraph of Article 703.05 of the Standard Specifications to read:

"Type I marking tape or paint shall be used at the option of the Contractor, except paint shall not be applied to the final wearing surface unless authorized by the Engineer for late season applications where tape adhesion would be a problem. Type III or Type IV marking tape shall be used on the final wearing surface when the temporary pavement marking will conflict with the permanent pavement marking such as on tapers, crossovers and lane shifts."

Revise Article 703.07 of the Standard Specifications to read:

"**703.07 Basis of Payment.** This work will be paid for as follows.

a) Short Term Pavement Marking. Short term pavement marking will be paid for at the contract unit price per foot (meter) for SHORT TERM PAVEMENT MARKING. Removal of short term pavement markings will be paid for at the contract unit price per square foot (square meter) for SHORT TERM PAVEMENT MARKING REMOVAL.

b) Temporary Pavement Marking. Where the Contractor has the option of material type, temporary pavement marking will be paid for at the contract unit price per foot (meter) for TEMPORARY PAVEMENT MARKING of the line width specified, and at the contract unit price per square foot (square meter) for TEMPORARY PAVEMENT MARKING LETTERS AND SYMBOLS.

Where the Department specifies the use of pavement marking tape, the Type III or Type IV temporary pavement marking will be paid for at the contract unit price per foot (meter) for PAVEMENT MARKING TAPE, TYPE III or PAVEMENT MARKING TAPE, TYPE IV of the line width specified and at the contract unit price per square feet (square meter) for PAVEMENT MARKING TAPE, TYPE III - LETTERS AND SYMBOLS or PAVEMENT MARKING TAPE, TYPE IV – LETTERS AND SYMBOLS.

Removal of temporary pavement markings will be paid for at the contract unit price per square foot (square meter) for TEMPORARY PAVEMENT MARKING REMOVAL.

When temporary pavement marking is shown on the Standard, the cost of the temporary pavement marking and its removal will be included in the cost of the Standard."

Add the following to Section 1095 of the Standard Specifications:

"**1095.11 Pavement Marking Tape, Type IV.** The temporary, preformed, patterned markings shall consist of a white or yellow tape with wet retroreflective media incorporated to provide immediate and continuing retroreflection during both wet and dry conditions. The tape shall be manufactured without the use of heavy metals including lead chromate pigments or other similar, lead-containing chemicals.

The white and yellow Type IV marking tape shall meet the Type III requirements of Article 1095.06 and the following.

(a) Composition. The retroreflective pliant polymer pavement markings shall consist of a mixture of high-quality polymeric materials, pigments and glass beads distributed throughout its base cross-sectional area, with a layer of wet retroreflective media bonded to a durable polyurethane topcoat surface. The patterned surface shall have approximately 40% ± 10% of the surface area raised and presenting a near vertical face to traffic from any direction. The channels between the raised areas shall be substantially free of exposed beads or particles.

(b) Retroreflectance. The white and yellow markings shall meet the following for initial dry and wet retroreflectance.

(1) Dry Retroreflectance. Dry retroreflectance shall be measured under dry conditions according to ASTM D 4061 and meet the values described in Article 1095.06 for Type III tape.

(2) Wet Retroreflectance. Wet retroreflectance shall be measured under wet conditions according to ASTM E 2177 and meet the values shown in the following table.

Wet Retroreflectance, Initial R_L

Color	R_L 1.05/88.76
White	300
Yellow	200

(c) Color. The material shall meet the following requirements for daylight reflectance and color, when tested, using a color spectrophotometer with 45 degrees circumferential/zero degree geometry, illuminant D65, and a two degree observer angle. The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm.

Color	Daylight Reflectance %Y
White	65 minimum
*Yellow	36-59

*Shall match Federal 595 Color No. 33538 and the chromaticity limits as follows.

x	0.490	0.475	0.485	0.530
y	0.470	0.438	0.425	0.456

(d) Skid Resistance. The surface of the markings shall provide an average minimum skid resistance of 50 BPN when tested according to ASTM E 303.

(e) Sampling, Testing, Acceptance, and Certification. Prior to approval and use of the wet reflective, temporary, removable pavement marking tape, the manufacturer shall submit a notarized certification from an independent laboratory, together with the results of all tests, stating that the material meets the requirements as set forth herein. The certification test report shall state the lot tested, manufacturer's name, and date of manufacture.

After approval by the Department, samples and certification by the manufacturer shall be submitted for each batch used. The manufacturer shall submit a certification stating that the material meets the requirements as set forth herein and is essentially identical to the material sent for qualification. The certification shall state the lot tested, manufacturer's name, and date of manufacture.

All costs of testing (other than tests conducted by the Department) shall be borne by the manufacturer."

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 **10**. 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 then 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 _10____.

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 BARRIER TERMINAL, TYPE 1 SPECIAL (BDE)
Effective: January 1, 2017

Revise Article 631.04 of the Standard Specifications to read:

"**631.04 Traffic Barrier Terminal, Type 1 Special (Tangent) and Traffic Barrier Terminal, Type 1 Special (Flared).** These terminals shall meet the testing criteria contained in either NCHRP Report 350 or MASH. In addition to meeting the criteria in one or both of these references, the terminals shall be on the Department's qualified product list.

The terminal shall be installed according to the manufacturer's specifications. The beginning length of need point of the terminal shall be placed within 12 ft 6 in (3.8 m) of the length of need point shown on the plans.

The terminal shall be delineated with a terminal marker direct applied. No other guardrail delineation shall be attached to the terminal section."

TUBULAR MARKERS (BDE)
Effective: January 1, 2017

Revise Article 701.03(j) of the Standard Specifications to read:

"(j) Tubular Markers ..... 1106.02"

Revise Article 701.15(g) of the Standard Specifications to read:

"(g) Tubular Markers. Tubular markers are used to channelize traffic. They shall only be used when specified."

Revise the second paragraph of Article 701.18(f) of the Standard Specifications to read:

"Devices no greater than 24 in. (600 mm) wide, may be used in place of tubular markers when the two-way operation is to be in place four days or less."

Revise the second sentence of the second paragraph of Article 1106.02 of the Standard Specifications to read:

"These include cones, tubular markers, and plastic drums with no attachments."

Revise the third sentence of the seventh paragraph of Article 1106.02 of the Standard Specifications to read:

"Sheeting used on cones, drums, and tubular markers shall be reboundable as tested according to ASTM D 4956."

Revise Article 1106.02(f) of the Standard Specifications to read:

"(f) Tubular Markers. Tubular Markers shall be designed to bend under repeated impacts and return to an upright position without damage to the impacting vehicle or the markers. The markers shall be readily removable from the bases to permit field replacement.

The markers shall be orange in color having two white and two fluorescent orange bands."

WARM MIX ASPHALT (BDE)
Effective: January 1, 2012 Revised: April 1, 2016

Description. This work shall consist of designing, producing and constructing Warm Mix Asphalt (WMA) in lieu of Hot Mix Asphalt (HMA) at the Contractor's option. Work shall be according to Sections 406, 407, 408, 1030, and 1102 of the Standard Specifications, except as modified herein. In addition, any references to HMA in the Standard Specifications, or the special provisions shall be construed to include WMA.

WMA is an asphalt mixture which can be produced at temperatures lower than allowed for HMA utilizing approved WMA technologies. WMA technologies are defined as the use of additives or processes which allow a reduction in the temperatures at which HMA mixes are produced and placed. WMA is produced by the use of additives, a water foaming process, or combination of both. Additives include minerals, chemicals or organics incorporated into the asphalt binder stream in a dedicated delivery system. The process of foaming injects water into the asphalt binder stream, just prior to incorporation of the asphalt binder with the aggregate.

Approved WMA technologies may also be used in HMA provided all the requirements specified herein, with the exception of temperature, are met. However, asphalt mixtures produced at temperatures in excess of 275 °F (135 °C) will not be considered WMA when determining the grade reduction of the virgin asphalt binder grade.

Equipment.

Revise the first paragraph of Article 1102.01 of the Standard Specifications to read:

"**1102.01 Hot-Mix Asphalt Plant.** The hot-mix asphalt (HMA) plant shall be the batch-type, continuous-type, or dryer drum plant. The plants shall be evaluated for prequalification rating and approval to produce HMA according to the current Bureau of Materials and Physical Research Policy Memorandum, "Approval of Hot-Mix Asphalt Plants and Equipment". Once approved, the Contractor shall notify the Bureau of Materials and Physical Research to obtain approval of all plant modifications. The plants shall not be used to produce mixtures concurrently for more than one project or for private work unless permission is granted in writing by the Engineer. The plant units shall be so designed, coordinated and operated that they will function properly and produce HMA having uniform temperatures and compositions within the tolerances specified. The plant units shall meet the following requirements."

Add the following to Article 1102.01(a) of the Standard Specifications.

"(11) Equipment for Warm Mix Technologies.

a. Foaming. Metering equipment for foamed asphalt shall have an accuracy of ± 2 percent of the actual water metered. The foaming control system shall be electronically interfaced with the asphalt binder meter.

b. Additives. Additives shall be introduced into the plant according to the supplier's recommendations and shall be approved by the Engineer. The system for introducing the WMA additive shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes."

Mix Design Verification.

Add the following to Article 1030.04 of the Standard Specifications.

"(e) Warm Mix Technologies.

(1) Foaming. WMA mix design verification will not be required when foaming technology is used alone (without WMA additives). However, the foaming technology shall only be used on HMA designs previously approved by the Department.

(2) Additives. WMA mix designs utilizing additives shall be submitted to the Engineer for mix design verification."

Construction Requirements.

Revise the second paragraph of Article 406.06(b)(1) of the Standard Specifications to read:

"The HMA shall be delivered at a temperature of 250 to 350 °F (120 to 175 °C). WMA shall be delivered at a minimum temperature of 215 °F (102 °C)."

Basis of Payment.

This work will be paid at the contract unit price bid for the HMA pay items involved. Anti-strip will not be paid for separately, but shall be considered as included in the cost of the work.

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.

BITUMINOUS MATERIALS COST ADJUSTMENTS (BDE)
Effective: November 2, 2006 Revised: August 1, 2017

Description. Bituminous material cost adjustments will be made to provide additional compensation to the Contractor, or credit to the Department, for fluctuations in the cost of bituminous materials when optioned by the Contractor. The bidder shall indicate with their bid whether or not this special provision will be part of the contract.

The adjustments shall apply to permanent and temporary hot-mix asphalt (HMA) mixtures, bituminous surface treatments (cover and seal coats), and preventative maintenance type surface treatments that are part of the original proposed construction, or added as extra work and paid for by agreed unit prices. The adjustments shall not apply to bituminous prime coats, tack coats, crack filling/sealing, joint filling/sealing, or extra work paid for at a lump sum price or by force account.

Method of Adjustment. Bituminous materials cost adjustments will be computed as follows.

$CA = (BPI_P - BPI_L) \times (\%AC_V / 100) \times Q$

Where: CA = Cost Adjustment, $.
BPI_P = Bituminous Price Index, as published by the Department for the month the work is performed, $/ton ($/metric ton).
BPI_L = Bituminous Price Index, as published by the Department for the month prior to the letting for work paid for at the contract price; or for the month the agreed unit price letter is submitted by the Contractor for extra work paid for by agreed unit price, $/ton ($/metric ton).
$\%AC_V$ = Percent of virgin Asphalt Cement in the Quantity being adjusted. For HMA mixtures, the % AC_V will be determined from the adjusted job mix formula. For bituminous materials applied, a performance graded or cutback asphalt will be considered to be 100% AC_V and undiluted emulsified asphalt will be considered to be 65% AC_V.
Q = Authorized construction Quantity, tons (metric tons) (see below).

For HMA mixtures measured in square yards: Q, tons = A x D x (G_{mb} x 46.8) / 2000. For HMA mixtures measured in square meters: Q, metric tons = A x D x (G_{mb} x 1) / 1000. When computing adjustments for full-depth HMA pavement, separate calculations will be made for the binder and surface courses to account for their different G_{mb} and % AC_V.

For bituminous materials measured in gallons: Q, tons = V x 8.33 lb/gal x SG / 2000
For bituminous materials measured in liters: Q, metric tons = V x 1.0 kg/L x SG / 1000

Where: A = Area of the HMA mixture, sq yd (sq m).
D = Depth of the HMA mixture, in. (mm).
G_{mb} = Average bulk specific gravity of the mixture, from the approved mix design.
V = Volume of the bituminous material, gal (L).
SG = Specific Gravity of bituminous material as shown on the bill of lading.

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

$$\text{Percent Difference} = \{(BPI_L - BPI_P) \div BPI_L\} \times 100$$

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

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

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

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

(a) Categories of Work.

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

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

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

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

(5) Category E: Structures. Structure items having a cumulative bid price that exceeds $250,000 for pay items constructed under Sections 502, 503, 504, 505, 512, 516 and 540 including any modified standard or nonstandard items where the character of the work to be performed is considered structure work when similar to that performed under these sections and not included in categories A through D.

(b) Fuel Usage Factors.

English Units

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

Metric Units

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

(c) Quantity Conversion Factors.

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

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

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

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

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

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

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

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

STEEL COST ADJUSTMENT (BDE)
Effective: April 2, 2004 Revised: August 1, 2017

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

Types of Steel Products. An adjustment will be made for fluctuations in the cost of steel used in the manufacture of the following items:

Metal Piling (excluding temporary sheet piling)
Structural Steel
Reinforcing Steel

Other steel materials such as dowel bars, tie bars, mesh reinforcement, guardrail, steel traffic signal and light poles, towers and mast arms, metal railings (excluding wire fence), and frames and grates will be subject to a steel cost adjustment when the pay items they are used in have a contract value of $10,000 or greater.

The adjustments shall apply to the above items when they are part of the original proposed construction, or added as extra work and paid for by agreed unit prices. The adjustments shall not apply when the item is added as extra work and paid for at a lump sum price or by force account.

Documentation. Sufficient documentation shall be furnished to the Engineer to verify the following:

(a) The dates and quantity of steel, in lb (kg), shipped from the mill to the fabricator.

(b) The quantity of steel, in lb (kg), incorporated into the various items of work covered by this special provision. The Department reserves the right to verify submitted quantities.

Method of Adjustment. Steel cost adjustments will be computed as follows:

SCA = Q X D

Where: SCA = steel cost adjustment, in dollars
Q = quantity of steel incorporated into the work, in lb (kg)
D = price factor, in dollars per lb (kg)

$D = MPI_M - MPI_L$

Where: MPI_M = The Materials Cost Index for steel as published by the Engineering News-Record for the month the steel is shipped from the mill. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

MPI_L = The Materials Cost Index for steel as published by the Engineering News-Record for the month prior to the letting for work paid for at the contract price; or for the month the agreed unit price letter is submitted by the Contractor for extra work paid for by agreed unit price,. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

The unit weights (masses) of steel that will be used to calculate the steel cost adjustment for the various items are shown in the attached table.

No steel cost adjustment will be made for any products manufactured from steel having a mill shipping date prior to the letting date.

If the Contractor fails to provide the required documentation, the method of adjustment will be calculated as described above; however, the MPI_M will be based on the date the steel arrives at the job site. In this case, an adjustment will only be made when there is a decrease in steel costs.

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

Percent Difference = $\{(MPI_L - MPI_M) \div MPI_L\} \times 100$

Steel cost adjustments will be calculated by the Engineer and will be paid or deducted when all other contract requirements for the items of work are satisfied. Adjustments will only be made for fluctuations in the cost of the steel as described herein. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, storage, etc.

The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

Attachment

Item	Unit Mass (Weight)
Metal Piling (excluding temporary sheet piling)	
Furnishing Metal Pile Shells 12 in. (305 mm), 0.179 in. (3.80 mm) wall thickness)	23 lb/ft (34 kg/m)
Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness)	32 lb/ft (48 kg/m)
Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness)	37 lb/ft (55 kg/m)
Other piling	See plans
Structural Steel	See plans for weights (masses)
Reinforcing Steel	See plans for weights (masses)
Dowel Bars and Tie Bars	6 lb (3 kg) each
Mesh Reinforcement	63 lb/100 sq ft (310 kg/sq m)
Guardrail	
Steel Plate Beam Guardrail, Type A w/steel posts	20 lb/ft (30 kg/m)
Steel Plate Beam Guardrail, Type B w/steel posts	30 lb/ft (45 kg/m)
Steel Plate Beam Guardrail, Types A and B w/wood posts	8 lb/ft (12 kg/m)
Steel Plate Beam Guardrail, Type 2	305 lb (140 kg) each
Steel Plate Beam Guardrail, Type 6	1260 lb (570 kg) each
Traffic Barrier Terminal, Type 1 Special (Tangent)	730 lb (330 kg) each
Traffic Barrier Terminal, Type 1 Special (Flared)	410 lb (185 kg) each
Steel Traffic Signal and Light Poles, Towers and Mast Arms	
Traffic Signal Post	11 lb/ft (16 kg/m)
Light Pole, Tenon Mount and Twin Mount, 30 - 40 ft (9 – 12 m)	14 lb/ft (21 kg/m)
Light Pole, Tenon Mount and Twin Mount, 45 - 55 ft (13.5 – 16.5 m)	21 lb/ft (31 kg/m)
Light Pole w/Mast Arm, 30 - 50 ft (9 – 15.2 m)	13 lb/ft (19 kg/m)
Light Pole w/Mast Arm, 55 - 60 ft (16.5 – 18 m)	19 lb/ft (28 kg/m)
Light Tower w/Luminaire Mount, 80 - 110 ft (24 – 33.5 m)	31 lb/ft (46 kg/m)
Light Tower w/Luminaire Mount, 120 - 140 ft (36.5 – 42.5 m)	65 lb/ft (97 kg/m)
Light Tower w/Luminaire Mount, 150 - 160 ft (45.5 – 48.5 m)	80 lb/ft (119 kg/m)
Metal Railings (excluding wire fence)	
Steel Railing, Type SM	64 lb/ft (95 kg/m)
Steel Railing, Type S-1	39 lb/ft (58 kg/m)
Steel Railing, Type T-1	53 lb/ft (79 kg/m)
Steel Bridge Rail	52 lb/ft (77 kg/m)
Frames and Grates	
Frame	250 lb (115 kg)
Lids and Grates	150 lb (70 kg)

SWPPP

Illinois Department of Transportation

Storm Water Pollution Prevention Plan

Route	FAI Route 74 (I-74)	Marked Rte.	I-74
Section	(81-1)R-1 & 81-1(HBR, HBR-1, HBR-2)	Project No.	P-92-078-08
County	Rock Island	Contract No.	64E26

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issued by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Kevin Marchek
Print Name

Deputy Director of Highways, Region 2 Engineerr
Title

Illinois Department of Transportation
Agency

K D Marchek
Signature

May 10, 2017
Date

I. Site Description:

A. Provide a description of the project location (include latitude and longitude):

This project will improve a section of Interstate 74 (FAI Route 74) located in Moline Township and Rock Island County. Interstate 74 will be realigned with a new structure over the Mississippi River and improved from a 4-lane Expressway section to a 6-lane Expressway section. The project will also include improvements to streets and highways that cross Interstate 74 and existing interchanges.

The specific section of the Interstate 74 project addressed in this Storm Water Pollution Prevention Plan is Package C. This section is proposed to begin south of Avenue of the Cities interchange (41 28'48"N, 90 29'41"W) and end near 7th Avenue (41°30'24"N, 90°30'31"W).

B. Provide a description of the construction activity which is the subject of this plan:

Construction activities include earthwork, drainage, temporary and permanent pavement and the construction of proposed structures and retaining walls. The activities also include the construction and removal of temporary pavement, earthwork, and drainage facilities required to maintain traffic and drainage during construction.

C. Provide the estimated duration of this project:

Approximately 47 months

D. The total area of the construction site is estimated to be 95 acres.

The total area of the site estimated to be disturbed by excavation, grading or other activities is 56 acres.

E. The following is a weighted average of the runoff coefficient for this project after construction activities are completed:

C = 0.88

F. List all soils found within project boundaries. Include map unit name, slope information, and erosivity:

Orthents, loamy, undulating (802B) - Orthents consist of disturbed materials such as fills. This soil is generally well drained, moderately-slowly permeable, has a moderate shrink-swell potential, is moderately susceptible to frost action, and moderately corrosive to steel and concrete.

Fayette Silt Loam 2 to 5 percent slopes (280B) and 2 to 5 percent slopes, eroded (280B2) - Fayette Silt Loam is generally of loessial origin and generally found on the summits or shoulders of glacial moraines. The soil is well drained, moderately permeable, has a moderate shrink-swell potential, is highly susceptible to frost action and moderately corrosive to steel and concrete.

Hickory Series - Hickory-Sylvan silt loams, 35 to 60 percent slopes (898G) and Hickory-Sylvan-Fayette silt loams, 18 to 30 percent slopes (960F) - The Hickory series is generally of glacial origin and consists of glacial till. The soil is well drained, moderately permeable, has a moderate shrink-swell potential, is moderately susceptible to frost action and is highly corrosive to steel and has low corrosion potential for concrete.

Orion Silt Loam, 0 to 2 percent slopes (3415A) - Orion Silt Loam is generally of alluvial origin and generally found on flood plains that are frequently flooded. The soil is somewhat poorly drained, moderately permeable, has a low potential for shrink-swell, is highly susceptible to frost action and is highly corrosive to steel and has a low corrosion potential for concrete.

G. Provide an aerial extent of wetland acreage at the site:

There are no wetlands located within or adjoining the project boundaries.

H. Provide a description of potentially erosive areas associated with this project:

Since soil properties are fairly similar throughout the project, the most critical areas would be the areas with the steepest slopes.

I. The following is a description of soil disturbing activities by stages, their locations, and their erosive factors (e.g. steepness of slopes, length of slopes, etc):

The soil disturbing activities on the project initially involves earthwork and the removal of existing structures. The activities will then include the construction of temporary and permanent pavement, structures and retaining walls. There are no activities outside the project limits that will involve land disturbances

The predominant soil types on the project are silty clays and clayey silts. These soils are sensitive to changes in moisture content, and can become very soft with the combined action of wet conditions, freeze/thaw action, and construction traffic. Immediately after the spring thaw and during periods of high precipitation, these soils will exhibit high water contents and correspondingly low strengths.

J. See the erosion control plans and/or drainage plans for this contract for information regarding drainage patterns, approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent offsite sediment tracking (to be added after contractor identifies locations), areas of soil disturbance, the location of major structural and non-structural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands) and locations where storm water is discharged to surface water including wetlands.

K. Identify who owns the drainage system (municipality or agency) this project will drain into:

City of Moline, Illinois Department of Transportation

L. The following is a list of General NPDES ILR40 permittees within whose reporting jurisdiction this project is located.

City of Moline, Illinois Department of Transportation

M. The following is a list of receiving water(s) and the ultimate receiving water(s) for this site. The location of the receiving waters can be found on the erosion and sediment control plans:

The project will drain into the City of Moline stormwater system. The Mississippi River is the closest receiving water.

N. Describe areas of the site that are to be protected or remain undisturbed. These areas may include steep slopes, highly erodible soils, streams, stream buffers, specimen trees, natural vegetation, nature preserves, etc.

If practical, existing ditches along the I-74 mainline and local roads were maintained to minimize disturbance. Steep slopes adjancent to the I-74 mainline and ramps were also maintained to the best extent practical, using retaining walls, as necessary, to minimize disturbance.

O. The following sensitive environmental resources are associated with this project, and may have the potential to be impacted by the proposed development:

- ☐ Floodplain
- ☐ Wetland Riparian
- ☐ Threatened and Endangered Species
- ☐ Historic Preservation
- ☐ 303(d) Listed receiving waters for suspended solids, turbidity, or siltation
- ☐ Receiving waters with Total Maximum Daily Load (TMDL) for sediment, total suspended solids, turbidity or siltation
- ☐ Applicable Federal, Tribal, State or Local Programs
- ☐ Other

1. 303(d) Listed receiving waters (fill out this section if checked above):

   a. The name(s) of the listed water body, and identification of all pollutants causing impairment:

   b. Provide a description of how erosion and sediment control practices will prevent a discharge of sediment resulting from a storm event equal to or greater than a twenty-five (25) year, twenty-four (24) hour rainfall event:

   c. Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:

   d. Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

2. TMDL (fill out this section if checked above)

   a. The name(s) of the listed water body:

   b. Provide a description of the erosion and sediment control strategy that will be incorporated into the site design that is consistent with the assumptions and requirements of the TMDL:

   c. If a specific numeric waste load allocation has been established that would apply to the project's discharges, provide a description of the necessary steps to meet that allocation:

P. The following pollutants of concern will be associated with this construction project:

☒	Soil Sediment	☒	Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids)
☒	Concrete	☒	Antifreeze / Coolants
☒	Concrete Truck Waste	☒	Waste water from cleaning construction equipment
☒	Concrete Curing Compounds	☐	Other (specify)
☐	Solid Waste Debris	☐	Other (specify)
☐	Paints	☐	Other (specify)
☐	Solvents	☐	Other (specify)
☒	Fertilizers / Pesticides	☐	Other (specify)

II. Controls:

This section of the plan addresses the controls that will be implemented for each of the major construction activities described in I.C. above and for all use areas, borrow sites, and waste sites. For each measure discussed, the Contractor will be responsible for its implementation as indicated. The Contractor shall provide to the Resident Engineer a plan for the implementation of the measures indicated. The Contractor, and subcontractors, will notify the Resident Engineer of any proposed changes, maintenance, or modifications to keep construction activities compliant with the Permit ILR10. Each such Contractor has signed the required certification on forms which are attached to, and are a part of, this plan:

A. **Erosion and Sediment Controls:** At a minimum, controls must be coordinated, installed and maintained to:

1. Minimize the amount of soil exposed during construction activity;
2. Minimize the disturbance of steep slopes;
3. Maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible;
4. Minimize soil compaction and, unless infeasible, preserve topsoil.

B. **Stabilization Practices:** Provided below is a description of interim and permanent stabilization practices, including site- specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Stabilization practices may include but are not limited to: temporary seeding, permanent seeding, mulching, geotextiles, sodding, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Except as provided below in II(B)(1) and II(B)(2), stabilization measures shall be initiated **immediately** where construction activities have temporarily or permanently ceased, but in no case more than **one (1) day** after the construction activity in that portion of the site has temporarily or permanently ceases on all disturbed portions of the site where construction will not occur for a period of fourteen (14) or more calendar days.

1. Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.

2. On areas where construction activity has temporarily ceased and will resume after fourteen (14) days, a temporary stabilization method can be used.

The following stabilization practices will be used for this project:

☐	Preservation of Mature Vegetation	☒	Erosion Control Blanket / Mulching
☐	Vegetated Buffer Strips	☐	Sodding
☐	Protection of Trees	☒	Geotextiles
☒	Temporary Erosion Control Seeding	☐	Other (specify)
☐	Temporary Turf (Seeding, Class 7)	☐	Other (specify)
☐	Temporary Mulching	☐	Other (specify)
☒	Permanent Seeding	☐	Other (specify)

Describe how the stabilization practices listed above will be utilized during construction:

The Contractor shall seed all disturbed areas within the project limits. Seeding Class 4 or 2A shall be used, except in front of properties where the grass will be mowed, then use Sodding. Class 2A shall be used on front slopes and ditch bottoms. Class 4 shall be used behind Type A gutter, on all backslopes and areas behind the backslope, and beyond the toe of front slope on fill sections without ditches. All temporary and permanent seeding will be installed per IDOT specifications.

Erosion control blanket will be installed over fill slopes and in high velocity areas where it has been brought to final grade and seeded.

Describe how the stabilization practices listed above will be utilized after construction activities have been completed:

All necessary stabilization practices listed above will be used as needed until all disturbed areas have been stabilized after the construction activities are completed.

C. **Structural Practices:** Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include but are not limited to: perimeter erosion barrier, earth dikes, drainage swales, sediment traps, ditch checks, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. The installation of these devices may be subject to Section 404 of the Clean Water Act.

The following structural practices will be used for this project:

☒	Perimeter Erosion Barrier	☐	Rock Outlet Protection
☒	Temporary Ditch Check	☐	Riprap
☒	Storm Drain Inlet Protection	☐	Gabions
☐	Sediment Trap	☐	Slope Mattress
☐	Temporary Pipe Slope Drain	☒	Retaining Walls
☐	Temporary Sediment Basin	☐	Slope Walls
☐	Temporary Stream Crossing	☒	Concrete Revetment Mats
☒	Stabilized Construction Exits	☐	Level Spreaders
☒	Turf Reinforcement Mats	☐	Other (specify)
☐	Permanent Check Dams	☐	Other (specify)
☐	Permanent Sediment Basin	☐	Other (specify)
☐	Aggregate Ditch	☐	Other (specify)
☐	Paved Ditch	☐	Other (specify)

Describe how the structural practices listed above will be utilized during construction:

A perimeter erosion barrier (silt fence) will be used in all areas where runoff from disturbed areas has the potential to travel offsite or into swales, ditches or other natural water bodies. Turf Reinforcement mats will also be used to help prevent soil erosion in drainage areas and on steep slopes. Inlet and pipe protection will be used where needed. See Erosion Control Plan Sheets

Describe how the structural practices listed above will be utilized after construction activities have been completed:

All temporary structural practices will be removed after everything has stabilized and construction activities have been completed. Permanent retaining walls are utilized at the ramps to minimize impacts to existing steep slopes.

D. **Treatment Chemicals**

Will polymer flocculants or treatment chemicals be utilized on this project: ☐ Yes ☒ No

If yes above, identify where and how polymer flocculants or treatment chemicals will be utilized on this project.

E. **Permanent Storm Water Management Controls:** Provided below is a description of measures that will be installed during the construction process to control volume and pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water Act.

1. Such practices may include but are not limited to: storm water detention structures (including wet ponds), storm water retention structures, flow attenuation by use of open vegetated swales and natural depressions, infiltration of runoff on site, and sequential systems (which combine several practices).

The practices selected for implementation were determined on the basis of the technical guidance in Chapter 41 (Construction Site Storm Water Pollution Control) of the IDOT Bureau of Design and Environment Manual. If practices other than those discussed in Chapter 41 are selected for implementation or if practices are applied to situations different from those covered in Chapter 41, the technical basis for such decisions will be explained below.

2. Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g. maintenance of hydrologic conditions such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

   Description of permanent storm water management controls:

   There are no anticipated measures to be installed to control pollutants in storm water discharges that occur after construction operations have been completed.

F. **Approved State or Local Laws:** The management practices, controls and provisions contained in this plan will be in accordance with IDOT specifications, which are at least as protective as the requirements contained in the Illinois Environmental Protection Agency's Illinois Urban Manual. Procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials shall be described or incorporated by reference in the space provided below. Requirements specified in sediment and erosion site plans, site permits, storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI, to be authorized to discharge under the Permit ILR10 incorporated by reference and are enforceable under this permit even if they are not specifically included in the plan.

Description of procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials:

All management practices, controls and other provisions provided in the plan are in accordance with IDOT Standard Specifications and the Illinois Urban Manual.

G. **Contractor Required Submittals:** Prior to conducting any professional services at the site covered by this plan, the Contractor and each subcontractor responsible for compliance with the permit shall submit to the Resident Engineer a Contractor Certification Statement, BDE 2342a.

1. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:

   - Approximate duration of the project, including each stage of the project
   - Rainy season, dry season, and winter shutdown dates
   - Temporary stabilization measures to be employed by contract phases
   - Mobilization timeframe
   - Mass clearing and grubbing/roadside clearing dates
   - Deployment of Erosion Control Practices
   - Deployment of Sediment Control Practices (including stabilized construction entrances/exits)
   - Deployment of Construction Site Management Practices (including concrete washout facilities, chemical storage, refueling locations, etc.)
   - Paving, saw-cutting, and any other pavement related operations
   - Major planned stockpiling operations
   - Timeframe for other significant long-term operations or activities that may plan non-storm water discharges such as dewatering, grinding, etc.
   - Permanent stabilization activities for each area of the project

2. The Contractor and each subcontractor shall provide, as an attachment to their signed Contractor Certification Statement, a discussion of how they will comply with the requirements of the permit in regard to the following items and provide a graphical representation showing location and type of BMPs to be used when applicable:

- Vehicle Entrances and Exits – Identify type and location of stabilized construction entrances and exits to be used and how they will be maintained.
- Material Delivery, Storage and Use – Discuss where and how materials including chemicals, concrete curing compounds, petroleum products, etc. will be stored for this project.
- Stockpile Management – Identify the location of both on-site and off-site stockpiles. Discuss what BMPs will be used to prevent pollution of storm water from stockpiles.
- Waste Disposal – Discuss methods of waste disposal that will be used for this project.
- Spill Prevention and Control – Discuss steps that will be taken in the event of a material spill (chemicals, concrete curing compounds, petroleum, etc.)
- Concrete Residuals and Washout Wastes – Discuss the location and type of concrete washout facilities to be used on this project and how they will be signed and maintained.
- Litter Management – Discuss how litter will be maintained for this project (education of employees, number of dumpsters, frequency of dumpster pick-up, etc.).
- Vehicle and Equipment Fueling – Identify equipment fueling locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Vehicle and Equipment Cleaning and Maintenance – Identify where equipment cleaning and maintenance locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Dewatering Activities – Identify the controls which will be used during dewatering operations to ensure sediments will not leave the construction site.
- Polymer Flocculants and Treatment Chemicals – Identify the use and dosage of treatment chemicals and provide the Resident Engineer with Material Safety Data Sheets. Describe procedures on how the chemicals will be used and identify who will be responsible for the use and application of these chemicals. The selected individual must be trained on the established procedures.
- Additional measures indicated in the plan.

III. Maintenance:

When requested by the Contractor, the Resident Engineer will provide general maintenance guides to the Contractor for the practices associated with this project. The following additional procedures will be used to maintain, in good and effective operating conditions, the vegetation, erosion and sediment control measures and other protective measures identified in this plan. It will be the Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

The contractor shall clean up and grade the work area to eliminate concentration of runoff, cover the openings of pipes in trenches and open inlets at the close of each day. Maintain and replace erosion and sediment control items as needed. The contractor shall remove and dispose of silt retained by temporary ersosion barriers when they meet specified heights in erosion and and sediment control plans. Areas of erosion control blanket which fail will be repaired immediately. All maintenance of erosion control systems will be the responsibility of the contractor.

IV. Inspections:

Qualified personnel shall inspect disturbed areas of the construction site which have not yet been finally stabilized, structural control measures, and locations where vehicles and equipment enter and exit the site using IDOT Storm Water Pollution Prevention Plan Erosion Control Inspection Report (BC 2259). Such inspections shall be conducted at least once every seven (7) calendar days and within twenty-four (24) hours of the end of a storm or by the end of the following business or work day that is 0.5 inch or greater or equivalent snowfall.

Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities are conducted, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.

If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer shall notify the appropriate IEPA Field Operations Section office by email at: epa.swnoncomp@illinois.gov, telephone or fax within twenty-four (24) hours of the incident. The Resident Engineer shall then complete and submit an "Incidence of Non-Compliance" (ION) report for the identified violation within five (5) days of the incident. The Resident Engineer shall use forms provided by IEPA and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of non-compliance shall be signed by a responsible authority in accordance with Part VI. G of the Permit ILR10.

The Incidence of Non-Compliance shall be mailed to the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Attn: Compliance Assurance Section
1021 North Grand East
Post Office Box 19276
Springfield, Illinois 62794-9276

Additional Inspections Required:

V. Failure to Comply:

Failure to comply with any provisions of this Storm Water Pollution Prevention Plan will result in the implementation of a National Pollutant Discharge Elimination System/Erosion and Sediment Control Deficiency Deduction against the Contractor and/or penalties under the Permit ILR10 which could be passed on to the Contractor.

Illinois Department of Transportation

Contractor Certification Statement

Prior to conducting any professional services at the site covered by this contract, the Contractor and every subcontractor must complete and return to the Resident Engineer the following certification. A separate certification must be submitted by each firm. Attach to this certification all items required by Section II.G of the Storm Water Pollution Prevention Plan (SWPPP) which will be handled by the Contractor/subcontractor completing this form.

Route	FAI Route 74 (I-74)	Marked Rte.	I-74
Section	(81-1)R-1 & 81-1(HBR, HBR-1, HBR-2)	Project No.	P-92-078-08
County	Rock Island	Contract No.	64E26

This certification statement is a part of SWPPP for the project described above, in accordance with the General NPDES Permit No. ILR10 issued by the Illinois Environmental Protection Agency.

I certify under penalty of law that I understand the terms of the Permit No. ILR 10 that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

In addition, I have read and understand all of the information and requirements stated in SWPPP for the above mentioned project; I have received copies of all appropriate maintenance procedures; and, I have provided all documentation required to be in compliance with the Permit ILR10 and SWPPP and will provide timely updates to these documents as necessary.

☐ Contractor

☐ Sub-Contractor

Print Name	Signature
Title	Date
Name of Firm	Telephone
Street Address	City/State/ZIP

Items which this Contractor/subcontractor will be responsible for as required in Section II.G. of SWPPP:

See list in Section II 5 a and b.