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Letting June 15, 2018

Notice to Bidders, Specifications and Proposal

Springfield, Illinois 62764

Contract No. 61E53
MCHENRY County
Section 06-00329-01-PW
Route FAP 336A (Randall Road)
Project PW2V-306 ()
District 1 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. June 15, 2018 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. 61E53
   MCHENRY County
   Section 06-00329-01-PW
   Project PW2V-306 ()
   Route FAP 336A (Randall Road)
   District 1 Construction Funds

Pavement widening, reconstruction and resurfacing, storm sewers, ADA sidewalks, curb & gutter, box culvert construction, pedestrian underpass and path, retaining walls, traffic signal installation and modernization, lighting, and pavement markings on FAP 336 (Randall Road) from Harnish Drive to north of Polaris Drive/Alcorn Lane and on Algonquin Road from Harvest Gate/Talaga Drive easterly to east of Crystal Lake Avenue. Project is located in the villages of Lake in the Hills and Algonquin.

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

CONTRACT 61E53

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2018

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

ERRATA Standard Specifications for Road and Bridge Construction
(Adopted 4-1-16) (Revised 1-1-18)

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CHECK SHEET
FOR
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BDE SPECIAL PROVISIONS

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

	File Name	Pg.		Special Provision Title	Effective	Revised
	80099	327	X	Accessible Pedestrian Signals (APS)	April 1, 2003	Jan. 1, 2014
	80382	329	X	Adjusting Frames and Grates	April 1, 2017	
	80274			Aggregate Subgrade Improvement	April 1, 2012	April 1, 2016
	80192			Automated Flagger Assistance Device	Jan. 1, 2008	
	80173	331	X	Bituminous Materials Cost Adjustments	Nov. 2, 2006	Aug. 1, 2017
	80241			Bridge Demolition Debris	July 1, 2009	
	5026I			Building Removal-Case I (Non-Friable and Friable Asbestos)	Sept. 1, 1990	April 1, 2010
	5048I			Building Removal-Case II (Non-Friable Asbestos)	Sept. 1, 1990	April 1, 2010
	5049I			Building Removal-Case III (Friable Asbestos)	Sept. 1, 1990	April 1, 2010
	5053I			Building Removal-Case IV (No Asbestos)	Sept. 1, 1990	April 1, 2010
	80366	333	X	Butt Joints	July 1, 2016	
	80386			Calcium Aluminate Cement for Class PP-5 Concrete Patching	Nov. 1, 2017	
	80396			Class A and B Patching	Jan. 1, 2018	
	80384	334	X	Compensable Delay Costs	June 2, 2017	
	80198			Completion Date (via calendar days)	April 1, 2008	
	80199			Completion Date (via calendar days) Plus Working Days	April 1, 2008	
	80293			Concrete Box Culverts with Skews > 30 Degrees and Design Fills ≤ 5 Feet	April 1, 2012	July 1, 2016
	80311	338	X	Concrete End Sections for Pipe Culverts	Jan. 1, 2013	April 1, 2016
	80277			Concrete Mix Design – Department Provided	Jan. 1, 2012	April 1, 2016
	80261	340	X	Construction Air Quality – Diesel Retrofit	June 1, 2010	Nov. 1, 2014
	80387	343	X	Contrast Preformed Plastic Pavement Marking	Nov. 1, 2017	
*	80029	344	X	Disadvantaged Business Enterprise Participation	Sept. 1, 2000	April 2, 2018
	80378	355	X	Dowel Bar Inserter	Jan. 1, 2017	Jan. 1, 2018
	80388	362	X	Equipment Parking and Storage	Nov. 1, 2017	
	80229	363	X	Fuel Cost Adjustment	April 1, 2009	Aug. 1, 2017
	80304	366	X	Grooving for Recessed Pavement Markings	Nov. 1, 2012	Nov. 1, 2017
	80246	369	X	Hot-Mix Asphalt – Density Testing of Longitudinal Joints	Jan. 1, 2010	April 1, 2016
	80347			Hot-Mix Asphalt – Pay for Performance Using Percent Within Limits - Jobsite Sampling	Nov. 1, 2014	Jan. 1, 2018
	80383			Hot-Mix Asphalt – Quality Control for Performance	April 1, 2017	Nov. 1, 2017
	80376	370	X	Hot-Mix Asphalt – Tack Coat	Nov. 1, 2016	
	80392	371	X	Lights on Barricades	Jan. 1, 2018	
	80336			Longitudinal Joint and Crack Patching	April 1, 2014	April 1, 2016
*	80393	373	X	Manholes, Valve Vaults, and Flat Slab Tops	Jan. 1, 2018	March 2, 2018
	80045			Material Transfer Device	June 15, 1999	Aug. 1, 2014
*	80394			Metal Flared End Section for Pipe Culverts	Jan. 1, 2018	April 1, 2018
	80165			Moisture Cured Urethane Paint System	Nov. 1, 2006	Jan. 1, 2010
	80349			Pavement Marking Blackout Tape	Nov. 1, 2014	April 1, 2016
	80371	375	X	Pavement Marking Removal	July 1, 2016	
	80390	376	X	Payments to Subcontractors	Nov. 2, 2017	
	80377	377	X	Portable Changeable Message Signs	Nov. 1, 2016	April 1, 2017
	80389	378	X	Portland Cement Concrete	Nov. 1, 2017	
	80359			Portland Cement Concrete Bridge Deck Curing	April 1, 2015	Nov. 1, 2017
	80385	379	X	Portland Cement Concrete Sidewalk	Aug. 1, 2017	
	80300			Preformed Plastic Pavement Marking Type D - Inlaid	April 1, 2012	April 1, 2016
	80328	380	X	Progress Payments	Nov. 2, 2013	
	3426I			Railroad Protective Liability Insurance	Dec. 1, 1986	Jan. 1, 2006
	80157			Railroad Protective Liability Insurance (5 and 10)	Jan. 1, 2006	

	File Name	Pg.		Special Provision Title	Effective	Revised
	80306			Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS)	Nov. 1, 2012	Jan. 1, 2018
	80395			Sloped Metal End Section for Pipe Culverts	Jan. 1, 2018	
	80340	381	X	Speed Display Trailer	April 2, 2014	Jan. 1, 2017
	80127	383	X	Steel Cost Adjustment	April 2, 2014	Aug. 1, 2017
*	80397	386	X	Subcontractor and DBE Payment Reporting	April 2, 2018	
	80391	387	X	Subcontractor Mobilization Payments	Nov. 2, 2017	
	80317			Surface Testing of Hot-Mix Asphalt Overlays	Jan. 1, 2013	April 1, 2016
	80298	388	X	Temporary Pavement Marking (NOTE: This special provision was previously named *"Pavement Marking Tape Type IV"*.)	April 1, 2012	April 1, 2017
	20338	391	X	Training Special Provision	Oct. 15, 1975	
	80318	394	X	Traversable Pipe Grate for Concrete End Sections (Note: This special provision was previously named "*Traversable Pipe Grate*".)	Jan. 1, 2013	Jan. 1, 2018
	80288	396	X	Warm Mix Asphalt	Jan. 1, 2012	April 1, 2016
	80302	398	X	Weekly DBE Trucking Reports	June 2, 2012	April 2, 2015
	80071			Working Days	Jan. 1, 2002	

The following special provisions are in the 2018 Supplemental Specifications and Recurring Special Provisions.

File Name	Special Provision Title	New Location	Effective	Revised
80368	Light Tower	Article 1069.08	July 1, 2016	
80369	Mast Arm Assembly and Pole	Article 1077.03(a)(1)	July 1, 2016	
80338	Portland Cement Concrete Partial Depth Hot-Mix Asphalt Patching	Recurring CS #35	April 1, 2014	April 1, 2016
80379	Steel Plate Beam Guardrail	Articles 630.02, 630.05, 630.06, and 630.08	Jan. 1, 2017	
80381	Traffic Barrier Terminal, Type 1 Special	Article 631.04	Jan. 1, 2017	
80380	Tubular Markers	Articles 701.03, 701.15, 701.18, and 1106.02	Jan. 1, 2017	

GUIDE BRIDGE SPECIAL PROVISION INDEX/CHECK SHEET

Effective as of the: June 15, 2018 Letting

Pg #	√	File Name	Title	Effective	Revised
		GBSP 4	Polymer Modified Portland Cement Mortar	June 7, 1994	Apr 1, 2016
		GBSP 12	Drainage System	June 10, 1994	Jun 24, 2015
		GBSP 13	High-Load Multi-Rotational Bearings	Oct 13, 1988	Apr 1, 2016
		GBSP 14	Jack and Remove Existing Bearings	April 20, 1994	April 13, 2018
		GBSP 15	Three Sided Precast Concrete Structure	July 12, 1994	Dec 21, 2016
		GBSP 16	Jacking Existing Superstructure	Jan 11, 1993	April 13, 2018
		GBSP 17	Bonded Preformed Joint Seal	July 12, 1994	Jan 1, 2007
		GBSP 18	Modular Expansion Joint	May 19, 1994	Dec 29, 2014
		GBSP 21	Cleaning and Painting Contact Surface Areas of Existing Steel Structures	June 30, 2003	April 13, 2018
		GBSP 25	Cleaning and Painting Existing Steel Structures	Oct 2, 2001	Apr 22, 2016
		GBSP 26	Containment and Disposal of Lead Paint Cleaning Residues	Oct 2, 2001	Apr 22, 2016
		GBSP 28	Deck Slab Repair	May 15, 1995	April 13, 2018
		GBSP 29	Bridge Deck Microsilica Concrete Overlay	May 15, 1995	Oct 20, 2017
		GBSP 30	Bridge Deck Latex Concrete Overlay	May 15, 1995	Oct 20, 2017
		GBSP 31	Bridge Deck High-Reactivity Metakaolin (HRM) Conc Overlay	Jan 21, 2000	Oct 20, 2017
		GBSP 33	Pedestrian Truss Superstructure	Jan 13, 1998	Dec 29, 2014
		GBSP 34	Concrete Wearing Surface	June 23, 1994	Oct 4, 2016
		GBSP 35	Silicone Bridge Joint Sealer	Aug 1, 1995	Oct 15, 2011
		GBSP 45	Bridge Deck Thin Polymer Overlay	May 7, 1997	Feb 6, 2013
399	X	GBSP 51	Pipe Underdrain for Structures	May 17, 2000	Jan 22, 2010
		GBSP 53	Structural Repair of Concrete	Mar 15, 2006	Apr 1, 2016
		GBSP 55	Erection of Curved Steel Structures	June 1, 2007	
		GBSP 56	Setting Piles in Rock	Nov 14, 1996	Apr 1, 2016
		GBSP 59	Diamond Grinding and Surface Testing Bridge Sections	Dec 6, 2004	Mar 29, 2017
		GBSP 60	Containment and Disposal of Non-Lead Paint Cleaning Residues	Nov 25, 2004	Apr 22, 2016
		GBSP 61	Slipform Parapet	June 1, 2007	Apr 22, 2016
		GBSP 67	Structural Assessment Reports for Contractor's Means and Methods	Mar 6, 2009	Oct 5, 2015
		GBSP 71	Aggregate Column Ground Improvement	Jan 15, 2009	Oct 15, 2011
		GBSP 72	Bridge Deck Fly Ash or GGBF Slag Concrete Overlay	Jan 18, 2011	Oct 20, 2017
		GBSP 75	Bond Breaker for Prestressed Concrete Bulb-T Beams	April 19, 2012	
400	X	GBSP 77	Weep Hole Drains for Abutments, Wingwalls, Retaining Walls And Culverts	April 19, 2012	Oct 22, 2013
		GBSP 78	Bridge Deck Construction	Oct 22, 2013	Dec 21, 2016
		GBSP 79	Bridge Deck Grooving (Longitudinal)	Dec 29, 2014	Mar 29, 2017
401	X	GBSP 81	Membrane Waterproofing for Buried Structures	Oct 4, 2016	April 13, 2018
		GBSP 82	Metallizing of Structural Steel	Oct 4, 2016	Oct 20, 2017
		GBSP 83	Hot Dip Galvanizing for Structural Steel	Oct 4, 2016	Oct 20, 2017
		GBSP 85	Micropiles	Apr 19, 1996	Oct 5, 2015
		GBSP 86	Drilled Shafts	Oct 5, 2015	Oct 4, 2016
		GBSP 87	Lightweight Cellular Concrete Fill	Nov 11, 2011	Apr 1, 2016
		GBSP 88	Corrugated Structural Plate Structures	Apr 22, 2016	April 13, 2018
		GBSP 89	Preformed Pavement Joint Seal	Oct 4, 2016	
		GBSP 90	Three Sided Precast Concrete Structure (Special)	Dec 21, 2016	April 13, 2018
		GBSP 91	Crosshole Sonic Logging Testing of Drilled Shafts	Apr 20, 2016	
		GBSP 92	Thermal Integrity Profile Testing of Drilled Shafts	Apr 20, 2016	

Pg #	√	File Name	Title	Effective	Revised
		GBSP 93	Preformed Bridge Joint Seal	Dec 21, 2016	April 13, 2018
		GBSP 94	Warranty for Cleaning and Painting Steel Structures	Mar 3, 2000	Nov 24, 2004
		GBSP 95	Bituminous Coated Aggregate Slopewall	April 13, 2018	

LIST ANY ADDITIONAL SPECIAL PROVISIONS BELOW

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

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

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

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

STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," adopted April 1, 2016 (hereinafter referred to as the Standard Specifications); the latest edition of the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways"; the "American National Standard Practice for Roadway Lighting, IES/IESNA RP-8"; the latest edition of the "National Electric Code"; the latest edition of the "Standard Specifications for Water and Sewer Main Construction in Illinois"; 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 Randall Road within the Villages of Algonquin and Lake in the Hills, and in case of conflict with any part, or parts, of said specifications, the said Special Provisions shall take precedence and shall govern.

Randall Road (F.A.P. Route 336)
Harnish Drive to Polaris Drive/West Acorn Lane
Section 06-00329-01-PW
McHenry County

Contract No.: 61E53

LOCATION OF PROJECT

This project begins at a point on the centerline of Randall Road, approximately 10 feet north of Harnish Drive, at Station 2139+35.00 and extends in a northerly direction for a distance of 8,915.00 feet (1.69 miles) to Station 2228+50, approximately 1,500 feet north of Polaris Drive/Acorn Lane. Additionally, the project begins on the centerline of Alogonquin Road, approximately 10' east of Harvest Gate/Talaga Drive at Station 1331+00.00 and extends in a easterly direction for a distance of 4,278.00 feet (0.81 miles) to Station 1373+78.00, approximately 1,118 feet east of Crystal Lake Avenue. The project is within the Villages of Lake in the Hills and Algonquin in McHenry County. The total project gross and net length is 13,193.00 feet (2.50 miles).

DESCRIPTION OF PROJECT

The work consists of pavement widening, reconstructing and resurfacing, completion, sidewalk, a pedestrian underpass and an associated multi-use path, the construction of five (5) retaining walls, traffic signal modernization at five (5) existing signalized intersection, new controllers at two (2) locations and two (2) new traffic signals, earth excavation, furnished excavation, portland cement concrete and hot-mix asphalt pavements on aggregate subgrade, combination concrete curb and gutter, retaining walls, box culvert construction, landscaping, striping, signing, storm sewers, traffic signals, lighting and all incidental and collateral work necessary to complete the project as shown on the plans and as described herein.

AVAILABLE REPORTS

☐ No project specific reports were prepared.

When applicable, the following checked reports and record information is available for Bidders' reference upon request:

☐ Record structural plans

☒ Preliminary Site Investigation (PSI)

☐ Preliminary Environmental Site Assessment (PESA)

☒ Soils/Geotechnical Report

☒ Boring Logs

☒ Pavement Cores

☐ Location Drainage Study (LDS)

☐ Hydraulic Report

☐ Noise Analysis

☐ Other: _____

Those seeking these reports should request access from:

Benjamin Redding, P.E. – Design Manager
McHenry County Division of Transportation
Phone: (815) 334-4980
Email: BARedding@co.mchenry.il.us

MAINTENANCE OF ROADWAYS
Effective: September 30, 1985
Revised: November 1, 1996

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

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

STATUS OF UTILITIES (D-1)
Effective: June 1, 2016

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

UTILTIES TO BE ADJUSTED

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

Pre-Stage

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
Randall Rd Sta. 2145+00 RT To Sta. 2148+00 RT Randall Rd Sta. 2141+60 RT	Underground Telephone	Conflict with proposed retaining wall and storm sewers Pedestal conflicts with path	AT&T	Contractor for AT&T to install new facility package: 240 days. Cutover services 30 days. 270 days total.

Randall Rd Sta. 2144+95 RT	Underground Telephone (Cont'd)	Storm trunk line / catch basin conflict	AT&T (cont'd)	
Randall Rd Sta. 2148+00 LT To Sta. 2154+00 LT		Conflicts with retaining wall and foundation		
Randall Rd Sta. 2157+90 LT		Conflicts with storm trunk line and path underpass		
Randall Rd Sta. 2159+00 LT		Catch basin and light conduit conflicts		
Randall Rd Sta. 2148+00 RT To Sta. 2157+00 RT		Retaining wall conflicts		
Randall Rd Sta. 2157+60 RT To Sta. 2160+00 RT		Storm sewer and light pole base conflicts		
Randall Rd Sta. 2158+25 RT		Curb and storm sewer conflicts.		
Randall Rd Sta. 2160+00 LT To Sta. 2162+60 LT		Under curb line and sidewalk, conflicts with several storm laterals and structures.		
Randall Rd Sta. 2163+75 LT		Pedestal conflicts with proposed PACE shelter pad		
Randall Rd Sta. 2164+10 LT		Traffic signal equipment conflicts		
Randall Rd Sta. 2165+50 LT		SAI box and pedestals in conflict with traffic signal equipment		

Randall Rd Sta. 2160+00 RT To Sta. 2164+10	Underground Telephone (Cont'd)	Conflicts with light pole bases and traffic signal equipment	AT&T (cont'd)	
Randall Rd Sta. 2165+30 RT		Relocate pedestal in roadway		
Randall Rd Sta. 2168+90 RT		Pedestal conflicts with curb		
Randall Rd Sta. 2168+90 RT To Sta. 2172+00 RT		Located under curb and conflicts with storm sewer and light pole bases.		
Randall Rd Sta. 2178+90 LT		Conflicts with traffic signal equipment and light pole base		
Randall Rd Sta. 2179+10 LT		Pedestal in proposed roadway		
Randall Rd Sta. 2179+10 LT To Sta. 2184+00 LT		In proposed pavement, conflicts with storm laterals and structures		
Randall Rd Sta. 2172+00 RT To Sta. 2184+00		Under curb line (or very close to) and conflicts with storm sewer structures and laterals		
Randall Rd Sta. 2172+50 RT		Conflict with catch basin		
Randall Rd Sta. 2176+50 RT		Conflict with catch basin		
Randall Rd Sta. 2177+60 RT		Conflict with lighting		
Randall Rd Sta. 218+50 RT		Pedestal in proposed walk		

Randall Rd Sta. 2180+70 RT	Underground Telephone (Cont'd)	Pedestal in proposed walk	AT&T (cont'd)	
Randall Rd Sta. 2181+90 RT		Conflict with storm lateral		
Randall Rd Sta. 2184+00 LT To Sta. 2190+50 LT		Under pavement and curb line. Conflicts with storm laterals and structures and possibly traffic signals		
Randall Rd Sta. 2190+60 LT		Pedestal and aerial wires conflict with signal equipment		
Randall Rd Sta. 2191+05 LT		Conflict with storm trunk line and manhole		
Randall Rd Sta. 2192+45 LT		Pedestal and aerial lines in roadway		
Randall Rd Sta. 2192+45 LT To Sta. 2199+00 LT	Overhead Lines	Aerial lines and poles in roadway		
Randall Rd Sta. 2192+40 LT	Underground	Conflict with storm trunk line		
Randall Rd Sta. 2185+00 RT	Underground	Conflict with storm lateral		
Randall Rd Sta. 2189+00 RT	Underground	RT cabinet in conflict with ditch		
Randall Rd Sta. 2190+80 RT	Underground	Conflicts with traffic signal equipment		
Randall Rd Sta. 2192+10 RT	Overhead Lines	Conflict with aerial / riser in curb line		

Randall Rd Sta. 2196+00 LT To Sta. 2208+00 LT	Overhead Lines	Poles in curb line / aerial lines in roadway	AT&T (cont'd)	
Randall Rd Sta. 2197+90 LT	Underground	Hand hole in curb line		
Randall Rd Sta. 2108+00 LT To Sta. 2220+00 LT	Overhead Lines	Poles in curb line and roadway		
Randall Rd Sta. 2208+95 LT	Underground	Hand hole in curb line		
Randall Rd Sta. 2214+40 LT	Underground	Conflict with traffic signal equip.		
Randall Rd Sta. 2214+40 LT+RT	Underground	Conflict with storm sewer and traffic signal equip.		
Randall Rd Sta. 2214+40 LT To Sta. 2217+95 LT	Underground	Conflict with storm sewer and light pole foundations		
Randall Rd Sta. 2220+00 LT To Sta. 2224+30 LT	Overhead Lines	Poles too close to back of curb		
Algonquin Rd Sta. 1333+95 LT To Sta. 1341+00 LT	Overhead Lines	Poles too close or in curb line, also conflicts with lighting and storm sewer		
Algonquin Rd Sta. 1339+44 RT	Underground	Pedestal and line in conflict with walk and storm trunk line		
Algonquin Rd Sta. 1341+00 RT To Sta. 1347+00 RT	Underground	Poles/lines in conflict with curb and lighting		

Algonquin Rd Sta. 1341+50 LT	Underground	Pedestal in walk	AT&T (cont'd)	
Algonquin Rd Sta. 1343+30 LT		Pedestal in conflict with walk and wires with storm trunk line		
Algonquin Rd Sta. 1351+00 LT To Sta. 1353+00 LT		Poles/lines in conflict with curb and lighting		
Algonquin Rd Sta. 1341+00 RT To Sta. 1343+25 RT		Conflict with lighting and storm sewer		
Algonquin Rd Sta. 1343+00 RT		SAI box in curb line		
Algonquin Rd Sta. 1343+25 RT		Pedestal in curb and on storm trunk line		
Algonquin Rd Sta. 1343+00 RT To Sta. 1347+00 RT		Under roadway pavement		
Algonquin Rd Sta. 1353+00 LT To Sta. 1362+05 LT	Overhead Lines	Poles/lines in roadway pavement		
Algonquin Rd Sta. 1357+30 LT	Underground	Pedestal in roadway pavement		
Algonquin Rd Sta. 1361+05 LT		Pedestal in walkway		
Algonquin Rd Sta. 1362+06 LT		Pedestal and wiring conflict with traffic signal equip.		
Algonquin Rd Sta. 1361+90 RT		Conflict with traffic signal equip		

Algonquin Rd Sta. 1362+88 RT	Underground (Cont'd)	Adjust manhole, conflicts with curb and signal equipment. Pedestal in roadway pavement	AT&T (cont'd)	
Algonquin Rd Sta. 1362+88 RT To Sta. 1364+00 RT		Under curb line conflicts with storm sewer and lighting		
Algonquin Rd Sta. 1364+00 RT To Sta. 1368+80 RT		Conflicts with storm sewer and lighting foundations		
Algonquin Rd Sta. 1364+37 RT		Pedestal in walkway and conflicts with storm sewer		
Bunker Hill Rd Sta. 14+50 LT To Sta. 16+00 LT		Conflicts with inlets		
Bunker Hill Rd Sta. 15+30 LT		Pedestal in conflict with inlet		
Bunker Hill Rd Sta. 16+25 RT		Conflicts with catch basin		
Huntington Dr Sta. 18+60 LT		Pedestal in roadway pavement		
Huntington Dr Sta. 20+05 LT		Conflict with catch basin		
Polaris Dr Sta. 32+15 RT		Pedestal in walkway and conflicts with storm		
Acorn Dr Sta. 37+45 LT		Conflict with lighting foundation		

Acorn Dr Sta. 38+90 LT	Underground (Cont'd)	Pedestal in curb line	AT&T (cont'd)	
Crystal Lake Rd Sta. 601+00 LT		Conflict with curb line		
Crystal Lake Rd Sta. 602+75 LT		Conflict with inlet		
Randall Rd Sta. 2151+93 LT	Underground Cable	Conflict with culvert extension	Comcast	Contractor for Comcast to install new facility package: 60 days. Cutover services 30 days. 90 days total.
Randall Rd Sta. 2152+00 LT To Sta. 2161+00 LT		Deficient cover in ditch		
Randall Rd Sta. 2153+50 LT		Conflict with culvert FES		
Randall Rd Sta. 2157+92 LT		Crosses structure and lateral for multi-use path drainage		
Randall Rd Sta. 2160+49 LT		Conflict with lighting conduit		
Randall Rd Sta. 2161+10 LT		Conflict with storm lateral		
Randall Rd Sta. 2161+48 LT		Crosses storm trunk line		
Randall Rd Sta. 2162+50 LT		Conflicts with storm lateral and light pole		

Randall Rd Sta. 2161+64 LT	Underground Cable (Cont'd)	Conflict with light conduit	Comcast (Cont'd)	
Randall Rd Sta. 2161+90 LT		Pedestal in conflict		
Randall Rd Sta. 2163+90 LT		Conflict with storm trunk line		
Randall Rd Sta. 2164+10 LT		Conflict with light pole foundation		
Randall Rd Sta. 2164+60 RT		Under curb line and road way pavement		
Randall Rd Sta. 2164+07 LT		Conflict with lighting and traffic signal foundation		
Randall Rd Sta. 2165+57 LT		Conflict with storm trunk line		
Randall Rd Sta. 2165+65 LT		Under curb line and conflicts with traffic signals		
Randall Rd Sta. 2165+91 LT		Conflicts with storm lateral and structure		
Randall Rd Sta. 2167+23 LT		Conflict with lighting foundation		
Randall Rd Sta. 2167+30 LT		Conflict with storm lateral		
Randall Rd Sta. 2170+13 LT		Conflict with storm lateral		
Randall Rd Sta. 2172+50 LT		Conflict with catch basin		
Randall Rd Sta. 2172+65 LT		Conflict with light pole foundation		
Randall Rd Sta. 2177+20 LT		Conflict with lighting conduit		

Randall Rd Sta. 2176+60 LT	Underground Cable (Cont'd)	Conflict with catch basin	Comcast (Cont'd)	
Randall Rd Sta. 2177+45 LT		Conflict with storm structure		
Randall Rd Sta. 2179+10 LT		Pedestal in conflict		
Randall Rd Sta. 2179+10 LT To Sta. 2190+00 LT		Under roadway pavement, conflicts with storm sewer laterals		
Randall Rd Sta. 2183+05 LT		Conflict with catch basin and lateral		
Randall Rd Sta. 2190+40 LT		Conflict with storm structure and lateral		
Randall Rd Sta. 2190+76 LT		Pedestal in conflict		
Randall Rd Sta. 2191+04 LT		Under roadway pavement and conflict with storm lateral		
Randall Rd Sta. 2191+90 LT		Underdrain conflict		
Randall Rd Sta. 2192+16 LT	Overhead Lines	Poles/lines in roadway pavement		
Randall Rd Sta. 2192+20 LT	Underground Cable	Conflict with storm lateral and light conduit		
Randall Rd Sta. 2192+53 LT To Sta. 2196+00 LT	Overhead Lines	Poles/lines in roadway pavement		

Randall Rd Sta. 2196+00 LT To Sta. 2208+00 LT	Overhead Lines (Cont'd)	Poles/lines in curb line	Comcast (Cont'd)	
Randall Rd Sta. 2208+00 LT To Sta. 2220+00 LT		Poles/lines in roadway pavement and curb line		
Randall Rd Sta. 2210+25 LT	Underground Cable	Conflict with storm trunk line		
Randall Rd Sta. 2220+00 LT To Sta. 2221+00 LT	Overhead Lines	Poles/lines near curb line		
Algonquin Rd Sta. 1339+00 LT To Sta. 1341+00 LT		Poles/lines near curb line		
Algonquin Rd Sta. 1339+40 LT To Sta. 1347+00 LT	Underground Cable	Under multi-use path		
Algonquin Rd Sta. 1341+00 LT To Sta. 1347+00 LT	Overhead Lines	Poles/lines in curb line, pavement and sidewalk		
Algonquin Rd Sta. 1339+00 LT To Sta. 1341+00 LT	Underground Cable	Pedestal in conflict		
Algonquin Rd Sta. 1350+00 LT To Sta. 1353+00 LT	Overhead Lines	Poles/lines in curb line		

Algonquin Rd Sta. 1353+00 LT To Sta. 1364+00 LT	Overhead Lines	Poles/lines in roadway pavement	Comcast (Cont'd)	
Algonquin Rd Sta. 1364+65 LT		Power pole in conflict		
Bunker Hill Rd Sta. 12+10 LT To Sta. 16+00 LT	Underground Cable	Conflict with curb line and sidewalk		
Bunker Hill Rd Sta. 14+50 LT		Conflict with inlet		
Huntington Blvd Sta. 19+50 RT To Sta. 23+00 RT		Under roadway		
Huntington Blvd Sta. 23+00 RT To Sta. 25+15 RT		Under multi-use path. Conflicts with storm structure		
Randall Rd Sta. 2145+00 RT To Sta. 2146+10 RT	Underground	Conflicts with storm culvert and structures	Com Ed	Contractor for ComEd to install new facility package: 305 days. Cutover services 60 days. 365 days total.
Randall Rd Sta. 2146+35 RT To Sta. 2148+00 RT		Conflicts with retaining wall foundation		
Randall Rd Sta. 2148+00 RT To Sta. 2157+25 RT		Conflicts with retaining wall and foundation		

Randall Rd Sta. 2157+00 RT To Sta. 2160+00 RT	Underground (Cont'd)	Conflicts with storm structures under curb line	Com Ed (Cont'd)	
Randall Rd Sta. 2151+95 RT		Conflict with culvert extension		
Randall Rd Sta. 2151+95 LT		Conflict with culvert extension		
Randall Rd Sta. 2160+49 LT		Conflict with lighting conduit		
Randall Rd Sta. 2161+10 LT		Conflict with storm lateral		
Randall Rd Sta. 2160+00 RT To Sta. 2163+81 RT		Conflicts with several storm laterals and structures under curb line		
Randall Rd Sta. 2161+85 LT		Conflict with junction box		
Randall Rd Sta. 2162+50 LT		Conflict with storm lateral		
Randall Rd Sta. 2164+17 LT		Conflict with traffic signals		
Randall Rd Sta. 2163+80 LT		Conflict with storm trunk line		
Randall Rd Sta. 2165+54 RT		Conflict with junction box		
Randall Rd Sta. 2165+50 LT		Conflict with storm sewer and traffic signal		
Randall Rd Sta. 2165+85 RT To Sta. 2163+73 RT		Conflicts with several storm structures in curb line		

Randall Rd Sta. 2167+06 LT Randall Rd Sta. 2170+13 LT Randall Rd Sta. 2178+91 RT Randall Rd Sta. 2177+50 LT Randall Rd Sta. 2179+00 LT To Sta. 2184+00 LT Randall Rd Sta. 2178+90 LT Randall Rd Sta. 2181+25 LT Randall Rd Sta. 2184+00 LT To Sta. 2195+00 LT Randall Rd Sta. 2185+72 LT Randall Rd Sta. 2187+05 LT Randall Rd Sta. 2187+05 LT Randall Rd Sta. 2188+90 RT Randall Rd Sta. 2190+80 RT	Underground (Cont'd)	Conflict with storm trunk line Conflict with catch basin Conflict with storm lateral Conflict with traffic signal equip Under pavement, conflicts with several storm laterals and structures Conflict with traffic signal equip. Manhole in roadway Under pavement, conflicts with storm sewer laterals, structures and lighting Conflict with storm structure Switch gear in conflict with curb Conflict with storm trunk line Junction box conflict with multi-use path Traffic signal conflicts	Com Ed (Cont'd)	

Randall Rd Sta. 2192+13 LT	Overhead Wires	Poles/lines in roadway pavement	Com Ed (Cont'd)	
Randall Rd Sta. 2192+25 LT To Sta. 2195+00 LT	Underground	Under curb line and pavement, conflicts with storm laterals and trunk line		
Randall Rd Sta. 2192+75 LT To Sta. 2196+00	Overhead Wires	Poles/lines in roadway pavement		
Randall Rd Sta. 2193+05 LT	Underground	Vault in pavement		
Randall Rd Sta. 2196+00 LT To Sta. 2208+00 LT	Overhead Wires	Pole/lines in curb line		
Randall Rd Sta. 2208+00 LT To Sta. 2220+00 LT		Poles/lines in roadway		
Randall Rd Sta. 2210+32 LT	Underground	Conflict with storm trunk line		
Randall Rd Sta. 2210+32 RT		Conflict with lighting conduit		
Randall Rd Sta. 2214+30 LT		Box conflict with traffic signal		
Randall Rd Sta. 2220+00 LT To Sta. 2221+00 LT	Overhead Wires	Poles/wires conflict with curb		
Algonquin Rd Sta. 1339+40 LT To Sta. 1341+00 LT		Poles/wires in walk / curb line		

Algonquin Rd Sta. 1339+40 LT	Underground	Conflict with storm trunk line.	Com Ed(Cont'd)	
Algonquin Rd Sta. 1341+00 LT To Sta. 1347+00 LT	Overhead Wires	Poles/lines in curb line		
Algonquin Rd Sta. 1343+34 LT To Sta. 1347+00 LT	Underground	Close to back of curb and lighting conflicts		
Algonquin Rd Sta. 1351+00 LT To Sta. 1353+00 LT	Overhead Wires	Poles/wires in curb line, walk and lighting conflicts		
Algonquin Rd Sta. 1352+00 RT To Sta. 1353+00 RT	Underground	Under multi-use path		
Algonquin Rd Sta. 1353+64 LT		Conflict with storm trunk line		
Algonquin Rd Sta. 1353+64 RT		Conflict with storm trunk line		
Algonquin Rd Sta. 1353+00 LT To Sta. 1364+00 LT	Overhead Wires	Poles/wires in roadway and walk		
Algonquin Rd Sta. 1355+69 LT	Underground	Transformer in roadway		
Algonquin Rd Sta. 1355+69 LT To Sta. 1358+50 LT		Under roadway and lighting conflicts		
Algonquin Rd Sta. 1357+60 LT To Sta. 1359+10 LT		Under roadway pavement		

Algonquin Rd Sta. 1364+65 LT	Overhead	Pole in conflict	Com Ed (Cont'd)	
Algonquin Rd Sta. 1364+65 RT	Underground	Conflict with storm trunk line		
Algonquin Rd Sta. 1366+10 LT	Overhead	Pole in conflict		
Bunker Hill Rd Sta. 13+15 LT To Sta. 16+00 LT	Underground	Under pavement. Conflicts with several storm laterals and structure.		
Polaris Dr Sta. 32+15 RT		Transformer in conflict		
Randall Rd Sta. 2145+65 LT To Sta. 2148+00 LT	Underground	Conflicts with retaining wall and foundation, also located under path and conflicts with lighting	State of Illinois CMS	Contractor for State of Illinois CMS to install new facility package: 60 days. Cutover services 30 days. 90 days total.
Randall Rd Sta. 2148+00 LT To Sta. 2154+00 LT		Conflicts with retaining wall and foundation, also located under path and conflicts with lighting		
Randall Rd Sta. 2154+78 LT		Conflicts with lighting		
Randall Rd Sta. 2155+50 LT To Sta. 2159+55 LT		Under walk		

Randall Rd Sta. 2160+00 LT To Sta. 2164+25 LT	Underground (Cont'd)	Under curb line, conflicts with storm structures and laterals and traffic signal equipment	State of Illinois CMS (Cont'd)	
Randall Rd Sta. 2165+65 LT To Sta. 2172+00 LT		Under curb line, conflicts with storm structures and laterals		
Randall Rd Sta. 2172+00 LT To Sta. 2175+00 LT		Under walk		
Randall Rd Sta. 2176+50 LT To Sta. 2184+00 LT		Under roadway pavement. Conflicts with several storm structures and laterals		
Randall Rd Sta. 2184+00 LT To Sta. 2196+00 LT		Under roadway pavement. Conflicts with several storm structures and laterals		
Randall Rd Sta. 2196+00 LT To Sta. 2220+00 LT		Under roadway pavement. Conflicts with several storm structures and laterals		
Randall Rd Sta. 2200+00 LT To Sta. 2208+00 LT		Conflicts with light pole foundations and conduits and traffic signal equipment		
Randall Rd Sta. 2208+00 LT To Sta. 2212+00 LT		Under curb line and walk. Conflicts with storm laterals and structures and lighting		

Randall Rd Sta. 2212+60 LT Randall Rd Sta. 2214+05 LT Randall Rd Sta. 2214+75 LT To Sta. 2222+00 LT	Underground (Cont'd)	Conflicts with traffic signals Conflicts with traffic signals Conflicts with lighting	State of Illinois CMS (Cont'd)	
Randall Rd Sta. 2157+60 RT To Sta. 2160+00 RT	Underground 6" Main	Under pavement. Conflicts with several storm laterals	Nicor	Contractor for Nicor to install new facility package: 150 days. Cutover services 30 days. 180 days total.
Randall Rd Sta. 2160+00 RT To Sta. 2172+00 RT Randall Rd Sta. 2172+00 RT To Sta. 2179+65 RT Randall Rd Sta. 2177+80 LT Randall Rd Sta. 2179+65 RT To Sta. 2184+00 RT Randall Rd Sta. 2184+00 RT To Sta. 2192+20 RT		Under pavement. Conflicts with several storm laterals Under pavement. Conflicts with storm laterals Conflicts with traffic signal conduits Conflicts with storm structures and laterals in curb line and lighting Under pavement. Conflicts with several storm laterals and structures		

Randall Rd Sta. 2191+05 RT Randall Rd Sta. 2192+10 RT Randall Rd Sta. 2192+20 RT Randall Rd Sta. 2184+00 RT To Sta. 2192+30 LT Randall Rd Sta. 2192+30 LT To Sta. 2196+00 LT Randall Rd Sta. 2196+00 LT To Sta. 2208+00 LT Randall Rd Sta. 2208+00 LT To Sta. 2212+50 LT Randall Rd Sta. 2212+50 LT To Sta. 2214+30 LT Randall Rd Sta. 2213+90 RT Randall Rd Sta. 2214+30 LT To Sta. 2220+00 LT	Underground 6" Main (Cont'd)	Conflict with storm trunk line Conflicts with storm trunk line and under roadway pavement Conflict with storm trunk line and under pavement Conflict with storm trunk line and under pavement Conflict with storm trunk line and under pavement Conflicts with storm structures and laterals and under pavement Under curb line and walk. Conflicts with several storm structures Conflicts with traffic signal equip Conflicts with storm trunk line Conflicts with storm laterals and lighting	Nicor (Cont'd)	

Algonquin Rd Sta. 1334+50 LT To Sta. 1340+39 LT	Underground 6" Main (Cont'd)	Conflicts with storm laterals and structures and lighting	Nicor (Cont'd)	
Algonquin Rd Sta. 1339+25 RT		Conflict with storm trunk line		
Algonquin Rd Sta. 1340+39 LT		Conflict with storm lateral		
Algonquin Rd Sta. 1340+39 LT To Sta. 1341+00 LT		Under roadway pavement		
Algonquin Rd Sta. 1341+00 LT To Sta. 1347+00 LT		Under roadway pavement		
Algonquin Rd Sta. 1341+00 LT To Sta. 1347+00 LT		Under roadway pavement		
Algonquin Rd Sta. 1350+05 LT		Conflict with lighting		
Algonquin Rd Sta. 1351+00 LT To Sta. 1353+00 LT		Under walk		
Algonquin Rd Sta. 1353+00 LT To Sta. 1356+00 LT		Under curb line. Conflicts with storm structures		
Algonquin Rd Sta. 1356+00 LT To Sta. 1360+75 LT	Underground 2" Main (Cont'd)	Under pavement and curb. Conflicts with storm trunk line and lighting.		

Algonquin Rd Sta. 1357+60 R	Underground 6" Main	Conflict with storm trunk line	Nicor (Cont'd)	
Algonquin Rd Sta. 1361+90 LT To Sta. 1363+10 LT		Conflicts with traffic signal equip.		
Algonquin Rd Sta. 1364+00 LT To Sta. 1368+00 LT		Under pavement. Conflicts with storm laterals and structures and lighting		
Bunker Hill Rd Sta. 10+00 LT To Sta. 16+00 LT	Underground 4" Main	Under centerline of roadway		
Huntington Dr Sta. 18+00 RT To Sta. 25+00 RT		Under roadway. Conflicts with several storm laterals		
Commercial Dr Sta. 201+80 RT To Sta. 203+00 RT		Under pavement		
Acorn Dr Sta. 36+75 LT To Sta. 40+20 LT		Under curb line and pavement. Conflicts with lighting and storm inlet.		

Stage 1

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
Bunker Hill Sta. 10+00 RT To Sta. 16+60 RT	Underground Sanitary Sewer, 8”	Crosses several storm sewer laterals and within pavement. No vertical conflicts due to depth. Adjust structure elevations	Village of Algonquin	Contractor for Village of Algonquin to adjust structure elevations: 5 days. Cutover services 0 days. 5 days total.
Bunker Hill Sta. 11+10 RT		Light pole and catch basin above sewer.		
Huntington Sta. 18+00 LT To Sta. 25+00 LT		Crosses several storm sewer laterals and within pavement. No vertical conflicts due to depth. Adjust structure elevations		
Huntington Sta. 24+90 RT		Sanitary directly below catch basin. No vertical conflict anticipated.		
Stonegate Sta. 102+20 LT	Underground sanitary sewer, 18”	Inlet over sanitary line. No vertical conflict anticipated		
Randall Rd Sta. 2165+00 LT and RT	Underground sanitary sewer, 8”	Under pavement. Crosses storm trunk line		
Randall Rd Sta. 2178+56 LT and RT	Underground sanitary sewer, 18”	Manhole in pavement to be adjusted. Crosses storm trunk line		

Randall Rd Sta. 2194+00 RT	Underground sanitary sewer, 8”	Crosses with storm. No vertical conflict anticipated. Adjust manhole elevation	Lake in the Hills Sanitary District	Contractor for Lake in the Hills Sanitary District to adjust structure elevations: 5 days. Cutover services 0 days. 5 days total.
Randall Rd Sta. 2197+90 LT		Crosses with storm trunk line. No vertical conflict anticipated. Adjust manhole elevations.		
Randall Rd Sta. 2203+30 RT	Underground sanitary sewer, 10”	Close to traffic signal equip and foundations		
Randall Rd Sta. 2203+80 RT		Crosses storm trunk line. No vertical conflict anticipated.		
Randall Rd Sta. 2204+40 RT		Close to traffic signal equip		
Randall Rd Sta. 2204+50 RT To Sta. 2205+40 RT		Behind retaining wall. No vertical conflict anticipated. Adjust manhole elevation		
Randall Rd. Sta. 2208+00 RT		Catch basin over sewer line. No vertical conflict anticipated		
Randall Rd. Sta. 2210+05 RT		Catch basin over sewer line. No vertical conflict anticipated		
Randall Rd. Sta. 2213+00 RT To Sta. 2214+00 RT		Close to traffic signal equip. Adjust manhole elevations		

Randall Rd. Sta. 2218+00 RT	Underground sanitary sewer, 10" (Cont'd)	Crosses with storm trunk line. Support sewer for storm construction. Tight vertical clearance with sanitary sewer above storm	Lake in the Hills Sanitary District (Cont'd)	
Randall Rd Sta. 2219+40 RT		Crosses storm trunk line. Support sewer for storm construction. Tight vertical clearance with sanitary sewer above storm		
Randall Rd Sta. 2192+40 LT	Underground water main, 10"	Conflict with traffic signal equip	Lake in the Hills Public Works	Contractor for Lake in the Hills Public Works to install new facility package: 60 days. Cutover services 30 days. 90 days total.
Randall Rd Sta. 2193+00 LT To Sta. 2196+00 LT		Under curb. Conflicts with storm and lighting		
Randall Rd Sta. 2196+00 LT To Sta. 2198+00 LT		Under curb and walk. Conflicts with storm sewer and walk.		
Randall Rd Sta. 2192+25 RT To Sta. 2196+00 RT		Under pavement. Conflicts with storm laterals		
Randall Rd Sta. 2196+00 LT To Sta. 2197+50 LT		Under curb. Conflicts with storm structures and laterals		
Randall Rd Sta. 2198+40 RT To Sta. 2208+00 RT		Under walk		

Randall Rd Sta. 2203+15 RT To Sta. 2204+75 RT	Underground water main, 10" (Cont'd)	Conflicts with traffic signal equip.	Lake in the Hills Public Works (Cont'd)	
Randall Rd Sta. 2208+00 RT		Conflicts with storm lateral		
Randall Rd Sta. 2208+00 RT To Sta. 2213+00 RT		Under walk		
Randall Rd Sta. 2210+04 RT		Conflicts with storm lateral		
Randall Rd Sta. 2212+90 RT To Sta. 2214+20 RT		Conflicts with traffic signal equip		
Randall Rd Sta. 2217+75 RT		Conflict with storm trunk line		
Randall Rd Sta. 2220+75 RT		Conflicts with storm outfalls		
Algonquin Rd Sta. 1339+00 LT To Sta. 1341+00 LT		Under walk		
Algonquin Rd Sta. 1341+05 LT		Hydrant conflicts with curb		
Algonquin Rd Sta. 1341+00 LT To Sta. 1345+10 LT		Under walk		
Algonquin Rd Sta. 1345+60 LT To Sta. 1348+20 LT		Under pavement. Conflicts with storm laterals		

Algonquin Rd Sta. 1349+50 LT To Sta. 1353+00 LT	Underground water main, 10" (Cont'd)	Under pavement. Conflicts with storm laterals	Lake in the Hills Public Works (Cont'd)	
Algonquin Rd Sta. 1353+00 LT To Sta. 1357+00 LT		Under pavement. Conflicts with storm laterals		
Algonquin Rd Sta. 1357+00 LT To Sta. 1360+50 LT		Under curb. Conflicts with storm structures and pipe		
Algonquin Rd Sta. 1360+50 LT To Sta. 1362+10 LT		Under path. Conflicts with lighting and traffic signals		
Algonquin Rd Sta. 1362+10 LT To Sta. 1364+00 LT		Under pavement. Conflicts with storm laterals.		
Algonquin Rd Sta. 1364+00 LT To Sta. 1365+60 LT		Under curb. Conflicts with storm structures and lighting		
Crystal Lake Rd Sta. 600+50 LT To Sta. 606+00 LT		Under curb. Conflicts with storm sewer and laterals.		

Stage 2

No conflicts to be resolved.

Stage 3

No conflicts to be resolved.

Pre-Stage: 995 Days Total Installation
Stage 1: 100 Days Total Installation
Stage 2: 0 Days Total Installation
Stage 3: 0 Days Total Installation

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

Agency/Company Responsible to Resolve Conflict	Name of contact	Address	Phone	e-mail address
AT&T	Hector Garcia	1000 Commerce Dr. Oak Brook, IL 60523	630-573-5465	hg2929@att.com
Comcast	Patrick Goheen	880 Donata Ct Lake Zurich, IL 60047	847-789-0976	Patrick.Goheen@ Cable.comcast.com
ComEd	Rich Seidel		630-229-5138	Richard.seidel@ Comed.com
State of IL CMS	Lori Sorenson	120 W Jefferson St. Springfield, IL 62702	217-557-6565	Lori.sorenson@ Illinois.gov

Nicor	Bruce Koppang	1844 Ferry Road Naperville, IL 60563	630-388-3046	bkoppan@ aglresources.com
Village of Algonquin	Michelle Zimmerman	110 Meyer Dr. Algonquin, IL 6012	847-658-2754	michellezimmerman@ Algonquin.org
Village of Lake in the Hills-Sanitary District	Rick Forner	515 Plum St Lake in the Hills, IL 60156	847-658-5122	rforner@lithsd.com
Village of Lake in the Hills-Public Works	Fred Mullard	9010 Haligus Rd Lake in the Hills, IL 60156	847-960-7500	fmullard@lith.org

UTILITIES TO BE WATCHED AND PROTECTED

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

*********All existing utilities within project area have been summarized above and all require some degree of relocation or adjustment. Note critical AT&T "Controlled Environment Vaults" listed below. These facilities are to be protected and remain undisturbed************

Pre-Stage

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER	ACTION
Bunker Hill Sta. 15+60 LT	Controlled Environment Vault	Shall not be impacted or disturbed	AT&T	Protect during construction
Randall Rd Sta. 2218+30 LT	Controlled Environment Vault	Shall not be impacted or disturbed	AT&T	Protect during construction

Stage 1, 2 and 3

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER	ACTION
Bunker Hill Sta. 15+60 LT	Controlled Environment Vault	Shall not be impacted or disturbed	AT&T	Protect during construction
Randall Rd Sta. 2218+30 LT	Controlled Environment Vault	Shall not be impacted or disturbed	AT&T	Protect during construction

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

Agency/Company Responsible to Resolve Conflict	Name of contact	Address	Phone	e-mail address
AT&T	Hector Garcia	1000 Commerce Dr. Oak Brook, IL 60523	630-573-5465	hg2929@att.com

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

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

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

COMPLETION DATE PLUS WORKING DAYS
Effective: September 30, 1985
Revised: January 1, 2007

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

"When a completion date plus working days is specified, the Contractor shall complete all roadway items and safely open all roadways to traffic by **11:59 PM on, June 30, 2021** except as specified herein.

The Contractor will be allowed to complete all clean-up work and punch list items within 15 working days after the completion date for opening the roadway to traffic. Under extenuating circumstances the Engineer may direct that certain items of work, not affecting the safe opening of the roadway to traffic, may be completed within the working days allowed for clean up work and punch list items. Temporary lane closures for this work may be allowed at the discretion of the Engineer.

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

RESTRICTION ON WORKING DAYS AFTER A COMPLETION DATE
Effective: January 21, 2003
Revised: January 1, 2007

All temporary lane closures during the period governed by working days after a completion date will not be permitted during the hours of 6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m. Monday through Friday.

All lane closure signs shall not be erected any earlier than one-half (1/2) hour before the starting hours listed above. Also, these signs should be taken down within one-half (1/2) hour after the closure is removed.

Failure to Open Traffic Lanes to Traffic: Should the Contractor fail to completely open and keep open all the traffic lanes to traffic in accordance with the limitations specified above, the Contractor shall be liable and shall pay to the Department the amount of $250 per lane blocked, not as a penalty but as liquidated and ascertained damages, for each and every 15 minute interval or a portion thereof that a lane is blocked outside the allowable time limitations. The Department may deduct such damages from any monies due the Contractor. These damages shall apply during the period governed by working days after a completion date and any extensions of that contract time.

PUBLIC CONVENIENCE AND SAFETY (DIST 1)
Effective: May 1, 2012
Revised: July 15, 2012

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

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

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

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

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

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

PROTECTION OF EXISTING TREES

The Contractor shall be responsible for taking measures to minimize damage to the tree limbs, tree trunks, and tree roots at each work site. All such measures shall be included in the contract price for other work except that payment will be made for TEMPORARY FENCE, TREE ROOT PRUNING and TREE PRUNING.

A. Earth Saw Cut of Tree Roots (Root Pruning):

1. Whenever proposed excavation falls within a drip-line of a tree, the Contractor shall:

    a. Root prune 6-inches behind and parallel to the proposed edge of trench a neat, clean vertical cut to a minimum depth directed by the Engineer through all affected tree roots.

    b. Root prune to a maximum width of 4-inches using a "Vermeer" wheel, or other similar machine. Trenching machines will not be permitted.

    c. Exercise care not to cut any existing utilities.

    d. If during construction it becomes necessary to expose tree roots which have not been precut, the Engineer shall be notified and the Contractor shall provide a clean, vertical cut at the proper root location, nearer the tree trunk, as necessary, by means of hand-digging and trimming with chain saw or hand saw. Ripping, shredding, shearing, chopping or tearing will not be permitted.

2. Whenever curb and gutter is removed for replacement, or excavation for removal of or construction of a structure is within the drip line/root zone of a tree, the Contractor shall:

    a. Root prune 6-inches behind the curbing so as to neatly cut the tree roots.

    b. Depth of cut shall be 12 inches for curb removal and replacement and 24 inches for structural work. Any roots encountered at a greater depth shall be neatly saw cut at no additional cost.

    c. Locations where earth saw cutting of tree roots is required will be marked in the field by the Engineer.

3. All root pruning work is to be performed through the services of a licensed arborist to be approved by the Engineer.

Root pruning will be paid for at the contract unit price each for TREE ROOT PRUNING, which price shall be payment for all labor, materials and equipment.

B. Temporary Fence:

1. The Contractor shall erect a temporary fence around all trees and existing landscape beds to remain within the construction area to establish a "tree protection zone" before any work begins or any material is delivered to the jobsite. No work is to be performed (other than root pruning), materials stored or vehicles driven or parked within the "tree protection zone".

2. The exact location and establishment of the "tree protection zone" fence shall be approved by the Engineer prior to setting the fence.

3. The fence shall be erected on three sides of the tree at the drip-line of the tree or as determined by the Engineer.

4. All work within the "tree protection zone" shall have the Engineer's prior approval. All slopes and other areas not regraded should be avoided so that unnecessary damage is not done to the existing turf, tree root system, or ground cover.

5. The grade within the "tree protection zone" shall not be changed unless approved by the Engineer prior to making said changes or performing the work.

The fence shall be similar to wood lath snow fence (48 inches high), plastic poly-type or any other type of highly visible barrier approved by the Engineer. This fence shall be properly maintained and shall remain up until final restoration, unless the Engineer directs removal otherwise. Tree fence shall be supported using T-Post style fence posts. **Utilizing re-bar as a fence post will not be permitted.**

Temporary fence will be paid for at the contract unit price per foot for TEMPORARY FENCE, which price shall include furnishing, installing, maintaining, and removing.

C. Tree Limb Pruning:

1. The Contractor shall inspect the work site in advance and arrange with the Roadside Development Unit (847.705.4171) to have any tree limbs pruned that might be damaged by equipment operations at least one week prior to the start of construction. Any tree limbs that are broken by construction equipment after the initial pruning must be pruned correctly within 72 hours.

Tree limb pruning will be paid for at the contract unit price per each for TREE PRUNING (1 TO 10 INCH DIAMETER) and/or TREE PRUNING (OVER 10 INCH DIAMETER), which price shall include labor, materials, and equipment.

D. Removal of Driveway Pavement and Sidewalk:

1. In order to minimize the potential damage to the tree root system(s), the Contractor will not be allowed to operate any construction equipment or machinery within the "tree protection zone" located between the curb or edge of pavement and the right-of-way property line.

2. Sidewalk to be removed in the areas adjacent to the "tree protection zones" shall be removed with equipment operated from the street pavement. Removal equipment shall be Gradall (or similar method), or by hand or a combination of these methods. The method of removal shall be approved by the Engineer prior to commencing any work.

3. Any pavement or pavement related work that is removed shall be immediately disposed of from the area and shall not be stockpiled or stored within the parkway area under any circumstances.

E. Backfilling:

1. Prior to placing the topsoil and/or sod, in areas outside the protection zone, the existing ground shall be disked to a depth no greater than one (1"), unless otherwise directed by the Engineer. No grading will be allowed within the drip-line of any tree unless directed by the Engineer.

F. Damages:

1. In the event that a tree not scheduled for removal is injured such that potential irreparable damage may ensure, as determined by the Roadside Development Unit, the Contractor shall be required to remove the damage tree and replace it on a three to one (3:1) basis, at his own expense. The Roadside Development Unit will select replacement trees from the pay items already established in the contract.

2. The Contractor shall place extreme importance upon the protection and care of trees and shrubs which are to remain during all times of this improvement. It is of paramount importance that the trees and shrubs which are to remain are adequately protected by the Contractor and made safe from harm and potential damage from the operations and construction of this improvement. If the Contractor is found to be in violation of storage or operations within the "tree protection zone" or construction activities not approved by the Engineer, a penalty shall be levied against the Contractor with the monies being deducted from the contract. The amount of the penalty shall be two hundred fifty dollars ($250.00) per occurrence per day.

EMBANKMENT I
Effective: March 1, 2011
Revised: November 1, 2013

Description
This work shall be according to Section 205 of the Standard Specifications except for the following.

Material
All material shall be approved by the District Geotechnical Engineer. The proposed material must meet the following requirements.

a) The laboratory Standard Dry Density shall be a minimum of 90 lb/cu ft (1450 kg/cu m) when determined according to AASHTO T 99 (Method C).

b) The organic content shall be less than ten percent determined according to AASHTO T 194 (Wet Combustion).

c) Soils which demonstrate the following properties shall be restricted to the interior of the embankment and shall be covered on both the sides and top of the embankment by a minimum of 3 ft (900 mm) of soil not considered detrimental in terms of erosion potential or excess volume change.

   1) A grain size distribution with less than 35 percent passing the number 75 um (#200) sieve.

   2) A plasticity index (PI) of less than 12.

   3) A liquid limit (LL) in excess of 50.

d) Reclaimed asphalt shall not be used within the ground water table or as a fill if ground water is present.

e) The RAP used shall be according to the current Bureau of Materials and Physical Research Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications". Gradation deleterious count shall not exceed 10% of total RAP and 5% of other by total weight.

CONSTRUCTION REQUIREMENTS

Samples
Embankment material shall be sampled, tested, and approved before use. The contractor shall identify embankment sources, and provide equipment as the Engineer requires, for the collection of samples from those sources. Samples will be furnished to the Geotechnical Engineer a minimum of three weeks prior to use in order that laboratory tests for approval and compaction can be performed. Embankment material placement cannot begin until tests are completed and approval given.

Placing Material
In addition to Article 202.03, broken concrete, reclaimed asphalt with no expansive aggregate, or uncontaminated dirt and sand generated from construction or demolition activities shall be placed in 6 inches (150 mm) lifts and disked with the underlying lift until a uniform homogenous material is formed. This process also applies to the overlaying lifts. The disk must have a minimum blade diameter of 24 inches (600 mm).

When embankments are to be constructed on hillsides or existing slopes that are steeper than 3H:1V, steps shall be keyed into the existing slope by stepping and benching as shown in the plans or as directed by the engineer.

Compaction
Soils classification for moisture content control will be determined by the Soils Inspector using visual field examination techniques and the IDH Textural Classification Chart.

When tested for density in place each lift shall have a maximum moisture content as follows.

a) A maximum of 110 percent of the optimum moisture for all forms of clay soils.

b) A maximum of 105 percent of the optimum moisture for all forms of clay loam soils.

Stability
The requirement for embankment stability in Article 205.04 will be measured with a Dynamic Cone Penetrometer (DCP) according to the test method in the IDOT Geotechnical Manual. The penetration rate must be equal or less than 1.5 inches (38 mm) per blow.

Basis of Payment
This work will not be paid separately but will be considered as included in the various items of excavation.

MOWING

Description
This work shall consist of mowing temporary cover vegetation and turf grass areas to a height not more than 3 inches (75 mm).

Schedule
Mow twice a month when grass is actively growing.

Equipment
The Contractor shall keep all mowing equipment sharp and properly equipped for operation along an urban arterial route. The equipment used shall be capable of completely severing all growth at the cutting height and distributing it evenly over the mowed area. Special equipment may be required on steep slopes, in narrow areas, and for trimming around posts, poles, fences, trees, shrubs, seedlings, etc.

Method
All mowing and trimming operations are to proceed in the direction of traffic flow. The cut material shall not be windrowed or left in a lumpy or bunched condition. Additional mowing or trimming may be required to obtain the height specified or to disperse mowed material.

Debris encountered during the mowing operations which hampers the operation or is visible from the roadway shall be removed and disposed of according to Article 202.03. All trimmings, windrowed material, and debris removal must be complete to the satisfaction of the Engineer. Damage to the turf, such as ruts or wheel tracks more than 2 inches (50 MM) in depth, or other plantings or highway appurtenances caused by the mowing or trimming operation shall be repaired at the Contractor's expense.

Method of Measurement
Mowing and trimming will be measured in acres (hectares) of surface area mowed at the completion of each mowing cycle.

Plan quantities are estimates only. Actual quantities will be measured in place. Agreement to plan quantities will not be allowed. Shrub beds or perennial beds within the mowed area that are less than 1000 square feet (90 square meters) will not be subtracted from the area mowed.

Basis of Payment

This work will be paid for at the contract unit price per acre (hectare) for MOWING. Any additional mowing or trimming required to obtain the height specified or to disperse mowed material will be considered as included in the cost of the initial mowing. Payment for mowing and trimming shall include the cost of all material, equipment, labor, removal, disposal and incidentals required to complete the work as specified herein and to the satisfaction of the Engineer.

SUPPLEMENTAL WATERING

Description

This work will include watering turf, trees, shrubs, vines and perennial plants at the rates specified and as directed by the Engineer.

Schedule

Water perennials once a week. Supplemental watering will only begin after the successful completion of period of establishment requirements of the plant material to be watered.

Watering must be completed in a timely manner. When the Engineer directs the Contractor to do supplemental watering, the Contractor must begin the watering operation within 24 hours of notice. A minimum of 10 units of water per day must be applied until the work is complete. Damage to plant material that is a result of the Contractor's failure to water in a timely way must be repaired or replaced at the Contractor's expense.

Source of Water

The Contractor shall notify the Engineer of the source of water used and provide written certification that the water does not contain chemicals harmful to plant growth.

Rate of Application

The normal rates of application for watering are as follows. The Engineer will adjust these rates as needed depending upon weather conditions.

Perennial Plants:	5 gallons per square yard
Trees:	30 gallons per tree
Shrubs:	7 gallons per shrub
Vines:	3 gallons per vine
Turf:	As directed by the Engineer per Section 252. SODDING

Method of Application

A spray nozzle that does not damage small plants must be used when watering perennial plants or turf. Water shall be applied at the base of the plant to keep as much water as possible off plant leaves. An open hose may be used to water trees, shrubs, and vines if mulch and soil are not displaced by watering. Water shall trickle slowly into soil

and completely soak the root zone. The Contractor must supply metering equipment as needed to assure the specified application rate of water.

Method of Measurement
Supplemental watering will be measured in units of 1000 gallons (3,785 liters) of water applied as directed.

Basis of Payment
This work will be paid for at the contract unit price per unit of SUPPLEMENTAL WATERING, measured as specified. Payment will include the cost of all water, equipment and labor needed to complete the work specified herein and to the satisfaction of the Engineer.

AGGREGATE SUBGRADE IMPROVEMENT (D-1)
Effective: February 22, 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 gradation CS 01 but shall not exceed 40 percent by weight of the total product. The top size of the Coarse 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 gradation CS 01 is used in lower lifts. When RAP is blended with any of the coarse aggregates, the blending shall be done with mechanically calibrated feeders. The final product shall not contain more than 40 percent by weight of RAP.

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. The calibration for the mechanical feeders shall have an accuracy of ± 2.0 percent of the actual quantity of material delivered.

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 gradation CS 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 Reclaimed Asphalt Pavement (RAP) is used, it shall be crushed and screened where 100 percent is passing the 1 1/2 in. (37.5 mm) sieve and being well graded. RAP that has been fractionated to size will not be permitted for use in capping. Capping aggregate will not be required when the aggregate subgrade improvement is used as a cubic yard pay item for undercut applications. When RAP is blended with any of the coarse aggregates, the blending shall be done with mechanically calibrated feeders.

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) 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. The top 12 inches of the aggregate subgrade improvement shall be 3 inches of capping material and 9 inches of crushed gravel, crushed stone or crushed concrete. In applications where greater than 36 inches of subgrade material is required, rounded gravel, meeting the CS01 gradation, may be used beginning at a depth of 12 inches below the bottom of pavement.

(b) Quality. The coarse aggregate shall consist of sound durable particles reasonably free of deleterious materials. Non-mechanically blended RAP may be allowed up to a maximum of 5.0 percent.

(c) Gradation.

(1) The coarse aggregate gradation for total subgrade thicknesses of 12 in. (300 mm) or greater shall be CS 01.

Grad No.	COARSE AGGREGATE SUBGRADE GRADATIONS Sieve Size and Percent Passing				
	8"	6"	4"	2"	#4
CS 01	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20

Grad No.	COARSE AGGREGATE SUBGRADE GRADATIONS (Metric) 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

The 3 in. (75 mm) capping aggregate shall be gradation CA 6 or CA 10

COARSE AGGREGATE FOR BACKFILL, TRENCH BACKFILL AND BEDDING (DISTRICT 1)
Effective: November 1, 2011
Revised: November 1, 2013

This work shall be according to Section 1004.05 of the Standard Specifications except for the following:

Reclaimed Asphalt Pavement (RAP) maybe blended with gravel, crushed gravel, crushed stone crushed concrete, crushed slag, chats, crushed sand stone or wet bottom boiler slag. The RAP used shall be according to the current Bureau of Materials and Physical Research Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications". The RAP shall be uniformly graded and shall pass the 1.0 in. (25 mm) screen. When RAP is blended with any of the coarse aggregate listed above, the blending shall be done mechanically with calibrated feeders. The feeders shall have an accuracy of ± 2.0 percent of the actual quantity of material delivered. The final blended product shall not contain more than 40 percent by weight RAP.

The coarse aggregate listed above shall meet CA 6 and CA 10 gradations prior to being blended with the processed and uniformly graded RAP. Gradation deleterious count shall not exceed 10% of total RAP and 5% of other by total weight.

HMA MIXTURE DESIGN REQUIREMENTS (D-1)
Effective: January 1, 2013
Revised: January 1, 2018

1) Design Composition and Volumetric Requirements

Revise the table in Article 406.06(d) of the Standard Specifications to read:

"MINIMUM COMPACTED LIFT THICKNESS	
Mixture Composition	Thickness, in. (mm)
IL-4.75	3/4 (19)
SMA-9.5, IL-9.5, IL-9.5L	1 1/2 (38)
SMA-12.5	2 (50)
IL-19.0, IL-19.0L	2 1/4 (57)"

Revise the table in Article 1004.03(c) of the Standard Specifications to read:

"Use	Size/Application	Gradation No.
Class A-1, 2, & 3	3/8 in. (10 mm) Seal	CA 16
Class A-1	1/2 in. (13 mm) Seal	CA 15
Class A-2 & 3	Cover	CA 14
HMA High ESAL	IL-19.0 IL-9.5	CA 11 1/ CA 16, CA 13 3/
HMA Low ESAL	IL-19.0L IL-9.5L Stabilized Subbase or Shoulders	CA 11 1/ CA 16
SMA 2/	1/2 in. (12.5mm) Binder & Surface IL 9.5 Surface	CA13 3/, CA14 or CA16 CA16, CA 13 3/

1/ CA 16 or CA 13 may be blended with the gradations listed.
2/ The coarse aggregates used shall be capable of being combined with stone sand, slag sand, or steel slag sand meeting the FA/FM 20 gradation and mineral filler to meet the approved mix design and the mix requirements noted herein.
3/ CA 13 shall be 100 percent passing the 1/2 in. (12.5mm) sieve.

Revise Article 1004.03(e) of the Supplemental Specifications to read:

"(e) Absorption. For SMA the coarse aggregate shall also have water absorption ≤ 2.0 percent."

Revise the last paragraph of Article 1102.01 (a) (5) of the Standard Specifications to read:

"IL-4.75 and Stone Matrix Asphalt (SMA) mixtures which contain aggregate having absorptions greater than or equal to 2.0 percent, or which contain steal slag sand, shall have minimum surge bin storage plus haul time of 1.5 hours."

Revise the nomenclature table in Article 1030.01 of the Standard Specifications to read:

"High ESAL	IL-19.0 binder; IL-9.5 surface; IL-4.75; SMA-12.5, SMA-9.5
Low ESAL	IL-19.0L binder; IL-9.5L surface; Stabilized Subbase (HMA)1/; HMA Shoulders2/

1/ Uses 19.0L binder mix.

2/ Uses 19.0L for lower lifts and 9.5L for surface lift."

Revise Article 1030.02 of the Standard Specifications and Supplemental Specifications to read:

"**1030.02 Materials.** Materials shall be according to the following.

Item	Article/Section
(a) Coarse Aggregate	1004.03
(b) Fine Aggregate	1003.03
(c) RAP Material	1031
(d) Mineral Filler	1011
(e) Hydrated Lime	1012.01
(f) Slaked Quicklime (Note 1)	
(g) Performance Graded Asphalt Binder (Note 2)	1032
(h) Fibers (Note 3)	
(i) Warm Mix Asphalt (WMA) Technologies (Note 4)	

Note 1. Slaked quicklime shall be according to ASTM C 5.

Note 2. The asphalt binder shall be an SBS PG 76-28 when the SMA is used on a full-depth asphalt pavement and SBS PG 76-22 when used as an overlay, except where modified herein. The asphalt binder shall be an Elvaloy or SBS PG 76-22 for IL-4.75, except where modified herein. The elastic recovery shall be a minimum of 80.

Note 3. A stabilizing additive such as cellulose or mineral fiber shall be added to the SMA mixture according to Illinois Modified AASHTO M 325. The stabilizing additive shall meet the Fiber Quality Requirements listed in Illinois Modified AASHTO M 325. Prior to approval and use of fibers, the Contractor shall submit a notarized certification by the producer of these materials stating they meet these requirements. Reclaimed Asphalt Shingles (RAS) may be used in Stone Matrix Asphalt (SMA) mixtures designed with an SBA polymer modifier as a fiber additive if the mix design with RAS included meets AASHTO T305 requirements. The RAS shall be from a certified source that produces either Type I or Type

2. Material shall meet requirements noted herein and the actual dosage rate will be determined by the Engineer.

Note 4. Warm mix additives or foaming processes shall be selected from the current Bureau of Materials and Physical Research Approved List, "Warm Mix Asphalt Technologies"."

Revise Article 1030.04(a)(1) of the Standard Specifications and the Supplemental Specifications to read:

"(1) High ESAL Mixtures. The Job Mix Formula (JMF) shall fall within the following limits.

High ESAL, MIXTURE COMPOSITION (% PASSING) 1/										
Sieve Size	IL-19.0 mm		SMA 4/ IL-12.5 mm		SMA 4/ IL-9.5 mm		IL-9.5 mm		IL-4.75 mm	
	min	max	min	max	min	max	min	max	min	max
1 1/2 in (37.5 mm)										
1 in. (25 mm)		100								
3/4 in. (19 mm)	90	100		100						
1/2 in. (12.5 mm)	75	89	80	100		100		100		100
3/8 in. (9.5 mm)				65	90	100	90	100		100
#4 (4.75 mm)	40	60	20	30	36	50	34	69	90	100
#8 (2.36 mm)	20	42	16	24 5/	16	32 5/	34 6/	52 2/	70	90
#16 (1.18 mm)	15	30					10	32	50	65
#30 (600 μm)			12	16	12	18				
#50 (300 μm)	6	15					4	15	15	30
#100 (150 μm)	4	9					3	10	10	18
#200 (75 μm)	3	6	7.0	9.0 3/	7.5	9.5 3/	4	6	7	9 3/
Ratio Dust/Asphalt Binder		1.0		1.5		1.5		1.0		1.0

1/ Based on percent of total aggregate weight.

2/ The mixture composition shall not exceed 44 percent passing the #8 (2.36 mm) sieve for surface courses with Ndesign = 90.

3/ Additional minus No. 200 (0.075 mm) material required by the mix design shall be mineral filler, unless otherwise approved by the Engineer.

4/ The maximum percent passing the #635 (20 μm) sieve shall be ≤ 3 percent.

5/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted above the percentage stated on the table.

6/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted below 34 percent.

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

"(1) High ESAL Mixtures. The target value for the air voids of the HMA shall be 4.0 percent and for IL-4.75 it shall be 3.5 percent at the design number of gyrations. The VMA and VFA of the HMA design shall be based on the nominal maximum size of the aggregate in the mix, and shall conform to the following requirements.

VOLUMETRIC REQUIREMENTS High ESAL				
	Voids in the Mineral Aggregate (VMA), % minimum			Voids Filled with Asphalt Binder (VFA), %
Ndesign	IL-19.0	IL-9.5	IL-4.75 1/	
50	13.5	15.0	18.5	65 – 78 2/
70				65 - 75
90				

1/ Maximum Draindown for IL-4.75 shall be 0.3 percent

2/ VFA for IL-4.75 shall be 72-85 percent"

Replace Article 1030.04(b)(3) of the Standard Specifications with the following:

"(3) SMA Mixtures.

Volumetric Requirements SMA 1/			
Ndesign	Design Air Voids Target %	Voids in the Mineral Aggregate (VMA), % min.	Voids Filled with Asphalt (VFA), %
80 4/	3.5	17.0 2/ 16.0 3/	75 - 83

1/ Maximum draindown shall be 0.3 percent. The draindown shall be determined at the JMF asphalt binder content at the mixing temperature plus 30 °F.

2/ Applies when specific gravity of coarse aggregate is ≥ 2.760.

3/ Applies when specific gravity of coarse aggregate is < 2.760.

4/ Blending of different types of aggregate will not be permitted.

For surface course, the coarse aggregate can be crushed steel slag, crystalline crushed stone or crushed sandstone. For binder course, coarse aggregate shall be crushed stone (dolomite), crushed gravel, crystalline crushed stone, or crushed sandstone.

Add to the end of Article 1030.05 (d) (2) a. of the Standard Specifications:

"During production, the Contractor shall test SMA mixtures for draindown according to AASHTO T305 at a frequency of 1 per day of production."

Delete last sentence of the second paragraph of Article 1102.01(a) (4) b. 2.

Add to the end of Article 1102.01 (a) (4) b. 2.:

"As an option, collected dust (baghouse) may be used in lieu of manufactured mineral filler according to the following:

(a.) Sufficient collected dust (baghouse) is available for production of the SMA mix for the entire project.

(b.) A mix design was prepared based on collected dust (baghouse).

2) Design Verification and Production

Revise Article 1030.04 (d) of the Standard Specifications to read:

"(d) Verification Testing. High ESAL, IL-4.75, and SMA mix designs submitted for verification will be tested to ensure that the resulting mix designs will pass the required criteria for the Hamburg Wheel Test (IL mod AASHTO T-324) and the Tensile Strength Test (IL mod AASHTO T-283). The Department will perform a verification test on gyratory specimens compacted by the Contractor. If the mix fails the Department's verification test, the Contractor shall make the necessary changes to the mix and resubmit compacted specimens to the Department for verification. If the mix fails again, the mix design will be rejected.

All new and renewal mix designs will be required to be tested, prior to submittal for Department verification and shall meet the following requirements:

(1)Hamburg Wheel Test criteria. The maximum allowable rut depth shall be 0.5 in. (12.5 mm). The minimum number of wheel passes at the 0.5 in. (12.5 mm) rut depth criteria shall be based on the high temperature binder grade of the mix as specified in the mix requirements table of the plans.

Illinois Modified AASHTO T 324 Requirements 1/

Asphalt Binder Grade	# Repetitions	Max Rut Depth (mm)
PG 70 -XX (or higher)	20,000	12.5
PG 64 -XX (or lower)	10,000	12.5

1/When produced at temperatures of 275 ± 5 °F (135 ± 3 °C) or less, loose Warm Mix Asphalt shall be oven aged at 270 ± 5 °F (132 ± 3 °C) for two hours prior to gyratory compaction of Hamburg Wheel specimens.

Note: For SMA Designs (N-80) the maximum rut depth is 6.0 mm at 20,000 repetitions.
For IL 4.75mm Designs (N-50) the maximum rut depth is 9.0mm at 15,000 repetitions.

(2) Tensile Strength Criteria. The minimum allowable conditioned tensile strength shall be 60 psi (415 kPa) for non-polymer modified performance graded (PG) asphalt binder and 80 psi (550 kPa) for polymer modified PG asphalt binder. The maximum allowable unconditioned tensile strength shall be 200 psi (1380 kPa)."

Production Testing. Revise first paragraph of Article 1030.06(a) of the Standard Specifications to read:

"(a) High ESAL, IL-4.75, WMA, and SMA Mixtures. For each contract, a 300 ton (275 metric tons) test strip, except for SMA mixtures it will be 400 ton (363 metric ton), will be required at the beginning of HMA production for each mixture at the beginning of each construction year according to the Manual of Test Procedures for Materials "Hot Mix Asphalt Test Strip Procedures". At the request of the Producer, the Engineer may waive the test strip if previous construction during the current construction year has demonstrated the constructability of the mix using Department test results."

Add the following after the sixth paragraph in Article 1030.06 (a) of the Standard Specifications:

"The Hamburg Wheel test shall also be conducted on all HMA mixtures from a sample taken within the first 500 tons (450 metric tons) on the first day of production or during start up with a split reserved for the Department. The mix sample shall be tested according to the Illinois Modified AASHTO T 324 and shall meet the requirements specified herein. Mix production shall not exceed 1500 tons (1350 metric tons) or one day's production, whichever comes first, until the testing is completed and the mixture is found to be in conformance. The requirement to cease mix production may be waived if the plant produced mixture demonstrates conformance prior to start of mix production for a contract.
If the mixture fails to meet the Hamburg Wheel criteria, no further mixture will be accepted until the Contractor takes such action as is necessary to furnish a mixture meeting the criteria"

Method of Measurement:

Add the following after the fourth paragraph of Article 406.13 (b):

"The plan quantities of SMA mixtures shall be adjusted using the actual approved binder and surface Mix Design's G_{mb}."

Basis of Payment.

Replace the fourth paragraph of Article 406.14 of the Standard Specifications with the following:

"Stone matrix asphalt will be paid for at the contract unit price per ton (metric ton) for POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, STONE MATRIX ASPHALT, of the mixture composition and Ndesign specified; and POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, STONE MATRIX ASPHALT, of the mixture composition and Ndesign specified."

HMA MIXTURE DESIGN REQUIREMENTS (VILLAGE OF ALGONQUIN)

Description and ·Materials
The following specification is to be used for the following Village of Algonquin roadways and multi-use paths paths:

1. Bunker Hill Drive/Huntingon Drive
2. Stonegate Road
3. Mutli-Use path connecting to underpass below Randall Road

Hot Mix Asphalt pavements shall be designed, produced, stored, controlled (sample inspection, sampling, and testing), shipped, and constructed in accordance with Section 406 and other applicable sections of the Standard Specifications for Road and Bridge Construction, applicable Special Provisions, and Chapter 44 of the Bureau of Local Roads and Streets Manual and the following:

1. All asphalt mix designs shall target 3.5% Air Voids and all production shall trend about 3.5% Air Voids.
2. N50, IL-19.0 mm Binder course shall have a minimum of 40% passing the #4 sieve.
3. N50, IL-9.5 mm Surface and Level courses shall have a minimum of 40% passing the #8 sieve.
4. Re-proportioning (within SSRBC adjustments allowed) of IDOT verified mix designs may be allowed and the contractor must submit these values for a revievv by the Engineer at least one week prior to the first day of production.
5. One field TSR test by the Contractor will be required to validate changes.
6. The AJMF during production shall meet the remaining IDOT volumetric requirements.

HOT-MIX ASPHALT MIXTURE REQUIREMENTS

ITEM	AC TYPE	VOIDS
Hot Mix Asphalt Surface Course, Mix "D," N50 – **used on Bunker Hill Drive/Huntington Drive & Stonegate Road**	PG 58-22/58-28*	3.5% @50 GYR
Hot Mix Asphalt Surface Course, Mix "D," N50 – **used on Mutli-Use path connecting to underpass below Randall Road**	PG 58-22/58-28*	3.0% @50 GYR

Leveling Binder (Machine Method), N50	PG 58-22/58-28*	3.5%@50 GYR
Hot Mix Asphalt Binder Course, IL-19, N50	PG 58-22/58-28*	3.5%@50 GYR

Note: The unit weight used to calculate all I-IMA surface mixture quantities is 112 lbs/sq yd/in

*When Asphalt Binder Replacement (ABR) exceeds 15%, the new asphalt binder in the mix shall be PG 58-28. No more than 2% Reclaimed Asphalt Shingles shall be allowed in the asphalt.

Hot Mix Asphalt Construction

1. Tack coat all longitudinal joints (hot and cold) and curb faces.
2. Pneumatic tired roller is required on all lifts, all mixes, all courses.
3. Auger extensions are required on all lifts, all mixes.
4. Reverse augers must be installed properly.
5. Augers shall be installed properly at the bearing point.
6. Roll (compact) the confined and curb line longitudinal joint by overlapping by 6" from the hot to cold side of mat and I or curbing.
7. Paving of the full roadway width shall be completed at the end of each day. Longitudinal joints shall be closed daily and within one truck load of HMA to prevent cold joints. Any violation shall require saw cutting edge back 3" to expose straight edge, shall be tack coated twice, and will be straight and uniform.
8. Asphalt along the curb line shall be compacted such that the asphalt is 1/i" above the curb line.

RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES (D-1)
Effective: November 1, 2012
Revised: January 1, 2018

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 resulting from cold milling or crushing an existing hot-mix asphalt (HMA) pavement. RAP will be considered processed FRAP after completion of both crushing and screening to size. The Contractor shall supply written documentation that the RAP originated from routes or airfields under federal, state, or local agency jurisdiction.

(b) Reclaimed Asphalt Shingles (RAS). Reclaimed asphalt shingles (RAS). RAS is from the processing and grinding of preconsumer or post-consumer shingles. RAS shall be a clean and uniform material with a maximum of 0.5 percent unacceptable material, as defined in Central Bureau of Materials Policy Memorandum, "Reclaimed Asphalt Shingle (RAS) Sources", by weight of RAS. All RAS used shall come from a Central Bureau of Materials approved processing facility where it shall be ground and processed to 100 percent passing the 3/8 in. (9.5 mm) sieve and 90 percent passing the #4 (4.75 mm) sieve. RAS 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. Additional processed RAP (FRAP) shall be stockpiled in a separate working pile, as designated in the QC Plan, and only added to the sealed stockpile when test results for the working pile are complete and are found to meet tolerances specified herein for the original sealed FRAP stockpile. Stockpiles shall be sufficiently separated to prevent intermingling at the base. All stockpiles (including unprocessed RAP and FRAP) shall be identified by signs indicating the type as listed below (i.e. "Non-Quality, FRAP -#4 or Type 2 RAS", etc…).

(1) Fractionated RAP (FRAP). FRAP shall consist of RAP from Class I, HMA (High and Low ESAL) or equivalent 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 processed prior to testing and sized into 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 in the coarse fraction shall pass the maximum sieve size specified for the mix the FRAP will be used in.

(2) Restricted FRAP (B quality) stockpiles shall consist of RAP from Class I, HMA (High ESAL), or HMA (High ESAL). If approved by the Engineer, the aggregate from a maximum 3.0 in. (75 mm) single combined pass of surface/binder milling will be classified as B quality. All millings from this application will be processed into FRAP as described previously.

(3) Conglomerate. Conglomerate RAP stockpiles shall consist of RAP from Class I, HMA (High and Low ESAL) or equivalent 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 (FRAP) prior to testing. Conglomerate RAP stockpiles shall not contain steel slag or other expansive material as determined by the Department.

(4) Conglomerate "D" Quality (DQ). Conglomerate DQ RAP stockpiles shall consist of RAP from HMA shoulders, bituminous stabilized subbases or HMA (Low ESAL)/HMA (Low ESAL) IL-19.0L binder mixture. The coarse aggregate in this RAP may be crushed or round but shall be at least D quality. This RAP may have an inconsistent gradation and/or asphalt binder content. Conglomerate DQ RAP stockpiles shall not contain steel slag or other expansive material as determined by the Department.

(5) Non-Quality. RAP stockpiles that do not meet the requirements of the stockpile categories listed above shall be classified as "Non-Quality".

RAP or FRAP containing contaminants, such as earth, brick, sand, concrete, sheet asphalt, bituminous surface treatment (i.e. chip seal), pavement fabric, joint sealants, plant cleanout 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 be sufficiently separated to prevent intermingling at the base. Each stockpile shall be signed indicating what type of RAS is present.

However, a RAS source may submit a written request to the Department for approval to blend mechanically a specified ratio of Type 1 RAS with Type 2 RAS. The source will not be permitted to change the ratio of the blend without the Department prior written approval. The Engineer's written approval will be required, to mechanically blend RAS with any fine aggregate produced under the AGCS, up to an equal weight of RAS, to improve workability. The fine aggregate shall be "B Quality" or better from an approved Aggregate Gradation Control System source. The fine aggregate shall be one that is approved for use in the HMA mixture and 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. FRAP and RAS testing shall be according to the following.

(a) FRAP Testing. When used in HMA, the FRAP shall be sampled and tested either during processing or after stockpiling. It shall also be sampled during HMA production.

(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) Incoming Material. For testing as incoming material, washed extraction samples shall be run at a minimum frequency of one sample per 2000 tons (1800 metric tons) or once per week, whichever comes first.

(3) 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.

Before extraction, each field sample of FRAP, shall be split to obtain two 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 shall be sampled and tested during stockpiling according to Central Bureau of Materials Policy Memorandum, "Reclaimed Asphalt Shingle (RAS) Sources". The Contractor shall also sample as incoming material at the HMA plant.

(1) During Stockpiling. Washed extraction and testing for unacceptable materials shall be run 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 1000 tons (900 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 shall be 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.

(2) Incoming Material. For testing as incoming material at the HMA plant, washed extraction shall be run at the minimum frequency of one sample per 250 tons (227 metric tons). A minimum of five samples are required for stockpiles less than 1000 tons (900 metric tons). The incoming material test results shall meet the tolerances specified herein.

The Contractor shall obtain and make available all test results from start of the initial stockpile sampled and tested at the shingle processing facility in accordance with the facility's QC Plan.

Before extraction, each field sample shall be split to obtain two 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 procedures. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

1031.04 Evaluation of Tests. Evaluation of test results shall be according to the following.

(a) Evaluation of FRAP Test Results. All test results shall be compiled to include asphalt binder content, gradation and, when applicable (for slag), G_{mm}. A five test average of results from the original pile will be used in the mix designs. Individual extraction test results run thereafter, shall be compared to the average used for the mix design, and will be accepted if within the tolerances listed below.

Parameter	FRAP
No. 4 (4.75 mm)	± 6 %
No. 8 (2.36 mm)	± 5 %
No. 30 (600 μm)	± 5 %
No. 200 (75 μm)	± 2.0 %
Asphalt Binder	± 0.3 %
G_{mm}	± 0.03 1/

1/ For stockpile with slag or steel slag present as determined in the current Manual of Test Procedures Appendix B 21, "Determination of Reclaimed Asphalt Pavement Aggregate Bulk Specific Gravity".

If any individual sieve and/or asphalt binder content tests are out of the above tolerances when compared to the average used for the mix design, the FRAP stockpile shall not be used in Hot-Mix Asphalt unless the FRAP representing those tests is removed from the stockpile. All test data and acceptance ranges shall be sent to the District for evaluation.

The Contractor shall maintain a representative moving average of five tests to be used for Hot-Mix Asphalt production.

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)" or Illinois Modified AASHTO T-164-11, Test Method A.

(b) Evaluation of RAS 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. A five test average of results from the original pile will be used in the mix designs. Individual test results run thereafter, when compared to the average used for the mix design, 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)	± 2.5 %
Asphalt Binder Content	± 2.0 %

If any individual sieve and/or asphalt binder content tests are out of the above tolerances when compared to the average used for the mix design, the RAS shall not be used in Hot-Mix Asphalt unless the RAS representing those tests is removed from the stockpile. All test data and acceptance ranges shall be sent to the District for evaluation.

(c) Quality Assurance by the Engineer. The Engineer may witness the sampling and splitting conduct assurance tests on split samples taken by the Contractor for quality control testing a minimum of once a month.

The overall testing frequency will be performed over the entire range of Contractor samples for asphalt binder content and gradation. The Engineer may select any or all split samples for assurance testing. The test results will be made available to the Contractor as soon as they become available.

The Engineer will notify the Contractor of observed deficiencies.

Differences between the Contractor's and the Engineer's split sample test results will be considered acceptable if within the following limits.

Test Parameter	Acceptable Limits of Precision	
% Passing:1/	FRAP	RAS
1/2 in.	5.0%	
No. 4	5.0%	
No. 8	3.0%	4.0%
No. 30	2.0%	4.0%
No. 200	2.2%	4.0%
Asphalt Binder Content	0.3%	3.0%
G_{mm}	0.030	

1/ Based on washed extraction.

In the event comparisons are outside the above acceptable limits of precision, the Engineer will immediately investigate.

(d) Acceptance by the Engineer. Acceptable of the material will be based on the validation of the Contractor's quality control by the assurance process.

1031.05 Quality Designation of Aggregate in RAP and FRAP.

(a) RAP. The aggregate quality of the RAP for homogeneous, conglomerate, and conglomerate "D" quality 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, HMA (High ESAL), or (Low ESAL) IL-9.5L surface mixtures are designated as containing Class B quality coarse aggregate.

(2) RAP from HMA (Low ESAL) IL-19.0L binder mixture is designated as Class D quality coarse aggregate.

(3) RAP from Class I, HMA (High ESAL) binder mixtures, bituminous base course mixtures, and bituminous base course widening mixtures are designated as containing Class C quality coarse aggregate.

(4) RAP from bituminous stabilized subbase and BAM shoulders are designated as containing Class D 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. Fractionated RAP stockpiles containing plus #4 (4.75 mm) sieve coarse aggregate shall have a maximum tonnage of 5,000 tons (4,500

metric tons). The Contractor shall obtain a representative sample witnessed by the Engineer. The sample shall be a minimum of 50 lb (25 kg). The sample shall be extracted according to Illinois Modified AASHTO T 164 by a consultant laboratory prequalified by the Department for the specified testing. The consultant laboratory shall submit the test results along with the recovered aggregate to the District Office. The cost for this testing shall be paid by the Contractor. The District will forward the sample to the Central Bureau of Materials Aggregate Lab for MicroDeval Testing, according to ITP 327. A maximum loss of 15.0 percent will be applied for all HMA applications. The fine aggregate portion of the fractionated RAP shall not be used in any HMA mixtures that require a minimum of "B" quality aggregate or better, until the coarse aggregate fraction has been determined to be acceptable thru a MicroDeval Testing.

1031.06 Use of FRAP and/or RAS in HMA. The use of FRAP and/or RAS shall be the Contractor's option when constructing HMA in all contracts.

(a) FRAP. The use of FRAP in HMA shall be as follows.

(1) Coarse Aggregate Size (after extraction). The coarse aggregate in all FRAP shall be equal to or less than the nominal maximum size requirement for the HMA mixture to be produced.

(2) Steel Slag Stockpiles. FRAP stockpiles containing steel slag or other expansive material, as determined by the Department, shall be homogeneous and will be approved for use in HMA (High ESAL and Low ESAL) mixtures regardless of lift or mix type.

(3) Use in HMA Surface Mixtures (High and Low ESAL). FRAP stockpiles for use in HMA surface mixtures (High and Low ESAL) shall have coarse aggregate that is Class B quality or better. FRAP shall be considered equivalent to limestone for frictional considerations unless produced/screened to minus 3/8 inch.

(4) Use in HMA Binder Mixtures (High and Low ESAL), HMA Base Course, and HMA Base Course Widening. FRAP stockpiles for use in HMA binder mixtures (High and Low ESAL), HMA base course, and HMA base course widening shall be FRAP in which the coarse aggregate is Class C quality or better.

(5) Use in Shoulders and Subbase. FRAP stockpiles for use in HMA shoulders and stabilized subbase (HMA) shall be FRAP, Restricted FRAP, conglomerate, or conglomerate DQ.

(b) RAS. RAS meeting Type 1 or Type 2 requirements will be permitted in all HMA applications as specified herein.

(c) FRAP and/or RAS Usage Limits. Type 1 or Type 2 RAS may be used alone or in conjunction with FRAP in HMA mixtures up to a maximum of 5.0 percent by weight of the total mix.

When FRAP is used alone or FRAP is used in conjunction with RAS, the percent of virgin asphalt binder replacement (ABR) shall not exceed the amounts indicated in the table below for a given N Design.

Max Asphalt Binder Replacement for FRAP with RAS Combination

HMA Mixtures 1/ 2/ 4/	Maximum % ABR		
Ndesign	Binder/Leveling Binder	Surface	Polymer Modified 3/
30L	50	40	30
50	40	35	30
70	40	30	30
90	40	30	30
4.75 mm N-50			40
SMA N-80			30

1/ For Low ESAL HMA shoulder and stabilized subbase, the percent asphalt binder replacement shall not exceed 50 % of the total asphalt binder in the mixture.

2/ When the binder replacement exceeds 15 % for all mixes, except for SMA and IL-4.75, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 % binder replacement using a virgin asphalt binder grade of PG64-22 will be reduced to a PG58-28). When constructing full depth HMA and the ABR is less than 15 %, the required virgin asphalt binder grade shall be PG64-28.

3/ When the ABR for SMA or IL-4.75 is 15 % or less, the required virgin asphalt binder shall be SBS PG76-22 and the elastic recovery shall be a minimum of 80. When the ABR for SMA or IL-4.75 exceeds 15%, the virgin asphalt binder grade shall be SBS PG70-28 and the elastic recovery shall be a minimum of 80.

4/ When FRAP or RAS is used alone, the maximum percent asphalt binder replacement designated on the table shall be reduced by 10 %.

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) FRAP and/or RAS. FRAP and /or RAS mix designs shall be submitted for verification. If additional FRAP or RAS stockpiles are tested and found to be within tolerance, as defined under "Evaluation of Tests" herein, and meet all requirements herein, the additional FRAP or RAS stockpiles may be used in the original design at the percent previously verified.

(b) RAS. Type 1 and Type 2 RAS are not interchangeable in a mix design.

The RAP, FRAP and RAS stone specific gravities (G_{sb}) shall be according to the "Determination of Aggregate Bulk (Dry) Specific Gravity (G_{sb}) or Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS)" procedure in the Department's Manual of Test Procedures for Materials.

1031.08 HMA Production. HMA production utilizing FRAP and/or RAS shall be as follows.

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 RAS and FRAP feed system to remove or reduce oversized material. .

If during mix production, corrective actions fail to maintain FRAP, RAS or QC/QA test results within control tolerances or the requirements listed herein the Contractor shall cease production of the mixture containing FRAP or RAS and conduct an investigation that may require a new mix design.

(a) 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.

(b) HMA Plant Requirements. HMA plants utilizing 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 RAS and FRAP 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 RAS and FRAP material as a percent of the total mix to the nearest 0.1 percent.

h. Aggregate RAS and FRAP moisture compensators in percent as set on the control panel. (Required when accumulated or individual aggregate and RAS and FRAP are printed in wet condition.)

i. When producing mixtures with FRAP and/or RAS, a positive dust control system shall be utilized.

j. Accumulated mixture tonnage.

k. Dust Removed (accumulated to the nearest 0.1 ton (0.1 metric ton))

(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).

f. RAS and FRAP weight to the nearest pound (kilogram).

g. Virgin asphalt binder weight to the nearest pound (kilogram).

h. Residual asphalt binder in the RAS and FRAP 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 or FRAP in aggregate surface course and aggregate shoulders shall be as follows.

(a) Stockpiles and Testing. RAP stockpiles may be any of those listed in Article 1031.02, except "Non-Quality" and "FRAP". The testing requirements of Article 1031.03 shall not apply. RAP used shall be according to the current Central Bureau of Materials Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications".

(b) Gradation. The RAP material shall meet the gradation requirements for CA 6 according to Article 1004.01(c), except the requirements for the minus No. 200 (75 µm) sieve shall not apply. The sample for the RAP material shall be air dried to constant weight prior to being tested for gradation."

GROUND TIRE RUBBER (GTR) MODIFIED ASPHALT BINDER (D-1)

Effective: June 26, 2006
Revised: April 1, 2016

Add the following to the end of article 1032.05 of the Standard Specifications:

"(c) Ground Tire Rubber (GTR) Modified Asphalt Binder. A quantity of 10.0 to 14.0 percent GTR (Note 1) shall be blended by dry unit weight with a PG 64-28 to make a GTR 70-28 or a PG 58-28 to make a GTR 64-28. The base PG 64-28 and PG 58-28 asphalt binders shall meet the requirements of Article 1032.05(a). Compatible polymers may be added during production. The GTR modified asphalt binder shall meet the requirements of the following table.

Test	Asphalt Grade GTR 70-28	Asphalt Grade GTR 64-28
Flash Point (C.O.C.), AASHTO T 48, °F (°C), min.	450 (232)	450 (232)
Rotational Viscosity, AASHTO T 316 @ 275 °F (135 °C), Poises, Pa·s, max.	30 (3)	30 (3)
Softening Point, AASHTO T 53, °F (°C), min.	135 (57)	130 (54)
Elastic Recovery, ASTM D 6084, Procedure A (sieve waived) @ 77 °F, (25 °C), aged, ss, 100 mm elongation, 5 cm/min., cut immediately, %, min.	65	65

Note 1. GTR shall be produced from processing automobile and/or light truck tires by the ambient grinding method. GTR shall not exceed 1/16 in. (2 mm) in any dimension and shall contain no free metal particles or other materials. A mineral powder (such as talc) meeting the requirements of AASHTO M 17 may be added, up to a maximum of four percent by weight of GTR to reduce sticking and caking of the GTR particles. When tested in accordance with Illinois modified AASHTO T 27, *a* 50 g sample of the GTR shall conform to the following gradation requirements:

Sieve Size	Percent Passing
No. 16 (1.18 mm)	100
No. 30 (600 μm)	95 ± 5
No. 50 (300 μm)	> 20

Add the following to the end of Note 1. of article 1030.03 of the Standard Specifications:

"A dedicated storage tank for the Ground Tire Rubber (GTR) modified asphalt binder shall be provided. This tank must be capable of providing continuous mechanical mixing throughout by continuous agitation and recirculation of the asphalt binder to provide a uniform mixture. The tank shall be heated and capable of maintaining the temperature of the asphalt binder at 300 °F to 350 °F (149 °C to 177 °C). The asphalt binder metering systems of dryer drum plants shall be calibrated with the actual GTR modified asphalt binder material with an accuracy of ± 0.40 percent."

Revise 1030.02(c) of the Standard Specifications to read:

"(c) RAP Materials (Note 5) ……..…..1031"

Add the following note to 1030.02 of the Standard Specifications:

Note 5. When using reclaimed asphalt pavement and/or reclaimed asphalt shingles, the maximum asphalt binder replacement percentage shall be according to the most recent special provision for recycled materials.

FRICTION AGGREGATE (D-1)
Effective: January 1, 2011
Revised: April 29, 2016

Revise Article 1004.03(a) of the Standard Specifications to read:

"**1004.03 Coarse Aggregate for Hot-Mix Asphalt (HMA).** The aggregate shall be according to Article 1004.01 and the following.

(a) Description. The coarse aggregate for HMA shall be according to the following table.

Use	Mixture	Aggregates Allowed
Class A	Seal or Cover	Allowed Alone or in Combination [5/]: Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag Crushed Concrete
HMA Low ESAL	Stabilized Subbase or Shoulders	Allowed Alone or in Combination [5/]: Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag[1/] Crushed Concrete
HMA High ESAL Low ESAL	Binder IL-19.0 or IL-19.0L SMA Binder	Allowed Alone or in Combination [5/ 6/]: Crushed Gravel Carbonate Crushed Stone[2/] Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Concrete[3/]
HMA High ESAL Low ESAL	C Surface and Leveling Binder IL-9.5 or IL-9.5L SMA Ndesign 50 Surface	Allowed Alone or in Combination [5/]: Crushed Gravel Carbonate Crushed Stone[2/] Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag[4/] Crushed Concrete[3/]

Use	Mixture	Aggregates Allowed	
HMA High ESAL	D Surface and Leveling Binder IL-9.5 SMA Ndesign 50 Surface	Allowed Alone or in Combination [5/]: Crushed Gravel Carbonate Crushed Stone (other than Limestone)[2/] Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag[4/] Crushed Concrete[3/]	
		Other Combinations Allowed:	
		Up to...	*With...*
		25% Limestone	Dolomite
		50% Limestone	Any Mixture D aggregate other than Dolomite
		75% Limestone	Crushed Slag (ACBF) or Crushed Sandstone
HMA High ESAL	E Surface IL-9.5 SMA Ndesign 80 Surface	Allowed Alone or in Combination [5/ 6/]: Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag No Limestone.	
		Other Combinations Allowed:	
		Up to...	*With...*
		50% Dolomite[2/]	Any Mixture E aggregate
		75% Dolomite[2/]	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone
		75% Crushed Gravel[2/] or Crushed Concrete[3/]	Crushed Sandstone, Crystalline Crushed Stone, Crushed Slag (ACBF), or Crushed Steel Slag

Use	Mixture	Aggregates Allowed	
HMA High ESAL	F Surface IL-9.5 SMA Ndesign 80 Surface	Allowed Alone or in Combination [5/ 6/]: Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag No Limestone.	
		Other Combinations Allowed:	
		Up to...	*With...*
		50% Crushed Gravel[2/], Crushed Concrete[3/], or Dolomite[2/]	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone

1/ Crushed steel slag allowed in shoulder surface only.
2/ Carbonate crushed stone (limestone) and/or crushed gravel shall not be used in SMA Ndesign 80. In SMA Ndesign 50, carbonate crushed stone shall not be blended with any of the other aggregates allowed alone in Ndesign 50 SMA binder or Ndesign 50 SMA surface.
3/ Crushed concrete will not be permitted in SMA mixes.
4/ Crushed steel slag shall not be used as leveling binder.
5/ When combinations of aggregates are used, the blend percent measurements shall be by volume."
6/ Combining different types of aggregate will not be permitted in SMA Ndesign 80."

SLIPFORM PAVING (D-1)
Effective: November 1, 2014

Revise Article 1020.04 Table 1, Note (5) of Standard Specifications to read:

"The slump range for slipform construction shall be 1/2 to 1 1/2 in."

Revise Article 1020.04 Table 1 (metric), Note (5) of Standard Specifications to read:

"The slump range for slipform construction shall be 13 to 40 mm."

FLY ASH RESTRICTION

The use of fly ash in any PCC mixtures will not be allowed. All references to fly ash in the Standard Specifications or contract special provisions shall not apply.

ADJUSTING WATER MAIN

Description
This work shall follow Article 562 of the Standard Specifications and applicable portions of Section 41 of the Standard Specifications for Water and Sewer Construction in Illinois. Work shall consist of adjusting (lowering) an existing water main in the location identified on the plans to no longer conflict with the proposed storm sewer improvements. This pay item shall include all pipe, bends, joint restraints, shutoffs (including valve closures and/or linestops), time, labor, and materials to complete the adjustment operation.

If adjustment is not feasible and the water main must be cut and new pipe laid, the cost of time, materials, and labor shall be considered included in the unit cost of this pay item and no additional compensation shall be provided.

The Village of Lake in the Hills Public Works Departments shall be notified if the main adjustment requires a shut off and must be approved by the Village prior to performing the work.

Method of Measurement.
This work shall be measured for payment by FOOT of water main to be adjusted.

Basis of Payment
This work shall be paid for at the contract unit price per FOOT for ADJUSTING WATER MAIN 8" or ADJUSTING WATER MAIN 10" or ADJUSTING WATER MAIN 14" which shall include include all pipe, bends, joint restraints, chlorination and testing, whips, connection to existing water main, pressure testing, sampling, and shutoffs (including valve closures and/or linestops), time, labor, and materials to complete the adjustment operation.

CONCRETE MEDIAN SURFACE, 6 INCH

This work shall construct a concrete median surface with a thickness of 6 inches be in accordance with Section 606 of the Standard Specifications and the details shown in the plans.

This work shall be paid for at the contract unit price per square foot for CONCRETE MEDIAN SURFACE, 6 INCH, which price shall include all labor, equipment and materials necessary to complete the work.

ENVIRONMENTAL NOTICE FOR DRAINAGE STRUCTURES

This work shall consist of providing an environmental notice that shall be placed on all proposed open lid drainage structures.

The text of the notice shall be "DUMP NO WASTE" and "DRAINS TO WATERWAYS" or similar wording meeting the approval of the Engineer. The notice shall be cast into the top of the lid, curb inlet, or grate (if the frame does not have a curb inlet).

If the Engineer determines that the proposed grate is not of sufficient size to allow the text of the notice to be cast or engraved into the grate, the Contractor shall furnish and install a separate grey iron or ductile iron casting plate with

the notice cast or engraved into the plate. The Contractor shall embed the plate in the plastic concrete flush with the tip of curb at curb drainage structure locations as the curb is constructed.

The plate shall be East Jordan Iron Works, Inc. 7001PL1 or Neenah Foundry Company R-3000-A.

The cost of this work will not be paid for separately, but shall be included in the contract unit price for the various drainage structures being constructed.

RESTRICTED DEPTH DRAINAGE STRUCTURES

Description
This work shall consist of constructing restricted depth manholes, catch basins and inlets with a specified frame and grate/lid at locations identified on the plans.

Materials
The materials shall meet the requirements of Article 602.02 of the "Standard Specifications".

General
The work shall be performed according to Section 602 of the "Standard Specifications"; the applicable IDOT Highway Standard(s) for the drainage structure type (manhole, catch basin or inlet); the IDOT Highway Standard Drawing 602601 [flat slab top] and the following:

- *The reinforced concrete slab shall be used in lieu of the cone section.*
- *A 24" sump shall be provided in a Catch Basin.*
- *For structures having Type 8 grates, a 24" inside diameter by 4" (minimum) high riser shall be installed on the flat slab to provide earth cover over the slab for vegetation.*

Method of Measurement
This work will be measured per each of the type drainage structure installed. Drainage structures of like type, size and frame and grate/lid will be counted under the same pay item regardless of whether a cone section (regular) or flat slab (restricted depth) top is used.

Basis of Payment
This work will be paid for at the contract unit price per each for MANHOLES, CATCH BASINS or INLETS, of the type and diameter specified, and with the frame and grate or frame and lid specified. The unit price shall include all equipment, labor and materials to install the drainage structure. No additional compensation will be made for drainage structures constructed as restricted depth.

CATCH BASINS, TYPE A, 4'-DIAMETER WITH SPECIAL FRAME AND GRATE

Description
This work shall consist of constructing a standard Type A catch basin within B-6.12 curb and gutter of the diameter specified in accordance with all applicable portions of Article 602 of the Standard Specifications and the plans except that the Frame shall be EAST JORDAN IRON WORKS CATALOG No. 7010 with an EAST JORDAN IRON WORKS 7010-T1 back and an EAST JORDAN IRON WORKS 7010 – M3 SINUSOIDAL grate.

If the slope in the gutter line is greater than 3%, a M4 vane shall be used in lieu of the M3.

A four-inch precast right shall be factory-installed on all flat top structures.

Chimney seals shall be provided which will capture at least 4" of the frame, all adjusting rings, and 4" of the precast eccentric cone section (if used).

Stonegate Road, Huntington Drive, and Bunker Hill Drive are under the Village of Algonquin maintenance jurisdiction; frames and grates shall conform to supply for maintenance purposes.

Basis of Payment
This work will be paid for at the contract unit price per EACH for CATCH BASINS, TYPE A, 4'-DIAMETER, WITH SPECIAL FRAME AND GRATE installed.

CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE 23 FRAME AND GRATE, SPECIAL

Description
This work shall consist of constructing a standard Type A catch basin within M6.18 curb and gutter along the underpass south of Bunker Hill Road of the diameter specified in accordance with all applicable portions of Article 602 of the Standard Specifications and the plans except that the Frame and Grate shall be Type 23.

Chimney seals shall be provided which will capture at least 4" of the frame, all adjusting rings, and 4" of the precast eccentric cone section (if used).

Stonegate Road, Huntington Drive, and Bunker Hill Drive are under the Village of Algonquin maintenance jurisdiction; frames and grates shall conform to supply for maintenance purposes.

Basis of Payment
This work will be paid for at the contract unit price per EACH for CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE 23 FRAME AND GRATE, SPECIAL installed.

CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE 24 FRAME AND GRATE, SPECIAL

Description
This work shall consist of constructing a standard Type A catch basin with a Type 24 Frame and Grate within type M or B-6.24 curb and gutter the diameter specified in accordance with all applicable portions of Article 602 of the Standard Specifications and the plans except Chimney seals shall be provided which will capture at least 4" of the frame, all adjusting rings, and 4" of the precast eccentric cone section (if used).

Stonegate Road, Huntington Drive, and Bunker Hill Drive are under the Village of Algonquin maintenance jurisdiction; frames and grates shall conform to supply for maintenance purposes.

Basis of Payment
This work will be paid for at the contract unit price per EACH for CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE 24 FRAME AND GRATE, SPECIAL installed.

INLETS, TYPE A, WITH SPECIAL FRAME AND GRATE

Description
This work shall consist of constructing a standard Type A inlet within B-6.12 curb and gutter of the diameter specified in accordance with all applicable portions of Article 602 of the Standard Specifications and the plans except that the Frame shall be EAST JORDAN IRON WORKS CATALOG No. 7010 with an EAST JORDAN IRON WORKS 7010-T1 back and an EAST JORDAN IRON WORKS 7010 – M3 SINUSOIDAL grate.

If the slope in the gutter line is greater than 3%, a M4 vane shall be used in lieu of the M3.

Stonegate Road, Huntington Drive, and Bunker Hill Drive are under the Village of Algonquin maintenance jurisdiction; frames and grates shall conform to supply for maintenance purposes.

Basis of Payment
This work will be paid for at the contract unit price per EACH for INLETS, TYPE A, 4'-DIAMETER, WITH SPECIAL FRAME AND GRATE installed.

DRAINAGE AND INLET PROTECTION UNDER TRAFFIC (DISTRICT 1)
Effective: April 1, 2011
Revised: April 2, 2011

Add the following to Article 603.02 of the Standard Specifications:

"(i) Temporary Hot-Mix Asphalt (HMA) Ramp (Note 1) 1030
(j) Temporary Rubber Ramps (Note 2)
Note 1. The HMA shall have maximum aggregate size of 3/8 in. (95 mm).

Note 2. The rubber material shall be according to the following.

Property	Test Method	Requirement
Durometer Hardness, Shore A	ASTM D 2240	75 ±15
Tensile Strength, psi (kPa)	ASTM D 412	300 (2000) min
Elongation, percent	ASTM D 412	90 min
Specific Gravity	ASTM D 792	1.0 - 1.3
Brittleness, °F (°C)	ASTM D 746	-40 (-40)"

Revise Article 603.07 of the Standard Specifications to read:

"**603.07 Protection Under Traffic.** After the casting has been adjusted and the Class PP concrete has been placed, the work shall be protected by a barricade and two lights according to Article 701.17(e)(3)b.

When castings are under traffic before the final surfacing operation has been started, properly sized temporary ramps shall be placed around the drainage and/or utility castings according to the following methods.

(a) Temporary Asphalt Ramps. Temporary hot-mix asphalt ramps shall be placed around the casting, flush with its surface and decreasing to a featheredge in a distance of 2 ft (600 mm) around the entire surface of the casting.

(b) Temporary Rubber Ramps. Temporary rubber ramps shall only be used on roadways with permanent posted speeds of 40 mph or less and when the height of the casting to be protected meets the proper sizing requirements for the rubber ramps as shown below.

Dimension	Requirement
Inside Opening	Outside dimensions of casting + 1 in. (25 mm)
Thickness at inside edge	Height of casting ± 1/4 in. (6 mm)
Thickness at outside edge	1/4 in. (6 mm) max.
Width, measured from inside opening to outside edge	8 1/2 in. (215 mm) min

Placement shall be according to the manufacturer's specifications.

Temporary ramps for castings shall remain in place until surfacing operations are undertaken within the immediate area of the structure. Prior to placing the surface course, the temporary ramp shall be removed. Excess material shall be disposed of according to Article 202.03."

ADJUSTMENTS AND RECONSTRUCTIONS
Effective: March 15, 2011

Revise the first paragraph of Article 602.04 to read:

"**602.04 Concrete.** Cast-in-place concrete for structures shall be constructed of Class SI concrete according to the applicable portions of Section 503. Cast-in-place concrete for pavement patching around adjustments and reconstructions shall be constructed of Class PP-1 concrete, unless otherwise noted in the plans, according to the applicable portions of Section 1020."
Revise the third, fourth and fifth sentences of the second paragraph of Article 602.11(c) to read:

"Castings shall be set to the finished pavement elevation so that no subsequent adjustment will be necessary, and the space around the casting shall be filled with Class PP-1 concrete, unless otherwise noted in the plans, to the elevation of the surface of the base course or binder course. HMA surface or binder course material shall not be allowed. The pavement may be opened to traffic according to Article 701.17(e)(3)b."

Revise Article 603.05 to read:

"**603.05 Replacement of Existing Flexible Pavement.** After the castings have been adjusted, the surrounding space shall be filled with Class PP-1 concrete, unless otherwise noted in the plans, to the elevation of the surface of the base course or binder course. HMA surface or binder course material shall not be allowed. The pavement may be opened to traffic according to Article 701.17(e)(3)b."

Revise Article 603.06 to read:

"**603.06 Replacement of Existing Rigid Pavement.** After the castings have been adjusted, the pavement and HMA that was removed, shall be replaced with Class PP-1 concrete, unless otherwise noted in the plans, not less than 9 in. (225 mm) thick. The pavement may be opened to traffic according to Article 701.17(e) (3) b.

The surface of the Class PP concrete shall be constructed flush with the adjacent surface."
Revise the first sentence of Article 603.07 to read:

"**603.07 Protection Under Traffic.** After the casting has been adjusted and the Class PP concrete has been placed, the work shall be protected by a barricade and two lights according to Article 701.17(e)(3)b."

PAVED FLUME

Description
This work shall construct a concrete paved flume in accordance with Section 606 of the Standard Specifications and the details shown in the plans.

Method of Measurement
This work shall be measured for payment by FOOT of paved flume from the back of curb to the edge drainage structure lid.

Basis of Payment
This work shall be paid for at the contract unit price per linear foot for PAVED FLUME, which price shall include all labor, equipment and materials necessary to complete the work.

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES

Revise Article 669.01 of the Standard Specifications to read:

"669.01 Description. This work shall consist of the transportation and proper disposal of contaminated soil and water. This work shall also consist of the removal, transportation, and proper disposal of underground storage tanks (UST), their content and associated underground piping to the point where the piping is above the ground, including determining the content types and estimated quantities."

Revise Article 669.08 of the Standard Specifications to read:

"669.08 Contaminated Soil and/or Groundwater Monitoring. The Contractor shall hire a qualified environmental firm to monitor the area containing the regulated substances. The affected area shall be monitored with a photoionization detector (PID) utilizing a lamp of 10.6eV or greater or a flame ionization detector (FID). Any field screen reading on the PID or FID in excess of background levels indicates the potential presence of contaminated material requiring handling as a non-special waste, special waste, or hazardous waste. No excavated soils can be taken to a clean construction and demolition debris (CCDD) facility or an uncontaminated soil fill operation with detectable PID or FID meter readings. The PID or FID meter shall be calibrated on-site and background level readings taken and recorded daily. All testing shall be done by a qualified engineer/technician. Such testing and monitoring shall be included in the work. The Contractor shall identify the exact limits of removal of non-special waste, special waste, or hazardous waste. All limits shall be approved by the Engineer prior to excavation. The Contractor shall take all necessary precautions.

Based upon PID or FID readings indicating contamination, a soil or groundwater sample shall be taken from the same location and submitted to an approved laboratory. Soil or groundwater samples shall be analyzed for the contaminants of concern, including pH, based on the property's land use history or the parameters listed in the maximum allowable concentration (MAC) for chemical constituents in uncontaminated soil established pursuant to Subpart F of 35 Illinois Administrative Code 1100.605. The analytical results shall serve to document the level of soil contamination. Soil and groundwater samples may be required at the discretion of the Engineer to verify the level of soil and groundwater contamination.

Samples shall be grab samples (not combined with other locations). The samples shall be taken with disposable instruments. The samples shall be placed in sealed containers and transported in an insulated container to the laboratory. The container shall maintain a temperature of 39 °F (4 °C). All samples shall be clearly labeled. The labels shall indicate the sample number, date sampled, location and elevation, and any other observations.

The laboratory shall use a detectable concentration which is equal to the lowest appropriate practical quantitation limits (PQL) or estimated quantitation limit (EQL) specified in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", EPA Publication No. SW-846 and "Methods for the Determination of Organic Compounds in Drinking Water", EPA, EMSL, EPA-600/4-88/039. For parameters where the specified cleanup

objective is below the acceptable detection limit (ADL), the ADL shall serve as the cleanup objective. For other parameters the ADL shall be equal to or below the specified cleanup objective."

Replace the first two paragraphs of Article 669.09 of the Standard Specifications with the following:

"669.09 Contaminated Soil and/or Groundwater Management and Disposal. The management and disposal of contaminated soil and/or groundwater shall be according to the following:

(a) Soil Analytical Results Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels exceed the most stringent maximum allowable concentration (MAC) for chemical constituents in uncontaminated soil established pursuant to Subpart F of 35 Illinois Administrative Code 1100.605, the soil shall be managed as follows:

(1) When analytical results indicate inorganic chemical constituents exceed the most stringent MAC but they are still considered within area background levels by the Engineer, the excavated soil can be utilized within the construction limits as fill, when suitable. Such soil excavated for storm sewers can be placed back into the excavated trench as backfill, when suitable, unless trench backfill is specified. If the soils cannot be utilized within the construction limits, they shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable.

(2) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for a Metropolitan Statistical Area (MSA) County, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an uncontaminated soil fill operation within an MSA County provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.

(3) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, or the MAC within the Chicago corporate limits, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an uncontaminated soil fill operation within an MSA County excluding Chicago or within the Chicago corporate limits provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.

(4) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an uncontaminated soil fill operation within an MSA County excluding Chicago provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.

(5) When the Engineer determines soil cannot be managed according to Articles 669.09(a)(1) through (a)(4) above, the soil shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable.

(b) Soil Analytical Results Do Not Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels do not exceed the most stringent MAC but the pH of the soil is less than 6.25 or

greater than 9.0, the excavated soil can be utilized within the construction limits or managed and disposed of off-site as "uncontaminated soil" according to Article 202.03. However the excavated soil cannot be taken to a CCDD facility or an uncontaminated soil fill operation.

(c) Groundwater. When groundwater analytical results indicate the detected levels are above Appendix B, Table E of 35 Illinois Administrative Code 742, the most stringent Tier 1 Groundwater Remediation Objectives for Groundwater Component of the Groundwater Ingestion Route for Class 1 groundwater, the groundwater shall be managed off-site as a special waste.

All groundwater encountered within lateral trenches may be managed within the trench and allowed to infiltrate back into the ground. If the groundwater cannot be managed within the trench it must be removed as a special or hazardous waste. The Contractor is prohibited from managing groundwater within the trench by discharging it through any existing or new storm sewer. The Contractor shall install backfill plugs within the area of groundwater contamination.

One backfill plug shall be placed down gradient to the area of groundwater contamination. Backfill plugs shall be installed at intervals not to exceed 50 ft (15 m). Backfill plugs are to be 4 ft (1.2 m) long, measured parallel to the trench, full trench width and depth. Backfill plugs shall not have any fine aggregate bedding or backfill, but shall be entirely cohesive soil or any class of concrete. The Contractor shall provide test data that the material has a permeability of less than 10^{-7} cm/sec according to ASTM D 5084, Method A or per another test method approved by the Engineer."

Revise Article 669.14 of the Standard Specifications to read:

"669.14 Final Environmental Construction Report. At the end of the project, the Contractor will prepare and submit three copies of the Environmental Construction Report on the activities conducted during the life of the project, one copy shall be submitted to the Resident Engineer, one copy shall be submitted to the District's Environmental Studies Unit, and one copy shall be submitted with an electronic copy in Adode.pdf format to the Geologic and Waste Assessment Unit, Bureau of Design and Environment, IDOT, 2300 South Dirksen Parkway, Springfield, Illinois 62764. The technical report shall include all pertinent information regarding the project including, but not limited to:

(a) Measures taken to identify, monitor, handle, and dispose of soil or groundwater containing regulated substances, to prevent further migration of regulated substances, and to protect workers,

(b) Cost of identifying, monitoring, handling, and disposing of soil or groundwater containing regulated substances, the cost of preventing further migration of regulated substances, and the cost for worker protection from the regulated substances. All cost should be in the format of the contract pay items listed in the contract plans (identified by the preliminary environmental site investigation (PESA) site number),

(c) Plan sheets showing the areas containing the regulated substances,

(d) Field sampling and testing results used to identify the nature and extent of the regulated substances,

(e) Waste manifests (identified by the preliminary environmental site investigation (PESA) site number) for special or hazardous waste disposal, and

(f) Landfill tickets (identified by the preliminary environmental site investigation (PESA) site number) for non-special waste disposal."

Revise the second paragraph of Article 669.16 of the Standard Specifications to read:

"The transportation and disposal of soil and other materials from an excavation determined to be contaminated will be paid for at the contract unit price per cubic yard (cubic meter) for NON-SPECIAL WASTE DISPOSAL, SPECIAL WASTE DISPOSAL, or HAZARDOUS WASTE DISPOSAL."

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 McHenry County Division of Transportation.** 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:

- The west/southwest leg of the intersection of Randall Road and Algonquin Road. The boundary of the area is defined by the Highway Authority Agreement (HAA), which is shown in the LPC-663 CCDD forms.

Backfill pugs shall be place within the following locations.

- Not applicable for this project.

TRAFFIC CONTROL PLAN
Effective: September 30, 1985
Revised: January 1, 2007

Traffic Control shall be according to the applicable sections of the Standard Specifications, the Supplemental Specifications, the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways", any special details and State Standards contained in the plans, and the Special Provisions contained herein.

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

The Contractor shall contact the District One Bureau of Traffic at least 72 hours in advance of beginning work.

STANDARDS

Special attention is called to the following State Standards related to traffic control:

701006-05	701011-04	701101-05	701106-02	701301-04
701311-03	701400-09	701421-08	701422-10	701423-10
701426-09	701427-05	701501-06	701601-09	701701-10
701801-06	701901-07	704001-08		

DETAILS

Special attention is called to the details included in the Plans related to traffic control:

Traffic Control and Protection for Side Roads, Intersections, and Driveways (TC-10)
District One Typical Pavement Markings (TC-13)
Traffic Control and Protection at Turn Bays (To Remain Open to Traffic) (TC-14)
Pavement Marking Letters and Symbols for Traffic Staging (TC-16)
Arterial Road Information Sign (TC-22)
Driveway Entrance Signing (TC-26)

SPECIAL PROVISIONS

Special attention is called to the following Special Provisions relating to traffic control:

BDE SPECIAL PROVISIONS
- Pavement Marking Removal
- Portable Changeable Message Signs
- Speed Display Trailer

SPECIAL PROVISIONS:
- Maintenance of Roadways
- Public Convenience and Safety (Dist 1)
- Traffic Control and Protection (Special)
- Traffic Control Surveillance
- Advanced Public Notification
- Aggregate Surface Course for Temporary Access
- Winterized Temporary Access
- High-Early-Strength Portland Cement Concrete Pavement (Jointed)
- Pavement Marking Tape, Type III
- Temporary Sidewalk
- Temporary Information Signing
- Temporary Pavement
- Temporary Pavement (Variable Depth)

TRAFFIC CONTROL AND PROTECTION (SPECIAL)

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

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

All intersections within project limits are to be constructed utilizing temporary short duration closures as described herein, with the exception of the following. The intersections listed below shall be stage constructed in accordance with the Suggested Maintenance of Traffic detailed in the plans, or as directed by the Engineer. At least one (1) lane of traffic must be maintained in each direction at all times. Stage construction may require Temporary Pavement, Temporary Pavement (Variable Depth), Temporary Access (Commercial Entrance), Temporary Access (Road) and Winterized Temporary Access.

Signalized intersections requiring stage construction include:

- Randall Road at Algonquin Road
- Randall Road at Bunker Hill Drive / Huntington Drive
- Randall Road at Polaris Drive / Acorn Lane
- Algonquin Road at Crystal Lake Road / Commercial Drive (Life Storage).

Unsignalized intersections requiring stage construction include:

- Randall Road at Stonegate Road
- Randall Road at Commercial Drive (Costco / AMC).

Method of Measurement
All traffic control (except TEMPORARY PAVEMENT MARKINGS and TEMPORARY CONCRETE BARRIER) indicated on the traffic control plan details and specified in the Special Provisions will be measured for payment on a lump sum basis.

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

TEMPORARY PAVEMENT MARKINGS and/or TEMPORARY CONCRETE BARRIER will be paid for separately unless shown on a Standard.

The following additional pay items will be paid for separately:

PAVEMENT MARKING TAPE, TYPE III
SHORT TERM PAVEMENT MARKING

TEMPORARY INFORMATION SIGNING
CHANGEABLE MESSAGE SIGN
TEMPORARY CONCRETE BARRIER
RELOCATE TEMPORARY CONCRETE BARRIER
TEMPORARY ACCESS (COMMERCIAL ENTRANCE)
TEMPORARY ACCESS (ROAD)
WINTERIZED TEMPORARY ACCESS
TEMPORARY PAVEMENT
TEMPORARY PAVEMENT (VARIABLE DEPTH)
TEMPORARY SIDEWALK
TRAFFIC CONTROL SURVEILLANCE

TRAFFIC CONTROL SURVEILLANCE

This work shall be performed in accordance with the applicable portions of Section 701 of the Standard Specifications.

Basis of Payment
This work shall be paid for at the contract unit price per calendar day for TRAFFIC CONTROL SURVEILLANCE.

ADVANCED PUBLIC NOTIFICATION

This work shall consist of furnishing, installing, maintaining, relocating for various stages of construction and eventually removing the advanced signing.

The Contractor shall provide notice to the public a minimum of 14 days in advance of any work that requires the closure of lanes and/or change in traffic patterns though the use of a changeable message sign or temporary information signing.

Method of Measurement
Temporary information signs will be measured for payment in place and the surface area of the front of the sign computed in square feet. The surface area is determined by calculating the area of the smallest rectangle, measured from edge-to-edge (horizontally and vertically), that will circumscribe an individual sign.

Basis of Payment
This work will be paid for at the contract unit price per calendar day for each sign for CHANGEABLE MESSAGE SIGN or at the contract unit price per square foot TEMPORARY INFORMATION SIGNING.

TRAFFIC SIGNAL SPECIFICATIONS (MCDOT)
Effective: January 1, 20107
Revised: October 26, 2017

These Traffic Signal Special Provisions and the "District 1 Standard Traffic Signal Design Details" supplement the requirements of the State of Illinois "Standard Specifications for Road and Bridge Construction." The intent of these Special Provisions is to prescribe the materials and construction methods commonly used for traffic signal installations. All material furnished shall be new. The locations and the details of all installations shall be as indicated on the Plans or as directed by the Engineer. Traffic signal construction and maintenance work shall be performed by personnel holding IMSA Traffic Signal Technician Level II certification. The work to be done under this contract consists of furnishing and installing all traffic signal work as specified in the Plans and as specified herein in a manner acceptable and approved by the Engineer.

SECTION 720 SIGNING

MAST ARM SIGN PANELS.

Add the following to Section 720.02 of the Standard Specifications:

Signs attached to poles or posts (such as mast arm signs) shall have mounting brackets and sign channels which are equal to and completely interchangeable with those used by the McHenry County Sign Shop. Signfix Aluminum Channel Framing System is currently recommended, ~~but other brands of mounting hardware are acceptable based upon the Department's approval~~. All signs shall have a white reflectorized legend and border on a green reflectorized background, and shall meet ASTM Type XI and IDOT Type ZZ reflective sheeting. The sign face shall not have any holes. 3M Scotch Joining Systems bonding tape shall be used in place of screws or rivets.

Sign stiffening channel systems shall be aluminum and meet the requirements of ASTM 6261-T5. Sign mounting banding, buckles and buckle straps shall be manufactured from AISI 201 stainless steel.

TRAFFIC SIGNAL GENERAL REQUIREMENTS.

These Traffic Signal Special Provisions and the "District One Standard Traffic Signal Design Details" supplement the requirements of the State of Illinois "Standard Specifications for Road and Bridge Construction." The intent of these Special Provisions is to prescribe the materials and construction methods commonly used for traffic signal installations.

- All material furnished shall be new unless otherwise noted herein.
- Traffic signal construction and maintenance work shall be performed by personnel holding current IMay 14, 2018
- MSA Traffic Signal Technician Level II certification. A copy of the certification shall be immediately available upon request of the Engineer.
- The work to be done under this contract consists of furnishing, installing and maintaining all traffic signal work and items as specified in the Plans and as specified herein in a manner acceptable and approved by the Engineer.

Definitions of Terms.
Add the following to Section 101 of the Standard Specifications:

101.56 Vendor. Company that sells a particular type of product directly to the contractor or the Equipment Supplier.

101.57 Equipment supplier. Company that supplies, represents and provides technical support for IDOT District One approved traffic signal controllers and other related equipment. The Equipment Supplier shall be located within IDOT District One and shall:

- Be full service with on-site facilities to assemble, test and trouble-shoot traffic signal controllers and cabinet assemblies.
- Maintain an inventory of IDOT District One approved controllers and cabinets.
- Be staffed with permanent sales and technical personnel able to provide traffic signal controller and cabinet expertise and support.
- Technical staff shall hold current IMSA Traffic Signal Technician Level III certification and shall attend traffic signal turn-ons and inspections with a minimum 14 calendar day notice.

Submittals.
Revise Article 801.05 of the Standard Specifications to read:

All material approval requests shall be submitted electronically through the District's SharePoint System unless directed otherwise by the Engineer. Electronic material submittals shall follow the District's Traffic Operations Construction Submittals guidelines. General requirements include:

1. All material approval requests shall be made prior to or no later than the date of the preconstruction meeting. A list of major traffic signal items can be found in Article 801.05. Material or equipment which is similar or identical shall be the product of the same manufacturer, unless necessary for system continuity. Traffic signal materials and equipment shall bear the U.L. label whenever such labeling is available.
2. Product data and shop drawings shall be assembled by pay item. Only the top sheet of each pay item submittal will be stamped by the Department with the review status, except shop drawings for mast arm pole assemblies and the like will be stamped with the review status on each sheet.
3. Original manufacturer published product data and shop drawing sheets with legible dimensions and details shall be submitted for review.
4. When hard copy submittals are necessary, four complete copies of the manufacturer's descriptive literatures and technical data for the traffic signal materials shall be submitted. For hard copy or electronic submittals, the descriptive literature and technical data shall be adequate for determining whether the materials meet the requirements of the plans and specifications. If the literature contains more than one item, the Contractor shall indicate which item or items will be furnished.
5. When hard copy submittals are necessary for structural elements, four complete copies of the shop drawings for the mast arm assemblies and poles, and the combination mast arm assemblies and poles showing, in detail, the fabrication thereof and the certified mill analyses of the materials used in the fabrication, anchor rods, and reinforcing materials shall be submitted.
6. Partial or incomplete submittals will be returned without review.
7. Certain non-standard mast arm poles and special structural elements will require additional review from IDOT's Central Office. Examples include ornamental/decorative, non-standard length mast arm pole

assemblies and monotube structures. The Contractor shall account for the additional review time in his schedule.

8. The contract number or permit number, project location/limits and corresponding pay code number must be on each sheet of correspondence, catalog cuts and mast arm poles and assemblies drawings.
9. Where certifications and/or warranties are specified, the information submitted for approval shall include certifications and warranties. Certifications involving inspections, and/or tests of material shall be complete with all test data, dates, and times.
10. After the Engineer reviews the submittals for conformance with the design concept of the project, the Engineer will stamp the drawings indicating their status as 'Approved', 'Approved-As-Noted', 'Disapproved', or 'Incomplete'. Since the Engineer's review is for conformance with the design concept only, it is the Contractor's responsibility to coordinate the various items into a working system as specified. The Contractor shall not be relieved from responsibility for errors or omissions in the shop, working, layout drawings, or other documents by the Department's approval thereof. The Contractor must still be in full compliance with contract and specification requirements.
11. The Contractor shall secure approved materials in a timely manner to assure construction schedules are not delayed.
12. All submitted items reviewed and marked 'APPROVED AS NOTED', 'DISAPPROVED', or 'INCOMPLETE' are to be resubmitted in their entirety, unless otherwise indicated within the submittal comments, with a disposition of previous comments to verify contract compliance at no additional cost to the contract.
13. Exceptions to and deviations from the requirements of the Contract Documents will not be allowed. It is the Contractor's responsibility to note any deviations from Contract requirements at the time of submittal and to make any requests for deviations in writing to the Engineer. In general, substitutions will not be acceptable. Requests for substitutions must demonstrate that the proposed substitution is superior to the material or equipment required by the Contract Documents. No exceptions, deviations or substitutions will be permitted without the approval of the Engineer.
14. Contractor shall not order major equipment such as mast arm assemblies prior to Engineer approval of the Contractor marked proposed traffic signal equipment locations to assure proper placement of contract required traffic signal displays, push buttons and other facilities. Field adjustments may require changes in proposed mast arm length and other coordination.

Marking Proposed Locations.

Revise "Marking Proposed Locations for Highway Lighting System" of Article 801.09 to read "Marking Proposed Locations for Highway Lighting System and Traffic Signals."

Add the following to Article 801.09 of the Standard Specifications:

It shall be the contractor's responsibility to verify all dimensions and conditions existing in the field prior to ordering materials and beginning construction. This shall include locating the mast arm foundations and verifying the mast arms lengths.

Inspection of Electrical Systems.

Add the following to Article 801.10 of the Standard Specifications:

(c) All cabinets including temporary traffic signal cabinets shall be assembled by an approved equipment supplier in District One. The Department reserves the right to request any controller and cabinet to be tested at the equipment supplier's facility prior to field installation, at no extra cost to this contract.

Maintenance and Responsibility.

Revise Article 801.11 of the Standard Specifications to read:

a. Existing traffic signal installations and/or any electrical facilities at all or various locations may be altered or reconstructed totally or partially as part of the work on this Contract. The Contractor is hereby advised that all traffic control equipment, presently installed at these locations, may be the property of the State of Illinois, Department of Transportation, Division of Highways, County, Private Developer, Municipality or Transit Agency in which they are located. Once the Contractor has begun any work on any portion of the project, all traffic signals within the limits of this contract or those which have the item "Maintenance of Existing Traffic Signal Installation," "Temporary Traffic Signal Installation(s)" and/or "Maintenance of Existing Flashing Beacon Installation," shall become the full responsibility of the Contractor. The Contractor shall supply the Engineer, Traffic Signal Maintenance and Operations Engineer, McHenry County Division of Transportation, and the Department's Electrical Maintenance Contractor with two 24-hour emergency contact names and telephone numbers.

b. Automatic Traffic Enforcement equipment such as red lighting running and railroad crossing camera systems are owned and operated by others and the Contractor shall not be responsible for maintaining this equipment.

c. Regional transit, County and other agencies may also have equipment connected to existing traffic signal or peripheral equipment such as PTZ cameras, switches, transit signal priority (TSP and BRT) servers and other devices that shall be included with traffic signal maintenance at no additional cost to the contract.

d. When the project has a pay item for "Maintenance of Existing Traffic Signal Installation," "Temporary Traffic Signal Installation(s)" and/or "Maintenance of Existing Flashing Beacon Installation," the Contractor must notify both the Area Traffic Signal Maintenance and Operations Engineer at (815) 334-4960 and the Department's Electrical Maintenance Contractor, of their intent to begin any physical construction work on the Contract or any portion thereof. This notification must be made a minimum of seven (7) working days prior to the start of construction to allow sufficient time for inspection of the existing traffic signal installation(s) and transfer of maintenance to the Contractor. The Department will attempt to full-fill the Contractor's inspection date request(s), however workload and other conditions may prevent the Department from accommodating specific dates or times. The Contractor shall not be entitled to any other compensation if the requested inspection date(s) cannot be scheduled by the Department. If work is started prior to an inspection, maintenance of the traffic signal installation(s) will be transferred to the Contractor without an inspection. The Contractor will become responsible for repairing or replacing all equipment that is not operating properly or is damaged at no cost to the owner of the traffic signal. Final repairs or replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted.

e. The Contractor is advised that the existing and/or temporary traffic signal installation must remain in operation during all construction stages, except for the most essential down time. Any shutdown of the traffic signal installation, which exceeds fifteen (15) minutes, must have prior approval of the Engineer. Approval to shut down the traffic signal installation will only be granted during the period extending

from 10:00 a.m. to 3:00 p.m. on weekdays. Shutdowns shall not be allowed during inclement weather or holiday periods.

f. The Contractor shall be fully responsible for the safe and efficient operation of the traffic signals and other equipment noted herein. Any inquiry, complaint or request by the Department, the Department's Electrical Maintenance Contractor or the public, shall be investigated and repairs begun within one hour. Failure to provide this service will result in liquidated damages of $1000 per day per occurrence. In addition, the Department reserves the right to assign any work not completed within this timeframe to the Electrical Maintenance Contractor. All costs associated to repair this uncompleted work shall be the responsibility of the Contractor. Failure to pay these costs to the Electrical Maintenance Contractor within one month after the incident will result in additional liquidated damages of $1000 per month per occurrence. Unpaid bills will be deducted from the cost of the Contract. The Department may inspect any signalizing device on the Department's highway system at any time without notification.

g. Any proposed activity in the vicinity of a highway-rail grade crossing must adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.

h. The Contractor shall be responsible to clear snow, ice, dirt, debris or other condition that obstructs visibility of any traffic signal display or access to traffic signal equipment.

i. The Contractor shall maintain the traffic signal in normal operation during short or long term loss of utility or battery back-up power at critical locations designated by the Engineer. Critical locations may include traffic signals interconnected to railroad warning devices, expressway ramps, intersection with an SRA route, critical corridors or other locations identified by the Engineer. Temporary power to the traffic signal must meet applicable NEC and OSHA guidelines and may include portable generators and/or replacement batteries. Temporary power to critical locations shall not be for separately but shall be included in the contract.

Damage to Traffic Signal System.

Add the following to Article 801.12(b) of the Standard Specifications to read:

Any traffic signal control equipment damaged or not operating properly from any cause shall be replaced with new equipment meeting current District One traffic signal specifications and provided by the Contractor at no additional cost to the Contract and/or owner of the traffic signal system, all as approved by the Engineer. Final replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted. Cable splices are only allowed at the bases pf post and mast arms.

Temporary replacement of damaged or knockdown of a mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Engineer to assure signal heads are located overhead and over traveled pavement. Temporary replacement of mast arm mount signals with post mount signals will not be permitted.

Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, and peripheral equipment, damaged or not operating properly from any cause, shall be the responsibility of the municipality or the Automatic Traffic Enforcement Company per Permit agreement.

Traffic Signal Inspection (TURN-ON).

Revise Article 801.15(b) of the Standard Specifications to read:

It is the intent to have all electric work completed and equipment field tested by the Equipment Supplier prior to the Department's "turn-on" field inspection. If in the event the Engineer determines work is not complete and the inspection will require more than two (2) hours to complete, the inspection shall be canceled and the Contractor will be required to reschedule at another date. The maintenance of the traffic signals will not be accepted until all punch list work is corrected and re-inspected.

When the road is open to traffic, except as otherwise provided in Section 850 of the Standard Specifications, the Contractor may request a turn-on and inspection of the completed traffic signal installation at each separate location. This request must be made to the Area Traffic Signal Maintenance and Operations Engineer at (815) 334-4960 a minimum of seven (7) working days prior to the time of the requested inspection. The Department will attempt to full-fill the Contractor's turn-on and inspection date request(s), however workload and other conditions may prevent the Department from accommodating specific dates or times. The Contractor shall not be entitled to any other compensation if the requested turn-on and inspection date(s) cannot be scheduled by the Department. The Department will not grant a field inspection until written or electronic notification is provided from the Contractor that the equipment has been field tested and the intersection is operating according to Contract requirements. The Contractor must invite local fire department personnel to the turn-on when Emergency Vehicle Preemption (EVP) is included in the project. When the contract includes the item RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM, OPTIMIZE TRAFFIC SIGNAL SYSTEM, or TEMPORARY TRAFFIC SIGNAL TIMINGS, the Contractor must notify the SCAT Consultant of the turn-on/detour implementation schedule, as well as stage changes and phase changes during construction.

The Contractor must have all traffic signal work completed and the electrical service installation connected by the utility company prior to requesting an inspection and turn-on of the traffic signal installation. The Contractor shall be responsible to provide a police officer to assist with traffic control at the time of testing.

The Contractor shall provide a representative from the control equipment vendor's office who is knowledgeable of the cabinet design and controller functions to attend the traffic signal inspection for both permanent and temporary traffic signal turn-ons.

Upon demonstration that the signals are operating and all work is completed in accordance with the Contract and to the satisfaction of the Engineer, the Engineer will then allow the signals to be placed in continuous operation. The Agency that is responsible for the maintenance of each traffic signal installation will assume the maintenance upon successful completion of this inspection.

The District requires the following Final Project Documentation from the Contractor at traffic signal turn-ons in electronic format in addition to hard copies where noted. A CD/DVD shall be submitted with separate folders corresponding to each numbered title below. The CD/DVD shall be labelled with date, project location, company

and contract or permit number. Record Drawings, Inventory and Material Approvals shall be submitted prior to traffic signal turn-on for review by the Department as described here-in.

Final Project Documentation:

1. Record Drawings. Signal plans of record with field revisions marked in red ink. One hard copy set of 11"x17" record drawings shall also be provided.
2. Inventory. Inventory of new and existing traffic signal equipment including cabinet types and devices within cabinets in an Excel spread sheet format. One hard copy shall also be provided.
3. Pictures. Digital pictures of a minimum 12M pixels of each intersection approach showing all traffic signal displays and equipment. Pictures shall include controller cabinet equipment in enough detail to clearly identify manufacture and model of major equipment.
4. Field Testing. Written notification from the Contractor and the equipment vendor of satisfactory field testing with corresponding material performance measurements, such as for detector loops and fiber optic systems (see Article 801.13). One hard copy of all contract required performance measurement testing shall also be provided.
5. Materials Approval. The material approval letter. A hard copy shall also be provided.
6. Manuals. Operation and service manuals of the signal controller and associated control equipment. One hard copy shall also be provided.
7. Cabinet Wiring Diagram and Cable Logs. Five (5) hard copies 11" x 17" of the cabinet wiring diagrams shall be provided along with electronic pdf and dgn files of the cabinet wiring diagram. Five hard copies of the cable logs and electronic excel files shall be provided with cable #, number of conductors and spares, connected device/signal head and intersection location.
8. Controller Programming Settings. The traffic signal controller's timings; backup timings; coordination splits, offsets, and cycles; TBC Time of Day, Week and Year Programs; Traffic Responsive Program, Detector Phase Assignment, Type and Detector Switching; and any other functions programmable from the keyboard. The controller manufacturer shall also supply a printed form, not to exceed 11" x 17" for recording that data noted above. The form shall include a location, date, manufacturer's name, controller model and software version. The form shall be approved by the Engineer and a minimum of three (3) copies must be furnished at each turn-on. The manufacturer must provide all programming information used within the controller at the time of turn-on.
9. Warrantees and Guarantees. All manufacturer and contractor warrantees and guarantees required by Article 801.14.
10. GPS coordinate of traffic signal equipment as describe in the Record Drawings section herein.

Acceptance of the traffic signal equipment by the Department shall be based upon inspection results at the traffic signal "turn on", completeness of the required documentation and successful operation during a minimum 72 hour "burn-in" period following activation of the traffic signal. If approved, traffic signal acceptance shall be verbal at the "turn on" inspection followed by written correspondence from the Engineer. The Contractor shall be responsible for all traffic signal equipment and associated maintenance thereof until Departmental acceptance is granted.

All equipment and/or parts to keep the traffic signal installation operating shall be furnished by the Contractor. No spare traffic signal equipment is available from the Department.

All punch list work shall be completed within two (2) weeks after the final inspection. The Contractor shall notify the Electrical Maintenance Contractor to inspect all punch list work. Failure to meet these time constraints shall result in liquidated damage charges of $500 per month per incident.

All cost of work and materials required to comply with the above requirements shall be included in the pay item bid prices, under which the subject materials and signal equipment are paid, and no additional compensation will be allowed. Materials and signal equipment not complying with the above requirements shall be subject to removal and disposal at the Contractor's expense.

Record Drawings.

The requirements listed for Electrical Installation shall apply for Traffic Signal Installations in Article 801.16. Revise the 2nd paragraph of Article 801.16 of the Standard Specifications to read:

"When the work is complete, and seven days before the request for a final inspection, the reduced-size set of contract drawings, stamped "RECORD DRAWINGS", shall be submitted to the Engineer for review and approval and shall be stamped with the date and the signature of the Contractor's supervising Engineer or electrician. The record drawings shall be submitted in PDF format on CDROM as well as hardcopy for review and approval. If the contract consists of multiple intersections, each intersection shall be saved as an individual PDF file with TS# and location name in its file name.

In addition to the record drawings, copies of the final catalog cuts which have been Approved or Approved as Noted shall be submitted in PDF format along with the record drawings. The PDF files shall clearly indicate the pay item either by filename or PDF Table of Contents referencing the respective pay item number for multi-item PDF files. Specific part or model numbers of items which have been selected shall be clearly visible."

As part of the record drawings, the Contractor shall inventory all traffic signal equipment, new or existing, on the project and record information in an Excel spreadsheet. The inventory shall include equipment type, model numbers, software manufacturer and version and quantities.

Add the following to Article 801.16 of the Standard Specifications:

"In addition to the specified record drawings, the Contactor shall record GPS coordinates of the following traffic signal components being installed, modified or being affected in other ways by this contract:

- All Mast Arm Poles and Posts
- Traffic Signal Wood Poles
- Rail Road Bungalow
- UPS
- Handholes
- Conduit roadway crossings
- Controller Cabinets
- Communication Cabinets
- Electric Service Disconnect locations
- CCTV Camera installations
- Fiber Optic Splice Locations
- Conduit Crossings

Datum to be used shall be North American 1983.

Data shall be provided electronically and in print form. The electronic format shall be compatible with MS Excel. Latitude and Longitude shall be in decimal degrees with a minimum of 6 decimal places. Each coordinate shall have the following information:

- File shall be named: TSXXX-YY-MM-DD (i.e. TS22157_15-01-01)
- Each intersection shall have its own file
- Row 1 should have the location name (i.e. IL 31 @ Klausen)
- Row 2 is blank
- Row 3 is the headers for the columns
- Row 4 starts the data
- Column A (Date) – should be in the following format: MM/DD/YYYY
- Column B (Item) – as shown in the table below
- Column C (Description) – as shown in the table below
- Column D and E (GPS Data) – should be in decimal form, per the IDOT special provisions

Examples:

Date	Item	Description	Latitude	Longitude
01/01/2015	MP (Mast Arm Pole)	NEQ, NB, Dual, Combination Pole	41.580493	-87.793378
01/01/2015	HH (Handhole)	Heavy Duty, Fiber, Intersection, Double	41.558532	-87.792571
01/01/2015	ES (Electrical Service)	Ground mount, Pole mount	41.765532	-87.543571
01/01/2015	CC (Controller Cabinet)		41.602248	-87.794053
01/01/2015	RSC (Rigid Steel Crossing)	IL 31 east side crossing south leg to center HH at Klausen	41.611111	-87.790222
01/01/2015	PTZ (PTZ)	NEQ extension pole	41.593434	-87.769876
01/01/2015	POST (Post)		41.651848	-87.762053
01/01/2015	MCC (Master Controller Cabinet)		41.584593	-87.793378
01/01/2015	COMC (Communication Cabinet)		41.584600	-87.793432
01/01/2015	BBS (Battery Backup System)		41.558532	-87.792571
01/01/2015	CNCR (Conduit Crossing)	4-inch IL 31 n/o of Klausen	41.588888	-87.794440

Prior to the collection of data, the contractor shall provide a sample data collection of at least six data points of known locations to be reviewed and verified by the Engineer to be accurate within 1 foot. Upon verification, data collection can begin. Data collection can be made as construction progresses, or can be collected after all items are installed. If the data is unacceptable the

contractor shall make corrections to the data collection equipment and or process and submit the data for review and approval as specified.

Accuracy. Data collected is to be mapping grade. A handheld mapping grade GPS device shall be used for the data collection. The receiver shall support differential correction and data shall have a minimum 1 foot accuracy after post processing.

GPS receivers integrated into cellular communication devices, recreational and automotive GPS devices are not acceptable.

The GPS shall be the product of an established major GPS manufacturer having been in the business for a minimum of 6 years."

Delete the last sentence of the 3rd paragraph of Article 801.16.

Locating Underground Facilities

Revise Section 803 to the Standard Specifications to read:

IDOT traffic signal facilities are not part of any of the one-call locating service such as J.U.L.I.E or Digger. If this Contract requires the services of an Electrical Contractor, the Contractor shall be responsible at his/her own expense for locating existing MCDOT electrical facilities prior to performing any work. If this Contract does not require the services of an Electrical Contractor, the Contractor may request one free locate for existing MCDOT electrical facilities from the MCDOT Electrical Maintenance Contractor prior to the start of any work. Additional requests may be at the expense of the Contractor. The location of underground traffic facilities does not relieve the Contractor of their responsibility to repair any facilities damaged during construction at their expense.

The exact location of all utilities shall be field verified by the Contractor before the installation of any components of the traffic signal system. For locations of utilities, locally owned equipment, and leased enforcement camera system facilities, the local Counties or Municipalities may need to be contacted: in the City of Chicago contact Digger at (312) 744-7000 and for all other locations contact J.U.L.I.E. at 1-800-892-0123 or 811.

Restoration of Work Area

Add the following article to Section 801 of the Standard Specifications:

801.17 Restoration of work area. Restoration of the traffic signal work area shall be included in the related pay items such as foundation, conduit, handhole, underground raceways, etc. All roadway surfaces such as shoulders, medians, sidewalks, pavement, etc. shall be replaced in kind. All damage to mowed lawns shall be replaced with an approved sod, and all damage to unmowed fields shall be seeded. All brick pavers disturbed in the work area shall be restored to their original configuration as directed by the Engineer. All damaged brick pavers shall be replaced with a comparable material approved by the Engineer. Restoration of the work area shall be included in the contract without any extra compensation allowed to the Contractor.

Bagging Signal Heads

Light tan colored traffic and pedestrian signal reusable covers shall be used to cover dark/un-energized signal sections and visors. Covers shall be made of outdoor fabric with urethane coating for repelling water, have elastic

fully sewn around the cover ends for a tight fit over the visor, and have a minimum of two straps with buckles to secure the cover to the backplate. A center mesh strip allows viewing without removal for signal status testing purposes. Covers shall include a message indicating the signal is not in service.

SERVICE INSTALLATION (TRAFFIC SIGNALS).

Revise Section 805 of the Standard Specifications to read:

Description.
This work shall consist of all materials and labor required to install, modify, or extend the electric service installation. All installations shall meet the requirements of the "District One Standard Traffic Signal Design Details".

General.
The electric service installation shall be the electric service disconnecting means and it shall be identified as suitable for use as service equipment.

The electric utility contact information is noted on the plans and represents the current information at the time of contract preparation. The Contractor must request in writing for service and/or service modification within 10 days of contract award and must follow-up with the electric utility to assure all necessary documents and payment are received by the utility. The Contractor shall forward copies of all correspondence between the contractor and utility company to the Engineer and Area Traffic Signal Maintenance and Operations Engineer. The service agreement and sketch shall be submitted for signature to the IDOT's Traffic Operations Programs Engineer.

Materials.

a. General. The completed control panel shall be constructed in accordance with UL Std. 508A, Industrial Control Panel, and carry the UL label. Wire terminations shall be UL listed.

b. Enclosures.
    1. Pole Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 4X, unfinished single door design, fabricated from minimum 0.080-inch (2.03 mm) thick Type 5052 H-32 aluminum. Seams shall be continuous welded and ground smooth. Stainless steel screws and clamps shall secure the cover and assure a watertight seal. The cover shall be removable by pulling the continuous stainless steel hinge pin. The cabinet shall have an oil-resistant gasket and a lock kit shall be provided with an internal O-ring in the locking mechanism assuring a watertight and dust-tight seal. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 14-inches (350 mm) high, 9-inches (225 mm) wide and 8-inches (200 mm) in depth is required. The cabinet shall be channel mounted to a wooden utility pole using assemblies recommended by the vendor.

    2. Ground Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 3R unfinished single door design with back panel. The cabinet shall be fabricated from Type 5052 H-32 aluminum with the frame and door 0.125-inch (3.175 mm) thick, the top 0.250-inch (6.350 mm) thick and the bottom 0.500-inch (12.70 mm) thick. Seams shall be continuous welded and ground smooth. The door and door opening shall be double flanged. The door shall be approximately 80% of the front surface, with a full length tamperproof stainless steel .075-inch (1.91 mm) thick hinge

bolted to the cabinet with stainless steel carriage bolts and nylocks nuts. The locking mechanism shall be slam-latch type with a keyhole cover. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 40-inches (1000 mm) high, 16-inches (400 mm) wide and 15-inches (375 mm) in depth is required. The cabinet shall be mounted upon a square Type A concrete foundation as indicated on the plans. The foundation is paid for separately.

3. All enclosures shall include a green external power indicator LED light with circuitry as shown in the Electrical Service-Panel Diagram detail sheet. For pole mounted service enclosures, the power indicator light shall be mounted as shown in the detail. For ground mounted enclosures, the power indicator light shall be mounted on the side of the enclosure most visible from the major roadway.

c. Electric Utility Meter Housing and Riser. The electric meter housing and meter socket shall be supplied and installed by the contractor. The contractor is to coordinate the work to be performed and the materials required with the utility company to make the final connection at the power source. Electric utility required risers, weather/service head and any other materials necessary for connection shall also be included in the pay item. Materials shall be in accordance with the electric utility's requirements. For ground-mounted service, the electric utility meter housing shall be mounted to the enclosure. The meter shall be supplied by the utility company. Metered service shall not be used unless specified in the plans.

d. Surge Protector. Overvoltage protection, with LED indicator, shall be provided for the 120 volt load circuit by the means MOV and thermal fusing technology. The response time shall be <5n seconds and operate within a range of –40C to +85C. The surge protector shall be UL 1449 Listed.

e. Circuit Breakers. Circuit breakers shall be standard UL listed molded case, thermal-magnetic bolt-on type circuit breakers with trip free indicating handles. 120 volt circuit breakers shall have an interrupting rating of not less than 65,000 rms symmetrical amperes. Unless otherwise indicated, the main disconnect circuit breaker for the traffic signal controller shall be rated 60 amperes, 120 V and the auxiliary circuit breakers shall be rated 10 amperes, 120 V.

f. Fuses, Fuseholders and Power Indicating Light. Fuses shall be small-dimensional cylindrical fuses of the dual element time-delay type. The fuses shall be rated for 600 V AC and shall have a UL listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated voltage. The power indicating light shall be LED type with a green colored lens and shall be energized when electric utility power is present.

g. Ground and Neutral Bus Bars. A single copper ground and neutral bus bar, mounted on the equipment panel shall be provided. Ground and neutral conductors shall be separated on the bus bar. Compression lugs, plus 2 spare lugs, shall be sized to accommodate the cables with the heads of the connector screws painted green for ground connections and white for neutral connections.

h. Utility Services Connection. The Contractor shall notify the Utility Company marketing representative a minimum of 30 working days prior to the anticipated date of hook-up. This 30 day advance notification will begin only after the Utility Company marketing representative has received service charge payments from the Contractor. Prior to contacting the Utility Company marketing representative for

service connection, the service installation controller cabinet and cable must be installed for inspection by the Utility Company.

i. Ground Rod. Ground rods shall be copper-clad steel, a minimum of 10 feet (3.0m) in length, and 3/4 inch (20mm) in diameter. Ground rod resistance measurements to ground shall be 25 ohms or less. If necessary additional rods shall be installed to meet resistance requirements at no additional cost to the contract.

Installation

a. General. The Contractor shall confirm the orientation of the traffic service installation and its door side with the engineer, prior to installation. All conduit entrances into the service installation shall be sealed with a pliable waterproof material.

b. Pole Mounted. Brackets designed for pole mounting shall be used. All mounting hardware shall be stainless steel. Mounting height shall be as noted on the plans or as directed by the Engineer.

c. Ground Mounted. The service installation shall be mounted plumb and level on the foundation and fastened to the anchor bolts with hot-dipped galvanized or stainless steel nuts and washers. The space between the bottom of the enclosure and the top of the foundation shall be caulked at the base with silicone.

Basis of Payment

The service installation shall be paid for at the contract unit price each for SERVICE INSTALLATION of the type specified which shall be payment in full for furnishing and installing the service installation complete. The CONCRETE FOUNDATION, TYPE A, which includes the ground rod, shall be paid for separately. SERVICE INSTALLATION, POLE MOUNTED shall include the 3/4 inch (20mm) grounding conduit, ground rod, and pole mount assembly. Any charges by the utility companies shall be approved by the engineer and paid for as an addition to the contract according to Article 109.05 of the Standard Specifications.

GROUNDING OF TRAFFIC SIGNAL SYSTEMS.

Revise Section 806 of the Standard Specifications to read:

General

All traffic signal systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC. This work shall be in accordance with IDOT's District One Traffic Signal Design Details.

The grounding electrode system shall include a ground rod installed with each traffic signal controller concrete foundation and all mast arm and post concrete foundations. An additional ground rod will be required at locations were measured resistance exceeds 25 ohms. Ground rods are included in the applicable concrete foundation or service installation pay item and will not be paid for separately.

Testing shall be according to Article 801.13 (a) (4) and (5).

a) The grounded conductor (neutral conductor) shall be white color coded. This conductor shall be bonded to the equipment grounding conductor only at the Electric Service Installation. All power cables shall include one neutral conductor of the same size.

b) The equipment grounding conductor shall be green color coded. The following is in addition to Article 801.04 of the Standard Specifications.

1) Equipment grounding conductors shall be bonded to the grounded conductor (neutral conductor) only at the Electric Service Installation. The equipment grounding conductor is paid for separately and shall be continuous. The Earth shall not be used as the equipment grounding conductor.

2) Equipment grounding conductor*s* shall be bonded, using a UL Listed grounding connector, to all traffic signal mast arm poles, traffic signal posts, pedestrian posts, pull boxes, handhole frames and covers, conduits, and other metallic enclosures throughout the traffic signal wiring system, except where noted herein. Bonding shall be made with a splice and pigtail connection, using a sized compression type copper sleeve, sealant tape, and heat-shrinkable cap. A UL listed electrical joint compound shall be applied to all conductors' terminations, connector threads and contact points. Conduit grounding bushings shall be installed at all conduit terminations including spare or empty conduits.

3) All metallic and non-metallic raceways shall have a continuous equipment grounding conductor, except raceways containing only detector loop lead-in circuits, circuits under 50 volts and/or fiber optic cable will not be required to include an equipment grounding conductor.

4. Individual conductor splices in handholes shall be soldered and sealed with heat shrink. When necessary to maintain effective equipment grounding, a full cable heat shrink shall be provided over individual conductor heat shrinks.

c) The grounding electrode conductor shall be similar to the equipment grounding conductor in color coding (green) and size. The grounding electrode conductor is used to connect the ground rod to the equipment grounding conductor and is bonded to ground rods via exothermic welding, UL listed pressure connectors, and UL listed clamps.

UNDERGROUND RACEWAYS.

Revise Article 810.04 - Installation of the Standard Specifications to read:

All underground conduit shall have a minimum depth of 2 ½ ft (750 mm) below the finished grade and shall be installed to avoid existing and proposed utilities within the project limits.

HANDHOLES.

Add the following to Section 814.00 of the Standard Specifications:

All handholes shall be concrete, poured in place, with inside dimensions of 21-1/2" (549 mm) minimum. Frames and lid openings shall match this dimension. The cover of the handhole frame shall be labeled “Traffic Signals" with legible raised letters.

For grounding purposes the handhole frame shall have provisions for a 7/16” (15.875 mm) diameter stainless bolt cast into one corner of the frame. The covers shall have a stainless steel threaded stint extended from the eye hook assembly for the purpose of attaching the grounding conductor to the handhole frame.

The minimum wall thickness for heavy duty hand holes shall be 12” (300 mm).

All conduits shall enter the handhole at a depth of 30” (760 mm) except for the conduits for detector loops when the handhole is less than 5’ (1.52 m) from the detector loop. All conduit ends should be sealed with a waterproof sealant to prevent the entrance of contaminants into the handhole.

Steel cable hooks shall be coated with hot-dipped galvanization in accordance with AASHTO Specification M111. Hooks shall be a minimum of 1/2 inch (12.7 mm) diameter with two 90 degree bends and extend into the handhole at least 6 inches (150 mm). Hooks shall be placed a minimum of 12 inches (300 mm) below the lid or lower if additional space is required.

GROUNDING CABLE.

The cable shall meet the requirements of Section 817 of the "Standard Specifications," except for the following:

Add to Section 817.02 (b) of the Standard Specifications:

Unless otherwise noted on the Plans, traffic signal grounding conductor shall be one conductor, #6 gauge copper, with a XLP jacket.

The traffic signal grounding conductor shall be bonded, using a Listed grounding connector (Burndy type KC/K2C, as applicable), to all proposed and existing traffic signal mast arm poles and traffic/pedestrian signal posts, including push button posts. The grounding conductor shall be bonded to all proposed and existing pull boxes, handhole frames and covers and other metallic enclosures throughout the traffic signal wiring system and noted herein and detailed on the plans. Bonding to existing handhole frames and covers shall be paid for separately.

Revise Section 817.05 of the Standard Specifications to read:

Basis of Payment Grounding cable shall be measured in place for payment in (meter) foot. Payment shall be at the contract unit price for ELECTRIC CABLE IN CONDUIT, EQUIPMENT GROUNDING CONDUCTOR, NO. 6, 1C, which price includes all associated labor and material including grounding clamps, splicing, exothermic welds/other Listed connectors and hardware.

FIBER OPTIC TRACER CABLE.

The cable shall meet the requirements of Section 817 of the "Standard Specifications," except for the following:

Add to Section 817.03 of the Standard Specifications:

In order to trace the fiber optic cable after installation, the tracer cable shall be installed in the same conduit as the fiber optic cable. The tracer cable shall be continuous, extended into the controller cabinet and terminated on a terminal strip mounted on the side wall of the controller cabinet. The terminal strip and tracer cable shall be clearly marked and identified. The tracer cable will be allowed to be spliced at the handholes only. All tracer cable splices shall be kept to a minimum and shall incorporate maximum lengths of cable supplied by the manufacturer. The tracer cable splice shall use a Western Union Splice soldered with resin core flux. All exposed surfaces of the solder shall be smooth. Splices shall be soldered using a soldering iron. Blow torches or other devices which oxidize copper cable shall not be allowed for soldering operations. The splice shall be covered with WCSMW 30/100 heat shrink tube, minimum length (100 mm) 4" and with a minimum (25 mm) 1" coverage over the XLP insulation, underwater grade.

Revise Section 817.05 of the Standard Specifications to read:

Basis of Payment
The tracer cable shall be paid for separately as ELECTRIC CABLE IN CONDUIT, TRACER, NO. 12 1C per (meter) foot, which price shall include all associated labor and material for installation.

MAINTENANCE OF EXISTING TRAFFIC SIGNAL AND FLASHING BEACON INSTALLATION.

General

1. Full maintenance responsibility shall start as soon as the Contractor begins any physical work on the Contract or any portion thereof. If Contract work is started prior to a traffic signal inspection, maintenance of the traffic signal installation(s) will be transferred to the Contractor without an inspection.

2. The Contractor shall have electricians with IMSA Level II certification on staff to provide signal maintenance. A copy of the certification shall be immediately available upon request of the Engineer.

3. This item shall include maintenance of all traffic signal equipment and other connected and related equipment such as flashing beacons, emergency vehicle pre-emption equipment, master controllers, uninterruptable power supply (UPS and batteries), PTZ cameras, vehicle detection, handholes, lighted signs, telephone service installations, communication cables, conduits to adjacent intersections, and other traffic signal equipment.

4. Regional transit, County and other agencies may also have equipment connected to existing traffic signal or peripheral equipment such as PTZ cameras, switches, transit signal priority (TSP and BRT) servers, radios and other devices that shall be included with traffic signal maintenance at no additional cost to the contract.

5. Maintenance shall not include Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, or peripheral equipment. This equipment is operated and maintained by the local municipality and should be de-activated while on contractor maintenance.

6. The energy charges for the operation of the traffic signal installation shall be paid for by the Contractor.

Maintenance

1. The Contractor shall check all controllers every two (2) weeks, which will include visually inspecting all timing intervals, relays, detectors, and pre-emption equipment to ensure that they are functioning properly. The Contractor shall check signal system communications and phone lines to assure proper operation. This item includes, as routine maintenance, all portions of emergency vehicle pre-emption equipment. The Contractor shall maintain in stock at all times a sufficient amount of materials and equipment to provide effective temporary and permanent repairs. Prior to the traffic signal maintenance transfer, the contractor shall supply a detailed maintenance schedule that includes dates, locations, names of electricians providing the required checks and inspections along with any other information requested by the Engineer.

2. The Contractor is advised that the existing and/or span wire traffic signal installation must remain in operation during all construction stages, except for the most essential down time. Any shutdown of the traffic signal installation, which exceeds fifteen (15) minutes, must have prior approval of the Engineer. Approval to shut down the traffic signal installation will only be granted during the period extending from 10:00 a.m. to 3:00 p.m. on weekdays. Shutdowns shall not be allowed during inclement weather or holiday periods.

3. The Contractor shall provide immediate corrective action when any part or parts of the system fail to function properly. Two far side heads facing each approach shall be considered the minimum acceptable signal operation pending permanent repairs. When repairs at a signalized intersection require that the controller be disconnected or otherwise removed from normal operation, and power is available, the Contractor shall place the traffic signal installation on flashing operation. The signals shall flash RED for all directions unless a different indication has been specified by the Engineer. The Contractor shall be required to place stop signs (R1-1-36) at each approach of the intersection as a temporary means of regulating traffic. When the signals operate in flash, the Contractor shall furnish and equip all their vehicles assigned to the maintenance of traffic signal installations with a sufficient number of stop signs as specified herein. The Contractor shall maintain a sufficient number of spare stop signs in stock at all times to replace stop signs which may be damaged or stolen.

4. The Contractor shall provide the Engineer with 2 (two) 24 hour telephone numbers for the maintenance of the traffic signal installation and for emergency calls by the Engineer.

5. Traffic signal equipment which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of the Standard Specifications and these special provisions.

6. The Contractor shall respond to all emergency calls from the Department or others within one (1) hour after notification and provide immediate corrective action. When equipment has been damaged or becomes faulty beyond repair, the Contractor shall replace it with new and identical equipment. The cost of furnishing and installing the replaced equipment shall be borne by the Contractor at no additional charge to the contract. The Contractor may institute action to recover damages from a responsible third party. If at any time the Contractor fails to perform all work as specified herein to keep the traffic signal installation in

proper operating condition or if the Engineer cannot contact the Contractor's designated personnel, the Engineer shall have the State's Electrical Maintenance Contractor perform the maintenance work. The Contractor shall be responsible for all of the State's Electrical Maintenance Contractor's costs and liquidated damages of $1000 per day per occurrence. The State's Electrical Maintenance Contractor shall bill the Contractor for the total cost of the work. The Contractor shall pay this bill within thirty (30) days of the date of receipt of the invoice or the cost of such work will be deducted from the amount due the Contractor. The Contractor shall allow the Electrical Maintenance Contractor to make reviews of the Existing Traffic Signal Installation that has been transferred to the Contractor for Maintenance.

7. Any proposed activity in the vicinity of a highway-rail grade crossing must adhere to the guidelines set forth in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) regarding work in temporary traffic control zones in the vicinity of highway-rail grade crossings which states that lane restrictions, flagging, or other operations shall not create conditions where vehicles can be queued across the railroad tracks. If the queuing of vehicles across the tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the crossing to prevent vehicles from stopping on the tracks, even if automatic warning devices are in place.

8. Equipment included in this item that is damaged or not operating properly from any cause shall be replaced with new equipment meeting current District One traffic signal specifications and provided by the Contractor at no additional cost to the Contract and/or owner of the traffic signal system, all as approved by the Engineer. Final replacement of damaged equipment must meet the approval of the Engineer prior to or at the time of final inspection otherwise the traffic signal installation will not be accepted. Cable splices outside the controller cabinet shall not be allowed.

9. Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, and peripheral equipment, damaged or not operating properly from any cause, shall be the responsibility of the municipality or the Automatic Traffic Enforcement Company per Permit agreement.

10. The Contractor shall be responsible to clear snow, ice, dirt, debris or other condition that obstructs visibility of any traffic signal display or access to traffic signal equipment.

11. The Contractor shall maintain the traffic signal in normal operation during short or long term loss of utility or battery back-up power at critical locations designated by the Engineer. Critical locations may include traffic signals interconnected to railroad warning devices, expressway ramps, intersection with an SRA route, critical corridors or other locations identified by the Engineer. Temporary power to the traffic signal must meet applicable NEC and OSHA guidelines and may include portable generators and/or replacement batteries. Temporary power to critical locations shall not be paid for separately but shall be included in the contract.

12. Temporary replacement of damaged or knockdown of a mast arm pole assembly shall require construction of a full or partial span wire signal installation or other method approved by the Engineer to assure signal heads are located overhead and over traveled pavement. Temporary replacement of mast arm mount signals with post mount signals will not be permitted.

Basis of Payment

This work will be paid for at the contract unit price per each for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION. Each intersection will be paid for separately. Maintenance of a standalone and or not connected

flashing beacon shall be paid for at the contract unit price for MAINTENANCE OF EXISITNG FLASHING BEACON INSTALLATION. Each flashing beacon will be paid for separately.

FULL-ACTUATED CONTROLLER (SPECIAL).

Description
This work shall consist of furnishing and installing a(n) "Econolite" brand traffic actuated solid state digital controller meeting the requirements of the current District One Traffic Signal Special Provisions 857.02TS Full Actuated Controller and Cabinet, and 857.02TS Railroad, Full Actuated Controller and Cabinet . This pay item shall include furnishing and installing the controller complete including malfunction management unit, load switches and flasher relays, and all necessary connections for proper operation.

Materials
Add the following to Article 857.02 of the Standard Specifications:

Controllers shall be NTCIP compliant, Econolite Cobalt with Cobalt Touch unless specified otherwise on the plans or elsewhere on these specifications. A NTCIP compliant controller may be used at a traffic signal interconnected to railroad warning devices but only upon the approval of the Engineer. Only controllers supplied by one of the District One approved closed loop equipment supplier will be allowed. The controller shall be the most recent model and software version supplied by the equipment supplier at the time of the traffic signal TURN-ON and include data key. The traffic signal controller shall provide features to inhibit simultaneous display of a circular yellow ball and a yellow arrow display. Individual load switches shall be provided for each vehicle, pedestrian, and right turn over lap phase. The controller shall prevent phases from being omitted during program changes and after all preemption events.

Basis of Payment
This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER (SPECIAL).

MASTER CONTROLLER.

General
This work shall consist of furnishing and installing a master controller, meeting the requirements of the current District One Traffic Signal Special Provisions 857.01TS FULL-ACTUATED CONTROLLER (SPECIAL), 857.02TS FULL-ACTUATED CONTROLLER AND CABINET, and 857.02TS RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET, including all necessary connections for proper operation.

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

Materials and Installation
Revise Articles 860.02 and 860.03 of the Standard Specifications to read:

Only controllers supplied by one of the District approved closed loop equipment supplier will be allowed. Only NEMA TS 2 Type 1 Econolite closed loop systems shall be supplied. The latest model and software version of master controller shall be supplied.

Functional requirements in addition to those in Section 863 of the Standard Specifications include:

The system commands shall consist of, as a minimum, six (6) cycle lengths, five (5) offsets, three (3) splits, and four (4) special functions. The system commands shall also include commands for free or coordinated operation.

Traffic Responsive operation shall consist of the real time acquisition of system detector data, data validation, and the scaling of acquired volumes and occupancies in a deterministic fashion so as to cause the selection and implementation of the most suitable traffic plan.

Upon request by the Engineer, each master shall be delivered with up to three (3) complete sets of the latest edition of registered remote monitoring software with full manufacture's support. Each set shall consist of software on CD, DVD, or other suitable media approved by the Engineer, and a bound set of manuals containing loading and operating instruction. One copy of the software and support data shall be delivered to the Agency in charge of system operation, if other than IDOT. One of these two sets will be provided to the Agency Signal Maintenance Contractor for use in monitoring the system.

The approved manufacturer of equipment shall loan the District one master controller and two intersection controllers of the most recent models and the newest software version to be used for instructional purposes in addition to the equipment to be supplied for the Contract.

The Contractor shall arrange to install a cellular modem to the master controller. This shall be accomplished through the following process utilizing MCDOT staff. An E911 address is required.

The cabinet shall be provided with an Outdoor Network Interface for termination of the telephone service. It shall be mounted to the inside of the cabinet in a location suitable to provide access for termination of the telephone service at a later date.

Full duplex communication between the master and its local controllers is recommended, but at this time not required. The data rate shall be 1200 baud minimum and shall be capable of speeds to 38,400 or above as technology allows. The controller, when installed in an Ethernet topology, may operate non-serial communications.

The cabinet shall be equipped with a 9600 baud, auto dial/auto answer modem. It shall be a US robotics 33.6K baud rate.

As soon as practical or within one week after the contract has been awarded, the Contractor shall contact the MCDOT Traffic Engineer at (815) 334-4971 to request the cellular service for the cellular modem. A follow-up contact shall include all required information pertaining to the cellular modem installation and should be made as soon as possible or within one week after the initial request has been made. A copy of this contact must be emailed by the Contractor to the Traffic Signal Systems Engineer. The required information to be supplied shall include (but not limited to): An E911 address for the new traffic signal controller (or nearby address); the name and number of the Contractor's employee for the telephone company to contact regarding site work and questions.

The usual time frame for the activation of the phone line will vary after the MCDOT has received the Contractor’s information and will depend on location and existing available facilities. The contractor shall provide the Administrative Support Manager with an expected installation date.

The cellular modem and cellular service shall be installed and activated one month before the system final inspection.

All costs associated with the cellular service installation and activation shall be paid for by the MCDOT (i.e., this will be an MCDOT phone number not a Contractor phone number).

Basis of Payment
This work will be paid for at the contract unit price each for MASTER CONTROLLER or MASTER CONTROLLER (SPECIAL).

UNINTERRUPTABLE POWER SUPPLY, SPECIAL.

This work shall be in accordance with section 862 of the Standard Specification except as modified herein

Add the following to Article 862.01 of the Standard Specifications:

The UPS shall have the power capacity to provide normal operation of a signalized intersection that utilizes all LED type signal head optics, for a minimum of 6 (six) hours.

Add the following to Article 862.02 of the Standard Specifications:

Materials shall be according to Article 1074.04 as modified in UNINTERRUPTABLE POWER SUPPLY, SPECIAL.

Add the following to Article 862.03 of the Standard Specifications:

The UPS shall additionally include, but not be limited to, a battery cabinet, where applicable. For Super-P (Type IV) and Super-R (Type V) cabinets, the battery cabinet is integrated to the traffic signal cabinet, and shall be included in the cost for the traffic signal cabinet of the size and type indicated on the plans.

The UPS shall provide reliable emergency power to the traffic signals in the event of a power failure or interruption.

Revise Article 862.04 of the Standard Specifications to read:

Installation
When a UPS is installed at an existing traffic signal cabinet, the UPS cabinet shall partially rest on the lip of the existing controller cabinet foundation and be secured to the existing controller cabinet by means of at least four (4) stainless steel bolts. The UPS cabinet shall be completely enclosed with the bottom and back constructed of the same material as the cabinet.

When a UPS is installed at a new signal cabinet and foundation, it shall be mounted as shown on the plans.

At locations where UPS is installed and an Emergency Vehicle Priority System is in use, any existing incandescent confirmation beacons shall be replaced with LED lamps in accordance with the District One Emergency Vehicle Priority System specification at no additional cost to the contract. A concrete apron shall be provided and be in accordance with Articles 424 and 202 of the Standard Specifications. The concrete apron shall also, follow the

District 1 Standard Traffic Signal Design Detail, Type D for Ground Mounted Controller Cabinet and UPS Battery Cabinet.

This item shall include any required modifications to an existing traffic signal controller as a result of the addition of the UPS including the addition of alarms.

Materials

Revise Article 1074.04(a)(1) of the Standard Specifications to read:

The UPS shall be line interactive or double conversion and provide voltage regulation and power conditioning when utilizing utility power. The UPS shall be sized appropriately for the intersection(s) normal traffic signal operating load. The UPS must be able to maintain the intersection's normal operating load plus 20 percent (20%) of the intersection's normal operating load. When installed at a railroad-interconnected intersection the UPS must maintain the railroad pre-emption load, plus 20 percent (20%) of the railroad preemption-operating load. The total connected traffic signal load shall not exceed the published ratings for the UPS.

The UPS shall provide a minimum of 6 (six) hours of normal operation run-time for signalized intersections with LED type signal head optics at 77 °F (25 °C) (minimum 1000 W active output capacity, with 86 percent minimum inverter efficiency).

Revise the first paragraph of Article 1074.04(a)(3) of the Standard Specifications to read:

The UPS shall have a minimum of four (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 or locking circular connectors, rated at a minimum 120 V/1 A, and labeled so as to identify each contact according to the plans.

Revise Article 1074.04(a)(10) of the Standard Specifications to read:

The UPS shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation.

Revise Article 1074.04(a)(17) of the Standard Specifications to read:

When the intersection is in battery backup mode, the UPS shall bypass all internal cabinet lights, ventilation fans, cabinet heaters, service receptacles, luminaires, any lighted street name signs, any automated enforcement equipment and any other devices directed by the Engineer.

Revise Article 1074.04(b)(2)b of the Standard Specifications to read:

Batteries, inverter/charger and power transfer relay shall be housed in a separate NEMA Type 3R cabinet. The cabinet shall be Aluminum alloy, 5052-H32, 0.125-inch thick and have a natural mill finish.

Revise Article 1074.04(b)(2)c of the Standard Specifications to read:

No more than three batteries shall be mounted on individual shelves for a cabinet housing six batteries and no more than four batteries per shelf for a cabinet housing eight batteries.

Revise Article 1074.04(b)(2)e of the Standard Specifications to read:

The battery cabinet housing shall have the following nominal outside dimensions: a width of 25 in. (785 mm), a depth of 16 in. (440 mm), and a height of 41 to 48 in. (1.1 to 1.3 m). Clearance between shelves shall be a minimum of 10 in. (250 mm).

End of paragraph 1074.04(b)(2)e

The door shall be equipped with a two position doorstop, one a 90° and one at 120°.

Revise Article 1074.04(b)(2)g of the Standard Specifications to read:

The door shall open to the entire cabinet, have a neoprene gasket, an Aluminum continuous piano hinge with stainless steel pin, and a three point locking system. The cabinet shall be provided with a main door lock which shall operate with a traffic industry conventional No. 2 key. Provisions for padlocking the door shall be provided.

Add the following to Article 1074.04(b)(2) of the Standard Specifications:

j. The battery cabinet shall have provisions for an external generator connection.

Add the following to Article 1074.04(c) of the Standard Specifications:

(8) The UPS shall include a tip or kill switch installed in the battery cabinet, which shall completely disconnect power from the UPS when the switch is manually activated.

(9) The UPS shall include standard RS-232 and internal Ethernet interface.

(10) The UPS shall incorporate a flanged electric generator inlet for charging the batteries and operating the UPS. The generator connector shall be male type, twist-lock, rated as 15A, 125VAC with a NEMA L5-15P configuration and weatherproof lift cover plate. Access to the generator inlet shall be from a secured weatherproof lift cover plate or behind a locked battery cabinet police panel. **A generator plug/cord shall be supplied for plugging a generator extension cord into UPS. The plug/cord shall be a minimum of 18" long from connector to connector.**

(11) The bypass switch shall include an internal power transfer relay that allows removal of the battery back-up unit, while the traffic signal is connected to utility power, without impacting normal traffic signal operation.

Revise Article 1074.04(d)(3) of the Standard Specifications to read:

All batteries supplied in the UPS shall be either gel cell or AGM type, deep cycle, completely sealed, prismatic lead calcium based, silver alloy, valve regulated lead acid (VRLA) requiring no maintenance. All batteries in a UPS installation shall be the same type; mixing of gel cell and AGM types within a UPS installation is not permitted.

Revise Article 1074.04(d)(4) of the Standard Specifications to read:

Batteries shall be certified by the manufacturer to operate over a temperature range of -13 to 160 °F (-25 to + 71 °C) for gel cell batteries and -40 to 140 °F (-40 to + 60 °C) for AGM type batteries.

Add the following to Article 1074.04(d) of the Standard Specifications:

(9) The UPS shall consist of an even number of batteries that are capable of maintaining normal operation of the signalized intersection for a minimum of 6 (six) hours. Calculations shall be provided showing the number of batteries of the type supplied that are needed to satisfy this requirement. A minimum of four batteries shall be provided.

(10) Battery Heater mats shall be provided, when gel cell type batteries are supplied.

Add the following to the Article 1074.04 of the Standard Specifications:

(e) Warranty. The warranty for an uninterruptable power supply (UPS) and batteries (full replacement) shall cover a minimum of 5 years from date the equipment is placed in operation.

(f) Installation. Bypass switch shall completely disconnect the traffic signal cabinet from the utility provider.

(g) The UPS shall be set-up to run the traffic signal continuously, without going to a red flashing condition, when switched to battery power unless otherwise directed by the Engineer. The Contractor shall confirm set-up with the Engineer. The continuous operation mode when switched to battery may require modification to unit connections and these modifications are included in the unit price for this item.

Revise Article 862.05 of the Standard Specifications to read:

Basis of Payment
This work will be paid for at the contract unit price per each for UNINTERRUPTABLE POWER SUPPLY, SPECIAL or UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL. Replacement of Emergency Vehicle Priority System confirmation beacons and any required modifications to the traffic signal controller shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY, SPECIAL or UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL item. The concrete apron and earth excavation required shall be included in the cost of the UNINTERRUPTABLE POWER SUPPLY AND CABINET, SPECIAL item.

FIBER OPTIC CABLE.

Add the following to Article 871.01 of the Standard Specifications:

The Fiber Optic cable shall be installed in conduit or as specified on the plans.

Add the following to Article 871.02 of the Standard Specifications:

The control cabinet distribution enclosure shall be 24 Port Fiber Wall Enclosure, unless otherwise indicated on plans. The fiber optic cable shall provide twelve fibers per tube for the amount of fibers called for in the Fiber Optic Cable pay item in the Contract. Fiber Optic cable may be gel filled or have an approved water blocking tape.

Add the following to Article 871.04 of the Standard Specifications:

A minimum of six multimode fibers from each cable shall be terminated with approved mechanical connectors at the distribution enclosure. Fibers not being used shall be labeled “spare." Fibers not attached to the distribution enclosure shall be capped. A minimum of 13.0 feet (4m) of extra cable length shall be provided for controller cabinets. The controller cabinet extra cable length shall be stored as directed by the Engineer.

Add the following to Article 871.06 of the Standard Specifications:

The distribution enclosure and all connectors will be included in the cost of the fiber optic cable.

Testing shall be in accordance with Article 801.13(d). Electronic files of OTDR signature traces shall be provided in the Final project documentation with certification from the Contractor that attenuation of each fiber does not exceed 3.5 dB/km nominal at 850nm for multimode fiber and 0.4 bd/km nominal at 1300nm for single mode fiber.

Basis of Payment
The work shall be paid for at the contract unit price for FIBER OPTIC CABLE IN CONDUIT, NO. 62.5/125, MM12F SM36F, per (meter) foot for the cable in place, including distribution enclosure and all connectors.

MAST ARM ASSEMBLY AND POLE.

Revise Article 877.01 of the Standard Specifications to read:

Description
This work shall consist of furnishing and installing a steel mast arm assembly and pole and a galvanized steel or extruded aluminum shroud for protection of the base plate.

Revise Article 877.03 of the Standard Specifications:

Mast arm assembly and pole shall be as follows.

(a) Steel Mast Arm Assembly and Pole and Steel Combination Mast Arm Assembly and Pole. The steel mast arm assembly and pole and steel combination mast arm assembly and pole shall consist of a traffic signal mast arm, a luminaire mast arm or davit (for combination pole only), a pole, and a base, together with anchor rods and other appurtenances. The configuration of the mast arm assembly, pole, and base shall be according to the details shown on the plans.

(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 "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 6th Edition, with 2015 Interim Revisions for 80 mph (130 km/hr) wind velocity. However, the arm-to-pole connection for tapered signal and luminaire arms shall be according to the "ring plate" detail as shown in Figure 11-1(f) of the 2002 Interim, to the AASHTO "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 2001 4th Edition.

(2) Structural Steel Grade. The mast arm and pole shall be fabricated according to ASTM A 595, Grade A or B, ASTM A 572 Grade 55, or ASTM A 1011 Grade 55 HSLAS Class 2. The base and flange plates shall be of structural steel according to AASHTO M 270 Grade 50 (M 270M Grade 345). Luminaire arms

and trussed arms 15 ft (4.5 m) or less shall be fabricated from one steel pipe or tube size according to ASTM A 53 Grade B or ASTM A 500 Grade B or C. All mast arm assemblies, poles, and bases shall be galvanized according to AASHTO M 111.

(3) Fabrication. The design and fabrication of the mast arm assembly, pole, and base shall be according to the requirements of the Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals published by AASHTO. The mast arm and pole may be of single length or sectional design. If section design is used, the overlap shall be at least 150 percent of the maximum diameter of the overlapping section and shall be assembled in the factory.

The manufacturer will be allowed to slot the base plate in which other bolt circles may fit, providing that these slots do not offset the integrity of the pole. Circumferential welds of tapered arms and poles to base plates shall be full penetration welds.

(4) Shop Drawing Approval. The Contractor shall submit detailed drawings showing design materials, thickness of sections, weld sizes, and anchor rods to the Engineer for approval prior to fabrication. These drawings shall be at least 11 x 17 in. (275 x 425 mm) in size and of adequate quality for microfilming. All product data and shop drawings shall be submitted in electronic form on CD-ROM

(b) Anchor Rods. The anchor rods shall be ASTM F 1554 Grade 105, coated by the hot-dip galvanizing process according to AASHTO M 232, and shall be threaded a minimum of 7 1/2 in. (185 mm) at one end and have a bend at the other end. The first 12 in. (300 mm) at the threaded end shall be galvanized. Two nuts, one lock washer, and one flat washer shall be furnished with each anchor rod. All nuts and washers shall be galvanized.

(c) The shroud shall be of sufficient strength to deter pedestrian and vehicular damage and shall be constructed and designed to allow air to circulate throughout the mast arm. The shroud shall not extend beyond the beveled edge of the top of the mast arm pole foundation to assure ADA requirements are met and to prevent infestation of insects or other animals. All mounting hardware shall be stainless steel. Where a shroud cannot meet these requirements, a stainless steel screen mesh ¼ inch maximum opening with a minimum wore diameter of AWG 16 with a minimum 2 inch lap shall be installed to enclose the void between the base plate and the foundation. The stainless steel screen wire shall be formed to the shape of the base plate and fasten to the base plate with ¾ inch stainless steel banding. The screen wire shall overlap and be fastened with a ring type connector.

Add the following to Article 877.04 of the Standard Specifications:

The shroud or stainless screen mesh shall not be paid for separately but shall be included in the cost of the mast arm assembly and pole.

Materials

Add the following to Article 1077.03 (a) of the Standard Specifications:

Traffic signal mast arms shall be one piece construction, unless otherwise approved by the Engineer. All poles shall be galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with TRAFFIC SIGNAL PAINTING specifications.

CONCRETE FOUNDATIONS

Add the following to Article 878.03 of the Standard Specifications:

All anchor bolts shall be according to Article 1006.09, with all anchor bolts hot dipped galvanized a minimum of 12 in. (300 mm) at the threaded end.

Foundations used for Combination Mast Arm Poles shall provide an extra 2-1/2 inch (65 mm) raceway.

No foundation is to be poured until the Resident Engineer gives his/her approval as to the depth of the foundation.

Add the following to the first paragraph of Article 878.05 of the Standard Specifications:

The price shall include a concrete apron in front of the cabinet and UPS as shown in the plans or as directed by the engineer.

Concrete Foundations, Type "A" for Traffic Signal Posts shall provide anchor bolts with the bolt pattern specified within the "District 1 Standard Traffic Signal Design Details." All Type “A" foundations shall be a minimum depth of 1.22 m (48”).

Concrete Foundations, Type “C” for Traffic Signal Cabinets with Uninterruptible Power Supply (UPS) cabinet installations shall be a combined concrete foundation with the UPS portion of the foundation located on the signal power panel side of the controller foundation. The dimensions of the Type C foundation shall be a minimum of 72 inches long and 36 inches wide. All Type “C” foundations shall be a minimum depth of 48 inches. The concrete apron in front Type IV or V cabinet shall be 36 in. x 72 in. x 5 in. The concrete apron in front of the UPS cabinet shall be 36 in. x 72 in. x 5 in. Anchor bolts shall provide bolt spacing as required by the manufacturer.

Concrete Foundations, Type “D” for Traffic Signal Cabinets shall be a minimum of 48 inches (1.22 m) long and 31 inches (790 mm) wide. All Type “D” foundations shall be a minimum depth of 48 inches (1.22 m). The concrete apron shall be 36 in. x 48 in. x 5 in. (910 mm X 1220 mm X 130 mm). Anchor bolts shall provide bolt spacing as required by the manufacturer.

Concrete Foundations, Type "E" for Mast Arm and Combination Mast Arm Poles shall meet the current requirements listed in the Highway Standards.

LIGHT EMITTING DIODE (LED) SIGNAL HEAD AND OPTICALLY PROGRAMMED LED SIGNAL HEAD

Add the following to the first paragraph of Article 880.04 of the Standard Specifications:

Basis of Payment
The price shall include furnishing the equipment described above, all mounting hardware and installing them in satisfactory operating condition.

LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD

Add the following to the third paragraph of Article 881.03 of the Standard Specifications:

No mixing of different types of pedestrian traffic signals or displays will be permitted.

Add the following to Article 881.03 of the Standard Specifications:

(a) Pedestrian Countdown Signal Heads.

(1) Pedestrian Countdown Signal Heads shall not be installed at signalized intersections where traffic signals and railroad warning devices are interconnected.

(2) Pedestrian Countdown Signal Heads shall be 16 inch (406mm) x 18 inch (457mm), for single units with the housings **glossy yellow** polycarbonate. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to the inspector at the signal turn-on.

(3) Each pedestrian signal LED module shall be fully MUTCD compliant and shall consist of double overlay message combining full LED symbols of an Upraised Hand and a Walking Person. "Egg Crate" type sun shields are not permitted. Numerals shall measure 9 inches (229mm) in height and easily identified from a distance of 120 feet (36.6m).

Add the following to Article 881.04 of the Standard Specifications:

Basis of Payment
The price shall include furnishing the equipment described above, all mounting hardwire and installing them in satisfactory operating condition.

EMERGENCY VEHICLE PRIORITY SYSTEM.

Revise Section 887 of the Standard Specifications to read:

It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle pre-emption equipment to be installed prior to the contract bidding. The equipment must be completely compatible with all components of the equipment currently in use by the Agency.

All new installations shall be equipped with Confirmation Beacons as shown on the "District One Standard Traffic Signal Design Details." The Confirmation Beacon shall consist of a 6 watt Par 38 LED flood lamp with a 30 degree light spread, or a 7 watt Par 30 LED flood lamp with a 15 degree or greater spread, maximum 7 watt energy consumption at 120V, and a 2,000 hour warranty for each direction of pre-emption. The lamp shall have an adjustable mount with a weatherproof enclosure for cable splicing. All hardware shall be cast aluminum or stainless steel. Holes drilled into signal poles, mast arms, or posts shall require rubber grommets. In order to maintain uniformity between communities, the confirmation beacons shall indicate when the control equipment receives the pre-emption signal. The pre-emption movement shall be signalized by a flashing indication at the rate specified by

Section 4L.01 of the "Manual on Uniform Traffic Control Devices," and other applicable sections of future editions. The stopped pre-empted movements shall be signalized by a continuous indication.

All light operated systems shall include security and transit preemption software and operate at a uniform rate of 14.035 Hz ±0.002, or as otherwise required by the Engineer, and provide compatible operation with other light systems currently being operated in the District.

This item shall include any required modifications to an existing traffic signal controller as a result of the addition of the EMERGENCY VEHICLE PRIORITY SYSTEM.

Basis of Payment

The work shall be paid for at the contract unit price each for furnishing and installing LIGHT DETECTOR and LIGHT DETECTOR AMPLIFIER. Furnishing and installing the confirmation beacon shall be included in the cost of the Light Detector. Any required modifications to the traffic signal controller shall be included in the cost of the LIGHT DETECTOR AMPLIFIER. The preemption detector amplifier shall be paid for on a basis of (1) one each per intersection controller and shall provide operation for all movements required in the pre-emption phase sequence.

CONFIRMATION BEACON

This item shall consist of furnishing and installing a Traffic Signal Emergency Confirmation Beacon (single channel or dual channel) at the locations specified on the plans and as described as follows for intersections which have existing emergency preemption systems previously installed.

Confirmation Beacon, Single Channel - Where the light detector is used to detect a single direction of traffic, one LED lamp for only that direction shall be provided. In cases where the detector covers opposing directions of traffic and has a single output, a separate lamp for each direction shall be provided but they shall have identical indications.

Confirmation Beacon, Dual Channel - A separate LED lamp with appropriate separate indications for each direction shall be provided.

It shall be the Contractor's responsibility to verify the existing brand of emergency vehicle equipment at the intersection and the confirmation beacons must be completely compatible with all existing components. The Confirmation Beacon shall consist of a 6 watt Par 38 LED flood lamp with a 30 degree light spread, or a 7 watt Par 30 LED flood lamp with a 15 degree or greater spread, maximum 7 watt energy consumption at 120V, and a 2,000 hour warranty for each direction of pre-emption. The lamp shall have an adjustable mount with a weatherproof enclosure for cable splicing. All hardware shall be cast aluminum or stainless steel. No new holes may be drilled into signal poles, mast arms, or posts. The Confirmation Beacon shall be mounted to the existing light detector hardware as shown on the mounting detail in the plans. In order to maintain uniformity between communities, the Confirmation Beacons shall indicate when the control equipment receives the pre-emption signal. The pre-emption movement shall be signalized by a flashing indication at the rate specified by Section 4L.01 of the "Manual on Uniform Traffic Control Devices," and other applicable sections of future editions. The stopped pre-empted movements shall be signalized by a continuous indication.

Any modification required to the existing light detector installation to meet the requirements of the mounting detail shown in the plans shall be included in this item.

Basis of Payment
This work will be paid for at the contract unit price per each for CONFIRMATION BEACON.

TEMPORARY TRAFFIC SIGNAL INSTALLATION.

Revise Section 890 of the Standard Specifications to read:

Description
This work shall consist of furnishing, installing, maintaining, and removing a temporary traffic signal installation as shown on the plans, including but not limited to temporary signal heads, emergency vehicle priority systems, interconnect, vehicle detectors, uninterruptible power supply, and signing. Temporary traffic signal controllers and cabinets interconnected to railroad traffic control devices shall be new. When temporary traffic signals will be operating within a county or local agency Traffic Management System, the equipment must be NTCIP compliant and compatible with the current operating requirements of the Traffic Management System.

General
Only an approved equipment vendor will be allowed to assemble the temporary traffic signal cabinet. Also, an approved equipment vendor shall assemble and test a temporary railroad traffic signal cabinet. (Refer to the "Inspection of Controller and Cabinet" specification). A representative of the approved control equipment vendor shall be present at the temporary traffic signal turn-on inspection.

Construction Requirements
(a) Controllers.

1. Only controllers supplied by one of the District approved closed loop equipment manufacturers will be approved for use at temporary signal locations. All controllers used for temporary traffic signals shall be fully actuated NEMA microprocessor based with RS232 data entry ports compatible with existing monitoring software approved by IDOT District 1, installed in TS2 cabinets with 8 phase back panels, capable of supplying 255 seconds of cycle length and individual phase length settings up to 99 seconds. On projects with one lane open and two way traffic flow, such as bridge deck repairs, the temporary signal controller shall be capable of providing an adjustable all red clearance setting of up to 30 seconds in length. All controllers used for temporary traffic signals shall meet or exceed the requirements of Section 857 of the Standard Specifications with regards to internal time base coordination and preemption. All railroad interconnected temporary controllers and cabinets shall be new and shall satisfy the requirements of Article 857.02 of the Standard Specifications as modified herein.

2. Only control equipment, including controller cabinet and peripheral equipment, supplied by one of the District approved closed loop equipment manufacturers will be approved for use at temporary traffic signal locations. All control equipment for the temporary traffic signal(s) shall be furnished by the Contractor unless otherwise stated in the plans. On projects with multiple temporary traffic signal installations, all controllers shall be the same manufacturer brand and model number with current software installed.

(b) Cabinets. All temporary traffic signal cabinets shall have a closed bottom made of aluminum alloy. The bottom shall be sealed along the entire perimeter of the cabinet base to ensure a water, dust and insect-proof seal. The bottom shall provide a minimum of two (2) 4 inch (100 mm) diameter holes to

run the electric cables through. The 4 inch (100 mm) diameter holes shall have a bushing installed to protect the electric cables and shall be sealed after the electric cables are installed.

(c) Grounding. Grounding shall be provided for the temporary traffic signal cabinet meeting or exceeding the applicable portions of the National Electrical Code, Section 807 of the Standard Specifications and shall meet the requirements of the District 1 Traffic Signal Specifications for "Grounding of Traffic Signal Systems".

(d) Traffic Signal Heads. All traffic signal sections and pedestrian signal sections shall be 12 inches (300 mm). Traffic signal sections shall be LED with expandable view, unless otherwise approved by the Engineer. Pedestrian signal heads shall be Light Emitting Diode (LED) Pedestrian Countdown Signal Heads except when a temporary traffic signal is installed at an intersection interconnected with a railroad grade crossing. When a temporary traffic signal is installed at an intersection interconnected with a railroad grade crossing, Light Emitting Diode (LED) Pedestrian Signal Heads shall be furnished. The temporary traffic signal heads shall be placed as indicated on the temporary traffic signal plan or as directed by the Engineer. The Contractor shall furnish enough extra cable length to relocate heads to any position on the span wire or at locations illustrated on the plans for construction staging. The temporary traffic signal shall remain in operation during all signal head relocations. Each temporary traffic signal head shall have its own cable from the controller cabinet to the signal head.

(e) Interconnect.

1. Temporary traffic signal interconnect shall be provided using fiber optic cable or wireless interconnect technology as specified in the plans. The Contractor may request, in writing, to substitute the fiber optic temporary interconnect indicated in the contract documents with a wireless interconnect. The Contractor must provide assurances that the radio device will operate properly at all times and during all construction staging. If approved for use by the Engineer, the Contractor shall submit marked-up traffic signal plans indicating locations of radios and antennas and installation details. If wireless interconnect is used, and in the opinion of the engineer, it is not viable, or if it fails during testing or operations, the Contractor shall be responsible for installing all necessary poles, fiber optic cable, and other infrastructure for providing temporary fiber optic interconnect at no cost to the contract.

2. The existing system interconnect and phone lines are to be maintained as part of the Temporary Traffic Signal Installation specified for on the plan. The interconnect shall be installed into the temporary controller cabinet as per the notes or details on the plans. All labor and equipment required to install and maintain the existing interconnect as part of the Temporary Traffic Signal Installation shall be included in the item Temporary Traffic Signal Installation. When shown in the plans, temporary traffic signal interconnect equipment shall be furnished and installed. The temporary traffic signal interconnect shall maintain interconnect communications throughout the entire signal system for the duration of the project.

3. Temporary wireless interconnect, compete. The radio interconnect system shall be compatible with Eagle or Econolite controller closed loop systems. This item shall include all materials, labor and testing to provide the completely operational closed loop system as shown on the plans. The radio interconnect system shall include the following components:

a. Rack or Shelf Mounted RS-232 Frequency Hopping Spread Spectrum (FHSS) Radio
b. Software for Radio Configuration (Configure Frequency and Hopping Patterns)
c. Antennas (Omni Directional or Yagi Directional)
d. Antenna Cables, LMR400, Low Loss. Max. 100-ft from controller cabinet to antenna
e. Brackets, Mounting Hardware, and Accessories Required for Installation
f. RS232 Data Cable for Connection from the radio to the local or master controller
g. All other components required for a fully functional radio interconnect system

All controller cabinet modifications and other modifications to existing equipment that are required for the installation of the radio interconnect system components shall be included in this item.

The radio interconnect system may operate at 900Mhz (902-928) or 2.4 Ghz depending on the results of a site survey. The telemetry shall have an acceptable rate of transmission errors, time outs, etc. comparable to that of a hardwire system.

The proposed master controller and telemetry module shall be configured for use with the radio interconnect at a minimum rate of 9600 baud.

The radio interconnect system shall include all other components required for a complete and fully functional telemetry system and shall be installed in accordance to the manufacturers recommendations.

The following radio equipment is currently approved for use in Region One/District One: Encon Model 5100 and Intuicom Communicator II.

(f) Emergency Vehicle Pre-Emption. All emergency vehicle preemption equipment (light detectors, light detector amplifiers, confirmation beacons, etc.) as shown on the temporary traffic signal plans shall be provided by the Contractor. It shall be the Contractor's responsibility to contact the municipality or fire district to verify the brand of emergency vehicle preemption equipment to be installed prior to the contract bidding. The equipment must be completely compatible with all components of the equipment currently in use by the Agency. All light operated systems shall operate at a uniform rate of 14.035 hz ±0.002, or as otherwise required by the Engineer, and provide compatible operation with other light systems currently being operated in the District. All labor and material required to install and maintain the Emergency Vehicle Preemption installation shall be included in the item Temporary Traffic Signal Installation.

(g) Vehicle Detection. All temporary traffic signal installations shall have vehicular detection installed as shown on the plans or as directed by the Engineer. Pedestrian push buttons shall be provided for all pedestrian signal heads/phases as shown on the plans or as directed by the Engineer. All approaches shall have vehicular detection provided by Video Vehicle Detection System as shown on the plans or as directed by the Engineer. The microwave vehicle sensor or video vehicle detection system shall be approved by IDOT before furnishing and installing. The Contractor shall install, wire, and adjust the alignment of the microwave vehicle sensor or video vehicle detection system in accordance to the manufacturer's recommendations and requirements. The Contractor shall be responsible for adjusting the alignment of the microwave vehicle sensor or video vehicle detection system for all construction staging changes and for maintaining proper alignment throughout the project. A representative of the

approved control equipment vendor shall be present and assist the contractor in setting up and maintaining the microwave vehicle sensor or video vehicle detection system. An in-cabinet video monitor shall be provided with all video vehicle detection systems and shall be included in the item Temporary Traffic Signal Installation.

(h) Uninterruptible Power Supply. All temporary traffic signal installations shall have Uninterruptible Power Supply (UPS). The UPS cabinet shall be mounted to the temporary traffic signal cabinet and meet the requirements of Uninterruptible Power Supply in Divisions 800 and 1000 of these specifications.

(i) Signs. All existing street name and intersection regulatory signs shall be removed from existing poles and relocated to the temporary signal span wire. If new mast arm assembly and pole(s) and posts are specified for the permanent signals, the signs shall be relocated to the new equipment at no extra cost.

(j) Energy Charges. The electrical utility energy charges for the operation of the traffic signal installation shall be paid for by others if the installation replaces an existing signal. Otherwise charges shall be paid for under 109.05 of the Standard Specifications.

(k) Maintenance. Maintenance shall meet the requirements of the Standard Specifications and MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION in Division 800 of these specifications. Maintenance of temporary signals and of the existing signals shall be included in the cost of the TEMPORARY TRAFFIC SIGNAL INSTALLATION pay item. When temporary traffic signals are to be installed at locations where existing signals are presently operating, the Contractor shall be fully responsible for the maintenance of the existing signal installation as soon as he begins any physical work on the Contract or any portion thereof. In addition, a minimum of seven (7) days prior to assuming maintenance of the existing traffic signal installation(s) under this Contract, the Contractor shall request that the Resident Engineer contact the County's Traffic Operations Engineer (815) 334-4960 for an inspection of the installation(s).

(l) Temporary Traffic Signals for Bridge Projects. Temporary Traffic Signals for bridge projects shall follow the State Standards, Standard Specifications, District 1 Traffic Signal Specifications and any plans for Bridge Temporary Traffic Signals included in the plans. The installation shall meet the above requirements for "Temporary Traffic Signal Installation". In addition all electric cable shall be aerially suspended, at a minimum height of 18 feet (5.5m), on temporary wood poles (Class 5 or better) of 45 feet (13.7 m), minimum height. The signal heads shall be span wire mounted or bracket mounted to the wood pole or as directed by the Engineer. The Controller cabinet shall be mounted to the wood pole or as directed by the Engineer. Microwave vehicle sensors or video vehicle detection may be used in place of the detector loops as approved by the Engineer.

(m) Temporary Portable Traffic Signal for Bridge Projects.

1. Unless otherwise directed by the Engineer, temporary portable traffic signals shall be restricted to use on roadways of less than 8000 ADT that have limited access to electric utility service, shall not be installed on projects where the estimated need exceeds ten (10) weeks, and shall not be in operation during the period of November through March. The Contractor shall replace the temporary portable traffic signals with temporary span wire traffic signals noted herein at no cost to the contract if the bridge project or Engineer requires temporary

traffic signals to remain in operation into any part of period of November through March. If, in the opinion of the engineer, the reliability and safety of the temporary portable traffic signal is not similar to that of a temporary span wire traffic signal installation, the Contractor shall replace the temporary portable traffic signals with temporary span wire traffic signals noted herein at no cost to the contract.

2. The controller and LED signal displays shall meet the Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION specification.

3. Work shall be according to Article 701.18(b) of the Standard Specifications except as noted herein.

4. General.

   a. The temporary portable bridge traffic signals shall be trailer-mounted units. The trailer-mounted units shall be set up securely and level. Each unit shall be self-contained and consist of two signal heads. The left signal head shall be mounted on a mast arm capable of extending over the travel lane. Each unit shall contain a solar cell system to facilitate battery charging. There shall be a minimum of 12 days backup reserve battery supply and the units shall be capable of operating with a 120 V power supply from a generator or electrical service.

   b. All signal heads located over the travel lane shall be mounted at a minimum height of 17 feet (5m) from the bottom of the signal back plate to the top of the road surface. All far right signal heads located outside the travel lane shall be mounted at a minimum height of 8 feet (2.5m) from the bottom of the signal back plate to the top of the adjacent travel lane surface.

   c. The long all red intervals for the traffic signal controller shall be adjustable up to 250 seconds in one-second increments.

   d. As an alternative to detector loops, temporary portable bridge traffic signals may be equipped with microwave sensors or other approved methods of vehicle detection and traffic actuation.

   e. All portable traffic signal units shall be interconnected using hardwire communication cable. Radio communication equipment may be used only with the approval of the Engineer. If radio communication is used, a site analysis shall be completed to ensure that there is no interference present that would affect the traffic signal operation. The radio equipment shall meet all applicable FCC requirements.

   f. The temporary portable bridge traffic signal system shall meet the physical display and operational requirements of conventional traffic signals as specified in Part IV of the Manual on Uniform Traffic Control Devices (MUTCD). The signal system shall be designed to continuously operate over an ambient temperature range between -30 ºF (-34 ºC) and 120 ºF (48 ºC). When not being utilized to inform and direct traffic, portable signals shall be treated as nonoperating equipment according to Article 701.11.

g. Basis of Payment. This work will be paid for according to Article 701.20(c).

Basis of Payment
This work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL INSTALLATION, TEMPORARY BRIDGE TRAFFIC SIGNAL INSTALLATION, or TEMPORARY PORTABLE BRIDGE TRAFFIC SIGNAL INSTALLATION. The price of which shall include all costs for the modifications required for traffic staging, changes in signal phasing as required in the Contract plans, microwave vehicle sensors, video vehicle detection system, any maintenance or adjustment to the microwave vehicle sensors/video vehicle detection system, all material required, the installation and complete removal of the temporary traffic signal.

REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT

Add the following to Section 895.05 of the Standard Specifications:

The traffic signal equipment, which is to be removed and is to become the property of the Contractor shall be disposed of by them outside the right-of-way at their expense.

All equipment to be returned to the County shall be delivered by the Contractor to the County's Traffic Signal Maintenance Contractor's main facility. The Contractor shall contact the County's Electrical Maintenance Contractor to schedule an appointment to deliver the equipment. No equipment will be accepted without a prior appointment. All equipment shall be delivered within 30 days of removing it from the traffic signal installation. The Contractor shall provide 5 copies of a list of equipment that is to remain the property of the State, including model and serial numbers, where applicable. He shall also provide a copy of the Contract plan or special provision showing the quantities and type of equipment. Controllers and peripheral equipment from the same location shall be boxed together (equipment from different locations may not be mixed) and all boxes and controller cabinets shall be clearly marked or labeled with the location from which they were removed. If equipment is not returned with these requirements, it will be rejected by the County's Electrical Maintenance Contractor. The Contractor shall be responsible for the condition of the traffic signal equipment from the time he takes maintenance of the signal installation until the acceptance of a receipt drawn by the County's Electrical Maintenance Contractor indicating the items have been returned in good condition.

The Contractor shall safely store and arrange for pick up of all equipment to be returned to agencies other than the State. The Contractor shall package the equipment and provide all necessary documentation as stated above.

Traffic signal equipment, which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of these Specifications.

TRAFFIC SIGNAL PAINTING

Description
This work shall include surface preparation, powder type painted finish application and packaging of new galvanized steel traffic signal mast arm poles and posts assemblies. All work associated with applying the painted finish shall be performed at the manufacturing facility for the pole assembly or post or at a painting facility approved by the

Engineer. Traffic signal mast arm shrouds and post bases shall also be painted the same color as the pole assemblies and posts.

Surface Preparation

All weld flux and other contaminates shall be mechanically removed. The traffic mast arms and post assemblies shall be degreased, cleaned, and air dried to assure all moisture is removed.

Painted Finish

All galvanized exterior surfaces shall be coated with a urethane or triglycidyl isocyanurate (TGIC) polyester powder to a dry film thickness of 2.0 mils. Prior to application, the surface shall be mechanically etched by brush blasting (Ref. SSPC-SP7) and the zinc coated substrate preheated to 450 degrees F for a minimum one (1) hour. The coating shall be electrostatically applied and cured by elevating the zinc-coated substrate temperature to a minimum of 400 degrees F.

The finish paint color shall be one of the manufacturer's standard colors and shall be as selected by the local agency responsible for paint costs. The Contractor shall confirm, in writing, the color selection with the local responsible agency and provide a copy of the approval to the Engineer and a copy of the approval shall be included in the material catalog submittal.

Traffic signal heads, pedestrian signal heads and controller cabinets are not included in this pay item.

Any damage to the finish after leaving the manufacturer's facility shall be repaired to the satisfaction of the Engineer using a method approvable by the Engineer and manufacturer. If while at the manufacturer's facility the finish is damaged, the finish shall be re-applied.

Warranty

The Contractor shall furnish in writing to the Engineer, the paint manufacturer's standard warranty and certification that the paint system has been properly applied.

Packaging

Prior to shipping, the poles and posts shall be wrapped in ultraviolet-inhibiting plastic foam or rubberized foam.

Basis of Payment

This work shall be paid for at the contract unit price each for PAINT NEW MAST ARM POLE, UNDER 40 FEET (12.19 METER); PAINT NEW MAST ARM POLE, 40 FEET (12.19 METER) AND OVER; PAINT NEW COMBINATION MAST ARM POLE, UNDER 40 FEET (12.19 METER); PAINT NEW COMBINATION MAST ARM POLE, 40 FEET (12.19 METER) AND OVER; or TRAFFIC SIGNAL POST of any height, which shall be payment in full for painting and packaging the traffic signal mast arm poles and posts described above including all shrouds, bases and appurtenances.

ILLUMINATED STREET NAME SIGN

Description
This work shall consist of furnishing and installing a LED internally illuminated street name sign.

Materials
The illuminated street name sign shall be as follows.

(a) Description.
The LEDs shall be white in color and utilize InGaN or UV thermally efficient technology. The LED Light Engines shall be designed to fit inside a standard fluorescent illuminated street sign housing in lieu of fluorescent lamps and ballasts or a slim line type housing. The LED internally-illuminated street name sign shall display the designated street name clearly and legibly in the daylight hours without being energized and at night when energized. The sign assemblies are generally available in four-, six-, or eight-foot lengths but are also available in 6 inch increments. White translucent 3M DG^3 reflective sheeting sign faces with the street name applied in 3M/Scotchlite Series 1177 transparent green shall be installed in hinged doors on the side of the sign for easy access to perform general cleaning and maintenance operations. Illumination shall occur with LED Light Engine as specified.

(b) Environmental Requirements.
The LED lamp shall be rated for use in the ambient operating temperature range of -40 to +50^{o}C (-40 to +122^{o}F) for storage in the ambient temperature range of -40 to +75^{o}C (-40 to +167^{o}F).

(c) General Construction.
1. The LED Light Engine shall be a single, self-contained device, for installation in an existing street sign housing. The power supply must be designed to fit and mounted on the inside wall at one end of the street sign housing. The LED components, power supply, and wiring harness shall be arranged as to allow for maintenance, up to and including the replacement of all three components, by the local Agency where the sign is installed. The LED Light Engine shall be mounted in the top and/or bottom of the sign housing and no components of the light source shall sit between the sign faces.

2. The assembly and manufacturing processes of the LED Light Engine shall be designed to ensure that all LED and electronic components are adequately supported to withstand mechanical shocks and vibrations in compliance with the specifications of the ANSI, C136.31-2001 standards.

3. The Manufacturer/Vendor shall supply shop drawings of the fixtures, sign, sign message and mounting hardware for approval. All hardware used to install the sign shall be in accordance with the manufacturer's recommendations.

(d) Mechanical Construction.
1. The sign shall be constructed using a weatherproof, aluminum housing consisting of an extruded aluminum top with a minimum thickness of .140" x 10 ¾" deep (including the drip edge). The extruded aluminum bottom is .094" thick x 5 7/8" deep. The ends of the housing shall be cast aluminum with a minimum thickness of .250". A six-foot sign shall be 72 5/8" long and 22 5/16" tall and not weigh more than 77 pounds. An eight-foot sign shall be 96 5/8" long and 22 5/16" tall and not weigh more than 92 pounds. sign shall be constructed using a weatherproof, aluminum housing consisting of an extruded aluminum with the maximum sign dimensions of 30" in height, 96" in length, 10.75" in depth (including the drip edge) and

shall not weight more than 92 pounds. All corners are continuous TIG (Tungsten Inert Gas) welded to provide a weatherproof seal around the entire housing.

2. The door shall be constructed of extruded aluminum. Two corners are continuous TIG welded with the other two screwed together to make one side of the door removable for installation of the sign face. The door is fastened to the housing on the bottom by a full length, .040" x 1 1/8" open stainless steel hinge. The sign shall also be fabricated in a way to ensure that no components fall out while a technician is opening or working inside the sign enclosure. The door shall be held secure onto a 1" wide by 5/32" thick neoprene gasket by three (six total for two-way sign) quarter-turn fasteners to form a watertight seal between the door and the housing.

3. The sign face shall be constructed of .125" white translucent polycarbonate or acrylic. Sign legend shall be according to D1 Mast Arm Mounted Street Name Sign detail and MUTCD. The sign face legend background shall consist of 3M/Scotchlite Series 4090T translucent diamond grade DG3 white and 3M/Scotchlite Series 1177 film applied to the front of the sign face and transparent green acrylic EC (electronic cut-able) film applied to the front of the sign face. The legend shall be framed by a white border. A logo symbol and/or name of the community may be included with approval of the Engineer.

4. All surfaces of the sign shall be unpainted and of a natural finish.

5. All fasteners and hardware shall be corrosion resistant stainless steel. No special tools shall be required for routine maintenance.

6. All wiring shall be secured by insulated wire compression nuts or barrier type terminal blocks.

7. A wire entrance junction box shall be supplied with the sign assembly. The box may be supplied mounted to the exterior or interior of the sign and provide a weather tight seal.

8. Each sign shall be activated by the same photocell/power panel mounted/installed inside the traffic signal cabinet on the left side of the cabinet when facing into the cabinet. All signs shall be wired to the same power panel with lighting contactor sized for the power consumption of the LED signs. The photo-cell shall be mounted above the door and under the lip of the signal cabinet on the left side of the cabinet. Each sign shall be individually fused.

9. Brackets and Mounting: LED internally illuminated street name signs will be factory drilled to accommodate mast arm two-point support assembly mounting brackets.

(e) Electrical.

1. Photocell shall be rated 105-305V, turn on at 1.5 fcs. with a 3-5 second delay. A manufacturer's warranty of six (6) years shall be provided. Power consumption shall be no greater than 1 watt at 120V.

2. The LED Light Engine shall operate from a 60 +- 3 cycle AC line power over a voltage range of 80 to 135 Vac rms. Fluctuations in line voltage over the range of 80 to 135 Vac shall not affect luminous intensity by more than +- 10%.

3. Total harmonic distortion induced into the AC power line by the LED Light Engine, operated at a nominal operating voltage, and at a temperature of +25^{o}C (+77^{o}F), shall not exceed 20%.

4. The LED Light Engine shall cycled ON and OFF with a photocell as shown on the detail sheet and shall not exceed the following maximum power values:

4-Foot Sign	60 W max
6-Foot Sign or less	90 W max
8-Foot Sign or less	120 W max

The signs shall not be energized when traffic signals are powered by an alternate energy source such as a generator or uninterruptable power source (UPS). The signs shall be connected to the generator or UPS bypass circuitry.

(f) Photometric Requirements.

1. The entire surface of the sign panel shall be evenly illuminated. The average maintained luminous intensity measured across the letters, operating under the conditions defined in Environmental Requirements and Wattage Sections shall be of a minimum value of 100 cd/m^2.

2. The manufacturer shall make available independent laboratory test results to verify compliance to Voltage Range and Luminous Intensity Distribution Sections.

3. Twelve (12) 1.25 watt LED units shall be mounted on 1-inch x 22-inch metal cone printed circuit boards (MCPCB). The viewing angle shall be 120 degrees. LED shall have a color temperature of 5200k nominal, CRI of 80 with a life expectancy of 75,000 hrs.

(g) Quality Assurance.

The LED Light Engine shall be manufactured in accordance with a vendor quality assurance (QA) program. The production QA shall include statistically controlled routine tests to ensure minimum performance levels of the LED Light Engine build to meet this specification. QA process and test result documentations shall be kept on file for a minimum period of seven (7) years. The LED Light Engine that does not satisfy the production QA testing performance requirements shall not be labeled, advertised, or sold as conforming to these specifications. Each LED Light Engine shall be identified by a manufacturer's serial number for warranty purposes. LED Light Engines shall be replaced or repaired if they fail to function as intended due to workmanship or material defects within the first sixty (60) months from the date of acceptance. LED Light Engines that exhibit luminous intensities less than the minimum value specified in Photometric Section within the first thirty-six (36) months from the date of acceptance shall be replaced or repaired.

Installation

The sign can be mounted on most steel mast arm poles. Mounting on aluminum mast arm pole requires supporting structural calculations. Some older or special designed steel mast arm poles may require structural evaluation to assure that construction of the mast arm pole is adequate for the proposed additional loading. Structural calculations and other supporting documentation as determined by the Engineer shall be provided by the contractor for review by the Department.

The sign shall be located on a steel traffic signal mast arm no further than 8-feet from the center of the pole to the center of the sign at a height of between 16 to 18-feet above traveled pavement. Mounting hardware shall be from an approved vendor, utilizing stainless steel components.

Signs shall be installed such that they are not energized when traffic signals are powered by an alternate energy source such as a generator or uninterruptable power supply (UPS). The signs shall be connected to the generator or UPS bypass circuitry.

Basis of Payment
This work will be paid for at the contract unit price each for LED INTERNALLY ILLUMINATED STREET NAME SIGN, of the length as specified in the contract plans which shall be payment in full for furnishing and installing the LED internally illuminated street name sign, complete with circuitry and mounting hardware including photo cell, circuit breaker, fusing, relay, connections and cabling as shown on the plans for proper operation and installation.

RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM

Description
This work shall consist of re-optimizing a closed loop traffic signal system according to the following Levels of work.

LEVEL I applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system. The purpose of this work is to integrate the improvements to the subject intersection into the signal system while minimizing the impacts to the existing system operation. This type of work would be commonly associated with the addition of signal phases, pedestrian phases, or improvements that do not affect the capacity at an intersection.

LEVEL II applies when improvements are made to an existing signalized intersection within an existing closed loop traffic signal system and detailed analysis of the intersection operation is desired by the engineer, or when a new signalized or existing signalized intersection is being added to an existing system, but optimization of the entire system is not required. The purpose of this work is to optimize the subject intersection, while integrating it into the existing signal system with limited impact to the system operations. This item also includes an evaluation of the overall system operation, including the traffic responsive program.

For the purposes of re-optimization work, an intersection shall include all traffic movements operated by the subject controller and cabinet.

After the signal improvements are completed, the signal shall be re-optimized as specified by an approved Consultant who has previous experience in optimizing Closed Loop Traffic Signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (847) 705-4424 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as note herein.

A listing of existing signal equipment, interconnect information, phasing data, and timing patterns may be obtained from the Department, if available and as appropriate. The existing SCAT Report is available for review at the District One office and if the Consultant provides blank computer disks, copies of computer simulation files for the existing optimized system and a timing database that includes intersection displays will be made for the Consultant. The Consultant shall confer with the Traffic Signal Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) LEVEL I Re-Optimization

1. The following tasks are associated with LEVEL I Re-Optimization.
   a. Appropriate signal timings shall be developed for the subject intersection and existing timings shall be utilized for the rest of the intersections in the system.
   b. Proposed signal timing plan for the new or modified intersection(s) shall be forwarded to IDOT for review prior to implementation.
   c. Consultant shall conduct on-site implementation of the timings at the turn-on and make fine-tuning adjustments to the timings of the subject intersection in the field to alleviate observed adverse operating conditions and to enhance operations. The consultant shall respond to IDOT comments and public complaints for a minimum period of 60 days from date of timing plan implementation.

2. The following deliverables shall be provided for LEVEL I Re-Optimization.
   a. Consultant shall furnish to IDOT a cover letter describing the extent of the re-optimization work performed.
   b. Consultant shall furnish an updated intersection graphic display for the subject intersection to IDOT and to IDOT's Traffic Signal Maintenance Contractor.

(b) LEVEL II Re-Optimization

1. In addition to the requirements described in the LEVEL I Re-Optimization above, the following tasks are associated with LEVEL II Re-Optimization.
   a. Traffic counts shall be taken at the subject intersection after the traffic signals are approved for operation by the Area Traffic Signal Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday and on a Saturday or Sunday, as directed by the Engineer, to account for special traffic generators such as shopping centers, educational institutes and special event facilities. The turning movement counts shall identify cars, and single-unit, multi-unit heavy vehicles, and transit buses.
   b. As necessary, the intersections shall be re-addressed and all system detectors reassigned in the master controller according to the current standard of District One.
   c. Traffic responsive program operation shall be evaluated to verify proper pattern selection and lack of oscillation and a report of the operation shall be provided to IDOT.

2. The following deliverables shall be provided for LEVEL II Re-Optimization.
   a. Consultant shall furnish to IDOT one (1) copy of a technical memorandum for the optimized system. The technical memorandum shall include the following elements:
      (1) Brief description of the project
      (2) Printed copies of the analysis output from Synchro (or other appropriate, approved optimization software file)
      (3) Printed copies of the traffic counts conducted at the subject intersection
   b. Consultant shall furnish to IDOT two (2) CDs for the optimized system. The CDs shall include the following elements:
      (1) Electronic copy of the technical memorandum in PDF format
      (2) Revised Synchro files (or other appropriate, approved optimization software file) including the new signal and the rest of the signals in the closed loop system

(3) Traffic counts conducted at the subject intersection
(4) New or updated intersection graphic display file for the subject intersection
(5) The CD shall be labeled with the IDOT system number and master location, as well as the submittal date and the consultant logo. The CD case shall include a clearly readable label displaying the same information securely affixed to the side and front.

Basis of Payment
This work shall be paid for at the contract unit price each for RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL I or RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM – LEVEL II, which price shall be payment in full for performing all work described herein per intersection. Following completion of the timings and submittal of specified deliverables, 100 percent of the bid price will be paid. Each intersection will be paid for separately.

OPTIMIZE TRAFFIC SIGNAL SYSTEM

Description
This work shall consist of optimizing a closed loop traffic signal system.

OPTIMIZE TRAFFIC SIGNAL SYSTEM applies when a new or existing closed loop traffic signal system is to be optimized and a formal Signal Coordination and Timing (SCAT) Report is to be prepared. The purpose of this work is to improve system performance by optimizing traffic signal timings, developing a time of day program and a traffic responsive program.

After the signal improvements are completed, the signal system shall be optimized as specified by an approved Consultant who has previous experience in optimizing Closed Loop Traffic Signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (815) 334-4960 for a listing of approved Consultants. Traffic signal system optimization work, including fine-tuning adjustments of the optimized system, shall follow the requirements stated in the most recent IDOT District 1 SCAT Guidelines, except as note herein.

A listing of existing signal equipment, interconnect information, phasing data, and timing patterns may be obtained from the Department, if available and as appropriate. The existing SCAT Report is available for review at the District One office and if the Consultant provides blank computer disks, copies of computer simulation files for the existing optimized system and a timing database that includes intersection displays will be made for the Consultant. The Consultant shall confer with the Traffic Signal Engineer prior to optimizing the system to determine if any extraordinary conditions exist that would affect traffic flows in the vicinity of the system, in which case, the Consultant may be instructed to wait until the conditions return to normal or to follow specific instructions regarding the optimization.

(a) The following tasks are associated with OPTIMIZE TRAFFIC SIGNAL SYSTEM.

1. Appropriate signal timings and offsets shall be developed for each intersection and appropriate cycle lengths shall be developed for the closed loop signal system.

2. Traffic counts shall be taken at all intersections after the permanent traffic signals are approved for operation by the Area Traffic Signal Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from

midday Monday to midday Friday. The turning movement counts shall identify cars, and single-unit and multi-unit heavy vehicles.

3. As necessary, the intersections shall be re-addressed and all system detectors reassigned in the master controller according to the current standard of District One.

4. A traffic responsive program shall be developed, which considers both volume and occupancy. A time-of-day program shall be developed for used as a back-up system.

5. Proposed signal timing plan for the new or modified intersection shall be forwarded to MCDOT for review prior to implementation.

6. Consultant shall conduct on-site implementation of the timings and make fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.

7. Speed and delay studies shall be conducted during each of the count periods along the system corridor in the field before and after implementation of the proposed timing plans for comparative evaluations. These studies should utilize specialized electronic timing and measuring devices.

(b) The following deliverables shall be provided for OPTIMIZE TRAFFIC SIGNAL SYSTEM.

1. Consultant shall furnish to MCDOT one (1) copy of a SCAT Report for the optimized system. The SCAT Report shall include the following elements:

Cover Page in color showing a System Map

Figures

1. System overview map – showing system number, system schematic map with numbered system detectors, oversaturated movements, master location, system phone number, cycle lengths, and date of completion.
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1. Two (2) CDs for the optimized system. The CDs shall include the following elements:
   a. Electronic copy of the SCAT Report in PDF format
   b. Copies of the Synchro files for the optimized system
   c. Traffic counts for the optimized system
   d. New or updated intersection graphic display files for each of the system intersections and the system graphic display file including system detector locations and addresses.

Basis of Payment

The work shall be paid for at the contract unit each for OPTIMIZE TRAFFIC SIGNAL SYSTEM, which price shall be payment in full for performing all work described herein for the entire traffic signal system. Following the completion of traffic counts, 25 percent of the bid price will be paid. Following the completion of the Synchro analysis, 25 percent of the bid price will be paid. Following the setup and fine tuning of the timings, the speed-delay study, and the TRP programming, 25 percent of the bid price will be paid. The remaining 25 percent will be paid when the system is working to the satisfaction of the engineer and the report and CD have been submitted.

TEMPORARY TRAFFIC SIGNAL TIMING

Description

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

All timings and adjustments necessary for this work shall be performed by an approved Consultant who has previous experience in optimizing Closed Loop Traffic signal Systems for District One of the Illinois Department of Transportation. The Contractor shall contact the Traffic Signal Engineer at (815) 334-4960 for a listing of approved Consultants.

The following tasks are associated with TEMPORARY TRAFFIC SIGNAL TIMING.

(a) Consultant shall attend temporary traffic signal inspection (turn-on) and/or detour meeting and conduct on-site implementation of the traffic signal timings.

(b) Consultant shall be responsible for making fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.

(c) Consultant shall provide monthly observation of traffic signal operations in the field.

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

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

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

Basis of Payment

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

MODIFYING EXISTING CONTROLLER CABINET

The work shall consist of modifying an existing controller cabinet as follows:

(a) Uninterruptible Power Supply (UPS). The addition of uninterruptible power supply (UPS) to an existing controller cabinet could require the relocation of the existing controller cabinet items to allow for the installation of the uninterruptible power supply (UPS) components inside the existing controller cabinet as outlined under Sections 862 and 1074.04 of the Standard Specifications.

(b) Light Emitting Diode (LED) Signal Heads, Light Emitting Diode (LED) Optically Programmed Signal Heads and Light Emitting Diode (LED) Pedestrian Signal Heads. The contractor shall verify that the existing load switches meet the requirements of Section 1074.03(5)(b)(2) of the Standard Specifications and the recommended load requirements of the light emitting diode (LED) signal heads that are being installed at the existing traffic signal. If any of the existing load switches do not meet these requirements, they shall be replaced, as directed by the Engineer.

(c) Light Emitting Diode (LED), Signal Head, Retrofit. The contractor shall verify that the existing load switches meet the requirements of Section 1074.03(2) of the Standard Specifications and the recommended load requirements of light emitting diode (LED) traffic signal modules, pedestrian signal modules, and pedestrian countdown signal modules as specified in the plans. If any of the existing load switches do not meet these requirements, they shall be replaced, as directed by the Engineer.

(d) Termination of Fiber Optic Cable. When adding newly constructed traffic signals to an existing closed loop system, all work associated with termination of fiber in an existing fiber optic transceiver shall be included in this pay item. All labor, equipment and materials needed to perform this work shall be included in this pay item including additional fiber optic modems if needed.

Basis of Payment
Modifying an existing controller cabinet will be paid for at the contract unit price per each for MODIFY EXISTING CONTROLLER CABINET. This shall include all material and labor required to complete the work as described above, the removal and disposal of all items removed from the controller cabinet, as directed by the Engineer. The equipment for the Uninterruptible Power Supply (UPS) and labor to install it in the existing controller cabinet shall be included in the pay item Uninterruptible Power Supply. Modifying an existing controller will be paid for at the contract unit price per each for MODIFY EXISTING CONTROLLER, per Sections 895.04 and 895.08 of the Standard Specifications.

DIVISION 1000 MATERIALS

PEDESTRIAN PUSH-BUTTON

Description
Revise Article 888.01 of the Standard Specifications to read:

This work shall consist of furnishing and installing a latching (single call) or non-latching (dual call) pedestrian push-button and a regulatory pedestrian instruction sign according to MUTCD, sign series R10-3e 9" x 15" sign with arrow(s) for a count-down pedestrian signal. The pedestrian station sign size without count-down pedestrian signals shall accommodate a MUTCD sign series R10-3b or R10-3d 9" x 12" sign with arrow(s).

Installation
Add the following to Article 888.03 of the Standard Specifications:

A mounting bracket and/or extension shall be used to assure proper orientation when two pedestrian push buttons are required for one post. The price of the bracket and/or extension shall be included in the cost of the pedestrian push button. The contractor is not allowed to install a push-button assembly with the sign below the push-button in order to meet mounting requirements.

Materials
Revise Article 1074.02(a) of the Standard Specifications to read:

The pedestrian push-button housing shall be constructed of aluminum alloy according to ASTM B 308 6061-T6 and powder coated yellow, unless otherwise noted on the plans. The housing shall be furnished with suitable mounting hardware.

Revise Article 1074.02(e) of the Standard Specifications to read:

Stations shall be designed to be mounted to a post, mast arm pole or wood pole. The station shall be aluminum and shall accept a 3 inch (75mm) round push-button assembly and a regulatory pedestrian instruction sign according to MUTCD, sign series R10-3e 9" x 15" sign with arrow(s) for a count-down pedestrian signal. The pedestrian station size without count-down pedestrian signals shall accommodate a MUTCD sign series R10-3b or R10-3d 9" x 12" sign with arrow(s).

Add the following to Article 1074.02 of the Standard Specifications:

(f) Location. Pedestrian push-buttons and stations shall be mounted to a post, mast arm pole or wood pole as shown on the plans and shall be fully ADA accessible from a paved or concrete surface. See the District's Detail sheets for orientation and mounting details.

Basis of Payment
Revise Article 888.04 of the Standard Specifications to read:

This work will be paid for at the contract unit price per each for PEDESTRIAN PUSH-BUTTON or PEDESTRIAN PUSH-BUTTON, NON-LATCHING.

ACCESSIBLE PEDESTRIAN SIGNALS.

Description
This work shall consist of furnishing and installing pedestrian push button accessible pedestrian signals (APS) type. Each APS shall consist of an interactive vibrotactile pedestrian pushbutton with speaker, an informational sign, a light emitting diode (LED) indicator light, a solid state electronic control board, a power supply, wiring, and mounting hardware. The APS shall meet the requirements of the MUTCD and Sections 801 and 888 of the Standard Specifications, except as modified herein.

Electrical Requirements

The APS shall operate with systems providing 95 to 130 VAC, 60 Hz and throughout an ambient air temperature range of -29 to +160 °F (-34 to +70 °C).

The APS shall contain a power protection circuit consisting of both fuse and transient protection.

Audible Indications

A pushbutton locator tone shall sound at each pushbutton with volume settings a maximum of 5 dBA louder than ambient sound.

If two accessible pedestrian pushbuttons are placed less than 10 ft (3 m) apart or placed on the same pole, the audible walk indication shall be a speech walk message.

A clear, verbal message shall be used to communicate the pedestrian walk interval. This message shall sound throughout the WALK interval only. The verbal message shall be modeled after: "Street Name." Walk Sign is on to cross "Street Name." No other messages shall be used to denote the WALK interval.

Where two accessible pedestrian pushbuttons are separated by at least 10 ft (3 m), the walk indication shall be an audible percussive tone. It shall repeat at 8 to 10 ticks per second with a dominant frequency of 880 Hz.

Automatic volume adjustments in response to ambient traffic sound level shall be provided up to a maximum volume of 100 dBA. Locator tone and verbal messages shall be no more than 5 dB louder than ambient sound.

Pedestrian Pushbutton

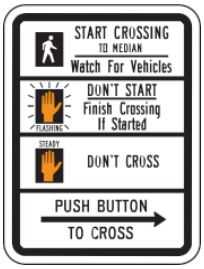
Pedestrian pushbuttons shall be at least 2 in. (50 mm) in diameter or width. The force required to activate the pushbutton shall be no greater than 3.5 lb (15.5 N).

A red LED indicator shall be located on or near the pushbutton which, when activated, acknowledges the pedestrians request to cross the street. The recorded messages and roadway designations shall be confirmed with the engineer and included with submitted product data.

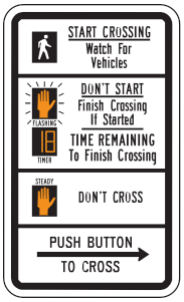
Signage

A sign shall be located immediately above the pedestrian pushbutton and parallel to the crosswalk controlled by the pushbutton. The sign shall be one of the following standard MUTCD designs: R10-3b, R10-3d, or R10-3e.

R10-3b



R10-3d



R10-3e

Tactile Arrow
A tactile arrow, pointing in the direction of travel controlled by a pushbutton, shall be provided either on the pushbutton or its sign.

Vibrotactile Feature
The pushbutton shall pulse when depressed and shall vibrate continuously throughout the WALK interval.

Training
The Contractor shall provide APS onsite training for Department personnel and person(s) or group that requested the installation of the APS. APS features and operation shall be demonstrated during the training. The training shall be presented by the APS equipment supplier. Time, date, and location of the training and demonstration shall be coordinated with the Engineer.

Basis of Payment
This work will be paid for at the contract unit price each for a pedestrian push button, ACCESSIBLE PEDESTRIAN SIGNALS type and shall include furnishing, installation, mounting hardware, message programming, and training.

ELECTRIC CABLE

Delete "or stranded, and No. 12 or" from the last sentence of Section 1076.04 (a) of the Standard Specifications.

Add the following to the Article 1076.04(d) of the Standard Specifications:

Service cable may be single or multiple conductor cable.

TRAFFIC SIGNAL POST

Add the following to Section 1077.03 (b) of the Standard Specifications:

All posts and bases shall be steel and hot dipped galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with TRAFFIC SIGNAL PAINTING in Division 800 of these specifications.

PEDESTRIAN PUSH-BUTTON POST

Revise the first sentence of Article 1077.02 (a) of the Standard Specifications to read:

The steel post shall be according to Article 1077.01. Washers for post bases shall be the same size or larger than the nut.

Revise the first sentence of Article 1077.02 (a) of the Standard Specifications to read:

All posts and bases shall be steel and hot dipped galvanized according to AASHTO M 111. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions.

Basis of Payment
This work will be paid for at the contract unit price per each for PEDESTRIAN PUSH-BUTTON POST, TYPE A.

MAST ARM ASSEMBLY AND POLE

Revise the second sentence of Article 1077.03 (a)(3) of the Standard Specifications to read:

Traffic signal mast arms shall be one piece construction, unless otherwise approved by the Engineer.

Add the following to Article 1077.03 (a)(3) of the Standard Specifications:

If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with TRAFFIC SIGNAL PAINTING Special Provisions. MAST ARMS TO BE UN-PAINTED.

The shroud shall be of sufficient strength to deter pedestrian and vehicular damage. The shroud shall be constructed and designed to allow air to circulate throughout the mast arm but not allow infestation of insects or other animals, and such that it is not hazardous to probing fingers and feet. All mounting hardware shall be stainless steel.

LIGHT EMITTING DIODE (LED) TRAFFIC SIGNAL HEAD

Materials
Add the following to Section 1078 of the Standard Specifications:

1. Representatives of LED traffic signal modules shall have a local office and warehouse within IDOT District One for inspection of materials and to handle inquiries and warranty issues.

2. LED modules proposed for use and not previously approved by IDOT District One will require independent testing for compliance to current VTCSH-ITE standards for the product and be Intertek ETL Verified. This would include modules from new manufacturers and new models from IDOT District One approved manufacturers.

3. The proposed independent testing facility shall be approved by IDOT District One. Independent testing must include a minimum of two (2) randomly selected modules of each type of module (i.e. ball, arrow, pedestrian, etc.) used in the District and include as a minimum Luminous Intensity and Chromaticity tests, however, complete module performance verification testing may be required by the Engineer to assure the accuracy of the manufacturer's published data and previous test results. An IDOT representative will select

sample modules from the local warehouse and mark the modules for testing. Independent test results shall meet current ITE standards and manufacturer's published data. Any module failures shall require retesting of the module type. All costs associated with the selection of sample modules, testing, reporting, and retesting, if applicable, shall be the responsibility of the LED module manufacturer and not be a cost to this contract.

4. All signal and pedestrian heads shall provide 12" (300 mm) displays with glossy yellow polycarbonate housings. All head housings shall be the same color (yellow) at the intersection. For new signalized intersections and existing signalized intersections where all signal and/or pedestrian heads are being replaced, the proposed head housings shall be yellow. Where only selected heads are being replaced, the proposed head housing color (yellow) shall match existing head housings. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to the inspector at the signal turn-on. Post top mounting collars are required on all posts, and shall be constructed of the same material as the brackets.

5. All signal heads shall have a "baseball" cap visor for each section. Tunnel visors shall not be accepted. All cap visors shall be black polycarbonate.

6. Pedestrian signal heads shall be furnished with the international symbolic "Walking Person" and "Upraised Palm" displays. Egg crate sun shields are not permitted.

7. Signal heads shall be positioned according to the "District One Standard Traffic Signal Design Details."

8. LED signal heads (All Face and Section Quantities), (All Mounting Types) shall conform fully to the requirements of Articles 1078.01 and 1078.02 of the Standard Specifications amended herein.

9. The LED signal modules shall be replaced or repaired if an LED signal module fails to function as intended due to workmanship or material defects within the first **72 months** from the date of delivery. LED signal modules which exhibit luminous intensities less than the minimum values specified in Table 1 of the ITE Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement (June 27, 2005) [VTSCH], or applicable successor ITE specifications, or show signs of entrance of moisture or contaminants within the first **15 years** of the date of delivery shall be replaced or repaired. The manufacturer's written warranty for the LED signal modules shall be dated, signed by an Officer of the company and included in the product submittal to the State.

   The LED signal modules shall be designed and constructed to meet the **15 year** warranty, and shall not be a 5 or 6 year warranty LED signal module with a manufacturer's written 15 year warranty.

(a) Physical and Mechanical Requirements

1. Modules can be manufactured under this specification for the following faces:

   a. 12 inch (300 mm) circular, multi-section
   b. 12 inch (300 mm) arrow, multi-section
   c. 12 inch (300 mm) pedestrian, 2 sections

2. The maximum weight of a module shall be 4 lbs. (1.8 kg).

3. Each module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.), and shall be weather proof after installation and connection.

4. Material used for the lens and signal module construction shall conform to ASTM specifications for the materials.

5. The lens of the module shall be tinted with a wavelength-matched color to reduce sun phantom effect and enhance on/off contrast. The tinting shall be uniform across the lens face. Polymeric lens shall provide a surface coating or chemical surface treatment applied to provide abrasion resistance. The lens of the module shall be integral to the unit, convex with a smooth outer surface and made of plastic. The lens shall have a textured surface to reduce glare.

6. The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.

7. Each module shall have a symbol of the type of module (i.e. circle, arrow, etc.) in the color of the module. The symbol shall be 1 inch (25.4 mm) in diameter. Additionally, the color shall be written out in 1/2 inch (12.7mm) letters next to the symbol.

(b) Photometric Requirements

1. The minimum initial luminous intensity values for the modules shall conform to the values in Table 1 of the VTCSH (2005) for circular signal indications, and as stated in Table 3 of these specifications for arrow and pedestrian indications at 25 °C.

2. The modules shall meet or exceed the illumination values stated in Articles 1078.01 and 1078.02 the Standard Specifications for circular signal indications, and Table 3 of these specifications for arrow and pedestrian indications, throughout the useful life based on normal use in a traffic signal operation over the operating temperature range.

3. The measured chromaticity coordinates of the modules shall conform to the chromaticity requirements of Section 4.2 of the VTCSH (2005) or applicable successor ITE specifications.

4. The LEDs utilized in the modules shall be AlInGaP technology for red and Portland orange (pedestrian) and InGaN for green, amber and white (pedestrian) indications, and shall be the ultra bright type rated for 100,000 hours of continuous operation from -40 °C to +74 °C.

(c) Electrical

1. Maximum power consumption for LED modules is per Table 2.

2. Operating voltage of the modules shall be 120 VAC. All parameters shall be measured at this voltage.

3. The modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors).

4. When a current of 20 mA AC (or less) is applied to the unit, the voltage read across the two leads shall be 15 VAC or less.

5. The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.

6. LED arrows shall be wired such that a catastrophic loss or the failure of one or more LED will not result in the loss of the entire module.

(d) Retrofit Traffic Signal Module

1. The following specification requirements apply to the Retrofit module only. All general specifications apply unless specifically superseded in this section.

2. Retrofit modules can be manufactured under this specification for the following faces:

   a. 12 inch (300 mm) circular, multi-section
   b. 12 inch (300 mm) arrow, multi-section
   c. 12 inch (300 mm) pedestrian, 2 sections

3. Each Retrofit module shall be designed to be installed in the doorframe of a standard traffic signal housing. The Retrofit module shall be sealed in the doorframe with a one-piece EPDM (ethylene propylene rubber) gasket.

4. The maximum weight of a Retrofit module shall be 4 lbs. (1.8 kg).

5. Each Retrofit module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.), and shall be weather proof after installation and connection.

6. Electrical conductors for modules, including Retrofit modules, shall be 39.4 inches (1m) in length, with quick disconnect terminals attached.

7. The lens of the Retrofit module shall be integral to the unit, shall be convex with a smooth outer surface and made of plastic or of glass.

(e) The following specification requirements apply to the 12 inch (300 mm) arrow module only. All general specifications apply unless specifically superseded in this section.

1. The arrow module shall meet specifications stated in Section 9.01 of the Equipment and Material Standards of the Institute of Transportation Engineers (November 1998) [ITE Standards], Chapter 2 (Vehicle Traffic Control Signal Heads) or applicable successor ITE specifications for arrow indications.

2. The LEDs arrow indication shall be a solid display with a minimum of three (3) outlining rows of LEDs and at least one (1) fill row of LEDs.

(f) The following specification requirement applies to the 12 inch (300 mm) programmed visibility (PV) module only. All general specifications apply unless specifically superseded in this section.

1. The LED module shall be a module designed and constructed to be installed in a programmed visibility (PV) signal housing without modification to the housing.

(g) The following specification requirements apply to the 12 inch (300 mm) Pedestrian module only. All general specifications apply unless specifically superseded in this section.

1. The arrow module shall meet specifications stated in VTCSH-ITE 2004 or applicable successor.

2. Two (2) pedestrian sections shall be installed. The top section shall be wired to illuminate only the upraised hand and the bottom section shall be the walking man.

3. "Egg Crate" type sun shields are not permitted. All figures must be a minimum of 9 inches (225mm) in height and easily identified from a distance of 120-feet (36.6m).

Basis of Payment
Add the following to the first paragraph of Article 880.04 of the Standard Specifications:

The price shall include furnishing the equipment described above, all mounting hardware and installing them in satisfactory operating condition.

Revise the second paragraph of Article 880.04 of the Standard Specifications to read:

If the work consists of retrofitting an existing polycarbonate traffic signal head with light emitting diodes (LEDs), it will be paid for as a SIGNAL HEAD, LED, RETROFIT, of the type specified, and of the particular kind of material, when specified. Price shall be payment in full for furnishing the equipment described above including LED modules, all mounting hardware, and installing them in satisfactory operating condition. The type specified will indicate the number of signal faces, the number of signal sections in each signal face and the method of mounting.

TRAFFIC SIGNAL BACKPLATE

Delete 1st sentence of Article 1078.03 of the Standard Specifications and add "All backplates shall be formed ABS plastic".

Add the following to the third paragraph of Article 1078.03 of the Standard Specifications. The retroreflective backplate shall not contain louvers.

Delete second sentence of the fourth paragraph of Article 1078.03 the Standard Specifications.

Add the following to the fourth paragraph of Article 1078.03 of the Standard Specifications:

When retro reflective sheeting is specified, it shall be Type ZZ sheeting according to Article 1091.03 and applied in preferred orientation for the maximum angularity according to the vendor's recommendations. The retroreflective sheeting shall be installed under a controlled environment at the vendor/equipment supplier before shipment to the contractor. The formed plastic backplate shall be prepared and cleaned, following recommendations of the retroreflective sheeting manufacturer.

INDUCTIVE LOOP DETECTOR

Add the following to Section 1079.01 of the Standard Specifications:

Contracts requiring new cabinets shall provide for card mounted detector amplifiers. Loop amplifiers shall provide LCD displays with loop frequency, inductance, and change of inductance readings.

FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL

Description

This work shall consist of furnishing and installing a traffic actuated solid state digital controller in the controller cabinet of the type specified, meeting the requirements of Section 857 of the Standard Specifications, as modified herein, including malfunction management unit, load switches and flasher relays, with all necessary connections for proper operation.

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

Materials

Add the following to Article 857.02 of the Standard Specifications:

For installation as a stand-alone traffic signal, connected to a closed loop system or integrated into an advance traffic management system (ATMS), controllers shall be Econolite Cobalt ATC with Cobalt Touch TS2 Type 1 connectors and Ethernet connector unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District One approved closed loop equipment suppliers will be allowed. Unless specified otherwise on the plans or these specifications, the controller shall be of the most recent model and software version supplied by the equipment supplier at the time of the traffic signal TURN-ON. A removable controller data key shall also be provided. Individual load switches shall be provided for each vehicle, pedestrian, and right turn over lap phase. The controller shall prevent phases from being skipped during program changes and after all preemption events and shall inhibit simultaneous display of circular yellow and yellow arrow indications.

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

Add the following to Article 1074.03 of the Standard Specifications:

(a) (6) Cabinets shall be designed for NEMA TS2 Type 1 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian and four (4) phases of overlap operation.

(b) (1) Revise “conflict monitor” to read “Malfunction Management Unit”

(b) (5) Cabinets – Provide 1/8" (3.2 mm) thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel. All seams/corners on the cabinet shall be welded.

(b) (6) Controller Harness – Provide a TS2 Type 2 "A" wired harness in addition to the TS2 Type 1 harness.

(b) (7) Surge Protection – – ASC Zone IT (50 kA rating) with LED status indicators. Model 91391 Zone IT base station and Model 91375 Zone IT.

(b) (8) BIU – shall be secured by mechanical means.

(b) (9) Transfer Relays – Solid state or mechanical flash relays are acceptable.

(b) (10) Switch Guards – All switches shall be guarded.

(b) (11) Heating – Two (2) 200 watt located in upper left and lower right corners, thermostatically-controlled, electric heaters. Heaters controlled by a universally mounted thermostat controlling both heaters.

(b) (12) Lighting – One (1) LED Panel shall be placed inside the cabinet top panel and one (1) LED Panel shall be placed on each side of the pull-out drawer/shelf assembly located beneath the controller support shelf. The LED Panels shall be controlled by a door switch. The LED Panels shall be provided from an approved vendor.

(b) (13) The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1 ½ inch (38mm) deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lbs. (23 kg) in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 18 inches (610mm) wide.

(b) (14) Plan & Wiring Diagrams – 12" x 15" (305mm x 406mm) moisture sealed container attached to door.

(b) (15) Detector Racks – Fully wired and labeled for four (4) channels of emergency vehicle pre-emption and sixteen channels (16) of vehicular operation.

(b) (16) Field Wiring Labels – All field wiring shall be labeled.

(b) (17) Field Wiring Termination – Approved channel lugs required.

(b) (18) Power Panel – Provide a nonconductive shield.

(b) (19) Circuit Breaker – The circuit breaker shall be sized for the proposed load but shall not be rated less than 30 amps.

(b) (20) Police Door – Provide wiring and termination for plug in manual phase advance switch.

(b) (21) Malfunction Management Unit (MMU) – The MMU supplied shall have a Liquid Crystal Display (LCD) and also have an Ethernet communications port.

(b) (23) Load Switch – All load switches shall have both input and output LED controller status indicators.

Layer II and Layer III switches shall be installed as shown on the plans. If required, the LAYER II (DATALINK) SWITCH and/or the LAYER III (NETWORK) SWITCH shall be included in the cost of the FULL ACTUATED CONTROLLER AND CABINET, of the type specified.

Basis of Payment

This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND TYPE IV CABINET; FULL-ACTUATED CONTROLLER AND TYPE V CABINET; FULL-ACTUATED CONTROLLER AND TYPE SUPER P CABINET; FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET; FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL; FULL-ACTUATED CONTROLLER AND TYPE V CABINET,

SPECIAL; FULL-ACTUATED CONTROLLER AND TYPE SUPER P CABINET (SPECIAL); FULL-ACTUATED CONTROLLER AND TYPE SUPER R CABINET (SPECIAL).

If required, the LAYER II (DATALINK) SWITCH and/or the LAYER III (NETWORK) SWITCH shall be included in the cost of the FULL ACTUATED CONTROLLER AND CABINET, of the type specified.

ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 18, 3/C

This work shall consist of furnishing and installing a Belden YR52311 electric cable in existing and/or new conduit. The cable shall consist of 18 AWG stranded bare copper, three (3) conductors, with HDPE insulation, and HDPE jacket and shall be capable of broadband over power communication. The nominal outside diameter shall be 0.341-inch.

The signal cable, No. 18, 3/C shall be run directly from the Autoscope Terra Interface Panel (TIP) to the Autoscope Terra MVP on the mast arm with no splicing of the cable allowed.

Basis of Payment
This work will be paid for at the contract unit price per foot for ELECTRIC CABLE IN CONDUIT, SIGNAL NO. 18, 3/C, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operation.

VIDEO DETECTION SYSTEM, (COMPLETE INTERSECTION)

1. Video Detection – General

This specification sets forth the minimum requirements for a system that monitors vehicles on a roadway via processing of video images. The detection of vehicles passing through the field-of-view of an image sensor shall be made available to a large variety of end user applications as simple contact closure outputs that reflect the current real-time detector or alarm states (on/off) or as summary traffic statistics that are reported locally or remotely. The contact closure outputs shall be provided to a traffic signal controller and comply with the National Electrical Manufacturers Association (NEMA) type C or D detector rack or 170 input file rack standards.

The system architecture shall fully support Ethernet networking of system components through a variety of industry standard and commercially available infrastructures that are used in the traffic industry. The data communications shall support direct connect, [modem,] and multi-drop interconnects. Simple, standard Ethernet wiring shall be supported to minimize overall system cost and improve reliability, utilizing existing infrastructure and ease of system installation and maintenance. Both streaming video and data communications shall optionally be interconnected over long distances through fiber optic, microwave, or other commonly used digital communications transport configurations.

On the software application side of the network, the system shall be integrated through a client-server relationship. A communications server application shall provide the data communications interface between as few as one to as many as hundreds of Machine Vision Processor (MVP) sensors and a number of client applications. The client applications shall either be hosted on the same PC as the communications server or may be distributed over a local

area network of PC's using the industry standard TCP/IP network protocol. Multiple client applications shall execute simultaneously on the same host or multiple hosts, depending on the network configuration. Additionally, a web-browser interface shall allow use of industry standard Internet web browsers to connect to MVP sensors for setup, maintenance, and playing digital streaming video.

1.1. System Hardware

The machine vision system hardware shall consist of three components: 1) a color, 22x zoom, MVP sensor 2) a modular cabinet interface unit 3) a communication interface panel. Additionally, an optional personal computer (PC) shall host the server and client applications that are used to program and monitor the system components. The real-time performance shall be observed by viewing the video output from the sensor with overlaid flashing detectors to indicate the current detection state (on/off). The MVP sensor shall optionally store cumulative traffic statistics internally in non-volatile memory for later retrieval and analysis.

The MVP shall communicate to the modular cabinet interface unit via the communications interface panel and the software applications using the industry standard TCP/IP network protocol. The MVP shall have a built-in, Ethernet-ready, Internet Protocol (IP) address and shall be addressable with no plug in devices or converters required. The MVP shall provide standard MPEG-4 streaming digital video. Achievable frame rates shall vary from 5 to 30 frames/sec as a function of video quality and available bandwidth.

The modular cabinet interface unit shall communicate directly with up to eight (8) MVP sensors and shall comply with the form factor and electrical characteristics to plug directly into a NEMA type C or D detector rack providing up to thirty-two (32) inputs and sixty-four (64) outputs or a 170 input file rack providing up to sixteen (16) contact closure inputs and twenty-four (24) contact closure outputs to a traffic signal controller.

The communication interface panel shall provide four (4) sets of three (3) electrical terminations for three-wire power cables for up to eight (8) MVP sensors that may be mounted on a pole or mast arm with a traffic signal cabinet or junction box. The communication interface panel shall provide high-energy transient protection to electrically protect the modular cabinet interface unit and connected MVP sensors. The communications interface panel shall provide single-point Ethernet connectivity via RJ45 connector for communication to and between the modular cabinet interface module and the MVP sensors.

1.2. System Software

The MVP sensor embedded software shall incorporate multiple applications that perform a variety of diagnostic, installation, fault tolerant operations, data communications, digital video streaming, and vehicle detection processing. The detection shall be reliable, consistent, and perform under all weather, lighting, and traffic congestion levels. An embedded web server shall permit standard internet browsers to connect and perform basic configuration, maintenance, and video streaming services.

There shall be a suite of client applications that reside on the host client / server PC. The applications shall execute under Microsoft Windows7and Windows 10 operating systems. Available client applications shall include:

- Master network browser: Learn a network of connected modular cabinet interface units and MVP sensors, display basic information, and launch applications software to perform operations within that system of sensors.
- Configuration setup: Create and modify detector configurations to be executed on the MVP sensor and the modular cabinet interface unit.

- Operation log: Retrieve, display, and save field hardware run-time operation logs of special events that have occurred.
- Software install: Reconfigure one or more MVP sensors with a newer release of embedded system software.
- Streaming video player: Play and record streaming video with flashing detector overlay.
- Data retrieval: Fetch once or poll for traffic data and alarms and store on PC storage media.
- Communications server: Provide fault-tolerant, real-time TCP/IP communications to / from all devices and client applications with full logging capability for systems integration.

2. Functional Capabilities

2.1. MVP Sensor

The MVP sensor shall be an integrated imaging color CCD array with zoom lens optics, high-speed, dual-core image processing hardware bundled into a sealed enclosure. The CCD array shall be directly controlled by the dual-core processor, thus providing high-quality video for detection that has virtually no noise to degrade detection performance. It shall be possible to zoom the lens as required for setup and operation. It shall provide JPEG video compression as well as standard MPEG-4 digital streaming video with flashing detector overlay. The MVP shall provide direct real-time iris and shutter speed control. The MVP image sensor shall be equipped with an integrated 22x zoom lens that can be changed using either configuration computer software. The digital streaming video output and all data communications shall be transmitted over the three-wire power cable.

2.1.1. Power

The MVP sensor shall operate on 110/220 VAC, 50/60Hz at a maximum of 25 watts. The camera and processor electronics shall consume a maximum of 10 watts and the remaining 15 watts shall support an enclosure heater.

2.1.2. Detection Zone Programming

Placement of detection zones shall be by means of a PC with a Windows 7 operating system, a keyboard, and a mouse. The PC monitor shall be able to show the detection zones superimposed on images of traffic scenes.

The detection zones shall be created by using a mouse to draw detection zones on the PC monitor. Using the mouse and keyboard it shall be possible to place, size, and orient detection zones to provide optimal road coverage for vehicle detection. It shall be possible to download detector configurations from the PC to the MVP sensor and cabinet interface module, to retrieve the detector configuration that is currently running in the MVP sensor, and to back up detector configurations by saving them to the PC fixed disks or other removable storage media.

The supervisor computer's mouse and keyboard shall be used to edit previously defined detector configurations to permit adjustment of the detection zone size and placement, to add detectors for additional traffic applications, or to reprogram the MVP sensor for different traffic applications or changes in installation site geometry or traffic rerouting.

2.1.3. Optimal Detection

The video detection system shall optimally detect vehicle passage and presence when the MVP sensor is mounted 30 feet (10 m) or higher above the roadway, when the image sensor is adjacent to the desired coverage area, and when the distance to the farthest detection zone locations are not greater than ten (10) times the mounting height of

the MVP. The recommended deployment geometry for optimal detection also requires that there be an unobstructed view of each traveled lane where detection is required. Although optimal detection may be obtained when the MVP is mounted directly above the traveled lanes, the MVP shall not be required to be directly over the roadway. The MVP shall be able to view either approaching or receding traffic or both in the same field of view. The preferred MVP sensor orientation shall be to view approaching traffic since there are more high contrast features on vehicles as viewed from the front rather than the rear. The MVP sensor placed at a mounting height that minimizes vehicle image occlusion shall be able to simultaneously monitor a maximum of six (6) traffic lanes when mounted at the road-side or up to eight (8) traffic lanes when mounted in the center with four lanes on each side.

2.2. Modular Cabinet Interface Unit

The modular cabinet interface unit shall provide the hardware and software means for up to eight (8) MVP sensors to communicate real-time detection states and alarms to a local traffic signal controller. It shall comply with the electrical and protocol specifications of the detector rack standards. The card shall have 1500 Vrms isolation between rack logic ground and street wiring.

The modular cabinet interface unit shall be a simple interface card that plugs directly into a 170 input file rack or a NEMA type C or D detector rack. The modular cabinet interface unit shall occupy only 2 slots of the detector rack. The modular cabinet interface unit shall accept up to sixteen (16) phase inputs and shall provide up to twenty-four (24) detector outputs.

2.3. Communications Interface Panel

The communications interface panel shall support up to eight MVPs. The communications interface panel shall accept 110/220 VAC, 50/60 Hz power and provide predefined wire termination blocks for MVP power connections, a Broadband-over-Power-Line (BPL) transceiver to support up to 10MB/s interdevice communications, electrical surge protectors to isolate the modular cabinet interface unit and MVP sensors, and an interface connector to cable directly to the modular cabinet interface unit.

The interface panel shall provide power for up to eight (8) MVP sensors, taking local line voltage 110/220 VAC, 50/60 Hz and producing 110/220 VAC, 50/60 Hz, at about 30 watts to each MVP sensor. Two ½-amp SLO-BLO fuses shall protect the communications interface panel.

3. System Installation & Training

The supplier of the video detection system may supervise the installation and testing of the video detection system and computer equipment as required by the contracting agency.

Training is available to personnel of the contracting agency in the operation, set up, and maintenance of the video detection system. The MVP sensor and its support hardware / software is a sophisticated leading-edge technology system. Proper instruction from certified instructors is recommended to ensure that the end user has complete competency in system operation. The User's Guide is not an adequate substitute for practical classroom training and formal certification by an approved agency.

4. Warranty, Service, & Support

For a minimum of two (2) years, the supplier shall warrant the video detection system. An option for additional year(s) warranty for up to 5 years shall be available. Ongoing software support by the supplier shall include software

updates of the MVP sensor, modular cabinet interface unit, and supervisor computer applications. These updates shall be provided free of charge during the warranty period. The supplier shall maintain a program for technical support and software updates following expiration of the warranty period. This program shall be available to the contracting agency in the form of a separate agreement for continuing support.

RADAR DETECTION SYSTEM, (COMPLETE INTERSECTION)

Description

This work shall consist of furnishing and installing a radar vehicle detection system as specified and/or as shown on the plan. This pay item shall include all necessary work and equipment required to have a fully operational system including but not limited to the detector unit/s, the interface unit and all the necessary hardware, cable and accessories required to complete the installation in accordance with the manufacturer's specifications.

The radar vehicle detection system shall work under all weather conditions, including rain, freezing rain, snow, wind, dust, fog, and changes in temperature and light. It shall work in an ambient temperature range of -34 to 74 degrees Celsius. It shall have a max power output of 75 watts or less.

The radar vehicle detection system shall be compatible with the District's approved traffic controller assemblies utilizing NEMA TS 1 or NEMA TS 2 controllers and cabinet components for full time operation. The radar vehicle detection system shall provide a minimum of one interface unit that has Ethernet connectivity, surge protection and shall be capable of supporting a minimum of 4 detector units.

The far back radar detection shall have a detection range of 400 feet or better.

A representative from the supplier of the radar vehicle detection system shall supervise the installation and testing of the radar vehicle detection system and shall be present at the traffic signal turn-on inspection. Once the radar vehicle detection system is configured, it shall not need reconfiguration to maintain performance, unless the roadway configuration or the application requirements change.

The mounting location/s of the detector unit/s shall be per the manufacturer's recommendations. If an extension mounting assembly is needed, it shall be included in this item. All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent chafing of wires.

The radar vehicle detection system shall be warrantied, free from material and workmanship defects for a period of two years from final inspection.

Basis of Payment

This work shall be paid for at the contract unit price each for RADAR VEHICLE DETECTION SYSTEM, SINGLE APPROACH, STOP BAR; RADAR VEHICLE DETECTION SYSTEM, SINGLE APPROACH, FAR BACK; RADAR VEHICLE DETECTION SYSTEM, SINGLE APPROACH, STOP BAR AND FAR BACK, the price of which shall include the cost for all of the work and material described herein and includes furnishing, installing, delivery, handling, testing, set-up and all appurtenances and mounting hardware necessary for a fully operational radar vehicle detection system.

GENERAL ELECTRICAL REQUIREMENTS
Effective: June 1, 2016

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

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

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

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

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

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

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

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

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

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

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

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

All connections to structural steel or fencing shall be made with exothermic welds. Care shall be taken not to weaken load carrying members. Where connections are made to epoxy coated reinforcing steel, the epoxy coating shall be sufficiently removed to facilitate a mechanical connection. The epoxy coating shall be repaired to the

satisfaction of the Engineer. Where connections are made to insulated conductors, the connection shall be wrapped with at least four layers of electrical tape extended 6 in. (150 mm) onto the conductor insulation.

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

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

Type of Work (discipline)	Item
All Electrical Work	Electric Service Metering Emergency Standby System Transformers Cable Unit Duct Splices Conduit Surge Suppression System
Lighting	Tower Pole Luminaire Foundation Breakaway Device Controllers Control Cabinet and Peripherals
ITS	Controller Cabinet and Peripherals CCTV Cameras Camera Structures Ethernet Switches Detectors Detector Loop Fiber Optic Cable

Within 30 calendar days after contract execution, the Contractor shall submit, for approval, one copy each of the manufacturer's product data (for standard products and components) and detailed shop drawings (for fabricated items). Submittals for the materials for each individual pay item shall be complete in every respect. Submittals which include multiple pay items shall have all submittal material for each item or group of items covered by a particular specification, grouped together and the applicable pay item identified. Various submittals shall, when taken together, form a complete coordinated package. A partial submittal will be returned without review unless prior written permission is obtained from the Engineer.

The submittal shall be properly identified by route, section, county, and contract number.

The Contractor shall have reviewed the submittal material and affixed his/her stamp of approval, with date and signature, for each individual item. In case of subcontractor submittal, both the subcontractor and the Contractor shall review, sign, and stamp their approval on the submittal.

Illegible print, incompleteness, inaccuracy, or lack of coordination will be grounds for rejection.

Items from multiple disciplines shall not be combined on a single submittal and transmittal. Items for lighting, signals, surveillance and CCTV must be in separate submittals since they may be reviewed by various personnel in various locations.

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

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

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

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

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

Authorized Project Delay. See Article 801.08

Maintenance transfer and Preconstruction Inspection:

General

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

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

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

Marking of Existing Cable Systems

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

Condition of Existing Systems

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

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

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

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

Maintenance and Responsibility During Construction.

Lighting Operation and Maintenance Responsibility

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

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

Energy and Demand Charges

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

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

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

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

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

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

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

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

Lighting systems. The following tests shall be made.

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

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

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

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

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

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

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

ITS. The following test shall be made in addition to the lighting system test above.

Detector Loops. Before and after permanently securing the loop in the pavement, the resistance, inductance, resistance to ground, and quality factor for each loop and lead-in circuit shall be tested. The loop and lead-in circuit shall have an inductance between 20 and 2500 microhenries. The resistance to ground shall be a minimum of 50 megohms under any conditions of weather or moisture. The quality factor (Q) shall be 5 or greater.

Fiber Optic Systems. Fiber optic testing shall be performed as required in the fiber optic cable special provision and the fiber optic splice special provision.

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

Contract Guarantee. The Contractor shall provide a written guarantee for all electrical work provided under the contract for a period of six months after the date of acceptance with the following warranties and guarantees.

(a) The manufacturer's standard written warranty for each piece of electrical material or apparatus furnished under the contract. The warranty for light emitting diode (LED) modules, including the maintained minimum luminance, shall cover a minimum of 60 months from the date of delivery.

(b) The Contractor's written guarantee that, for a period of six months after the date of final acceptance of the work, all necessary repairs to or replacement of said warranted material or apparatus for reasons not

proven to have been caused by negligence on the part of the user or acts of a third party shall be made by the Contractor at no additional cost to the Department.

(c) The Contractor's written guarantee for satisfactory operation of all electrical systems furnished and constructed under the contract for a period of six months after final acceptance of the work.

The warranty for an uninterruptable power supply (UPS) shall cover a minimum of two years from date the equipment is placed in operation; however, the batteries of the UPS shall be warranted for full replacement for a minimum of five years.

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

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

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

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

The inventory shall include:

- Location of Equipment, including rack, chassis, slot as applicable.
- Designation of Equipment
- Equipment manufacturer
- Equipment model number
- Equipment Version Number
- Equipment Configuration
    - Addressing, IP or other
    - Settings, hardware or programmed
- Equipment Serial Number

The following electronic inventory forms are available from the Engineer:

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

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

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

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

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

Final documentation shall be submitted as a complete submittal package, i.e. record drawings, test results, inventory, etc. shall be submitted at the same time. Partial piecemeal submittals will be rejected without review. A total of five hardcopies and CDROMs of the final documentation shall be submitted.

GPS Documentation. In addition to the specified record drawings, the Contactor shall record GPS coordinates of the following electrical components being installed, modified or being affected in other ways by this contract:

- All light poles and light towers.
- Handholes and vaults.
- Junction Boxes
- Conduit roadway crossings.
- Controllers.
- Control Buildings.
- Structures with electrical connections, i.e. DMS, lighted signs.
- Electric Service locations.
- CCTV Camera installations.
- Roadway Surveillance installations.
- Fiber Optic Splice Locations.
- Fiber Optic Cables. Coordinates shall be recorded along each fiber optic cable route every 200 feet.
- All fiber optic slack locations shall be identified with quantity of slack cable included. When sequential cable markings are available, those markings shall be documented as cable marking into enclosure and marking out of enclosure.

Datum to be used shall be North American 1983.

Data shall be provided electronically and in print form. The electronic format shall be compatible with MS Excel. Latitude and Longitude shall be in decimal degrees with a minimum of 6 decimal places. Each coordinate shall have the following information:

1. District
2. Description of item
3. Designation
4. Use
5. Approximate station
6. Contract Number
7. Date
8. Owner
9. Latitude
10. Longitude
11. Comments

A spreadsheet template will be available from the Engineer for use by the Contractor.

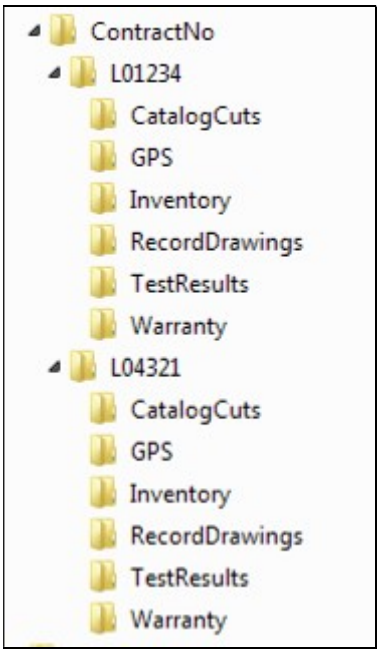
Prior to the collection of data, the contractor shall provide a sample data collection of at least six data points of known locations to be reviewed and verified by the Engineer to be accurate within 20 feet. Upon verification, data collection can begin. Data collection can be made as construction progresses, or can be collected after all items are installed. If the data is unacceptable the contractor shall make corrections to the data collection equipment and or process and submit the data for review and approval as specified. Data collection prior to the submittal and review of the sample data of existing data points will be unacceptable and rejected.

Accuracy. Data collected is to be mapping grade. A handheld mapping grade GPS device shall be used for the data collection. The receiver shall support differential correction and data shall have minimum 5 meter accuracy after post processing.

GPS receivers integrated into cellular communication devices, recreational and automotive GPS devices are not acceptable.

The GPS shall be the product of an established major GPS manufacturer having been in the business for a minimum of 6 years."

The documents on the CD shall be organized by the Electrical Maintenance Contract Management System (EMCMS) location designation. If multiple EMCMS locations are within the contract, separate folders shall be utilized for each location as follows:



Extraneous information not pertaining to the specific EMCMS location shall not be included in that particular folder and sub-folder.

The inspection will not be made until after the delivery of acceptable record drawings, specified certifications, and the required guarantees.

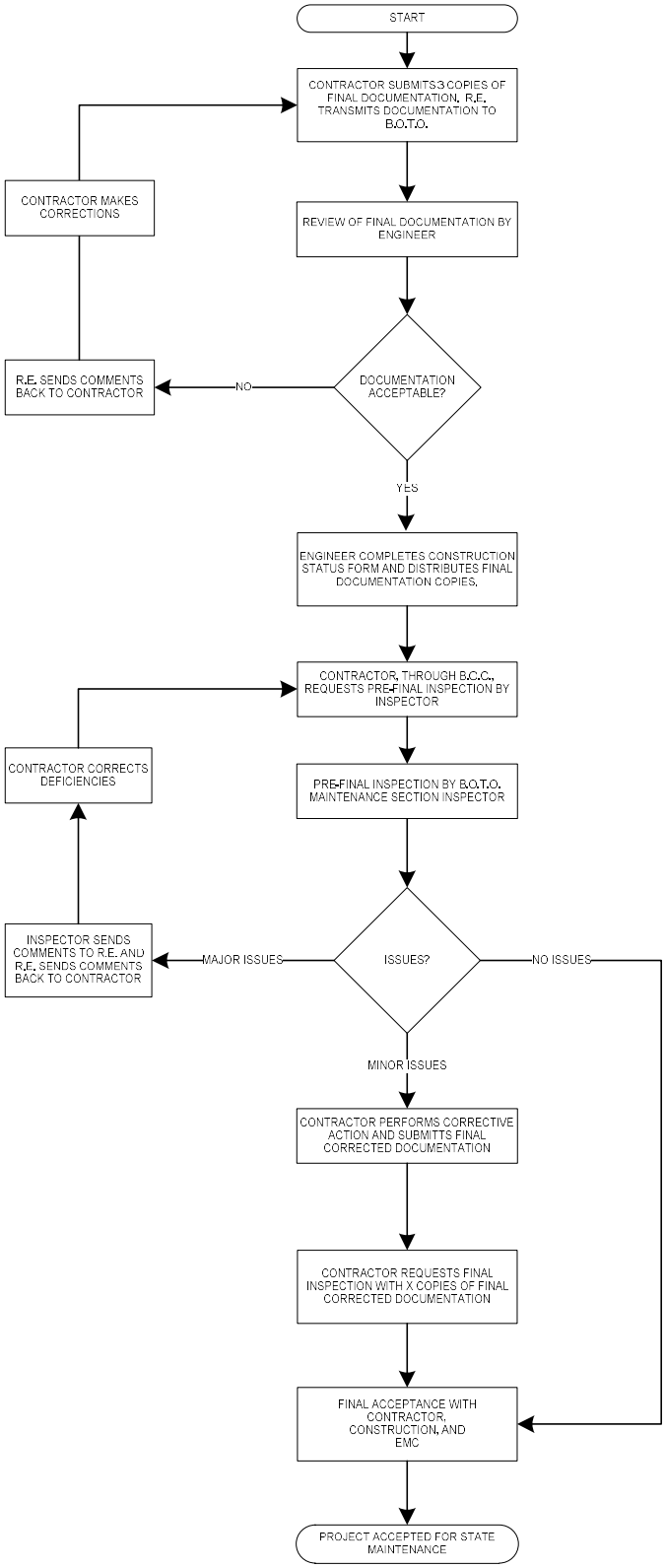
The Final Acceptance Documentation Checklist shall be completed and is contained elsewhere herein.

All CD's shall be labeled as illustrated in the CD Label Template contained herein.

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

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

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


START
CONTRACTOR SUBMITS 3 COPIES OF FINAL DOCUMENTATION. R.E. TRANSMITS DOCUMENTATION TO B.O.T.O.
REVIEW OF FINAL DOCUMENTATION BY ENGINEER
DOCUMENTATION ACCEPTABLE?
NO
R.E. SENDS COMMENTS BACK TO CONTRACTOR
CONTRACTOR MAKES CORRECTIONS
YES
ENGINEER COMPLETES CONSTRUCTION STATUS FORM AND DISTRIBUTES FINAL DOCUMENTATION COPIES.
CONTRACTOR, THROUGH B.C.C., REQUESTS PRE-FINAL INSPECTION BY INSPECTOR
PRE-FINAL INSPECTION BY B.O.T.O. MAINTENANCE SECTION INSPECTOR
ISSUES?
MAJOR ISSUES
INSPECTOR SENDS COMMENTS TO R.E. AND R.E. SENDS COMMENTS BACK TO CONTRACTOR
CONTRACTOR CORRECTS DEFICIENCIES
NO ISSUES
MINOR ISSUES
CONTRACTOR PERFORMS CORRECTIVE ACTION AND SUBMITTS FINAL CORRECTED DOCUMENTATION
CONTRACTOR REQUESTS FINAL INSPECTION WITH X COPIES OF FINAL CORRECTED DOCUMENTATION
FINAL ACCEPTANCE WITH CONTRACTOR, CONSTRUCTION, AND EMC
PROJECT ACCEPTED FOR STATE MAINTENANCE

Final Acceptance Documentation Checklist

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

ITEM	Contractor (Verify)	Resident Engineer (Verify)
Record Drawings -Four hardcopies (11" x 17") -Scanned to two CD-ROMs	☐ ☐	☐ ☐
Field Inspection Tests -Voltage -Amperage -Cable Insulation Resistance -Continuity -Controller Ground Rod Resistance (Four Hardcopies & scanned to two CD's)	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐
GPS Coordinates -Excel file (Check Special Provisions, Excel file scanned to two CD's)	☐	☐
Job Warranty Letter (Four Hardcopies & scanned to two CD's)	☐	☐
Catalog Cut Submittals -Approved & Approved as Noted (Scanned to two CD's)	☐	☐
Lighting Inventory Form (Four Hardcopies & scanned to two CD's)	☐	☐
Lighting Controller Inventory Form (Four Hardcopies & scanned to two CD's)	☐	☐

Light Tower Inspection Form (If applicable, Four Hardcopies & scanned to two CD's)	☐	☐

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

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

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

GPS Coordinates – Check special provisions "General Electrical Requirements". Submit electronic "EXCEL" file.

Job Warranty Letter – See standard specifications.

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

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

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

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

CD LABEL FORMAT TEMPLATE.

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

ELECTRIC SERVICE INSTALLATION
Effective: January 1, 2012

Description
This item shall consist of all material and labor required to extend, connect or modify the electric services, as indicated or specified, which is over and above the work performed by the utility. Unless otherwise indicated, the cost for the utility work, if any, will be reimbursed to the Contractor separately under ELECTRIC UTILITY SERVICE CONNECTION. This item may apply to the work at more than one service location and each will be paid separately.

Materials
Materials shall be in accordance with the Standard Specifications.

CONSTRUCTION REQUIREMENTS

General
The Contractor shall ascertain the work being provided by the electric utility and shall provide all additional material and work not included by other contract pay items required to complete the electric service work in complete compliance with the requirements of the utility.

No additional compensation will be allowed for work required for the electric service, even though not explicitly shown on the Drawings or specified herein

Method of Measurement
Electric Service Installation shall be counted, each.

Basis of Payment
This work will be paid for at the contract unit price each for ELECTRIC SERVICE INSTALLATION which shall be payment in full for the work specified herein.

ELECTRIC UTILITY SERVICE CONNECTION (COMED)
Effective: January 1, 2012

Description
This item shall consist of payment for work performed by ComEd in providing or modifying electric service as indicated. THIS MAY INVOLVE WORK AT MORE THAN ONE ELECTRIC SERVICE. For summary of the Electrical Service Drop Locations see the schedule contained elsewhere herein.

CONSTRUCTION REQUIREMENTS

General
It shall be the Contractor's responsibility to contact ComEd. The Contractor shall coordinate his work fully with the ComEd both as to the work required and the timing of the installation. No additional compensation will be granted under this or any other item for extra work caused by failure to meet this requirement. Please contact ComEd, New Business Center Call Center, at 866 NEW ELECTRIC (1-866-639-3532) to begin the service connection process. The Call Center

Representatives will create a work order for the service connection. The representative will ask the requestor for information specific to the request. The representative will assign the request based upon the location of project.

The Contractor should make particular note of the need for the earliest attention to arrangements with ComEd for service. In the event of delay by ComEd, no extension of time will be considered applicable for the delay unless the Contractor can produce written evidence of a request for electric service within 30 days of execution.

Method of Payment

The Contractor will be reimbursed to the exact amount of money as billed by ComEd for its services. Work provided by the Contractor for electric service will be paid separately as described under ELECTRIC SERVICE INSTALLATION. No extra compensation shall be paid to the Contractor for any incidental materials and labor required to fulfill the requirements as shown on the plans and specified herein.

For bidding purposes, this item shall be estimated as $2,000.00

Basis of Payment

This work will be paid for at the contract lump sum price for ELECTRIC UTILITY SERVICE CONNECTION which shall be reimbursement in full for electric utility service charges.

UNDERGROUND RACEWAYS

Effective: March 1, 2015

Revise Article 810.04 of the Standard Specifications to read:

> "Installation. All underground conduit shall have a minimum depth of 30-inches (700 mm) below the finished grade."

Add the following to Article 810.04 of the Standard Specifications:

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

Add the following to Article 810.04 of the Standard Specifications:

> "All raceways which extend outside of a structure or duct bank but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum or 300 mm (12") or the length shown on the plans beyond the structure or duct bank. The end of this extension shall be capped and sealed with a cap designed for the conduit to be capped.
>
> The ends of rigid metal conduit to be capped shall be threaded, the threads protected with full galvanizing, and capped with a threaded galvanized steel cap.
>
> The ends of rigid nonmetallic conduit and coilable nonmetallic conduit shall be capped with a rigid PVC cap of not less than 3 mm (0.125") thick. The cap shall be sealed to the conduit using a room-temperature-vulcanizing (RTV) sealant compatible with the material of both the cap and the

conduit. A washer or similar metal ring shall be glued to the inside center of the cap with epoxy, and the pull cord shall be tied to this ring."

UNIT DUCT
Effective: January 1, 2012

Revise the first paragraph of Article 810.04 to read:

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

Revise Article 1088.01(c) to read:

"(c) Coilable Nonmetallic Conduit.

General:

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

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

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

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

Dimensions:

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

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

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

Marking:

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

Performance Tests:

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

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

WIRE AND CABLE
Effective: January 1, 2012

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

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

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

Aerial Electric Cable Properties

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

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

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

Revise Article 1066.04 to read:

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

Revise the second paragraph of Article 1066.05 to read:

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

LIGHTING CONTROLLER, BASE MOUNTED, 240VOLT, 100AMP

Description
This item shall consist of furnishing and installing a Control Center complete with all circuit breakers and appurtenances as shown on the plans, Section 825 of the SSRBC and as modified herein.

Materials
The Control Center, complete, shall consist of the following:

1. Controller foundation and pad.
2. Ground Mounted Aluminum Cabinet, 50" x 30" x 19" minimum size.
3. Enclosure to house mechanically held contactor of proper size for system with 120 volt coil. Also to contain thermal magnetic main circuit breaker of adequate size. Wiring for the number of circuit breakers to be provided. Provide the number of circuit breakers indicated on the plans.
4. GFI Duplex Convenience outlet and porcelain lampholder with pull chain.
5. Hand-Off-Auto Switch.
6. Photo-electric cell

The concrete foundation and pad for the cabinet shall be of the dimensions shown on the plans. The concrete shall conform to specifications for Class "SI" concrete as outlined in the Standard Specifications.

Rigid Steel Conduit and elbows, of the diameter indicated, shall be placed in the foundation and extended into the cabinet as shown on the plans. Insulating bushings shall be neoprene and shall be of a creditable manufacturer's make, anchor bolts shall be provided as shown on the plans.

The cabinet shall have a smooth and even texture and shall be free from marks and imperfections. After fabrication and painting, the outside surface of the control cabinet shall be covered with a tough nonstaining gummed paper. Such protective covering shall remain in place until such time as the Engineer will order its removal. After the protective covering has been removed, the entire cabinet shall be thoroughly cleaned to the satisfaction of the Engineer.

Equipment mounting panels shall be of the dimensions and shape indicated on the plans and shall be fabricated from non-conducting inorganic, non-asbestos subpanel. Equipment to be mounted on the panels will be as shown on the plans.

Each panel shall be easily mounted or removed from the front of the cabinet. All equipment mounted on panels shall be easily installed or removed from the front. All wiring of equipment shall be in the front of the panels and wire sizes shall be as designated on the Control Cabinet Wiring Diagram.

A suggested arrangement of equipment on the control equipment panels is shown on the plans. This arrangement has been carefully planned and any deviation from same shall be submitted to the Engineer for approval.

The control cabinet door shall face away from the roadway. All panel and equipment shall be front mounted necessitating no back entry to the cabinet. All cable and connections shall be in front of the panels as shown. All wire or cable sizes shall be as shown on the plans. Bus bar and wire or cable sizes shall be in conformity with the National Electrical code. Bus bars for the equipment shall be insulated, where exposed, except at terminal points.

The main breakers shall be standard UL listed molded case, which are sufficient to trip the branch circuit breakers. The Main Breakers shall be of the size indicated on the plans. The electrically operated mechanically held automatic switch shall be 100 Amp, 2P, 600v, with 120v coil. The contactor shall be complete with coil clearing contacts to interrupt current through the coil once the contactor is held in position. The main contacts for the automatic switch shall be double breaksilver type protected by arcing contacts. Contacts shall be self-aligning and renewable from the front of the panel.

A three position switch as indicated on the plans shall be provided. The switch shall provide for automatic operation, manual and off.

The photocell shall be provided at the controller cabinet as indicated in the plan details.

It is called to the attention of the Contractor that all branch circuits shall be identified by numbers as indicated on the control cabinet wiring diagram. The exact color and number sequence, shown on the plans, must be followed in order to maintain the designed load across each pole of the main switch.

All ends of conduit terminating in the control cabinet shall be blocked with a neoprene plug, and sealed with an approved sealing compound.

Submittal of Drawings

The Contractor shall furnish, prior to any shop work or fabrication, complete and detailed drawings as to dimensions, type of material and method of fabrication for the control cabinet, equipment mounting panel, arrangement of equipment of panels, bus bar sizes, wire or cable sizes for connections between main breaker, automatic switches, photo electric cell, circuit breakers, H-O-A switch, all appurtenances as shown on the plans, and any other equipment as may be necessary for proper operation and control of the lighting system.

Basis of Payment

This work will be paid for at the contract unit price each for LIGHTING CONTROLLER, BASE MOUNTED, 240VOLT, 100AMP, which price shall be payment in full for furnishing and placing Class “SI” concrete foundation with rigid steel conduit for cable entrance and grounding of equipment; Class “SI” concrete pad; furnishing and placing ground rod, furnishing and placing fabricated cabinet complete with equipment panels and all necessary circuit breakers, appurtenances and wiring of same as indicated on the plans; furnishing, installing and connecting the photo-electric cells, and shall include all labor, materials, tools and incidentals necessary to complete and test the operation of the control cabinet as herein specified and as shown on the plans.

LIGHTING CONTROLLER, BASE MOUNTED, 240VOLT, 200AMP

Description

This item shall consist of furnishing and installing a Control Center complete with all circuit breakers and appurtenances as shown on the plans, Section 825 of the SSRBC and as modified herein.

Materials

The Control Center, complete, shall consist of the following:

1. Controller foundation and pad.
2. Ground Mounted Aluminum Cabinet, 50” x 30” x 19” minimum size.

3. Enclosure to house mechanically held contactor of proper size for system with 120 volt coil. Also to contain thermal magnetic main circuit breaker of adequate size. Wiring for the number of circuit breakers to be provided. Provide the number of circuit breakers indicated on the plans.
4. GFI Duplex Convenience outlet and porcelain lampholder with pull chain.
5. Hand-Off-Auto Switch.
7. Photo-electric cell

The concrete foundation and pad for the cabinet shall be of the dimensions shown on the plans. The concrete shall conform to specifications for Class "SI" concrete as outlined in the Standard Specifications.

Rigid Steel Conduit and elbows, of the diameter indicated, shall be placed in the foundation and extended into the cabinet as shown on the plans. Insulating bushings shall be neoprene and shall be of a creditable manufacturer's make, anchor bolts shall be provided as shown on the plans.

The cabinet shall have a smooth and even texture and shall be free from marks and imperfections. After fabrication and painting, the outside surface of the control cabinet shall be covered with a tough nonstaining gummed paper. Such protective covering shall remain in place until such time as the Engineer will order its removal. After the protective covering has been removed, the entire cabinet shall be thoroughly cleaned to the satisfaction of the Engineer.

Equipment mounting panels shall be of the dimensions and shape indicated on the plans and shall be fabricated from non-conducting inorganic, non-asbestos subpanel. Equipment to be mounted on the panels will be as shown on the plans.

Each panel shall be easily mounted or removed from the front of the cabinet. All equipment mounted on panels shall be easily installed or removed from the front. All wiring of equipment shall be in the front of the panels and wire sizes shall be as designated on the Control Cabinet Wiring Diagram.

A suggested arrangement of equipment on the control equipment panels is shown on the plans. This arrangement has been carefully planned and any deviation from same shall be submitted to the Engineer for approval.

The control cabinet door shall face away from the roadway. All panel and equipment shall be front mounted necessitating no back entry to the cabinet. All cable and connections shall be in front of the panels as shown. All wire or cable sizes shall be as shown on the plans. Bus bar and wire or cable sizes shall be in conformity with the National Electrical code. Bus bars for the equipment shall be insulated, where exposed, except at terminal points.

The main breakers shall be standard UL listed molded case, which are sufficient to trip the branch circuit breakers. The Main Breakers shall be of the size indicated on the plans. The electrically operated mechanically held automatic switch shall be 200 Amp, 2P, 600v, with 120v coil. The contactor shall be complete with coil clearing contacts to interrupt current through the coil once the contactor is held in position. The main contacts for the automatic switch shall be double breaksilver type protected by arcing contacts. Contacts shall be self-aligning and renewable from the front of the panel.

A three position switch as indicated on the plans shall be provided. The switch shall provide for automatic operation, manual and off.

The photocell shall be provided at the controller cabinet as indicated in the plan details.

It is called to the attention of the Contractor that all branch circuits shall be identified by numbers as indicated on the control cabinet wiring diagram. The exact color and number sequence, shown on the plans, must be followed in order to maintain the designed load across each pole of the main switch.

All ends of conduit terminating in the control cabinet shall be blocked with a neoprene plug, and sealed with an approved sealing compound.

Submittal of Drawings

The Contractor shall furnish, prior to any shop work or fabrication, complete and detailed drawings as to dimensions, type of material and method of fabrication for the control cabinet, equipment mounting panel, arrangement of equipment of panels, bus bar sizes, wire or cable sizes for connections between main breaker, automatic switches, photo electric cell, circuit breakers, H-O-A switch, all appurtenances as shown on the plans, and any other equipment as may be necessary for proper operation and control of the lighting system.

Basis of Payment

This work will be paid for at the contract unit price each for LIGHTING CONTROLLER, BASE MOUNTED, 240VOLT, 200AMP, which price shall be payment in full for furnishing and placing Class "SI" concrete foundation with rigid steel conduit for cable entrance and grounding of equipment; Class "SI" concrete pad; furnishing and placing ground rod, furnishing and placing fabricated cabinet complete with equipment panels and all necessary circuit breakers, appurtenances and wiring of same as indicated on the plans; furnishing, installing and connecting the photo-electric cells, and shall include all labor, materials, tools and incidentals necessary to complete and test the operation of the control cabinet as herein specified and as shown on the plans.

REMOVE EXISTING DOUBLE HANDHOLE

Add the following to Article 895.05 of the Standard Specifications.

Description

The existing double handhole which is to be removed and is to become the property of the Contractor shall be disposed of at the Contractor's expense. This work shall include all of the necessary work to remove the existing double handholes from the ground and to restore the existing pavement or ground to match the adjacent conditions at the site. Holes created should be filled or barricaded immediately to prevent safety hazards.

Basis of Payment

This work shall be paid for at the contract unit price, per each, for REMOVE EXISTING DOUBLE HANDHOLE, of the type indicated on the plans, which price shall include all work, excavation, materials, all equipment and labor required to complete the work as specified and to restore the existing ground or pavement.

REMOVE EXISTING SIGNAL CABLE

Revise Article 895.08 Paragraph 6 of the Standard Specifications to read:

Basis of Payment

Removal of existing signal electric cable shall be included in the contract unit cost for REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT. The salvage value of the removed cables shall be reflected in the contract bid price.

FIBER OPTIC SPLICE
Effective: June 1, 2014

Description
The Contractor will splice optical fibers from different cable sheaths and protect them with a splice closure at the locations shown on the Plans. Fiber splicing consists of in-line fusion splices for all fibers described in the cable plan at the particular location.

Two splices are identified. A mainline splice includes all fibers in the cable sheath. In a lateral splice, the buffer tubes in the mainline cable are dressed out and those fibers identified on the plans are accessed in and spliced to lateral cables.

Materials.

Splice Closures. Splice Closures shall be designed for use under the most severe conditions such as moisture, vibration, impact, cable stress and flex temperature extremes as demonstrated by successfully passing the factory test procedures and minimum specifications listed below:

Physical Requirements. The closures shall provide ingress for up to four cables in a butt configuration. The closure shall prevent the intrusion of water without the use of encapsulates.

The closure shall be capable of accommodating splice organizer trays that accept mechanical, or fusion splices. The splice closure shall have provisions for storing fiber splices in an orderly manner, mountings for splice organizer assemblies, and space for excess or un-spliced fiber. Splice organizers shall be re-enterable. The splice case shall be UL rated.

Closure re-entry and subsequent reassembly shall not require specialized tools or equipment. Further, these operations shall not require the use of additional parts.

The splice closure shall have provisions for controlling the bend radius of individual fibers to a minimum of 38 mm (1.5 in.).

Factory Testing.

Compression Test. The closure shall not deform more than 10% in its largest cross-sectional dimension when subjected to a uniformly distributed load of 1335 N at temperatures of –18 and 38 degrees Celsius (0 and 100 degrees Fahrenheit). The test shall be performed after stabilizing at the required temperature for a minimum of two hours. It shall consist of placing an assembled closure between two flat parallel surfaces, with the longest closure dimension parallel to the surfaces. The weight shall be placed on the upper surface for a minimum of 15 minutes. The measurement shall then be taken with weight in place.

Impact Test. The assembled closure shall be capable of withstanding an impact of 28 N-M at temperatures of –18 and 38 degrees Celsius (0 and 100 degrees Fahrenheit). The test shall be performed after stabilizing the closure at the required temperature for a minimum of 2 hours. The test fixture shall consist of 9 kg (20 lb) cylindrical steel impacting head with a 50 mm (2 in.) spherical radius at the point where it contacts the closure. It shall be dropped from a height of 305 mm (12 in.). The closure shall not exhibit any cracks or fractures to the housing that would preclude it from passing the water immersion test. There shall be no permanent deformation to the original diameter or characteristic vertical dimension by more than 5%.

Cable Gripping and Sealing Testing. The cable gripping and sealing hardware shall not cause an increase in fiber attenuation in excess of 0.05 dB/fiber @ 1550 nm when attached to the cables and the closure assembly. The test shall consist of measurements from six fibers, one from each buffer tube or channel, or randomly selected in the case of a single fiber bundle. The measurements shall be taken from the test fibers before and after assembly to determine the effects of the cable gripping and sealing hardware on the optical transmission of the fibers.

Vibration Test. The splice organizers shall securely hold the fiber splices and store the excess fiber. The fiber splice organizers and splice retaining hardware shall be tested per EIA Standard FOTP-II, Test Condition 1. The individual fibers shall not show an increase in attenuation in excess of 0.1 dB/fiber.

Water Immersion Test. The closure shall be capable of preventing a 3 m (10 ft) water head from intruding into the splice compartment for a period of 7 days. Testing of the splice closure is to be accomplished by the placing of the closure into a pressure vessel and filling the vessel with tap water to cover the closure. Apply continuous pressure to the vessel to maintain a hydrostatic head equivalent 3 m (10 ft) on the closure and cable. This process shall be continued for 30 days. Remove the closure and open to check for the presence of water. Any intrusion of water in the compartment containing the splices constitutes a failure.

Certification. It is the responsibility of the Contractor to insure that either the manufacturer, or an independent testing laboratory has performed all of the above tests, and the appropriate documentation has been submitted to the Department. Manufacturer certification is required for the model(s) of closure supplied. It is not necessary to subject each supplied closure to the actual tests described herein.

CONSTRUCTION REQUIREMENTS

The closure shall be installed according to the manufacturer's recommended guidelines. For mainline splices, the cables shall be fusion spliced. 45 days prior to start of the fiber optic cabling installation, the Contractor shall submit the proposed locations of the mainline splice points for review by the Department.

The Contractor shall prepare the cables and fibers in accordance with the closure and cable manufacturers' installation practices. A copy of these practices shall be provided to the Engineer 21 days prior to splicing operations.

Using a fusion splicer, the Contractor shall optimize the alignment of the fibers and fuse them together. The Contractor shall recoat the fused fibers and install mechanical protection over them.

Upon completing all splicing operations for a cable span, the Contractor shall measure the mean bi-directional loss at each splice using an Optical Time Domain Reflectometer. This loss shall not exceed 0.1 dB.

The Contractor shall measure the end-to-end attenuation of each fiber, from connector to connector, using an optical power meter and source. This loss shall be measured at from both directions and shall not exceed 0.5 dB per

installed kilometer of single mode cable. Measurements shall be made at both 1300 and 1550 nm for single mode cable. For multimode cable, power meter measurements shall be made at 850 and 1300 nm. The end-to-end attenuation shall not exceed 3.8 dB/installed kilometers at 850nm or 1.8 dB per installed kilometer at 1300nm for multimode fibers.

As directed by the Engineer, the Contractor at no additional cost to the Department shall replace any cable splice not satisfying the required objectives.

The Contractor shall secure the Splice Closure to the side of the splice facility using cable support brackets. All cables shall be properly dressed and secured to rails or racks within the manhole. No cables or enclosures will be permitted to lie on the floor of the splice facility. Cables that are spliced inside a building will be secured to the equipment racks or walls as appropriate and indicated on the Plans.

Method of Measurement
Fiber optic splice of the type specified will be measured as each, completely installed and tested with all necessary splices completed within the enclosure, and the enclosure secured to the wall of the splice facility.

Basis of Payment
This item shall be paid at the contract unit price each for FIBER OPTIC SPLICE, LATERAL or FIBER OPTIC SPLICE, MAINLINE of the type specified, which shall be payment in full for the work, complete, as specified herein.

EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C

This work shall consist of furnishing and installing lead-in cable for light detectors installed at existing and/or proposed traffic signal installations as part of an emergency vehicle priority system. The work includes installation of the lead-in cables in existing and/or new conduit. The electric cable shall be shielded and have three (3) stranded conductors colored blue, orange, and yellow with a stranded tinned copper drain wire. The cable shall meet the requirements of the manufacturer of the Emergency Vehicle Priority System Equipment.

Basis of Payment
This work will be paid for at the contract unit price per foot for EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operation.

ROD AND CLEAN EXISTING CONDUIT
Effective: January 1, 2015
Revised: July 1, 2015

Description
This work shall consist of inserting a duct rod or electrical fish rod or tape of sufficient length and rigidity into an electrical conduit opening in one electrical handhole, and pushing the said rod through the conduit to emerge at the next or subsequent handhole in the conduit system at the location(s) shown on the plans. The duct rod may be inserted and removed by any standard construction method which causes no damage to the conduit. The size of the conduit may vary, but there shall be no differentiation in cost for the size of the conduit.

The conduit which is to be rodded and cleaned may exist with various amounts of standing water in the handholes to drain the conduit and to afford compatible working conditions for the installation of the duct rods and/or cables. Pumping of handholes shall be included with the work of rodding and cleaning of the conduit.

Any handhole which, in the opinion of the Engineer contains excessive debris, dirt or other materials to the extent that conduit rodding and cleaning is not feasible, shall be cleaned at the Engineer's order and payment approval as a separate pay item.

Prior to removal of the duct rod, a duct cleaning attachment such as a properly sized wire brush or cleaning mandrel shall be attached to the duct rod, which by removal of the duct rod shall be pulled through the conduit to remove sand, grit, or other light obstructions from the duct to provide a clean, clear passage for the installation of cable. Whenever the installation of cables is not performed as an adjunct to or immediately following the cleaning of the duct, a light weight pulling line such as a 1/8" polyethylene line or conduit measuring tape shall be placed and shall remain in the conduit to facilitate future work. When great difficulty of either inserting the duct rod or removal of the cleaning mandrel is encountered, the duct may require further cleaning by use of a compressed air gun, or a low pressure water hose. In the case of a broken conduit, the conduit must be excavated and repaired. The existence and location of breaks in the conduit may be determined by rodding, but the excavation and repair work required will be paid for separately.

This work shall be measured per lineal foot for each conduit cleaned. Measurements shall be made from point to point horizontally. No vertical rises shall count in the measurement.

Basis of Payment
This work shall be paid for at the contract unit price per lineal foot for ROD AND CLEAN EXISTING CONDUIT for the installation of new electric cables in existing conduits. Such price shall include the furnishing of all necessary tools, equipment, and materials required to prepare a conduit for the installation of cable.

OUTDOOR RATED NETWORK CABLE

Description
This work shall consist of furnishing and installing a network cable from the traffic signal cabinet to the associated field device as shown on the plans.

Materials
The outdoor rated network cable shall be a black Category 5e cable, meeting the TIA/EIA 568-B.2 telecommunication standards. The cable shall be composed of 24 AWG solid bare copper conductors, twisted pairs, polyolefin insulation, inner LLPE jacket, overall shield (100% coverage), 24 AWG stranded TC drain wire, industrial grade sunlight- and oil-resistant LLPE jacket. The cable shall be capable of performing from -40 ºF to 160 ºF.

Each end of the cable shall be terminated with an RJ-45 connector installed according to the TIA/EIA 568B standard. The drain wire at the cabinet end shall be terminated with a ring lug and attached to a suitable ground point.

General
The work shall be performed according to the applicable portions of Section 873 of the "Standard Specifications", and details as shown on the plans.

Basis of Payment
This work will be paid for at the contract unit price per foot for OUTDOOR RATED NETWORK CABLE. The unit price shall include all equipment, materials and labor required to furnish and install the cable, and making all connections necessary for proper operation. The unit price shall also include furnishing and installing the RJ-45 connectors, ring terminals and grounding the cable.

REMOTE CONTROLLED VIDEO SYSTEM

Description
This work shall consist of furnishing and installing an IP based remote controlled video system at a location designated by the Traffic Engineer. The work shall include a color camera, dome assembly, all mounting hardware, connectors, cables, power injectors, and related equipment necessary to complete the installation according to the manufacturer's specifications.

Materials
The PTZ camera shall be one of the following approved models:

- TKH Security Solutions PD1103Z2-E
- AXIS Q6055-E
- Cohu 4220HD

The Contractor shall furnish the required number of power injectors for the camera make and model selected, including operation of the camera heater, as well as all required mounting hardware, connectors, patch cables, and power supplies.

The system shall have anonymous FTP capabilities disabled by the vendor/equipment supplier or provide a feature for the user to disable the functionality through the standard internal menu.

Installation
The camera shall be installed as shown on the plans, either on the luminaire arm near the luminaire, or on the combination mast arm assembly pole, angled toward the center of the intersection using a mounting bracket compatible with the camera and procured from one of the approved camera manufacturers. When installed on the pole, the camera shall be mounted to provide a minimum of 12 inches clear space between face of the pole and the camera housing. When installed on the luminaire arm, the camera shall be installed with a 30-degree tilt-adjustable bracket. The camera and any external hardware and housing shall be installed with stainless steel straps.

All holes drilled into signal poles, mast arms, or posts shall require rubber grommets to prevent the chafing of wires.

The Contractor shall contact the Traffic Engineer prior to installing the camera and associated wiring, to receive final approval on the camera location.

If the Remote Controlled Video System will be connected to the Gigabit Ethernet network, then a Layer II (Datalink) Switch and/or a Layer III (Network) Switch shall be required. Layer II and Layer III switches shall be installed as shown on the plans. If required, the LAYER II (DATALINK) SWITCH and/or the LAYER III (NETWORK) SWITCH shall be included in the cost of the FULL ACTUATED CONTROLLER AND CABINET, of the type specified.

Basis of Payment
This item will be paid for at the contract unit price per each for REMOTE CONTROLLED VIDEO SYSTEM. The unit price shall include all associated equipment, hardware, cables, materials and labor required to install the complete system in place and in operation to the satisfaction of the Traffic Engineer. The OUTDOOR RATED NETWORK cable from the traffic signal cabinet will be paid for separately.

DATA AGGREGATOR

Description
This work shall consist of furnishing and installing a data aggregator in the traffic signal cabinet.

Materials
1) The operating temperature of the device shall be - 40ºF to 176ºF (-40ºC to 80ºC) with humidity ranging from 5% - 95% non-condensing.
2) The weight of the device including the battery shall not exceed 4.0 lbs. (1.81Kg)
3) The device shall have, on the rear side of the box, a DC or AC power supply connector.
   a) The Power supply input shall be 24 VDC and have an operating range of between 18 VDC and 30 VDC,
   b) There shall be an optional AC power supply version.
      i) This version shall use 120 AC voltage as the power source for the device instead of 24 VDC.
   c) The device shall have a maximum operating power consumption of 2.0 Amps with the Cell and GPS operational.
4) The device shall have, on the back side of the box, connectors for 5 harnesses herein named C1 – C5 with 3 pins, 10 pins, 10 pins, 20 pins, and 20 pins respectively.
   a) C1 (DC POWER) shall be for the Analog DC input for powering the device.
      i) Optional AC POWER connector shall also be used in AC units.
   b) C2 (ANALOG AC INPUTS) shall be for Analog AC inputs for measuring voltages from 0 – 130 VAC.
   c) C3 (ANALOG DC INPUTS) shall be for Analog DC inputs which measures voltages from 0 – 30 VDC.
   d) C4 (RELAY/PED) shall be Digital Outputs and Pedestrian Pushbutton inputs
      i) There shall be three (3) relays for user programmed functions with both N.O. (normally open) and N.C. (normally closed) contact closures.
      ii) There shall be one relay output, with both N.O. and N.C. contact closures for providing a Sync pulse or Line Sync used by controllers to set their internal clocks in the absence of an NTP server.
      iii) There shall be four (4) inputs for pedestrian push button monitoring.
   e) C5 (DIGITAL DC INPUT) shall be for Digital inputs which shall monitor up to 16 individual detector inputs.
   f) There shall be a fuse holder with a 2 Amp SloBlo Fuse on the back face of the box
5) The device shall have an SDLC Port on the front face of the box (SDLC) supporting inbound clocking rate of up to 153600.
   a) The SDLC shall provide for the following:
      i) Detector Activations
      ii) Detector failures
      iii) Phase colors
      iv) Cabinet Fault Status
      v) Cabinet Fault condition
6) The device shall have, on the front of the box, eight (8) 2.5 mm jacks for connection to Oracle detector outputs, (AUX 1 – 8)

a) The Detector inputs shall provide the following information from the Oracles:
    i) Detector Counts per channel
    ii) Channel loop status
    iii) Channel fault conditions

7) The device shall have, on the front of the box, an SMA Female GPS antenna connector. (GPS)
    a) The GPS shall provide the following:
        i) Latitude and Longitude of the device
        ii) Time information used by the device to provide a sync pulse if used.
8) The device shall have, on the front of the box, an SMA Female Cellular antenna connector. (CELL)
    a) There shall be a cellular signal indication provided by a seven segment LED display where 0 is no signal and 9 is the strongest signal.
9) The device shall have, on the front of the box, an SMA Male Wi-Fi connector. (WI-FI)
    a) This Wi-Fi connection shall be used for receiving Wi-Fi polls from Wi-Fi devices used for travel time calculations.
    b) It shall not be used for "hot spot" applications.
    c) The Wi-Fi radio shall be able to monitor Wi-Fi devices in the vicinity of the antenna and log and report 3rd party device MAC addresses and Signal Strength for use in travel time and OD calculations.
10) The device shall have, on the front of the box, a nine pin Sub-D connector for Serial (EIA-232) communications. (EIA232)
    a) The Serial port shall be usable as a pass through port.
11) The device shall have, on the front of the box, two RJ-45 Ethernet connectors. (ETH1 / ETH2).
    a) The Ethernet ports shall be used as pass through ports for communications to 3rd Part devices.
12) The device shall, on the front of the box two USB communications ports (Not labeled)
13) The device shall have 2 LEDs to indicate the following:
    a) Power indicator (POWER)
    b) Heart Beat (HEART)
14) The device shall have a separate compartment for the 6 VDC 4.5 Ah sealed gel cell battery.
    a) The battery shall be accessible by a single thumb screw release which will unlatch the compartment.
15) There shall be a button on the front panel of the device (FUNC) used to trigger the following:
    a) Battery disconnect
    b) Programming mode
    c) Force communications mode
16) An external 5 band antenna shall be mounted on the outside of the traffic signal cabinet or school flasher cabinet and shall be used to connect to the device's GPS and Cellular modem.
    a) The five bands should include
        i) Cellular (GSM/GPRS/LTE)
        ii) GPS
        iii) Wi-Fi – 2.4GHz
        iv) Bluetooth – 2.4GHz
        v) DSRC – 5.9 GHz
    b) The antenna shall be through-hole mounted using an M12 – 1inch long bolt.
    c) The Radome shall be either White ASA UV inhibitive plastic or Black ASA UV inhibitive plastic.
    d) Four of the leads of the antenna shall be terminated with a male SMA connector.
        i) The Wi-Fi antenna lead shall be an SMA-R female connector.
    e) All cables shall be RG-174U cabling.
    f) The leads of the connector shall be 6.56 ft. (2 Meters)
    g) The operating temperature of the antenna shall be - 40ºF to 176ºF (-40ºC to 80ºC).

17) An auxiliary cabinet side mount bracket shall be available if necessary due to restrictions of mounting the antenna directly to the top of a traffic signal cabinet.
18) Cable harness(s) for C1, C2, C3, C4 and C5 shall be provided in lengths of 8 feet / 1.830 meters. Wires shall be crimped and soldered. Wires shall be individually labeled and packaged with a documented wire matrix.
    a) Each wire shall be 18 AWG and be partially stripped 10 mm from the end.
    b) Each wire shall be hot stamped marked providing information about the function of the input or output associated with the wire.
19) Each device shall be provided with an internal mini SIM for use on GSM networks T-Mobile or AT&T; Verizon and Sprint users will require a different modem because the technology is CDMA and will require different modem hardware. This shall be determined by the location of the installation.
    a) The user shall have the option of providing their own SIM card if required.
20) The cell modem shall be a 3G modem certified for communications on AT&T, T-Mobile, and Rogers (Canada).
21) The cell modem for Verizon, Sprint and other CDMA communications networks shall be approved and certified for use on those networks.
22) There shall be two processors: An applications processor running at a minimum of 600 MHz and shall be industrial rated. A real time Processor for SDLC which shall have an operating processor speed of at least 100 MHz
    a) RAM shall be 1 Gigabytes and the Flash Memory shall be 4 Gigabytes.
23) The operating system shall be Linux (Ubuntu) 12.04.2 LTS or newer with Kernel ver. 3.15.3

Functionality

The device shall be designed and configured to communicate to a cloud based software developed specifically to provide information regarding the condition of the operation of traffic signal cabinets. Operational information, including detector counts, phase condition and intersection operations shall also be provided. The device shall also be able to provide data concerning travel time and Origin-Destination statistics.

1) The device shall communicate to the iCITE G2 host through a Cellular connection.
2) The device shall optionally communicate to the iCITE G2 host through an existing wired Ethernet connection.
3) The device shall communicate via the cellular network to the iCITE G2 host only when an event or monitored condition occurs.
4) The device shall have the ability to use the Ethernet or Serial ports to provide pass through communications for 3rd party devices.
5) The device shall communicate to the iCITE G2 host at a user programmable interval with a “heartbeat” to indicate to the iCITE G2 host it is still connected and operating normally.
6) The ETH1 port shall be used to connect to either an Eberle Design, Inc. (EDI) or Reno A&E (RAE) NEMA Type MMU or MMU2 equipment or Caltrans Type 2010 or 2018 monitors with Ethernet ports.
    a) The device shall be capable or determining the device it is connected to.
    b) The device shall be capable or retrieving the following information from any monitor.
        i) The Fault status of the cabinet, indicating any conflict or other fault
        ii) The state of the cabinet during fault, verifying what each channel was indicating prior to fault.
        iii) The voltages of active channels
        iv) The condition of the power in the cabinet
            (1) AC Voltage
            (2) Frequency
            (3) 24 DC Voltage
            (4) 12 DC voltage, if programmed in the Monitor
        v) The logs available by MMU or Monitor device type.

7) The ETH2 port shall be used to connect to any device or in cases where there are Ethernet or LAN connections available be used to connect to remote locations.
8) The AUX COMM slots shall be capable of receiving data from either 2 or 4 channel Oracle 2ECX or 4ECX detectors from Eberle Design.
    a) The detector count information shall be available
    b) The detector fault status shall be available.
    c) The detector on/off status shall be available.
    d) There shall be no configuration necessary to communicate to an Oracle Detector.
9) The GPS shall provide location and time to the device
    a) The device shall use the GPS provided time to activate the user programmed sync pulse.
    b) The device shall report back to the iCITE G2 host software, in latitude and longitude, the location of the device for geolocation on the iCITE G2 host map.
10) The device shall use the cellular connection to the iCITE G2 Host software to report back on the EDI MMU, MMU2, 2010 or 2018 information as stated above.
11) The device shall use the cellular connection to the iCITE G2 Host software to report back information available on the SDLC port.
    a) Detector activations
    b) Detector Fault Status
    c) Cabinet Fault Status
    d) Channel Status
    e) Signal Status – On / Off / Flashing
12) The device shall report data to the iCITE G2 Host software in user defined bin and interval lengths.
13) The device shall use the Cellular modem to connect to the iCITE G2 Host software and provide basic information about the status or health of the cabinet.
    a) Door – Open / Closed (AC analog inputs)
    b) Fan – On / Off (AC analog inputs)
    c) Heater – On / Off (AC analog inputs)
    d) Cabinet Flash – On / Off (DC Digital Inputs)
    e) Stop Time – On / Off (DC Digital Inputs)
    f) Battery Backup System (BBS) Battery Low (DC analog Inputs)
    g) BBS On (DC Digital Inputs)
    h) 24 VDC (DC Analog Inputs) condition
    i) Cabinet VAC (AC Analog Inputs) condition
    j) BBS VAC (AC Analog Inputs) condition
    k) BBC Battery (DC Analog Inputs) condition
    l) 12 VDC Battery (DC Analog Inputs) condition
    m) Multiple user definable 24 VDC inputs (DC digital Input)
    n) Multiple user definable AC inputs (AC Analog Inputs)
14) When a TOC or NOC connection is lost, the device shall be capable of providing information to determine whether the communication is lost, the cabinet has lost power, or the cabinet has gone into a fault condition.
15) The device shall alert on a loss of Ping response on the secondary Ethernet.
16) The device shall be capable of reporting by user defined intervals information regarding hashed Wi-Fi MAC addresses identified at its location.
17) The device shall perform Data Compression in order to minimize cellular Data Package limitations.

Cabinet Interface

The device is cabinet agnostic and shall be useable in the both NEMA TS-1 and TS-2 cabinets or hybrids thereof, as well as Caltrans 33X cabinets.

1) NEMA TS-1 cabinets
   a) The interface to these cabinets shall be provided by detector inputs through the rear Digital DC inputs
      i) 16 inputs shall be designated for Vehicle detection
      ii) 4 inputs shall be designated for Pedestrian inputs.
   b) Phase colors and timing shall be provided through either an EDI or Reno A&E MMU via the Ethernet or Serial port.
2) NEMA TS-2 cabinets
   a) The primary interface for detections and phase color and timings shall be provided by the SDLC connector.
   b) Detector counts shall be provided through the Digital DC connector on the rear of the device
   c) Additional information shall be provided via the Ethernet or Serial port of an EDI or Reno A&E MMU.
3) Caltrans 33X cabinets.
   a) The interface to these cabinets shall be provided by detector inputs through the rear Digital DC inputs
      i) 16 inputs shall be designated for Vehicle detection
      ii) 4 inputs shall be designated for Pedestrian inputs.
   b) Phase colors and timing shall be provided through either an EDI or Reno A&E 2018 via the Ethernet or Serial port.
4) ATCC / ITS cabinets
   a) The functionality shall be similar to the NEMA TS2 application which will also be able to utilize the Oracle 2ECX or Oracle 4ECX detectors.
5) Non-Intrusive Signal State Data Acquisition for NEMA TS1 and 33X style Signal Cabinets.
   a) Signal state information shall be obtained in a way that does not interfere with the Controller and its operations.
   b) Interconnect boxes such as those that intercept Controller commands and operations from the MS or C1 connectors shall be prohibited.
      i) These interfaces introduce unnecessary multiple points of failure resulting in misperception when diagnosing cabinet faults.
   c) Signal state information for these cabinet types shall be obtained from the Conflict Monitor via RS-232 or Ethernet connection.

LED Displays

1) HEART - The device shall flash this LED as long as it is actively polling interfaces.
2) POWER – The device shall flash this LED when in the process of communications. It shall go solid from post request until acknowledgement.

Parameter Receipt and Data Posting (Communications)

1) Using the internal cellular modem, the device shall establish a connection to the either the Internet, or a private carrier specific APN.
   a) SIMS with support for dynamic IPs and dedicated IPs shall be supported.
   b) Over the cellular data network a connection using Point to Point Protocol PPP is established.
   c) The data aggregator shall use this path information for a protocol called HTTP to download iCITE G2 specific configuration parameters and to report successful communications in iCITE G2.
   d) If required encryption shall be provided with 128 bit encryption.
2) On an alarm event – the device shall upload data to ICITE G2 using an HTTP push.
   a) The iCITE G2 software shall collect and log the data into its database for the device ID.

b) In the absence of a successful push, the data aggregator shall queue its upload requests.
3) The device shall use time stamped Unix Epoch time for its events.
4) The iCITE G2 website must display the status of the device ID database. Communications logs and Alarm events shall be displayed there.
5) In local programming mode, the device shall support responses to the Ping protocol to confirm communications.

Internals
1) The design of the device shall include a watchdog function which shall trigger a reset.
2) The design of the device shall include an output for status information on boot and is displayable via the connector. This shall be readable as Async RS-232 at 115200 bps through the EIA 232 port or Eth1.
3) The design of the device shall include code for the carrier specific APN SIM to be loaded into the cellular modem.
4) The design of the device shall include code to establish a configuration Web interface.
5) In local programming mode the device shall support the SSH / FTP protocol for file transfer.
6) In local programming mode, the device shall support the ability for FTP to display access rights.

System Security
1) In local programming mode, the device shall require a password for SSH / FTP access.
2) A carrier APN is recommended along with cost tracking plans.
3) The iCITE G2 software shall be setup with firewalls to limit remote desktop access.
4) The iCITE G2 software user passwords shall be individual by organization.
5) SQL database access is only allowed by EDI/RENO, reporting shall be setup in advance.
6) The system shall be capable of using MAC address identification as an additional security measurement. This is to prevent rogue devices from being installed
7) The system shall provide 128 bit encryption for all data that is provided by data aggregator hardware to iCITE G2.
8) The system shall be password protected and have three (4) software levels including but not limited to as “Administrator”, “Read/Write”, “Read only”, “Limited Read”.
9) A minimum level of security for password choices shall be required.
10) Passwords must be diverse, (e.g. can’t use “password”, “123”, carriage return)
11) If a data aggregator with an unknown ID is setup the data shall NOT be posted and shall be ignored.
12) If multiple data aggregators are setup with common ID’s the data shall be captured.

iCITE G2 Diagnostic Information

1) If the post of information to iCITE G2 is not successful, the device shall log a message to its diagnostic port, queue the file for the next transmission, and iCITE G2 host shall log a time stamp entry “Server check-in failed. Retry Attempt #”.
2) If the post of information is not successful for 3 attempts, iCITE G2 host shall log a time stamp entry “Server check-in failed on 3 consecutive retries, checking connections”.
3) If a “Soft Reset” has occurred, a time stamped entry is displayed in the Error Log for that data aggregator unit.
4) If a “Hard Reset” has occurred, a time stamped entry is displayed in the Error Log for that data aggregator unit.
5) Each Configuration sent and each dataset post shall have its own time stamped communication log entry in iCITE G2.

SQL Structured Query Language Data Extraction

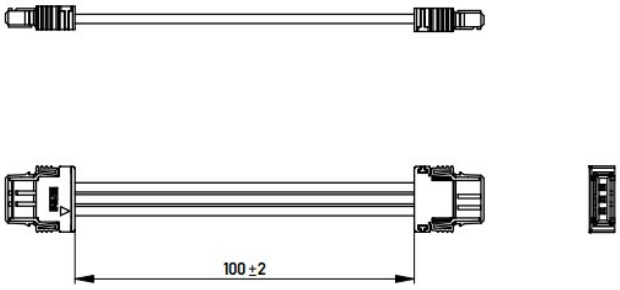
1) The system shall allow for time stamped data to be extracted using the device id as a key to the database maintained in iCITE G2.
2) Database security shall require individual passwords to allow users to access the data.

Standards Compliance

1) The hardware shall meet all CE and CSA electrical and environmental requirements.
2) The hardware shall meet all FCC, CSA, and CE requirements for GSM/GPRS devices.
3) The hardware shall meet all NEMA, Caltrans 170, and 2070 requirements for traffic signal controller interface.
4) The hardware shall meet all ITS and ATC requirements for traffic signal controller interface.

Hardware Pin Assignments

Input Power Connector - C1 (3 Inputs)



18AWG WIRE ARE TO BE PARTIALLY STRIP 10MM FROM END

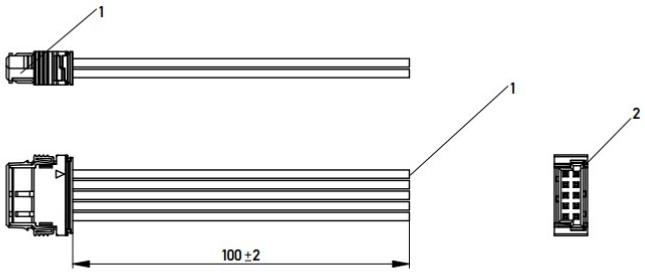
ERNI PN# 364215, 1 PLC TYP

HOT STAMP OR MARK EACH WIRE AT 1FT (305MM) INTERVALS WITH LABEL NOMENCLATURE

INPUT POWER		
PIN LOCATION	SIGNAL (LABEL NOMENCLACTURE)	WIRE COLOR
A1	LOGIC GND	BLACK
A2	EGND	GREEN
A3	DC POWER	RED

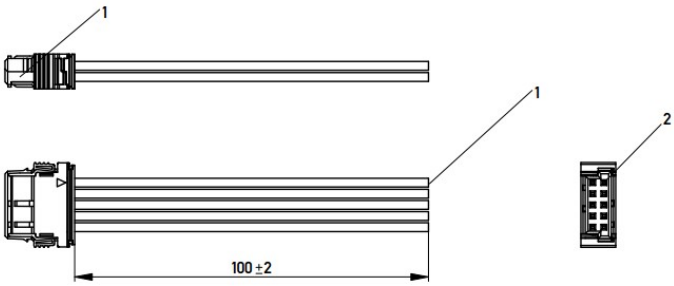
Analog AC Inputs - C2 (8 Inputs)

ERNI PN# 474036, 1 PLC TYP



ANANLOG AC INPUTS (CABLE)		
PIN LOCATION	SIGNAL (LABEL NOMENCLACTURE)	WIRE COLOR
A1	AC1 (CAB AC LINE)	YELLOW
A2	AC2 (BBS AC LINE)	YELLOW
A3	AC3 (HEATER)	YELLOW
A4	AC4 (AC FAN)	YELLOW
A5	**(NONE)**	
B1	AC5 (CAB DOOR ALARM)	YELLOW
B2	AC6	YELLOW
B3	AC7	YELLOW
B4	AC8	YELLOW
B5	AC_NEUT	WHITE

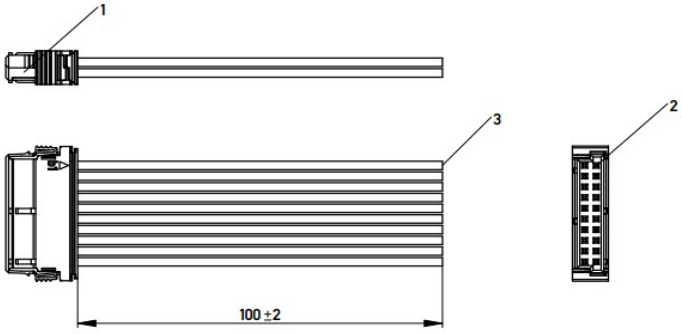
Analog DC Inputs – C3 - 8 Inputs



ERNI PN# 474034, 1 PLC TYP

ANALOG DC INPUTS (CABLE)		
PIN LOCATION	SIGNAL (LABEL NOMICLACTURE)	WIRE COLOR
A1	DC1 (STOP TIME)	BLUE
A2	DC2 (BBS BATT +)	BLUE
A3	DC3 (BBS LOW BATT)	BLUE
A4	DC4 (FLASH SENSE)	BLUE
A5	**(NONE)**	
B1	DC5 (BBS LOW BATT)	BLUE
B2	DC6 (BBS ON BATT)	BLUE
B3	DC7	BLUE
B4	DC8	BLUE
B5	LOGIC GND	BLACK

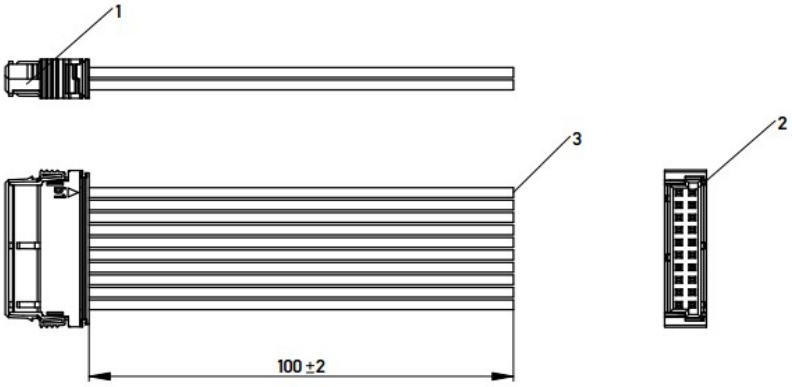
Relay Outputs / Ped Inputs – C4
4 Peds / 3 relays / Sync Pulse



ERNI PN# 3743364, 1 PLC TYP

RELAY/PED		
PIN LOCATION	SIGNAL (LABEL NOMICLACTURE)	WIRE COLOR
A1	PED1	BLUE
A2	PED2	BLUE
A3	PED DC	RED
A4	NO1/DRAIN1	VIOLET
A5	COM1/SOURCE1	BROWN
A6	NC1	GRAY
A7	NO2/DRAIN2	VIOLET
A8	COM2/SOURCE2	BROWN
A9	NC2	GRAY
A10	**(NONE)**	
B1	PED3	BLUE
B2	PED4	BLUE
B3	**(NONE)**	
B4	NO3/DRAIN3	VIOLET
B5	COM3/SOURCE3	BROWN
B6	NC3	GRAY
B7	SYNC NO/DRAIN	VIOLET
B8	SYNC COM/SOURCE	BROWN
B9	SYNC NC	GRAY
B10	LOGIC GND	BLACK

Digital DC Inputs C5



ERNI PN# 374335, 1 PLC TYP

DC INPUTS/CAN		
PIN LOCATION	SIGNAL (LABEL NOMICLACTURE)	WIRE COLOR
A1	DET1	BLUE
A2	DET2	BLUE
A3	DET3	BLUE
A4	DET4	BLUE
A5	DET5	BLUE
A6	DET6	BLUE
A7	DET7	BLUE
A8	DET8	BLUE
A9	CANL	ORANGE
A10	DET DC	RED
B1	DET9	BLUE
B2	DET10	BLUE
B3	DET11	BLUE
B4	DET12	BLUE
B5	DET13	BLUE
B6	DET14	BLUE
B7	DET15	BLUE
B8	DET16	BLUE
B9	CANH	ORANGE
B10	LOGIC GND	BLACK

Basis of Payment

This item will be paid for at the contract unit price per each for DATA AGGREGATOR. The unit price shall include all associated equipment, hardware, cables, materials and labor required to install the complete system in place and in operation to the satisfaction of the Traffic Engineer.

TEMPORARY LUMINAIRE, HIGH PRESSURE SODIUM VAPOR, HORIZONTAL MOUNT, 400 WATT

Description
This item shall consist of furnishing, installing and removal of a luminaire on a temporary wood pole with mast arm. All work shall be according to Section 821 of the Standard Specifications and the IDOT District 1 Special Provision for Luminaire.

The luminaire shall have medium cutoff optics with type 3 distribution.

Basis of Payment
Temporary luminaire will be paid for at the contract unit price per each for TEMPORARY LUMINAIRE, HIGH PRESSURE SODIUM VAPOR, HORIZONTAL MOUNT, 400 WATT, which shall include the cost for removing the luminaire.

CONCRETE FOUNDATION, TYPE D

Description
This item shall consist of constructing a concrete foundation for the installation of a traffic signal, cabinet, and cabinet with pedestal, anchor bolt, and ground rod in accordance with the following requirements and conforming in all respects to the lines, grades and dimensions shown on the plans or as directed by the Engineer and in applicable portions of Section 878 of the Standard Specifications and the Highway Standard Concrete Foundation Detail #878001-10.

Materials
The materials shall conform to the specifications of Class SI concrete and concrete Reinforcement Bars in the Standard Specifications for Road and Bridge Construction. The conduit and fittings within the limits of the foundation shall conform to the same requirements as that specified for the conduit outside these limits.

Anchor bolts shall meet the requirements of Section 505 of the Standard Specifications and the material shall conform to the requirements of Article 1006.09 of the Standard Specifications for Road and Bridge Construction. A ground rod shall be installed in each foundation and shall conform to Section 806. Unless otherwise indicated in plans, ground rods shall be one piece copper-clad steel rods 3/4” x 10’ (2cm x 3 m).

Construction Details
Concrete foundations shall be Type A or Type D and location as specified on the plans. The top of the foundation shall be finished level. Shimming will not be permitted. All edges along the top of the foundation shall be given a 1 inch (25mm) bevel. A form extending a minimum of 9 inches (225mm) below the top surface of the foundation is required. The form shall be set level and means shall be provided for holding same rigidly in place while the concrete is being deposited. Whenever the excavation is irregular, a form shall be used to provide the proper dimension of the entire foundation below the ground surface. Where a concrete foundation is contiguous to a sidewalk, preformed joint filler of 1/2 inch (12mm) thickness shall be placed between the foundation and the sidewalk.

All conduit in the foundation shall be installed rigidly in place before concrete is deposited in the form. Insulated bushings shall be provided at the ends of conduit. Anchor bolts shall be set in place before the concrete is deposited by means of a template constructed to space the anchor bolts in accordance with the pattern of the bolt holes in the base. After installation of cables, all conduit openings in foundations shall be sealed with an approved mastic. The required number and size of galvanized steel conduits shall be installed in every concrete foundation as shown on the plans. An excess of galvanized steel conduits shall be installed in every concrete foundation. These excess stubs shall be 2 inches (50 mm) in diameter. Placement and quantity shall be determined by the Engineer, and the ends of the stubs shall be capped.

Included in the cost of each control box foundation, the Contractor shall construct a 5" (125 mm) P.C.C. sidewalk of a rectangular area 3 ft (1 mm.) by 4 ft (1.2 meter.) immediately adjacent to the cabinet door, with the 4' (1.2 meter) dimension of the rectangle parallel to the cabinet door when closed. This paragraph shall be applicable at all cabinet foundation locations included in this Section. The only situations where this paragraph shall not apply are as follows: When the foundation is immediately adjacent to or within a paved sidewalk or shoulder area and no further surfacing is require. The Engineer shall be the sole judge as to the applicability of this paragraph in all questions arising there from.

Basis of Payment
This work will be paid for at the contract unit price per foot for CONCRETE FOUNDATION TYPE D, which price shall be payment in full for all necessary excavating, backfilling, disposal of surplus material and formwork and furnishing all materials, anchor bolts, stubs and ground rod within the limits of the foundation.

REMOVE TEMPORARY WOOD POLE

This work shall consist of the removal of temporary poles and all associated apparatus and connections. The poles shall become property of the Contractor and removed offsite.

The void caused by the removal of the pole shall be backfilled in accordance with Section 841 of the Standard Specifications.

This work shall be paid for at the Contract unit price per each for REMOVE TEMPORARY WOOD POLE, which shall include the labor, equipment, and materials required to perform the work described herein.

TEMPORARY STORM SEWER PLUGS

Description
This work shall consist of plugging temporary storm sewers where shown on the plans at staged construction limits for future connection and sewer line completion. The pipe end shall be capped with bricks and mortar or other approved method to seal the pipe invert with 24" of lateral length along each pipe to be filled with a slurry seal or other method approved by the engineer. This work shall be in conformance with Article 550 of the Standard Specifications.

For purposes of this contract, all temporary storm sewer plugs will be paid for at the same unit cost regardless of size of sewer line to be temporarily plugged.

Method of Measurement
This work shall be measured for payment by EACH for storm sewers to be temporarily plugged.

Basis of Payment
This work shall be paid for at the contract unit price for TEMPORARY STORM SEWER PLUGS per EACH regardless of size. This item includes all material, excavation, and labor to complete the operation as described.

PROPOSED STORM SEWER CONNECTION TO EXISTING STORM SEWER

Description
This work shall govern the placement of a concrete collar to support the connection between an existing storm sewer pipe and a proposed storm sewer pipe in locations as shown on the plans to the satisfaction of the Engineer. Reinforced concrete collars shall be constructed according to Section 503 and Section 542.08 of the Standard Specifications.

Concrete jointing collar shall be rectangular shaped and extend 1'-0" minimum from center along each pipe in which the existing and proposed pipe ends are to be joined and supported by #4 reinforcing bars. Collar shall extend a minimum of 0'-6" around the outer wall of the pipe in all directions.

After centering pipe ends—which may include cutting the existing or proposed pipe to create a flush connection—joints shall be wrapped with a 3" wide polyvinyl tape or rubber adapter.

Materials
Concrete shall be Portland Cement Concrete Class SI and shall conform to Section 1020 of the standard specifications. Reinforcement bars shall be #4 bars and placed no less than 0'-2" from the external edge of the collar.

Method of Measurement
This work will be measured for payment in place as EACH for PROPOSED STORM SEWER CONNECTION TO EXISTING STORM SEWER made and shall include pipe cutting, concrete, reinforcing bars, excavation, polyvinyl tape, and all other materials necessary for construction.

Basis of Payment
This work will be paid for as EACH for PROPOSED STORM SEWER CONNECTION TO EXISTING STORM SEWER made. The unit price shall include all equipment, materials and labor required to construct the concrete jointing collar.

REMOVE EXISTING FLARED END SECTION

Description
This work shall consist of the removal and disposal of flared end section(s) as shown on the Plans in accordance with Section 551.

Basis of Payment
This work shall be measured and paid for at the contract unit price per EACH for REMOVE EXISTING FLARED END SECTION and shall include all labor, excavation, backfill, material, and equipment to complete this item as specified.

TEMPORARY END SECTION

Description
This work shall consist of providing temporary flared end sections at temporary culverts as shown on the plans during various stages of traffic control. This pay item shall include providing and installing each end section as well as removal and disposal following the need for utilizing the temporary culverts. All time, labor, excavation, materials, fasteners, gaskets, or other materials necessary to complete the operation are considered included in this pay item.

For purposes of this contract, all temporary end sections will be paid for at the same unit cost regardless of size of end section shown in the plans.

Method of Measurement/Basis of Payment
This work shall be paid for at the contract unit price per EACH for TEMPORARY END SECTION placed.

BIAXIAL GEOGRID

Description
This work shall consist of furnishing all labor, material and equipment required to place and compact the 24-inch thick aggregate Load Transfer Platform and install biaxial geogrid in layers as indicated on the plans and as directed by the Engineer and as specified herein.

General Requirements
The multiple layers of the geosynthetic fabric (geogrid) shall form a positive mechanical interlocking system with the embankment fill, to create a stiff reinforced soil mass, in the form of a platform that transfers the load from the embankment above to the supporting piles below the platform.

Qualifications
The geosynthetic fabric shall be a product that has been commercially available for a period of at least 5 years. Samples of the proposed material shall be supplied to the Engineer with the factory testing certificate.

Materials
The Load Transfer Platform aggregate shall be CA-19 gradation. The geosynthetic fabric shall consist of an integrally formed Biaxial Geogrid, with Polypropylene Polymers.

Geogrid Product Properties: Each individual layer of selected product shall conform to the following minimum requirements.

Index Properties:

	Units	MD Values	XMD Values
▪ Tensile Strength @ 5% Strain	lb/ft	750	750
▪ Ultimate Tensile Strength	lb/ft	800	800

Structural Integrity:

▪ Junction Efficiency[4]	%	93
▪ Flexural Stiffness[5]	mg-cm	250,000
▪ Aperture Stability[6]	m-N/deg	0.30

Durability

▪ Resistance to Installation Damage[7]	%SC/%SW/%GP	95 / 93 /90
▪ Resistance to Long Term Degradation[8]	%	100
▪ Resistance to UV Degradation[9]	%	100

The biaxial geogrid shall be delivered to the jobsite in roll form with each roll individually identified.

Notes:

1. Unless indicated otherwise, strength values shown are minimum average roll values (MARV) determined in accordance with ASTM D4759. The "MD Values" represents results from testing the product in the Machine Direction; "XMD Values" represents results from testing the product in the Cross-Machine (Transverse) Direction.
2. Nominal dimensions.
3. True resistance to elongation should be when initially subjected to a load determined in accordance with ASTM D6637 without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties.
4. Load transfer capability determined in accordance with GRI-GG2-87 and expressed as a percentage of ultimate tensile strength.
5. Resistance to bending force determined in accordance with ASTM D5732-95, using specimens of width two ribs wide, with transverse ribs cut flush with exterior edges of longitudinal ribs (as a "ladder"), and of length sufficiently long to enable measurement of the overhang dimension. The overall Flexural Stiffness is calculated as the square root of the product of MD and XMD Flexural Stiffness values.
6. Resistance to in-plane rotational movement measured by applying a 20 kg-cm (2 m-N) moment to the central junction of a 9 inch x 9 inch specimen restrained at its perimeter in accordance with U.S. Army Corps of Engineers Methodology for measurement of Torsional Rigidity.
7. Resistance to loss of load capacity or structural integrity when subjected to mechanical installation stress in clayey sand (SC), well graded sand (SW), and crushed stone classified as poorly graded gravel (GP). The geogrid shall be sampled in accordance with ASTM D5818 and load capacity shall be determined in accordance with ASTM D6637.
8. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments in accordance with EPA 9090 immersion testing.

9. Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355.

Delivery, Storage, and Handling

Storage and Protection

1. Prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to the geogrid materials.
2. Store at temperatures above -20 degrees F (-29 degrees C).
3. Rolled materials may be laid flat or stood on end.
4. Geogrid materials should not be left directly exposed to sunlight for a period longer than the period recommended by the manufacturer

Construction Requirements

The Load Transfer Platform aggregate shall be placed in lifts on greater than 8 inches loose thickness, at +/- 2% of the optimum moisture content and compacted to no less than 95% of the maximum dry density in accordance with AASHTO T 180, Modified Proctor method.

The geosynthetic fabric layers shall be installed in accordance with the manufacturer's specifications. Prior to the start of installation, the placement of the fabric as well as the overlapping requirements shall be discussed, during a pre-construction conference, with all parties involved, in order to obtain the reinforced load transfers platform indicated on the plans.

Any roll of geogrid damaged before, during and after installation shall be replaced by the Contractor at no additional cost to the Owner.

Method of Measurement

The Load Transfer Platform will be measured in the final position by cubic yards of Porous Granular Embankment computed by method of average end areas. The geogrid work will be measured in place per square yard for each layer of geosynthetic fabric, when installed in accordance with this Special Provision.

Basis of Payment

This work will be paid for at the contract unit price per square yard for BIAXIAL GEOGRID, which price shall be payment in full for all labor, materials and equipment required to install the geogrid as specified herein. The Load Transfer Platform shall be paid for at the contract unit price per cubic yard for Porous Granular Embankment.

PLUG EXISTING STORM SEWERS

Description

This work shall consist of plugging and abandoning existing storm sewers where shown on the plans in existing manholes, at right-of-way lines or as directed by the engineer. The pipe end shall be capped with bricks and mortar to seal the pipe invert with 24" of lateral length along each pipe to be filled with a slurry seal or other method approved by the engineer. This work shall be in conformance with Article 550 of the Standard Specifications.

Method of Measurement
This work shall be measured for payment by CUBIC YARD of brick and mortar and slurry seal for each storm sewer to be plugged.

Basis of Payment
This work shall be paid for at the contract unit price for PLUG EXISTING STORM SEWERS per CUBIC YARD. This item includes all material, excavation, and labor to complete the operation as described.

SOLAR-POWERED FLASHING BEACON ASSEMBLY (COMPLETE)

Description
This work shall consist of furnishing and installing a Solar-Powered Flashing Beacon (SPFB) Assembly (Complete); solar power supply; traffic signal post; foundation; pedestrian push button; warning signs and plaques; pedestrian push-button sign; controller and cabinet; and communication equipment as shown on the plans and/or as specified by the Engineer. All equipment and hardware required to mount the SPFB and associated equipment to the assembly shall be included in the unit cost of this item.

Materials
All components shall be manufactured and assembled as a complete system and consist of the following:

Solar-Powered Flashing Beacon
The beacon shall consist of a 12" amber LED indication and shall be flashed at a rate of not less than 50 nor more than 60 times per minute. The illuminated period of each flash shall not be less than one-half and not more than two-thirds of the total cycle. The beacon shall conform to all subsequent FHWA Official Interpretation Letters and the 2009 edition of the Manual of Uniform Traffic Control Devices (MUTCD), including the unit size, mounting location, flash rate, and operational parameters unless modified herein by this special provision. The SPFB assembly shall be programmable to allow the County Traffic Engineer to set the duration of the flashing beacon display based on the crossing time requirements established in the MUTCD. The Contractor shall furnish and install two direction SPFB units with far side indicator light mounted to the sign structure as indicated on the plans. The SPFB shall be rated for Class I light intensity output according to the Society of Automotive Engineers (SAE) Standard J595 with a 15 year life expectancy. The minimum size of the LED beacon shall be 12 inches. The SPFB shall be able to seen at least 1,000 feet in advance of the crossing during the day. The SPFB shall have an operating temperature meeting NEMA specifications.

Power Supply
The installation must be a solar power supply.

A. Solar Power Supply: If used the solar power supply shall be easy to install, fully self-contained weather, corrosion, and vandal-resistant, with a UV-resistant solar panel. The solar power supply shall be power autonomous without need of an external power supply. The batteries shall be sealed, maintenance free, and field-replaceable independently of other components. The battery pack shall have a minimum rated lifespan of three years. The power supply system shall have the capacity to operate the SPFB for 30 days at a normal use of 400 activations of 30 seconds per day without solar charging. The SPFB shall have an automatic

light control to provide useful light during extreme conditions that prevent charging over an extended period of time. The manufacturer shall provide documentation for each installation consisting of solar power calculations to verify load, duty cycle and battery capacity based on location. The solar panel shall be installed at the highest point on the assembly structure, or as directed by the Engineer, and away from the travelled way. The solar panel shall be installed at an angle specified by the manufacturer facing the equator (due south) with a full unobstructed solar exposure for optimum performance of the system, or as recommended by the manufacturer and directed by the Engineer. If batteries are to be installed in a separate cabinet, the cabinet shall be a minimum of seven feet above the ground and located on the post as to be not over the sidewalk, bike path or trail.

Controller

The SPFB controller shall meet the requirements of Section 858 of the "Standard Specifications" and the following:

A. Power Options: The controller unit shall only be Solar powered. AC powered systems are not acceptable.
B. Controller to Controller Communication: At each location all installed SPFB assemblies shall communicate wirelessly using an unlicensed radio band so as to simultaneously commence operation of their alternating rapid flashing indications and cease operation simultaneously. The communication equipment shall comply with FCC requirements and the vendor representative shall field test the equipment prior to placing the units in operation to demonstrate the SPFBs ability to achieve proper operation.
C. Timing: The controller shall provide the full programmed timing upon all push button activations. This timing coordination shall be acceptable to the County and the Engineer prior to acceptance.

Traffic Signal Post

The traffic signal post shall meet the requirements of Section 875 for traffic signal post or traffic signal post, special, as shown on the plans.

Foundation

The traffic signal post foundation shall be concrete. Bolt and anchor pattern shall follow manufacturer's specifications and the following:

A. Concrete Foundation: The concrete foundation shall meet the requirements of Section 878 of the Standard Specifications.
B. Anchor bolts for the pole base shall be set in place prior to pouring concrete. Anchors must meet the minimum mechanical requirements of ASTM A36 and have a minimum tensile strength of 58,000 PSI and minimum yield of 36,000 PSI, ASTM F1554 Grade 36.
C. Must be Hot-Dipped Galvanized in accordance with ASTM F2329.
D. Nuts and washers shall comply with ASTM A563 Grade A.
E. Anchors shall be equipped with breakaway bolts and universal couplers to ensure the SPFB Assembly is breakaway-compliant.
F. Any deviations to the above must be approved by the Engineer prior to installation.

Signs

Each SPFB assembly shall include two sets of crossing signs: two (W11-2) 36 inch x 36 inch dimension, and two "downward diagonal arrow" (W16-7P) plaques 9 inch x 12 inch dimension, mounted back-to-back, with the W-series sign mounted above the SPFB and the "downward diagonal arrow" plaque mounted below. The W-series sign panels shall be manufactured with fluorescent yellow green type ZZ sheeting meeting the requirements of Section 1091of the "Standard Specifications. All signs shall meet the latest requirements of the MUTCD. The signs shall have brackets and sign channels which are equal to and completely interchangeable with those used by the MCDOT Sign Shop.

Warranty

All materials shall be warranted for three years from date of acceptance or turn on by the MCDOT Traffic Department.

Installation

The SPFB Assembly shall be installed strictly according to the manufacturer's recommendations, the applicable portions of the "Standard Specifications" and/or as directed by the Engineer. The final elevation and location of the light bar beacons shall be approved by the Engineer prior to the Contractor beginning work.

Finishing

The post, base and push button enclosures shall all be powder coated (black) in accordance with the special provisioin for TRAFFIC SIGNAL PAINTING.

Basis of Payment

This work will be paid at the contract unit price per EACH for SOLAR-POWERED FLASHING BEACON ASSEMBLY (COMPLETE). The unit price shall include all labor, equipment, materials and documentation required to furnish and install the SPFB assembly complete with solar power supply; traffic signal post; foundation; signs and plaques; controller and cabinet; communication equipment; wiring; testing and timing; poweder coated (black) finishing; and mounting hardware.

WASHOUT BASIN

Description

The WASHOUT BASIN at locations identified on the plans is used to contain concrete liquids when the chutes of concrete trucks are rinsed out after the delivery of concrete to the construction site. These washout facilities function to consolidate soils for disposal and prevent runoff liquids associated with concrete. Details of the construction of the non-portable facilities are included within the plans as "temporary concrete washout facilities." Failure to comply with appropriate washout location requirements will result in monetary deficiency deduction against the Contractor.

General Requirements

The Contractor must submit a plan of his/her proposed temporary concrete washout facility to the Engineer for his/her approval at least 10 days prior to the first concrete pour.

Temporary concrete washout facilities are to be in place prior to any delivery of concrete to the construction site.

Temporary concrete washout facilities are to be located at least 50 feet from storm drain inlets, open drainage facilities, or water bodies. Each facility is

A sign is to be installed adjacent to each temporary concrete washout facility to inform concrete equipment operations of the designated washout facility.

Design

Two types of concrete washout facilities are available for use on this project:

1. Prefabricated portable facilities (as approved by the Engineer)

2. Non-portable facilities:

    a. Above Grade: Constructed using barrier wall & polyethylene sheeting. Barrier walls are constructed to create a berm with a single sheet of 10-mil polyethylene sheeting which is free of holes, tears, or other defects which pay compromise the impermeability of the material. Sandbags are used to hold the sheeting in place on top of the berm. Sheeting must extend over the entire basin and berm to prevent escape of discharge.
    b. Below Grade: Constructed via excavation and the use of polyethylene sheeting and sandbags. A pit is first excavated in a designated location with a single sheet of 10-mil polyethylene sheeting which is free of holes, tears, or other defects, which may compromise the impermeability of the material. Sandbags are then used to hold the sheeting in place.

Size of Washout

Number and size of washout facility is to be determined by the Contractor. It is his/her responsibility to provide enough storage for the excess concrete and water produced on the target. Non-portable facilities are to have a minimum length and width of 10'.

Inspection/Maintenance/Removal:

Temporary concrete washout facilities are to be inspected by the Engineer during his/her weekly erosion and sediment control inspection per the requirements of the SWPPP. The inspector is to ensure there are no leaks, spills, and the capacity of the facility has not yet been compromised.

Any overflowing of the washout facility onto the ground must be cleaned up and removed within 24 hours of discovery.

If a rain or snow event is forecasted, a non-collapsing, non-water collecting cover shall be placed over the washout facility and secured to prevent accumulation and overflow of precipitation.

Contents of each facility are not to exceed 75% of design capacity. If contents reach 75% capacity, discontinue pouring concrete into the facility until it has been cleaned out.

Allow slurry to evaporate or remove the site in a safe manner (i.e. vacuum truck). All hardened material can then be removed or disposed of properly.

If a lined basin is used, immediately replace the liner if it becomes damaged.

Remove temporary concrete washout facilities when they are no longer required and restore the disturbed areas to their original condition.

Note locations of these facilities and any changes to these locations on the SWPPP.

Basis of Payment
This work shall be paid for at the contract unit price LUMP SUM for WASHOUT BASIN, which price shall be payment in full for all material, labor, excavation, and disposal of all basins to be utilized for this contract.

TEMPORARY CONNECTION TO EXISTING STORM SEWER

Description
This work shall consist of providing a temporary connection to an existing storm sewer facility (pipe or manhole) on the plans during various stages of traffic control. This pay item shall include providing all time, labor, and materials to make the proposed temporary connection. All time, labor, excavation, materials, necessary to complete the operation are considered included in this pay item.

For purposes of this contract, all temporary connections will be paid for at the same unit cost regardless of size of sewer pipe to be connected.

Method of Measurement/Basis of Payment
This work shall be paid for at the contract unit price per EACH for TEMPORARY CONNECTION TO EXISTING STORM SEWER made.

TEMPORARY WOOD POLE

This work shall consist of furnishing and installing a Temporary Wood Pole, Class 4, of the height specified, in accordance with Section 830 of the Standard Specifications and the Temporary Lighting Plans.

This work shall be paid for at the Contract unit price per each for TEMPORARY WOOD POLE, CLASS 4, of the height specified, which shall include the labor, equipment, and materials required to perform the work described herein.

BIKE PATH REMOVAL

This work shall consist of the removal of the existing hot-mix asphalt multi-use/bike path at the locations indicated in the plans or as directed by the Engineer. This work shall conform to this special provision and Articles 440.03 and 440.06 of the Standard Specifications.

Method of Measurement
Removal of the existing hot-mix asphalt path will be measured for payment in place and the area computed in square yards.

Basis of Payment
This work will be paid for at the contract unit price per square yard for BIKE PATH REMOVAL.

DEWATERING

Description
DEWATERING as it pertains to this contract refers to the pumping or bypassing of water which accumulates in excavations during the process of work so that all work can be done in the dry. In addition, dewatering operations shall be conducted to prevent damage to adjacent properties, buildings, structures, utilities, and other existing features as a result of settlement or other groundwater-related effects. Dewatering shall be used in wet locations that may be encountered during construction.

General Requirements
At all times, have on the work site sufficient pumping equipment for immediate use, including standby pumps for use in case other pumps become inoperable. Contractor shall dispose of water so as to cause no injury to personnel or the pubic, damage to public or private property, nor menace to the public health.

Contractor may discharge no water which exceeds regulatory requirements or the County's discharge requirements. Contractor may discharge into a downstream storm sewer manhole, provided an Engineer-approved silt filtration measure is applied beforehand (silt bag, floc hogger, channel with polymerizing agents, etc.) as defined by the Illinois Urban Manual:

1) Inspections shall be conducted to ensure proper operation and compliance with any permits or water quality standards.
2) Accumulated sediment shall be removed from the flow area and temporary diversions shall be repaired, as needed.
3) Outlet areas shall be checked and repairs shall be made in a timely manner, as needed.
4) Pump outlets shall be inspected for erosion and sumps shall be inspected for accumulated sediment.
5) Dewatering bags shall be removed and replace when half-full of sediment or when the pump discharge has reduced to an impractical rate.
6) If the receiving area is showing any signs of cloudy water, erosion, or sediment accumulation, discharges shall be stopped immediately once safety and property damage concerns have been addressed.
7) Sediment shall be disposed of in accordance with all applicable laws and regulations.

No well points shall be placed to draw down the water table should situations be encountered where groundwater is present.

Basis of Payment
This work will be paid for at the contract LUMP SUM unit price for DEWATERING for which unit price shall include all equipment, materials and labor required to meet the requirements of this special provision over the duration of the

contract at all locations including pumps, silt bags, or other equipment necessary to maintain a dry working environment.

TEMPORARY STORM SEWER 12"

Description
This work will consist of the construction and removal of temporary storm sewer as indicated on the Maintenance of Traffic plans or as directed by the Engineer.

Temporary storm sewer shall be constructed to provide a fully-functional storm sewer system throughout staged construction. Upon completion of the permanent sewers and at the direction of the Engineer, the temporary storm sewer shall be removed and disposed of according to Article 202.03. All work shall comply with the applicable portions of Section(s) 550, 551, and Section 605 of the Standard Specifications. Materials shall meet the requirements of Articles 550.02 and 550.03 of the Standard Specifications.

Method of Measurement
TEMPORARY STORM SEWER 12" will be measured for payment in place per FOOT.

Basis of Payment
This work will be paid for at the contract unit price per FOOT for TEMPORARY STORM SEWER 12". The unit price shall include all materials, labor, equipment, and miscellaneous work necessary to complete the installation, removal, and disposal of the items.

RADAR SPEED SIGN

Description
This work shall consist of installing and programming a solar powered RADAR SPEED SIGNS at locations as shown on the Plans and as directed by the ENGINEER.

The Contractor shall supply new hardware and accessories as needed for installation of the RADAR SPEED SIGN.

Assembly
Radar speed signs shall be mounted on Traffic Signal Post. Galvanized Steel, 14 FT as shown on the plans Comply with manufacturer's written installation instructions.

Galvanized Steel Pole and Light Pole Foundation, Special
The radar speed sign shall be installed on a galvanized steel pole as shown in the Plans. The pole shall be a TRAFFIC SIGNAL POST, GALVANIZED STEEL, 14 FT in accordance with Section 876 of the Standard Specifications. The pole shall be installed on a Light Pole Foundation, Special. The cost for the TRAFFIC SIGNAL POST GALVANIZED STEEL, 14 FT and LIGHT POLE FOUNDATION, SPECIAL shall not be included in the cost for the RADAR SPEED SIGN.

Speed Display Specifications

Speed display has a minimum height of 15" and minimum width of 8" Digits have at least 112 LED/digit The speed display measures a maximum of 40" x 30" x 3" and weighs a maximum of 18 lbs The speed display has a "YOUR SPEED" sign with high intensity prismatic reflective background and 6" high letters Thumbscrews and tamper proof hardware are included for holding sign in positon.

Technical Specifications:

- Miles Per Hour (mph) or Kilometers Per Hour (km/h)
- Aluminum protective cover: 0.1875" (d)
- Yellows or white High-Intensity prismatic reflective sheeting on the sign face with black colored text
- MUTCD approved colors and format.
- Operating Temperatures F (C): -40° (-40°) to 185° (85°)
- Conformal coating on all circuit boards
- Power input:
  - Solar Powered
  - Built in ambient light sensing and automatic brightness control
- Radar
  - Internal Radar: Doppler (FCC approved)
  - Radar RF out 5 *mW* maximum
  - Radar f-center 24.125 GHz center +/-25 MHz
  - Pickup distance Up to 1,200 feet (366 m)
  - Beam angle: 11° x 11°
  - Beam polarization: Linear
  - DCC ID (Radar): TIADR1500
- Display
  - LEDs 245:
  - Digits 224 Amber 23°, 5 mm, luminous Intensity (5680 — 8200 mcd/LED)
  - Optical lenses: 245 lenses
  - Ambient light sensor and automatic brightness adjustment
  - Speed Violator Strobe shall not be used to ensure MUTCD compliancy
- Enclosure
  - 12 gauge aluminum flat black powder coated front for reduced glare and maximum contrast, fight gray powder coated body to minimize heat absorption
  - Weatherproof, NEMA 4X-12. IP65 level compliant
  - Non-sealed and ventilated

Communication (all communication shall be encrypted)

- Bluetooth 2 0
- WiFi

Speed Display Programming

- 24/7 365 day unlimited programming and scheduling
- Display Settings
  - Display On/Stealth Modes (In Stealth Mode, speed is not displayed but data is collected)
  - Display Minimum speed, Display Maximum speed
  - Digit Flashing Speed, Threshold (digits flash above selected speed)

- Speed Violator Strobe (pulsing strobe flashes with digits or alone above Display Maximum Speed)

Data Collection and Reporting

- Traffic data collected and stored by location
- Stealth Mode (capture baseline traffic data with speed display off)
- download through wireless connection
- Statistical Reporting & Charts
  - Summary Reports
  - Weekly Reports
  - Period Comparison Reports
  - Full custom reports and Charts
  - Reporting Parameters
    - Average Vehicle Count
    - Total Vehicle Count
    - Total Number of Speed Violations

Other Features

- Minimum and Maximum Speed
- 85% Speed
- Counters by Speed Bins
- 5 MPH Bin Resolution
  - Reports print directly or can be exported into CSV format, MS Excel, Adobe Acrobat PDF and HTML
  - Charts may be printed directly or converted into Adobe Acrobat PDF and picture formats

Basis of Payment

This work shall be paid for at the Contract unit price per each for RADAR SPEED SIGN, which price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated on the drawings.

EROSION CONTROL BLANKET (SPECIAL)

Description

This work shall consist of furnishing and placing erosion control blanket over seeded areas on slopes 3:1 or flatter in locations as indicated on the plans. The work shall be performed according to Article 251.04 of the "Standard Specifications".

Materials

The erosion control blanket shall meet the requirements of Article 1081.10 of the "Standard Specifications", except that:

The blanket material shall be 100% biodegradable leno-woven agricultural straw.

List of Vendors & Product Name:

- Tensar/North American Green – S75BN
- ADS Geosynthetics – 00S2AN
- Western Excelsior Corporation – Excel SR-1AN (All-Natural)
- American Excelsior Company – Premier Single Straw
- East Coast Erosion Control – ECS-1B
- Erosion Control Blanket.com – S31 BD "Big Daddy"

Each blanket will be secured with a 12" degradable stake. Securing devices are not paid for separately but included in the cost of the pay item.

Method of Measurement
This work will be measured for payment in place in square yards of actual area covered.

Basis of Payment
This work will be paid for at the contract unit price per square yard for EROSION CONTROL BLANKET (SPECIAL). The unit price shall include all equipment, materials and labor required to furnish and place the erosion control blanket

TEMPORARY DITCH CHECKS

Description
This work shall consist of furnishing, constructing, maintaining and removing temporary ditch checks in accordance with the applicable portions of Section 280 of the Standard Specifications, the details in the plans and as modified herein. The furnished materials shall remain the property of the Contractor upon removal.

Materials

Urethane Foam Geotextile Ditch Checks
The temporary ditch check shall be triangular shaped, urethane foam covered with a geotextile fabric. The temporary ditch check shall be installed on a geotextile fabric apron. The temporary ditch check shall have a triangle base of 20" wide and a minimum triangle height of 10". Standard length of each unit ditch check shall be no less than 7 feet. The temporary ditch checks shall be installed at the locations as shown on the plans, and/or as directed by the Engineer. The temporary ditch check installation shall be according to the detail shown on the plans and the manufacturer's recommendations.

The temporary ditch checks shall remain in place until just before placing the final landscaping in the ditch area. The Contractor shall not remove the temporary ditch checks if it is raining and/or rain is in the immediate forecast.

Triangular Grid Ditch Checks
The temporary ditch check shall be High Density Polyethylene (HDPE) triangular shaped with a UV inhibitor, having a minimum height of 8 inches in the center and installed perpendicular to the prepared channel of the ditch or drainage swale. The ditch checks shall be porous in nature, approximately 35% porosity, allowing the water to flow through, while reducing the velocity and trapping sediment. Standard length of each unit ditch check shall be no less than 3.3 feet. The temporary ditch checks shall be

installed at the locations as shown on the plans, and/or as directed by the Engineer. The temporary ditch check installation shall be according to the detail shown on the plans and the manufacturer's recommendations.

Erosion control blanket (ECB) and seeding shall be installed prior to installing the triangular grid ditch check. Secure the ECB with 6" staples at intervals of 1.5 feet on the upstream and downstream ends of the temporary ditch check or according to manufacturer's recommendations.

Method of Measurement
Temporary Ditch Checks will be measured in place and the length calculated in feet for each unit of ditch check installed.

Basis of Payment
(a) Urethane Foam Geotextile Ditch Checks. This work will be paid for at the contract unit price per FOOT for TEMPORARY DITCH CHECKS.

(b) Triangular Grid Ditch Checks. This work will be paid for at the contract unit price per FOOT for TEMPORARY DITCH CHECKS (SPECIAL).

The unit price shall include all work and materials necessary to install, maintain, and remove and dispose of the temporary ditch checks at the completion of the project.

PERIMETER EROSION BARRIER, SPECIAL

Description
This work shall consist of constructing, removing, and disposing of perimeter erosion barrier, special as part of the project's temporary erosion control system. Wire-back mesh Perimeter erosion control barrier, special shall be utilized adjacent to existing wetlands. Unsupported may be used in all other project areas.

General
The work shall be performed according to Section 280 of the "Standard Specifications," special provision "PERIMETER EROSION BARRIER" and the following:

Materials
Geotextile Requirements: The geotextile used for the temporary silt fence shall be classified as supported (with a wire of polymeric mesh backing) or unsupporting (no backing). The temporary silt fence geotextile shall meet the requirements of the Table included below. All numeric values except Apparent Opening Size (AOS) represent Minimum Average Roll Values (MARV as defined in ASTM D4439). The values for AOS are the Maximum Average Roll Values.

Table – Temporary Silt Fence Requirements

Requirements	Test Methods	Wire Backed Supported Silt Fence[a]
Maximum Post Spacing		4 feet
Grab Strength	ASTM D4632	
Machine Direction		90 lbs
X-Machine Direction		90 lbs
Permittivity[b]	ASTM D4491	0.05 sec^{-1}
Apparent Opening Size	ASTM D4751	0.024in maximum average roll value
Ultraviolet Stability	ASTM D4355	70% after 500 hours of exposure

Notes:

a) Silt fence support shall consist of 12-gauge steel wire with a mesh backing of 6"x6" or prefabricated polymeric mesh of equivalent strength.

b) These default filtration property values are based on empirical evidence with a variety of sediments. For environmentally sensitive areas, a review of previous experience and/or site or regionally specific geotextile tests should be performed to confirm the suitability of these requirements.

The wire support fence shall:

1) Be a minimum of 12-gauge
2) Have a minimum of six horizontal wires
3) The maximum vertical wire spacing shall be 6"

Method of Measurement

This work will be measured for payment in place by FOOT.

Basis of Payment

This work will be paid for at the contract unit price per FOOT for PERIMETER EROSION BARRIER, SPECIAL. The unit price shall include all work and materials necessary to properly install the barrier and to remove and dispose of the used materials at the completion of the project. Maintenance requirements shall be included and paid for according to Section 280 of the "Standard Specifications."

AGGREGATE SURFACE COURSE FOR TEMPORARY ACCESS

Effective: April 1, 2001
Revised: January 2, 2007

Revise Article 402.10 of the Standard Specifications to read:

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

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

(a) Private Entrance. The minimum width shall be 12 ft (3.6 m). The minimum compacted thickness shall be 6 in. (150 mm). The maximum grade shall be eight percent, except as required to match the existing grade.

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

(c) Road. The minimum width shall be 24 ft (7.2 m). The minimum compacted thickness shall be 9 in. (230 mm). The grade and elevation shall be the same as the removed pavement, except as required to meet the grade of any new pavement constructed.

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

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

Add the following to Article 402.12 of the Standard Specifications:

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

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

"Aggregate surface course for temporary access will be paid for at the contract unit price per each for TEMPORARY ACCESS (PRIVATE ENTRANCE), TEMPORARY ACCESS (COMMERCIAL ENTRANCE) or TEMPORARY ACCESS (ROAD).

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

(a) Upon construction of the temporary access, sixty percent of the contract unit price per each, of the type constructed, will be paid.
(b) Subject to the approval of the Engineer for the adequate maintenance and removal of the temporary access, the remaining forty percent of the pay item will be paid upon the permanent removal of the temporary access."

WINTERIZED TEMPORARY ACCESS
Effective: January 1, 2012
Revised: March 5, 2012

Description
This work shall consist of constructing, maintaining and removing winterized temporary access for private and commercial entrances and side roads designed for use throughout the winter months.

Materials
Materials shall be according to the following.

ITEM	ARTICLE/SECTION
Hot-Mix Asphalt	1030

Construction Requirements
For projects lasting longer than one construction season, the contractor shall construct and maintain temporary access composed of an HMA surface course over an existing aggregate temporary access. The contractor shall install the winterized temporary access prior to winter shut down at the direction of the engineer. The top 2" of the existing aggregate temporary access should be removed and replaced with 2" of Hot-Mix Asphalt. Compensation will be given for the winterized temporary access at the time of the installation of the Hot-Mix Asphalt surface course.

HMA Surface Course. The Hot-Mix Asphalt surface course shall be 2 in. thick when compacted. HMA Surface Course, Mix "D", N50 shall be used except as modified by the plans or as directed by the Engineer. This work shall be constructed in accordance with the applicable portions of Section 406 of the Standard Specifications and as directed by the Engineer. The material shall conform to the applicable portions of Section 1030 of the Standard Specifications.

The winterized temporary access shall be constructed to the dimensions and grades of the existing aggregate temporary access.

Maintaining the winterized temporary access shall include repairing the HMA surface course after any operation that may disturb or remove the winterized temporary access to the satisfaction of the Engineer.

When use of the winterized temporary access is discontinued, the winterized temporary access shall be removed according to Article 440.03 of the Standard Specifications. The material shall be disposed of according to Article 202.03 of the Standard Specifications or may be utilized in the permanent construction with the approval of the Engineer.

Method of Measurement
Winterized temporary access for private and commercial entrances and roads will be measured for payment at the contract unit price per square yard for every private entrance, commercial entrance or road constructed for the purpose of winterized temporary access.

Basis of Payment
Winterized temporary access for private and commercial entrances and roads will be paid for at the contract unit price per square yard for TEMPORARY ACCESS (WINTERIZE) as specified in the plans.

Partial payment of the square yard amount bid for each winterized temporary access will be paid according to the following schedule:

(a) Upon construction of the winterized temporary access, sixty percent of the contract unit price per square yard will be paid.

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

HIGH-EARLY-STRENGTH PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED)

This work shall consist of constructing high-early-strength portland cement concrete pavement at locations directed by the Engineer. This work shall be performed in accordance with Section 420 of the Standard Specifications.

Basis of Payment
This work will be paid for at the contract unit price per square yard for HIGH-EARLY-STRENGTH PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED), of the thickness specified.

PORTLAND CEMENT SIDEWALK, 8 INCH SPECIAL

This work shall consist of constructing a Portland cement sidewalk of a minimum thickness of 8 inches at the approach ends to the pedestrian boardwalk structure. This work shall be in accordance with Section 424 of the Standard Specifications and the details shown in the boardwalk plans.

This work shall be paid for at the contract unit price per square foot for PORTLAND CEMENT SIDEWALK, 8 INCH, SPECIAL, which price shall include all labor, equipment and materials necessary to complete the work.

DETECTABLE WARNINGS (SPECIAL)

Description
This work shall consist of providing and installing DETECTABLE WARNINGS (SPECIAL) at the locations shown on the plans within the Village of Algonquin.

The DETECTABLE WARNINGS (SPECIAL) shall be installed per the Village of Algonquin's sidewalk and ramp details, which has been included in the plans. Additionally, the DETECTABLE WARNINGS (SPECIAL) shall be procured from the Village's approved materials list.

Method of Measurement
This work shall be measured for payment in SQUARE FEET for DETECTABLE WARNINGS (SPECIAL).

Basis of Payment
This work shall be paid for at the contract unit price per square foot for DETECTABLE WARNINGS (SPECIAL) to be installed. This item includes all material, excavation, and labor to complete the operation as described.

STAINING CONCRETE STRUCTURES

Description
This work shall consist of staining the Form Liner Textured Surface, Form Liner Textured Surface, Special and the precast concrete panels of the Mechanically Stabilized Earth Retaining Wall as shown on the plans to replicate the look of actual stone masonry. The staining shall match the color variations present in natural limestone, accurately simulating the appearance of real stone including the multiple colors, shades, flecking, and veining that is apparent in real stone. It shall also simulate the colors that may be present from aging, such as staining from oxidation, rusting and/or organic staining from soil and vegetation. An example of the desired staining is shown below.

Materials
The stain shall create a surface finish that is breathable (allowing water vapor transmission), and that resists deterioration from water, acid, alkali, fungi, sunlight, and/or weathering. The stain shall be odor free and V.O.C. compliant. The stain shall meet the requirements for weathering resistance of 2000 hours accelerated exposure.

Store concrete stain materials in an area where temperatures will not be less than 50°F (10°C) or more than 100°F (38°C) and in accordance with OSHA and local Fire Code Requirements. Deliver materials in original and sealed containers, clearly marked with the manufacturer's name, brand name, type of material, batch number, and date of manufacture.

Submittal
Contractor shall submit to the Engineer for approval evidence of the selected subcontractor's five years of experience making color stains to match natural stone colors on concrete surfaces.

Upon receipt of notification of the style of form liner to be used the Contractor shall submit a proposed procedure for obtaining the simulated finish using the approved architectural form liner style and stain (see the Special Provision for FORM LINER TEXTURED SURFACE). The procedure shall include plans and details for the form liner pattern and dimensions, and be submitted for the Engineer's approval no later than 30 calendar days from the date of notification of approval of the style type. If such plans and details are not satisfactory to the Engineer and McHenry

County, the Contractor shall make any changes as may be required by the Engineer or McHenry County at no additional cost to the Department.

Upon approval of the form liner plans and details, the Contractor shall submit three 6' by 6' (minimum) mock-up cast concrete panel of the simulated stone masonry finish including the staining. One of the strained panels shall also include Anti-Graffiti Coating (see the Special Provision for ANTI-GRAFFITI COATING). The sample panels shall be delivered and positioned on the job site at a location to be determined by the Engineer. The approved sample panel shall be the standard for concrete staining to replicate the look of actual stone masonry throughout the project (see the Special Provision for FORM LINER TEXTURED SURFACE).

General

The surfaces to be stained shall be structurally sound, clean, dry, and fully cured. The concrete shall be at least 30 days old prior to applying the stain. Curing agents must be removed a minimum of 14 days prior to staining to allow the concrete to dry out.

Temperature and relative humidity conditions shall meet the manufacturer's application instructions. Do not apply the stain under rainy conditions or within three (3) days after surfaces became wet from rainfall or other moisture. Do not apply when the weather is foggy or overcast.

The concrete surface shall be cleaned prior to the applying the stain materials. The methods and materials used for cleaning the substrate shall be as recommended by the manufacturer of the water repellent stain. The Contractor shall insure that the surface is free of latency, dirt, dust, grease, efflorescence, paint, or other foreign material. The Contractor shall not use sandblasting as a cleaning method. The preferred method to remove latency is pressure washing with water, at a minimum 3000 psi (3-4 gal/min), using fan nozzle. The nozzle should be positioned perpendicular to and at a distance of 1-2 feet from the concrete surface. The cleaned surface shall be free of blemished, discoloration, surface voids and unnatural form marks.

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

A test area of 10 square feet shall be prepared and the stain applied to the surface to verify the surface preparation, adhesion and color. Once the Engineer has approved the results from the test area the application of the stain to the rest of the exposed surfaces may be completed.

Take precautions to ensure that workman and work areas are adequately protected from fire and health hazards resulting from handling, mixing and application of materials. Furnish all the necessary equipment to complete the work. Provide drop cloths and other forms of protection necessary to protect all adjoining work and surfaces to render them completely free of overspray and splash from the concrete stain work. Any surfaces, which have been damaged or splattered, shall be cleaned, restored, or replaced to the satisfaction of the Engineer.

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

Anti-Graffiti Coating shall be applied to the final exposed surface (see the Special Provision for ANTI-GRAFFITI COATING).

Method of Measurement
The exposed surfaces will be measured in place and the area computed in square feet. Staining mock-ups will not be measured for payment.

Basis of Payment
This work will be paid for at the contract unit price per square foot for STAINING CONCRETE STRUCTURES.

BICYCLE RAILING, SPECIAL

Description
This work shall consist of furnishing and erecting wall mounted aluminum railing as detailed in the contract plans, and in accordance with Section 509 and Article 1006.30(b) of the Standard Specifications except as modified herein.

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 through all posts and gaps.

Basis of Payment
This work shall be paid for at the contract unit price per foot of BICYCLE RAILING, SPECIAL, including all railing connections and cleaning and painting new aluminum structures.

PARAPET RAILING, SPECIAL

Description
This work shall consist of furnishing and erecting parapet mounted aluminum railing as detailed in the contract plans, and in accordance with Section 509 and Article 1006.30(b) of the Standard Specifications except as modified herein.

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 through all posts and gaps.

Basis of Payment
This work shall be paid for at the contract unit price per foot of PARAPET RAILING, SPECIAL, including all railing connections and cleaning and powder coating new aluminum structures.

PRECAST CONCRETE BOX CULVERTS 16' X 11' (SPECIAL)

Description
The Precast Concrete Box Culvert 16' x 11' (Special) shall be constructed as detailed in the plans an in accordance with Section 540 of the Standard Specifications. The Precast Concrete Box Culvert 16' x 11' (Special) shall meet the design requirements of ASTM C 1577.

Method of Measurement
This work shall be measured for payment in place in feet along the length of the box culvert.

Basis of Payment
This work shall be paid at the contract unit price per foot for PRECAST CONCRETE BOX CULVERTS 16' X 11' (SPECIAL).

CLEANING EXISTING DRAINAGE STRUCTURES
Effective: September 30, 1985
Revised: December 1, 2011

All existing storm sewers, pipe culverts, manholes, catch basins and inlets shall be considered as drainage structures insofar as the interpretation of this Special Provision is concerned. When specified for payment, the location of drainage structures to be cleaned will be shown on the plans.

All existing drainage structures which are to be adjusted or reconstructed shall be cleaned in accordance with Article 602.15 of the Standard Specifications. This work will be paid for in accordance with Article 602.16 of the Standard Specifications.

All other existing drainage structures which are specified to be cleaned on the plans will be cleaned according to Article 602.15 of the Standard Specifications.

Basis of Payment
This work will be paid for at the contract unit price each for DRAINAGE STRUCTURES TO BE CLEANED, and at the contract unit price per foot (meter) for STORM SEWERS TO BE CLEANED, of the diameter specified.

REMOVE AND RELOCATE END SECTIONS

Description
This work shall consist of removing and relocating an existing 45"x29" existing end section as shown on the plans during various stages of traffic control. This pay item shall include removal and relocation of the existing end section as well as assocaiated restoration of the affected area to conditions satisfactory to the Engineer. All time, labor, excavation, materials, fasteners, gaskets, or other materials necessary to complete the operation are considered included in this pay item.

Method of Measurement/Basis of Payment
This work shall be paid for at the contract unit price per EACH for REMOVE AND RELOCATE END SECTION.

WATER MAIN TO BE ABANDONED

Description
This work shall meet the requirements of Section 1019 of the Standard Specifications. This work shall consist of furnishing, transporting and placing controlled low-strength material (CLSM) in water mains of the diameter specified to be abandoned/filled as shown on the plans.

The Contractor shall not open cut the pipe trench beyond that which is reasonably necessary to access the water main. Concrete or brick and mortar bulkheads per Article 550.05 shall be installed at the limits of the water main abandonment if necessary as determined by the Engineer, to ensure the pipe is completely filled with the CLSM and no air voids remain. All excess material resulting from the filling of the existing sewer shall be disposed of by the contractor according to Article 202.03. The backfilling of locations at the limits of abandonment shall be according to Article 550.07.

Method of Measurement
This work shall be measured for payment in feet.

Basis of Payment
This work shall be paid for at the contract unit price per foot for WATER MAIN TO BE ABANDONED. This price shall include all labor, materials and equipment necessary to complete this work as described herein and directed by the Engineer.

WATER MAIN REMOVAL and TRENCH BACKFILL, if required, will be paid for separately as provided for elsewhere in the contract.

WATER MAIN REMOVAL

Description
This work shall consist of the removal of portions of the existing water main. This work shall be performed at locations shown on the plans and/or subject to the review of the Engineer in accordance with Section 551 of the Standard Specifications, except as specified herein.

Work shall also include coordination with the Village of Algonquin or Lake in the Hills for shutdown of existing valves.

Method of Measurement
This work will be measured for payment in place per FOOT for WATER MAIN REMOVAL, of the diameter specified.

Basis of Payment
This work will be paid for at the contract unit price per lineal foot for WATER MAIN REMOVAL, of the diameter specified, measured as removed.

MANHOLES, TYPE A, 6' OR 8'-DIAMETER, WITH 2 TYPE 1 FRAME, CLOSED LID, RESTRICTOR PLATE

Description
This work shall consist of constructing a Type A manhole of the diameter specified with restrictor in accordance with Sections 602 and 1006 of the Standard Specifications and the plans and/or as directed by the Engineer.

Construction Requirements
Construction shall conform to the details shown in the plans, all applicable Standard Drawings, and all applicable portions of Sections 602 and 1006 of the Standard Specifications.

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

Basis of Payment
This work will be paid for at the contract unit price per EACH for MANHOLES, TYPE A, 6 or 8'' DIAMETER, WITH 2 TYPE 1 FRAME, CLOSED LID, RESTRICTOR PLATE installed. Price shall include but not be limited to all frames, grates, lids, sand cushion, steps, 6" concrete wall, flat slab tops, snout or debris trap, all excavation and backfilling, and all other labor, materials, and equipment needed to perform the work as specified herein.

MANHOLES, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, CLOSED LID, SPECIAL

Description
This work shall consist of constructing a standard 4' Type A manhole of the diameter specified in accordance with all applicable portions of Article 602 of the Standard Specifications and the plans except that the Frame and Lid shall be EAST JORDAN IRON WORKS CATALOG No. 1050-Z1 FLAT HEAVY DUTY Lid with a 1" concealed pick hole and the word "STORM" and Village of Algonquin Logo cast into the lid.

The detail in the plans for "Storm Manhole" per the Village of Algonquin Specifications shall be followed for construction.

Chimney seals shall be provided which will capture at least 4" of the frame, all adjusting rings, and 4" of the precast eccentric cone section.

A 2" ring precast into the top including manhole wrap shall also be included on this manhole.

Basis of Payment
This work will be paid for at the contract unit price per EACH for MANHOLES, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, CLOSED LID, SPECIAL installed.

CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE 11 FRAME AND GRATE, SPECIAL

Description
This work shall consist of constructing a standard 4' Type A catch basin within B-6.12 curb and gutter of the diameter specified in accordance with all applicable portions of Article 602 of the Standard Specifications and the

plans except that the Frame shall be EAST JORDAN IRON WORKS CATALOG No. 7010 with an EAST JORDAN IRON WORKS 7010-T1 back and a EAST JORDAN IRON WORKS 7010 – M3 SINUSOIDAL grate.

If the slope in the gutter line is greater than 3%, a M4 vane shall be used in lieu of the M3.

A four-inch precast rignt shall be factory-installed on all flat top structures.

Chimney seals shall be provided which will capture at least 4" of the frame, all adjusting rings, and 4" of the precast eccentric cone section (if used).

Basis of Payment
This work will be paid for at the contract unit price per EACH for CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE 11 FRAME AND GRATE, SPECIAL.

INLETS, TYPE A, WITH TYPE 24 FRAME AND GRATE, SPECIAL

Description
This work shall consist of constructing a standard Type A inlet within B-6.12 curb and gutter of the diameter specified in accordance with all applicable portions of Article 602 of the Standard Specifications and the plans except that the Frame shall be EAST JORDAN IRON WORKS CATALOG No. 7010 with an EAST JORDAN IRON WORKS 7010-T1 back and a EAST JORDAN IRON WORKS 7010 – M3 SINUSOIDAL grate.

If the slope in the gutter line is greater than 3%, a M4 vane shall be used in lieu of the M3.

Stonegate Road, Huntington Drive, and Bunker Hill Drive are under the Village of Algonquin maintenance jurisdiction; frames and grates shall conform to supply for maintenance purposes.

Basis of Payment
This work will be paid for at the contract unit price per EACH for INLETS, TYPE A, 4'-DIAMETER, WITH SPECIAL FRAME AND GRATE installed.

INLETS, TYPE A, WITH TYPE 11 FRAME AND GRATE, SPECIAL

Description
This work shall consist of constructing a standard Type A inlet within B-6.12 curb and gutter of the diameter specified in accordance with all applicable portions of Article 602 of the Standard Specifications and the plans except that the Frame shall be EAST JORDAN IRON WORKS CATALOG No. 7010 with an EAST JORDAN IRON WORKS 7010-T1 back and a EAST JORDAN IRON WORKS 7010 – M3 SINUSOIDAL grate. The Inlet shall follow construction requirements outlined in the detail included with the plans.

Chimney seals shall be provided which will capture at least 4" of the frame, all adjusting rings, and 4" of the precast upper cone section.

If the slope in the gutter line is greater than 3%, a M4 vane shall be used in lieu of the M3.

Basis of Payment
This work will be paid for at the contract unit price per EACH for INLETS, TYPE A, 4'-DIAMETER, WITH TYPE 11 FRAME AND GRATE, SPECIAL installed.

SANITARY MANHOLES TO BE ADJUSTED

Description
This work shall be done in accordance with Section 602 of the Standard Specifications and shall consist of the adjustment of sanitary manholes. Non-hardening butyl rubber mastic sealant; minimum thickness ¼" shall be used between adjusting rings in place of mortar. In locations where external frame seals exist, it shall be removed and replaced and disposed of and an internal/external frame seal shall be installed. In locations where an internal frame seal exists, it shall be removed and disposed of and an internal/external seal shall be installed. In locations where there are no existing frame seals, an internal/external frame seal shall be installed. The installation of the internal/external frame seal will not be paid for separately and should rather be included in this pay item.

The Internal/External Frame seal shall consist of the following:

1. Provide frame seals consisting of a flexible internal rubber sleeve, rubber ring, and external rubber sleeve and extension, and stainless steel compression bands.
2. Rubber sleeve, ring, butyl tape, and extension:
    a. Provide rubber sleeve and extension complying with ASTM D412 and ASTM D2240.
    b. Provide rubber ring complying with ASTM D-2000.
    c. Provide butyl tape: Comply with 1000% minimum webbing @ 77 degrees F, 500% minimum elongation @ 32 degrees F, and maximum 75 psi compressibility @ 7 degrees F.
    d. Provide sleeve with a minimum thickness of 0.062" and unexpanded external vertical heights of 10 to 12 inches.
    e. Provide an extension having a minimum thickness of 0.062"
    f. Comply with a minimum 1500 psi tensile strength, maximum of 18 percent compression set and a hardness (durameter) of 48+/-5.
3. Compression band:
    a. Provide compression band to compress the sleeve to the manhole.
    b. Use 16-gauge stainless steel conforming to ASTM A240 Type 304 with no welded attachments and having a minimum width of ½".
    c. Make a watertight seal having a minimum adjustment range of 2 diameter inches.
    d. Provide stainless steel screws, bolts, and nuts conforming to ASTM F593 and 594, Type 304.
4. Acceptable Products:
    a. Adaptor Inc. Internal/External Adaptor Seal
    b. WrapidSeal™ Manhole Encapsulation System
    c. Cretex Internal/External Adaptor Seal

The Internal/External Frame Seal shall be installed as follows:

1. Install internal/external rubber gasket on the manhole chimney. Provide watertight gasket to eliminate leakage between the internal/external frame seal and the adjusting ring and between each adjusting ring down to and including cone section.

2. Clean surface and prepare the lower 2 inches of the manhole frame and exterior of all adjusting rings and cone section/corbel surfaces.
3. Install internal rubber gasket in accordance with manufacturer's recommendation.
    a. Field-verify for suitable dimensions and layout prior to installation.
    b. Realign frame as required.
4. Repair and apply mortar grout to the adjusting rings as required to provide a smooth circular surface for the rubber gasket.
5. Install external rubber gasket in accordance with manufacturer's recommendations.
    a. Field-verify for suitable dimensions and layout before installation
    b. Utilize sealing caulk where required
    c. Provide chimney seal extensions as required.
6. Test installation by flooding area around the manhole with water before backfilling and surface restoration. Gaskets are required to provide watertight seal at openings between the frame and adjusting rings and between adjacent adjusting rings down to the cone/corbel section.
7. Reinstall and retest failing gaskets at no additional cost to the contract.

Basis of Payment
This work shall be paid for at the contract unit price for each of SANITARY MANHOLES TO BE ADJUSTED, which price shall include all of the above.

FRAMES AND LIDS TO BE AJUSTED (SPECIAL)

Description
This work shall consist of the adjustment of inlets, catch basins, valve vaults, and manholes at those locations as directed by the Engineer in the field. This work shall be completed in accordance with the applicable portions of Section 602, 603, and 604 of the Standard Specifications as well as the District One Standard Detail "Details for Frames and Lids Adjustment with Milling" (BD600-03 (BD-8)).

The existing pavement around each structure to be adjusted or reconstructed shall be removed by a straight, saw-cut joint.

All structures requiring frame and lid adjustment shall also be cleaned in accordance with Article 602.15.

Any trench backfill necessary to fill in the area around the adjusted structure will not be paid for separately but considered included in the cost of the structure being adjusted or reconstructed.

After adjustment or reconstruction is completed the pavement around the structure shall be replaced with Leveling Binder (Hand Method), N50. The leveling binder will be placed on a compacted, prepared subgrade, and the thickness shall match the existing conditions. The pavement being replaced will not be paid for separately but considered included in the cost of the structure being adjusted or reconstructed.

Method of Measurement
This work will be measured for payment per EACH.

Basis of Payment
The work will be paid for at the contract unit price per EACH for FRAMES AND LIDS TO BE ADJUSTED (SPECIAL) which price shall include all material and equipment to perform the work specified above.

CONCRETE MEDIAN, TYPE SB-6.24 (SPECIAL)

This work shall be in accordance with Section 606 of the Standard Specifications and the details shown in the plans.

This work shall be paid for at the contract unit price per square foot for CONCRETE MEDIAN, TYPE SB-6.24 (SPECIAL), which price shall include all labor, equipment and materials necessary to complete the work.

TELESCOPING STEEL SIGN SUPPORT (SPECIAL)

Description
This work shall consist of furnishing and installing telescoping steel sign supports for ground-mounted signs utilizing a telescoping base in accordance with applicable articles of Section 728 and as detailed in the plans and the following:

Posts as specified in Article 1093.01 (c) shall be formed of 14 gage steel, except that the base shall be formed of 12 gage steel. Holes 7/16+or-1/64 inch diameter will be spaced one inch on centers on all sides for the entire length of the posts. Holes shall be on the centerline of each side in true alignment and opposite of each other to accept a 3/8 inch bold through the post at any location. The post shall have a smooth galvanized finish applied either before or after forming.

The base shall be constructed with 12 gage steel winged anchors by using standard tubular steel and welding metal triangular fins on each corner of the tubular steel. The four triangular fins shall be 10 inches long by 4 inches wide mounted 9 inches from the top of the base pointing in a downward direction. The base shall be 3 feet in length. The base shall have a smooth galvanized finish applied either before or after fabrication.

Splicing of the top section will not be permitted.

The base shall be driven according to Article 728.04 (b) except that leaving the top 9 inches above the adjacent finished ground surface.

Method of Measurement
This work will be measured for payment per FOOT. The length measured will be the total length of all sections installed, except for any telescoping of a top section more than 12 inches into a base section.

Basis of Payment
This work will be paid for at the contract unit price per FOOT for TELESCOPING STEEL SIGN SUPPORT (SPECIAL) and shall include a 6 inch sleeve for signs to be installed on medians and pavement.

TEMPORARY LUMINAIRE, HIGH PRESSURE SODIUM VAPOR, HORIZONTAL MOUNT, 400 WATT

Description
This item shall consist of furnishing, installing and removal of a luminaire on a temporary wood pole with mast arm. All work shall be according to Section 821 of the Standard Specifications and the IDOT District 1 Special Provision for Luminaire.

The luminaire shall have medium cutoff optics with type 3 distribution.

Basis of Payment
Temporary luminaire will be paid for at the contract unit price per each for TEMPORARY LUMINAIRE, HIGH PRESSURE SODIUM VAPOR, HORIZONTAL MOUNT, 400 WATT, which shall include the cost for removing the luminaire.

UNDERPASS LUMINAIRE (SPECIAL)

Description
This item shall consist of furnishing and installing of a wall sconce luminaire. All work shall be according to Section 821 of the Standard Specifications and the IDOT District 1 Special Provision for Luminaire.

The luminaire shall be a 30 watt LED vandal resistant fixture delivering approximately 1665 lumens. The underpass lighting shall be UL Listed, standard wet location, wall mount IP65 rated. Shall consist of a clear polycarbonate lens. All fasteners shall consist of stainless steel tamper resistant screws. Luminaires color temp shall be 3000K and run off of 120V.

Basis of Payment
Underpass luminaire will be paid for at the contract unit price per each for UNDERPASS LUMINAIRE (SPECIAL), which shall include the cost for furnishing and installing the luminaire.

LUMINAIRE (SPECIAL)

Description
This item shall consist of furnishing and installing of a wall sconce luminaire. All work shall be according to Section 821 of the Standard Specifications and the IDOT District 1 Special Provision for Luminaire.

The luminaire shall be a 20 watt LED vandal resistant fixture. Approximate delivered lumens is to be approximately 1650 lumens. The wall sconce shall be UL Listed, standard wet location, wall mount IP65 rated. Shall have a clear polycarbonate prismatic lens with an eyelid to concentrate the light down to the walkway. All fasteners shall be stainless steel tamper resistant screws.

Luminaires shall be mounted onto the recessed back boxes mounted in the retaining wall. Each luminaire shall be mounted 24” A.F.G. at approximately 20 foot spacing.

Basis of Payment
Wall sconce luminaire will be paid for at the contract unit price per each for LUMINAIRE (SPECIAL), which shall include the cost for furnishing and installing the luminaire.

LUMINAIRE, LED
Effective: January 1, 2017

Description.
This work shall consist of furnishing and installing LED luminaire as shown on the plans, as specified herein.

General.
The luminaire including the housing, driver and optical assembly shall be assembled in the U.S.A. The luminaire shall be assembled by and manufactured by the same manufacturer. The luminaire shall be in compliance with ANSI C136.37. LED light source(s) and driver(s) shall be RoHS compliant.

Submittal Requirements.
The Contractor shall submit, for approval, an electronic version of all associated luminaire IES files, AGi32 files and the TM-21 or TM-28 calculator spreadsheet with inputs and reports associated with the project luminaires. The Contractor shall also provide (as a minimum) an electronic (PDF) version of each of the following manufacturer's product data for each type of luminaire:

1. Descriptive literature and catalogue cuts for luminaire, LED driver, and surge protection device.
2. LED drive current, total luminaire input wattage and total luminaire current at the system operating voltage or voltage range and ambient temperature of 25 C.
3. LED efficacy per luminaire expressed in lumens per watt (lpw).
4. Initial delivered lumens at the specified color temperature, drive current, and ambient temperature.
5. Computer photometric calculation reports as specified and in the luminaire performance table.
6. TM-15 BUG rating report.
7. Isofootcandle chart with max candela point and half candela trace indicated.
8. Documentation of manufacturers experience and verification that luminaires were assembled in the U.S.A. as specified.
9. Supporting documentation of compliance with ANSI standards as well as UL listing as specified.
10. Supporting documentation of laboratory accreditations and certifications for specified testing as indicated.
11. Thermal testing documents as specified.

12. IESNA LM-79, LM-80 (or LM-84) and TM-21 (or TM-28) reports as specified.

13. Salt fog test reports and certification as specified.

14. Vibration Characteristics Test Reports and certification as specified.

15. Ingress Protection Test Reports as specified.

16. Written warranty.

A sample luminaire shall be provided upon request of the Engineer. The sample shall be as proposed for the contract and shall be delivered to the District Headquarters.

Manufacturer Experience.
The luminaire shall be designed to be incorporated into a lighting system with an expected 20 year lifetime. The luminaire manufacturer shall have a minimum of 33 years' experience manufacturing HID roadway luminaires and shall have a minimum of seven (7) years' experience manufacturing LED roadway luminaires. The manufacturer shall have a minimum of 25,000 total LED roadway luminaires installed on a minimum of 100 separate installations, all within the U.S.A.

Housing.
Material. The luminaire shall be a single device not requiring on-site assembly for installation. The power supply for the luminaire shall be integral to the unit.

Finish. Painted or finished luminaire surfaces exposed to the environment shall exceed a rating of six, according to ASTM D1654, after 1000 hours of ASTM B117 testing. The coating shall exhibit no greater than 30% reduction of gloss, according to ASTM D523, after 500 hours of ASTM G154 Cycle 6 QUV® accelerated weathering testing.

Unless otherwise indicated in the plans, the luminaire color shall be grey.

The luminaire shall slip-fit on a mounting arm with a 2" diameter tenon (2.375" outer diameter), and shall have a barrier to limit the amount of insertion. The slip fitter clamp shall utilize four (4) bolts to clamp to the tenon arm. The luminaire shall be provided with a leveling surface and shall be capable of being tilted ±5 degrees from the axis of attachment in 2.5 degree increments and rotated to any degree with respect to the supporting arm.

The housing shall be designed to prevent the accumulation of water, ice, dirt and debris and to ensure maximum heat dissipation.

The effective projected area of the luminaire shall not exceed 1.6 sq. ft.

The total weight of the luminaire(s) and accessories shall not exceed 75 pounds.

A passive cooling method with no moving, rotating parts, or liquids shall be employed for heat management.

The luminaire shall include a fully prewired, 7-pin twist lock ANSI C136.41-compliant receptacle. Unused pins shall be connected as directed by the Manufacturer and as approved by the Engineer. A shorting cap shall be provided with the luminaire.

Vibration Characteristics. All luminaires shall be vibration tested and pass ANSI C136.31 requirements. Luminaires shall be rated for "3G" peak acceleration. Vibration testing shall be run using the same luminaire in all three axes.

Labels and Decals. All luminaires shall have labels in accordance with ANSI C136.15 for an external label, and ANSI C136.22 for an internal label.

The luminaire shall be Listed for wet locations by a U.S. Occupational Safety Health administration (OSHA) Nationally Recognized Testing Laboratory (NRTL) and shall be in compliance with UL 8750 and UL 1598. It shall be identified as such by the NRTL tag/sticker on the inside of the luminaire.

Hardware. All fasteners shall be stainless steel. Captive screws are required on any components that require maintenance after installation.

Internal Luminaire Electrical Connections. Quick connect/disconnect plugs shall be supplied between the discrete electrical components within the luminaire such as the driver, surge protection device and optical assembly for easy removal. The keyed quick connect/disconnect plugs shall be operable without the use of tools while wearing insulated gloves.

Provisions for any future house-side external or internal shielding should be indicated along with means of attachment.

Circuiting shall be designed to minimize the impact of individual LED failures on the operation of the other LED's.

Wiring. Wiring within the electrical enclosure shall be rated at 600v, 105°C or higher.

Driver.
The driver shall be integral to the luminaire.

The driver shall tolerate indefinite open and short circuit output conditions without damage.

Ingress Protection. The driver Ingress Protection (IP) rating as defined in the ANSI/IEC 60529 standard shall have an IP66 rating.

Input Voltage. The driver shall be suitable for operation over a range of 120 to 277 volts or 347 to 480 volts as required by the system operating voltage.

Operating Temperature. The driver shall have an operating ambient temperature range of -40ºC to 70ºC.

Driver Life. The driver shall provide a life time of 100,000 hours at 25° C ambient.

Safety/UL. The driver shall be UL Listed under standard UL 1012.

Power Factor. Drivers shall maintain a power factor of 0.9 or higher and total harmonic distortion of less than 20%.

Driver efficiency. Efficiency of the driver is defined by the ratio of output power and input power. The driver shall deliver a maximum efficiency of >90% at maximum load and an efficiency of >85% for the driver operating at 50% power.

Electrical Interference. The driver shall meet the Electromagnetic Compatibility (EMC) requirements per FCC Title 47 Code of Federal Regulations (CFR) Part 15 Class A.

Thermal Fold Back. The driver shall reduce the current to the LED module if the driver is overheating due to abnormal conditions.

Dimming. The driver shall have dimming capability. The driver shall accept a dimming control signal that is compliant with the 0-10V protocol in accordance with ANSI C136.37.

Leakage current. The driver shall comply with safety standards in accordance with IEC 61347-1.

The Surge Protection Device shall be UL 1449 labeled as Type 4 and be an integral part of the luminaire. The SPD shall be compliant with ANSI C136.2-2014 (Draft).

Thermal performance

Thermal Testing shall be provided as defined by ANSI/UL 1598. The luminaire shall start and operate in the ambient temperature range specified in the driver section. The maximum rated case temperature of the driver, LEDs, and other internal components shall not be exceeded when the luminaire is operated in the ambient temperature range specified.

Mechanical design of protruding external surfaces (heat sink fins) shall facilitate hose-down cleaning and discourage debris accumulation. Testing shall be submitted (whenever is available) to show the maximum rated case temperature of the driver, LEDs, and other internal components are not exceeded when the luminaire is operated with the heat sink filled with debris.

LED Optical Assembly

The LED optical assembly shall be a scalable array consisting of discrete LED panels or modules. Each panel or module shall have a minimum IP rating of 66.

The optical assembly shall utilize high brightness, long life, minimum 70 CRI, 4,000K color temperature (+/-300K) LEDs binned in accordance with ANSI C78.377. Lenses shall be UV-stabilized acrylic or glass.

Lumen depreciation at 50,000 hours of operation shall not exceed 15% of initial lumen output at the specified LED drive current and an ambient temperature of 25° C.

The luminaire may or may not have a glass lens over the LED modules. If a glass lens is used, it must be a flat lens. Material other than glass will not be acceptable. If a glass lens is not used, the LED modules may not protrude lower than the luminaire housing.

The assembly shall have individual serial numbers or other means for manufacturer tracking.

Photometric Performance.
Luminaires shall be tested according to IESNA LM-79. This testing shall be performed by a test laboratory holding accreditation from the National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) for the IESNA LM-79 test procedure.

Data reports as a minimum shall yield an isofootcandle chart, with max candela point and half candela trace indicated, maximum plane and maximum cone plots of candela, a candlepower table (house and street side), a coefficient of utilization chart, a luminous flux distribution table, spectral distribution plots, chromaticity plots, and other standard report outputs of the above mentioned tests.

Lumen maintenance shall be measured for the LEDs according to LM-80 or for the luminaires according to LM-84. The LM-80 report shall be based on a minimum of 6,000 hours, yet 10,000 hour reports shall be provided for luminaires where those tests have been completed.

The luminaire shall have a BUG rating of Back Light B3 or less, Up Light rating of U0, and a Glare rating of G3 or less unless otherwise indicated in the luminaire performance table.

Lumen Maintenance Projection.
The luminaire shall have long term lumen maintenance documented according to IESNA TM-21 or IESNA TM-28. Ambient temperature shall be 25º C.

The submitted calculations shall incorporate the light loss factors as indicated the respective performance tables.

Photometric Calculations.
Calculations. Submitted report shall include a luminaire classification system graph with both the recorded lumen value and percent lumens by zone along with the BUG rating according to IESNA TM-15.

Complete point-by-point luminance and veiling luminance calculations as well as listings of all indicated averages and ratios as applicable shall be provided in accordance with IESNA RP-8 recommendations. Lighting calculations shall be performed using AGi32 software with all luminance calculations performed to two decimal places (i.e. x.xx cd/m2). Uniformity ratios shall also be calculated to two decimal places (i.e. x.xx:1). Calculation results shall demonstrate that the submitted luminaire meets the lighting metrics specified in the project Luminaire Performance Table(s). Values shall be rounded to the number of significant digits indicated in the luminaire performance table(s).

All photometry must be **photopic**. Scotopic or mesopic factors will not be allowed.

IDOT DISTRICT 1 LUMINAIRE PERFORMANCE TABLE
ROADWAY LIGHTING

GIVEN CONDITIONS

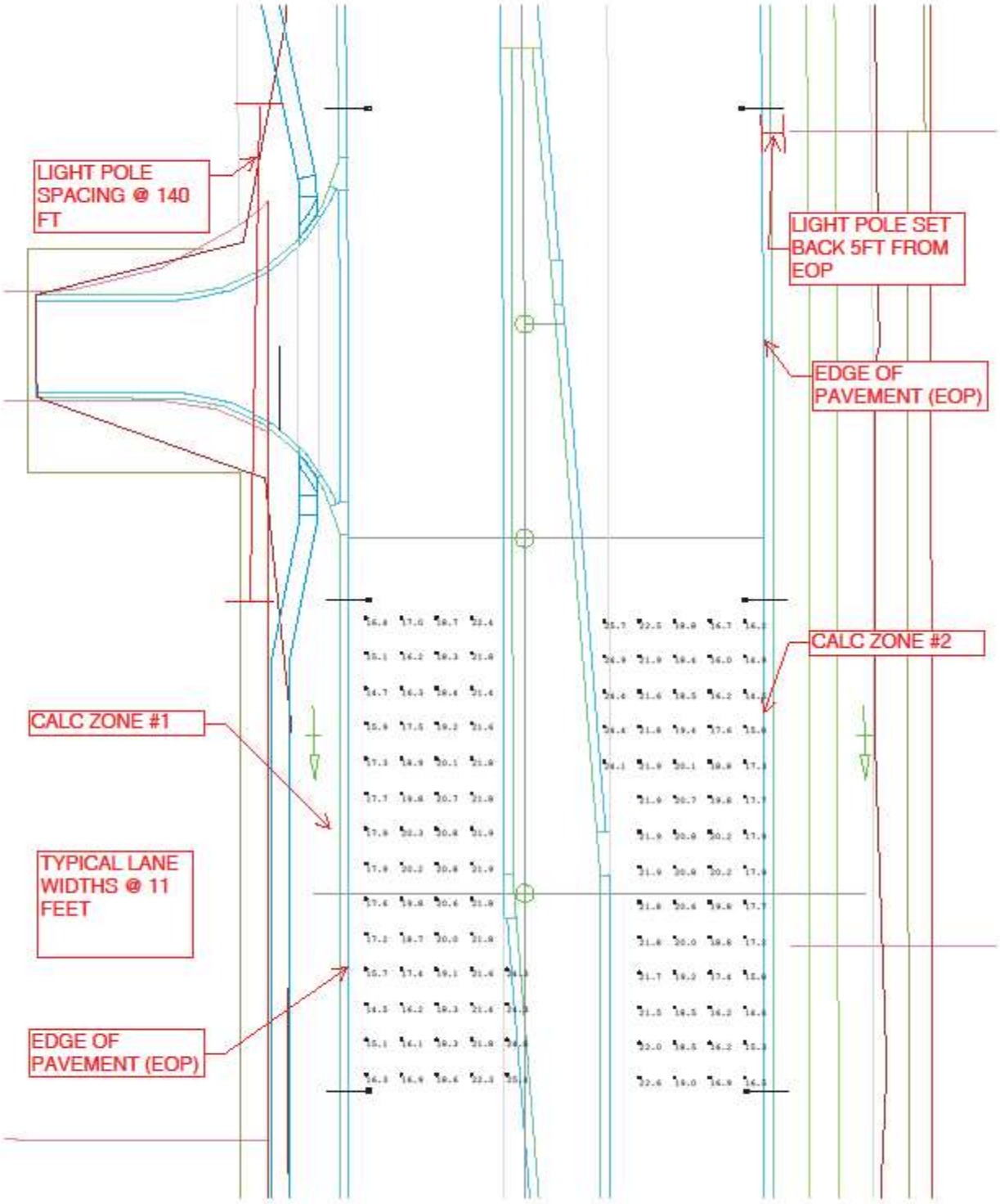
ROADWAY DATA	Pavement Width	103 (ft)
	Number of Lanes	8 (ft)
	Median Width	6 (ft)
	I.E.S. Surface Classification	R3
	Q-Zero Value	.07
LIGHT POLE DATA	Mounting Height	47.5 ft
	Mast Arm Length	12 (ft)
	Pole Set-Back From Face of Curb	5 (ft)
LUMINAIRE DATA	Lumens	22,000 – 36,000
	BUG Rating	B3 – U0 – G3
	I.E.S. Vertical Distribution	Medium
	I.E.S. Lateral Distribution	Type III
	Total Light Loss Factor	0.75
LAYOUT DATA	Spacing	140 (ft)
	Configuration	Opposite
	Luminaire Overhang over EOP	6 (ft)

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

PERFORMANCE REQUIREMENTS

NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

ROADWAY LUMINANCE	Average Luminance, L_{AVE}	1.2	Cd/m^2 (Max)
		0.9	Cd/m^2 (Min)
	Uniformity Ratio, L_{AVE}/L_{MIN}	3.0	(Max)
	Uniformity Ratio, L_{MAX}/L_{MIN}	5.0	(Max)
	Veiling Luminance Ratio, L_V/L_{AVE}	0.3	(Max)


LIGHT POLE SPACING @ 140 FT
LIGHT POLE SET BACK 5FT FROM EOP
EDGE OF PAVEMENT (EOP)
CALC ZONE #2
CALC ZONE #1
TYPICAL LANE WIDTHS @ 11 FEET
EDGE OF PAVEMENT (EOP)

Independent Testing

When a contract has 30 or more luminaires of the same type (distribution type and lumen output/wattage), that luminaire type shall be independently tested, unless otherwise noted. The quantity of luminaires to be tested shall be as specified in the following table.

Contract Quantity	Luminaires to be Tested
1-29	0 (unless otherwise noted)
30-80	2
81-130	3
131-180	4
181-230	5
231-280	6
281-330	7

The Contractor shall coordinate the testing with the contract schedule taking into account submittal, manufacturing, testing, and installation lead-times and deadlines.

The Electrical Engineer shall select from all the project luminaires at the Contractor's or distributor's storage facility, within District 1, the luminaires for testing. In all cases, the selection of luminaires shall be a random selection from the entire completed lot of luminaires required for the contract. Selections from partial lots will not be allowed. An additional luminaire shall also be selected for physical inspection by the Engineer at the District Headquarters. This luminaire will be available for the Contractor to pick up at a later date to be installed under this contract. This luminaire is in addition to the luminaire required as a part of the submittal process specified elsewhere.

Luminaires shall be tested at a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory approved for each of the required tests. All costs associated with luminaire testing shall be included in the bid price of the luminaire.

The selection of the proposed independent laboratory shall be presented with the information submitted for approval.

The testing performed shall include photometric and electrical testing.

Photometric testing shall be according to IES recommendations and as a minimum, shall yield an isofootcandle chart, with max candela point and half candela trace indicated, an isocandela diagram, maximum planned and maximum cone plots of candela, a candlepower table (House and street side), a coefficient of utilization chart, a luminous flux distribution table, BUG rating report, and complete calculations based on specified requirements and test results.

Electrical testing shall conform to NEMA and ANSI standards and, as a minimum shall include a complete check of wiring connections and a table of characteristics showing input amperes, watts, power factor, total harmonic distortion and LED drive current.

Two copies of the summary report and the test results (including CDROM) shall be certified by the test laboratory and shall be sent by certified mail directly to the Engineer.

To: McHenry County Division of Transportation
Attn: MCDOT Traffic Engineer
McHenry County Division of Transportation
16111 Nelson Road
Woodstock, IL 60098

The package shall state “luminaire test reports” and the contract number clearly.

A copy of this material shall be sent to the Contractor and the Resident Engineer at the same time.

Photometric performance shall meet or exceed that of the specified values. If the luminaire does not meet the specified photometric values, the luminaire has failed regardless of whether the test results meet the submitted factory data.

Should any of the tested luminaires of a given type, and distribution fail to satisfy the specifications and perform according to approved submittal information, the luminaire type of that distribution type and wattage shall be unacceptable and be replaced by alternate equipment meeting the specifications with the submittal and testing process repeated in their entirety; or corrections made to achieve required performance.

In the case of corrections, the Contractor shall advise the Engineer of the proposed corrections and shall request a repeat of the specified testing and, if the corrections are deemed reasonable by the Engineer, the testing process shall be repeated in its entirety.

The number of luminaires to be tested shall be the same quantity as originally tested as required in the above table.

Retesting, should it become necessary, shall not be grounds for additional compensation or extension of time

Submittal information shall include a statement of intent to provide the testing as well as a request for approval of the chosen laboratory.

Installation.
Each luminaire shall be installed according to the luminaire manufacturer’s recommendations.

Luminaires which are pole mounted shall be mounted on site such that poles and arms are not left unloaded. Pole mounted luminaires shall be leveled/adjusted after poles are set and vertically aligned before being energized. When mounted on a tenon, care shall be exercised to assure maximum insertion of the mounting tenon. Each luminaire shall be checked to assure compatibility with the project power system. When the night-time check of the lighting system by the Engineer indicates that any luminaires are mis-aligned, the mis-aligned luminaires shall be corrected at no additional cost.

No luminaire shall be installed before it is approved. Where independent testing is required, full approval will not be given until complete test results, demonstrating compliance with the specifications, have been reviewed and accepted by the Engineer.

Pole wiring shall be provided with the luminaire. Pole wire shall run from handhole to luminaire.

Pole wire shall be sized No. 10, rated 600 V, RHW/USE-2, and have copper conductors, stranded in conformance with ASTM B 8. Pole wire shall be insulated with cross-linked polyethylene (XLP) insulation. Wire shall be trained within the pole or sign structure so as to avoid abrasion or damage to the insulation.

Pole wire shall be extended through the pole, pole grommet, luminaire ring, and any associated arm and tenon. The pole wire shall be terminated in a manner that avoids sharp kinks, pinching, pressure on the insulation, or any other arrangement prone to damaging insulation value and producing poor megger test results. Wires shall be trained away from heat sources within the luminaire. Wires shall be terminated so all strands are extended to the full depth of the terminal lug with the insulation removed far enough so it abuts against the shoulder of the lug, but is not compressed as the lug is tightened.

Included with the pole wiring shall be fusing located in the handhole. Fusing shall be according to Article 1065.01 with the exception that fuses shall be 6 ampere.

Each luminaire and optical assembly shall be free of all dirt, smudges, etc. Should the optical assembly require cleaning, a luminaire manufacturer approved cleaning procedure shall be used.

Horizontal mount luminaires shall be installed in a level, horizontal plane, with adjustments as needed to insure the optics are set perpendicular to the traveled roadway.

When the pole is bridge mounted, a minimum size stainless steel 1/4-20NC set screw shall be provided to secure the luminaire to the mast arm tenon. A hole shall be drilled and tapped through the tenon and luminaire mounting bracket and then fitted with the screw.

Warranty.
The entire luminaire and all of its component parts shall be covered by a 10 year warranty. Failure is when one or more of the following occur:

1) Negligible light output from more than 10 percent of the discrete LEDs.
2) Significant moisture that deteriorates performance of the luminaire.
3) Driver that continues to operate at a reduced output due to overheating.

The warranty period shall begin on the date of project final acceptance. A copy of the acceptance letter shall be sent to the luminaire manufacturer and luminaire manufacturer's representative by the Contractor upon final acceptance.

The replacement luminaire shall be of the same manufacturer, model, and photometric distribution as the original.

Method of Measurement.
LED Luminaire classification shall be Type C as follows:

Type	Min Lumens	Max Lumens
A	3,000	12,000
B	12,001	22,000
C	22,001	36,000
D	36,001	50,000

Where delivered lumens is defined as the initial delivered lumens at the specified color temperature.

Note: Luminaires above the stated maximums for the specified type will not be accepted

Basis of Payment
This work will be paid for at the contract unit price per each for LUMINAIRE, LED, HORIZONTAL MOUNT, SPECIAL.

LIGHTING CONTROLLER, SPECIAL

Description
This item shall consist of furnishing and installing a Control Center for the pedestrian underpass lighting system, complete with all circuit breakers and appurtenances as shown on the plans, Section 825 of the SSRBC and as modified herein.

Materials
The Control Center, complete, shall consist of the following:

1. Controller foundation and pad.
2. Ground Mounted Aluminum Cabinet, 50" x 30" x 19" minimum size.
3. Enclosure to house mechanically held contactor of proper size for system with 120 volt coil. Also to contain thermal magnetic main circuit breaker of adequate size. Wiring for the number of circuit breakers to be provided. Provide the number of circuit breakers indicated on the plans.
4. GFI Duplex Convenience outlet and porcelain lampholder with pull chain.
5. Hand-Off-Auto Switch.
6. Photo-electric cell

The concrete foundation and pad for the cabinet shall be of the dimensions shown on the plans. The concrete shall conform to specifications for Class "SI" concrete as outlined in the Standard Specifications.

Rigid Steel Conduit and elbows, of the diameter indicated, shall be placed in the foundation and extended into the cabinet as shown on the plans. Insulating bushings shall be neoprene and shall be of a creditable manufacturer's make, anchor bolts shall be provided as shown on the plans.

The cabinet shall have a smooth and even texture and shall be free from marks and imperfections. After fabrication and painting, the outside surface of the control cabinet shall be covered with a tough nonstaining gummed paper. Such protective covering shall remain in place until such time as the Engineer will order its removal. After the protective covering has been removed, the entire cabinet shall be thoroughly cleaned to the satisfaction of the Engineer.

Equipment mounting panels shall be of the dimensions and shape indicated on the plans and shall be fabricated from non-conducting inorganic, non-asbestos subpanel. Equipment to be mounted on the panels will be as shown on the plans.

Each panel shall be easily mounted or removed from the front of the cabinet. All equipment mounted on panels shall be easily installed or removed from the front. All wiring of equipment shall be in the front of the panels and wire sizes shall be as designated on the Control Cabinet Wiring Diagram.

A suggested arrangement of equipment on the control equipment panels is shown on the plans. This arrangement has been carefully planned and any deviation from same shall be submitted to the Engineer for approval.

The control cabinet door shall face away from the roadway. All panel and equipment shall be front mounted necessitating no back entry to the cabinet. All cable and connections shall be in front of the panels as shown. All wire or cable sizes shall be as shown on the plans. Bus bar and wire or cable sizes shall be in conformity with the National Electrical code. Bus bars for the equipment shall be insulated, where exposed, except at terminal points.

The main breakers shall be standard UL listed molded case, which are sufficient to trip the branch circuit breakers. The Main Breakers shall be of the size indicated on the plans. The electrically operated mechanically held automatic switch shall be 100 Amp, 1P, 600v, with 120v coil. The contactor shall be complete with coil clearing contacts to interrupt current through the coil once the contactor is held in position. The main contacts for the automatic switch shall be double breaksilver type protected by arcing contacts. Contacts shall be self-aligning and renewable from the front of the panel.

A three position switch as indicated on the plans shall be provided. The switch shall provide for automatic operation, manual and off.

The photocell shall be provided at the controller cabinet as indicated in the plan details. As shown on the lighting plan Circuit A shall be operational 24/7. Circuit B shall be controlled by photocell for daytime operation.

It is called to the attention of the Contractor that all branch circuits shall be identified by numbers as indicated on the control cabinet wiring diagram. The exact color and number sequence, shown on the plans, must be followed in order to maintain the designed load across each pole of the main switch.

All ends of conduit terminating in the control cabinet shall be blocked with a neoprene plug, and sealed with an approved sealing compound.

Submittal of Drawings

The Contractor shall furnish, prior to any shop work or fabrication, complete and detailed drawings as to dimensions, type of material and method of fabrication for the control cabinet, equipment mounting panel, arrangement of equipment of panels, bus bar sizes, wire or cable sizes for connections between main breaker, automatic switches, photo electric cell, circuit breakers, H-O-A switch, all appurtenances as shown on the plans, and any other equipment as may be necessary for proper operation and control of the lighting system.

Basis of Payment

This work will be paid for at the contract unit price each for LIGHTING CONTROLLER, SPECIAL, which price shall be payment in full for furnishing and placing Class “SI” concrete foundation with rigid steel conduit for cable entrance and grounding of equipment; Class “SI” concrete pad; furnishing and placing ground rod, furnishing and placing fabricated cabinet complete with equipment panels and all necessary circuit breakers, appurtenances and wiring of same as indicated on the plans; furnishing, installing and connecting the photo-electric cells, and shall include all labor, materials, tools and incidentals necessary to complete and test the operation of the control cabinet as herein specified and as shown on the plans.

LIGHT POLE FOUNDATION, SPECIAL

This work shall consist of furnishing and installing a metal helix light pole foundation in accordance with Section 836 of the Standard Specifications and the metal foundation plan details.

The Contractor shall coordinate bolt hole sizes and hardware with light pole base plate as noted in the plan details.

Additionally, the Contractor shall coordinate the bolt hole sizes and hardware with the TRAFFIC SIGNAL POST, GALVANIZED STEEL, 14 FT that is to be used for the RADAR SPEED SIGN, per the detail in the plans.

This work shall be paid for at the Contract unit price per each for LIGHT POLE FOUNDATION, SPECIAL, which shall include the labor, equipment, and materials required to perform the work described herein.

LIGHT POLE FOUNDATION, 24" DIAMETER, OFFSET

This work shall consist of constructing a light pole foundation in accordance with Section 836 of the Standard Specifications and District Detail BE-310 on the plans.

This work shall be paid for at the Contract unit price per foot for LIGHT POLE FOUNDATION, 24" DIAMETER, OFFSET, which shall include the labor, equipment, and materials required to perform the work described herein.

REMOVE AND RELOCATE EXISTING LIGHTING CONTROLLER

This work shall consist of removing and relocating an existing lighting controller cabinet to a temporary wood pole. The controller cabinet shall be disconnected and removed from the existing foundation.

Any damage sustained to the lighting controller during removal and reinstallation operations shall be repaired, or replaced in kind, to the satisfaction of the Engineer.

This work shall be paid for at the Contract unit price each for REMOVE AND RELOCATE EXISTING LIGHTING CONTROLLER, which shall include the labor, equipment, and materials required to perform the work described herein.

STORM SEWER REMOVAL, SPECIAL

Description
This work shall consist of removing existing elliptical storm sewer pipe, 45"x29" equivalent, in locations identified on the plans. This work shall follow applicable portions of Article 551 of the special provisions.

Method of Measurement
This work shall be measured for payment by FOOT of elliptical storm sewer to be removed.

Basis of Payment
This work shall be paid for at the contract unit price per FOOT for STORM SEWER REMOVAL, SPECIAL This item includes all material, excavation, and labor to complete the operation as described. Backfill of the existing trench shall be paid for separately with TRENCH BACKFILL.

ANTI-GRAFFITI COATING

Description
This work shall consist of the furnishing and application of an anti-graffiti coating to exposed concrete surfaces designated on the plans.

General
The anti-graffitti coating product shall be submitted to the Engineer for approval. Product features shall include: Zero VOC, 10 year unlimited warranty for graffiti removals, binary prime coat, non-yellowing, non-chalking and breathable.

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

Qualifications
The anti-graffiti coating shall be a product that has been commercially available for a period of at least five (5) years. Contractor shall apply the material to a test patch following the manufacturer's recommendation. After the manufacturer's recommended curing period, the Engineer will apply various types of graffiti materials to the coating. After three (3) days the removal agent shall be used to remove the graffiti. If after graffiti removal the anti-graffiti coating is clean and undamaged, with no evidence of ghosting, shadowing or staining, then the anti-graffiti coating is approved for use.

Surface Preparation
Prior to application of the anti-graffiti coating, all designated surfaces shall be cleaned of loose debris, previous coatings (except staining) and all foreign matter by a method as recommended by the coating manufacturer and approved by the Engineer. All surfaces shall be thoroughly clean, dry and free of dust that might prevent penetration of the coating. New concrete should be thoroughly cured before application of the coating. Glossy, glazed and slick troweled surfaces of unstained concrete should be lightly etched or abraded before application of the coating. Concrete surfaces shall be properly sealed according to the manufacturer's recommendations so the application of the system does not produce any noticeable long-term change in color of the surfaces being treated. A technical representative of the manufacturer shall be present to approve surface preparation and application of the anti-graffiti coating.

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

than 40^{0} F nor greater than 100^{0} F, or is expected to exceed these temperatures within twelve (12) hours of application.

Application
The manufacturer's product data sheets and application guides shall be submitted to the Engineer prior to coating application. All information contained in the data sheets and application guides shall be strictly followed. All coatings shall be applied in the presence of the Engineer. Film thickness shall be measured by the Contractor in the presence of the Engineer and shall be according to the manufacturer's recommendation. Application of the clear protective coating shall take place after the application and curing of the concrete staining as appropriate for the surface to be treated (see the special provision for STAINING CONCRETE STRUCTURES).

In a contrasting color of the same anti-graffiti system, the name of the system used and the date of application shall be stenciled in letters not to exceed 2 inches high. The location of the stencil shall be near one end of the work at the bottom of the surface to be protected. For projects greater than 3,000 sq. ft. the stencil shall be periodically repeated once for every 3,000 sq. ft. near the bottom at the locations designated by the Engineer.

Cleaning Agent
The Contractor shall supply the Engineer with an initial quantity of the removal agent and written instructions for its use, as recommended by the manufacturer for graffiti removal. The amount shall be furnished at a rate of one (1) gallon per 81 sq. yd. of treated surface.

Method of Measurement.
This work will be measured in place per square foot of surface area upon which the anti-graffiti coating has been applied and accepted by the Engineer. No surface area will be measured for payment for areas below final grade. Applying anti-graffiti coating to mock-up will not be measured for payment.

Basis of Payment
This Work will be paid for at the contract unit price per square foot for ANTI-GRAFFITI COATING which shall be payment in full for the cleaning of designated surfaces, the application of the anti-graffiti coating, supplying the manufacturer's technical representative and supplying the initial quantity of cleaning agent.

EXPLORATION TRENCH (SPECIAL)

Description
This work shall be in accordance with Section 213 of the Standard Specifications insofar as applicable and the following provisions.

This item shall consist of excavating a trench at locations as directed by the Engineer for the purpose of locating existing sewer lines, water mains, sanitary sewers and other utilities within or adjacent to the proposed project limits.

The trench shall be deep enough to expose the sewer lines, water mains, sanitary sewers or other utilities. The width of the trench shall be sufficient to allow proper investigation to determine if the existing facility needs to be adjusted.

The Contractor shall familiarize himself with the locations of all underground utilities of facilities as outlined in applicable Articles 105 of the Standard Specifications and shall save such facilities from damage.

The exploration trench shall be backfilled with trench backfill meeting the requirements of Article 208 of the Standard Specifications, the cost of which shall be included in the item Exploration Trench (Special).

Payment shall be based on actual length of trench explored without change in unit price because of adjustment in plan quantities due to field conditions.

Method of Measurement
This work shall be measured in place and measured per cubic yard.

Basis of Payment
This work will be paid for at the contract unit price per cubic yard for EXPLORATION TRENCH (SPECIAL) and no extra compensation will be allowed for any delays, inconvenience or damage sustained by the Contractor in performing this work. This price shall include excavation, backfill, and disposal of excess material.

FORM LINER TEXTURED SURFACE

Description
This work shall consist of the construction of form liner textured surfaces on designated surfaces in the contract plans.

Materials
The materials shall be according to Article 503.02 of the "Standard Specifications" and the following: Form liners for **Form Liner Textured Surface** and **Form Liner Textured Surface, Special** shall duplicate closely the appearance of natural stone masonry and be non-repeating. Seam lines or match lines caused from two or more molds coming together will not be apparent when viewing final wall.

The molds shall not compress more than ¼ inch when concrete is poured at a rate of 10 vertical feet per hour. The molds shall be removable without causing deterioration of surface or underlying concrete.

The forms shall be constructed so that the completed concrete structures conform to the shape, lines and dimensions of the members of the approved pattern. The forms shall be properly braced or tied together to maintain position and shape. The forms shall be made sufficiently tight to prevent leakage of the mortar. The formwork shall have the strength and stability to ensure finished concrete dimensions within the tolerances specified herein.

The following form liner suppliers and patterns have been pre-approved for Form Liner Textured Surface and Form Liner Textured Surface, Special:

Custom Rock International
1156 Homer Street St. Paul, Minnesota
55116 (800) 637-2447
www.custom-rock.com
Pattern Number 12005 – Bearpath Coursed Stone

Sika Greenstreak
601 Avenue Delmar
Point-Claire, Quebec, Canada 63122-6614
(800)933-SIKA
www.sika.ca
Pattern Number 477 – Meramec Drystack Stone

Fitzgerald Formliners
1500 East Chestnut Ave.
Santa Ana, California 92701
(800) 547-7760
www.formliners.com
Pattern Number 17008 – Brayman Drystack
APS Plastic

Pre-approval of the form liner does not include material acceptance at the job site.

For Form Liner Textured Surface and Form Liner Textured Surface, Special the Contractor shall select a form liner pattern from above or propose an equivalent form liner. The pattern for Form Liner Textured Surface, Special shall match the pattern selected for Form Liner Texture Surface, except that the maximum relief depth shall be ½" and the maximum relief width shall be 1" for Form Liner Textured Surface, Special.

Form liners shall be according to Article 503.06(a) and the requirements detailed in this specification.

The form ties shall be made of either metal or fiberglass. Metal ties, which result in a portion of the tie permanently embedded in the concrete, shall be designed to separate at least one inch back from finished surface, leaving only a neat hole that can be plugged with patching material. Contractor shall submit the type of form ties to the Engineer, for approval prior to use in this work.

Concrete used for the cast-in-place concrete designated to receive form liner textured surfaces shall contain a high range water-reducing admixture according to Article 1021.03(c) of the "Standard Specifications" to obtain a 5" to 7" slump.

Submittals
For a proposed equivalent the Contractor shall submit to the Engineer one (1) specification including bonding and releasing agents, catalog cut sheet and 36" x 36" liner sample for the style of architectural form liner proposed for use on Form Liner Textured Surfaces on the project. Note that the same style of form liner shall be used on all surfaces to receive Form Liner Textured Surfaces within the project limits. The submittal shall be made no later than 14 calendar days from the date of notification to proceed with the contract. Upon receipt of the information, the Engineer, in consultation with McHenry County will have 14 calendar days to approve and notify the Contractor of which style of form liner is to be used on the project.

Contractor shall submit to the Engineer for approval evidence of the selected subcontractor's five years experience making stone masonry molds to create formed concrete surfaces to match natural stone shapes, surface textures.

Upon receipt of notification of the style of form liners to be used or if the Contractor is proposing a form liner from the pre-approved list, he/she shall submit a proposed procedure for obtaining the simulated finish. The procedure shall

include plans and details for the form liner pattern and dimensions, and be submitted for the Engineer's approval no later than 14 calendar days from the date of notification of approval of the style type. If such plans and details are not satisfactory to the Engineer, the Contractor shall make any changes as may be required by the Engineer or McHenry County at no additional cost to the Department.

Upon approval of the form liner plans and details, the Contractor shall submit up to three 6' by 6' (minimum) mock-up concrete panel(s) of the simulated stone masonry finish of the Form Liner Textured Surface Surface and Form Liner Textured Surface, Special each. Include an area to demonstrate wall mold butt joint.

The sample panel(s) shall be delivered and positioned on the job site at a location to be determined by the Engineer. The mock-up shall also include the concrete staining if it is included in the contract. The approved form liners shall be used throughout the project to replicate natural stone surfaces unless otherwise noted in the plans. The approved mock-ups shall be the standard for replicated natural stone surfaces and special surfaces where required throughout the project.

General

The work shall be performed according to Article 503.06 of the "Standard Specifications" and the following:

The form liners shall be installed according to the manufacturers' recommendations to achieve the highest quality concrete appearance possible. The form liners shall withstand the concrete placement pressures without leakage, physical or visual defects.

The Contractor shall clean the form liners, removing any buildup prior to each use. The Contractor shall inspect each form for blemishes or tears and make repairs as needed following manufacturer's recommendations.

The Contractor shall install the form liners with less than ¼ inch separation between them. The molds shall be attached securely to the forms following manufacturer's recommendations. The panels shall be attached to each other with flush seams and seams filled as necessary to eliminate visible evidence of seams in the cast concrete.

The liner butt joints shall be blended into the pattern so as to eliminate visible vertical or horizontal seams and conspicuous form butt joint marks. The liner joints shall fall within pattern joints or reveals. The finished textures shall be continuous without visual disruption and properly aligned over adjacent and multiple liner panels. Continuous or single liner panels shall be used where liner joints may interrupt the intended pattern. Panel remnants shall not be pieced together.

The Contractor shall notify the Engineer at least 48 hours prior to placing concrete. Concrete shall not be placed until the Engineer has inspected the formwork and the placement of reinforcing bars for compliance with the plans.

The Contractor shall apply the form release agent to all surfaces of the form liner which will come in contact with concrete, according to the manufacturers' recommendations.

The Contractor shall employ proper consolidation methods to ensure the highest quality finish. Internal vibration shall be achieved with a vibrator of appropriate size, the highest frequency and low to moderate amplitude. Concrete placement shall be in lifts not to exceed 1.5 feet. Internal vibrator operation shall be at appropriate intervals and depths and withdrawn slowly enough to assure a minimal amount of surface air voids and the best possible finish without causing segregation. An external form vibrator may be required to assure the proper results. The use of an external form vibrator must be approved by the form liner manufacturer and the Department. The Contractor shall

coordinate concrete pours to prevent visible differences between individual pours or batches. Concrete pours shall be continuous between construction or expansion joints. Cold joints shall not occur within continuous form liner pattern fields.

The form liners shall be stripped between 12 and 24 hours as recommended by the manufacturer. When stripping the forms the Contractor shall avoid creating defects in finished surface.

Wall ties shall be coordinated with the liner and form to achieve the least visible result. Place form ties at thinnest points of molds (high points of finished wall). Neatly patch the remaining hole after disengaging the protruding portion of the tie so that it will not be visible after coloring the concrete surface.

Where an expansion joint must occur at a point other than at mortar or rustication joints, such as at the face of concrete texture, which is to have the appearance of stone, consult manufacturer for proper treatment of expansion material.

Curing methods shall be according to Article 1020.13 of the "Standard Specifications" and compatible with the desired aesthetic result. The use of curing compounds will not be allowed. No rubbing of flat areas or other repairs should be required after form removal. The finished exposed formed concrete surfaces shall be free of visible vertical seams, horizontal seams, and butt joint marks. Grinding and chipping of finished formed surfaces shall be avoided.

Releasing Form Liners

Products and application procedures for form liner release agents shall be approved by the form liner manufacturer. Release agents shall not cause swelling of the form liner material or delamination of the form liner. Release agents shall not stain the concrete or react with the form liner material. Release agent shall coat form liner with a thin film. Following application of release agent, the form liner surface shall be cleaned of excess amounts of release agent using compressed air. Buildup of release agent caused by reuse of a form liner shall be removed at least every 5 uses.

Form liners shall release without leaving particles or pieces of form liner material on concrete and without pulling or breaking concrete from the textured surface. The concrete and textured surfaces exposed by removing form liners shall be protected from damage. Form stripping and related construction shall avoid creating defects in the concrete.

All concrete shall be cured in conformance with the Standard Specifications except that curing compounds will not be allowed.

Method of Measurement

This work will be measured for payment in place and the area computed in square feet for FORM LINER TEXTURED SURFACE and FORM LINER TEXTURED SURFACE, SPECIAL. Measurement will include all costs associated with providing the aesthetic treatment on the walls including the furnishing, installing, stripping and reusing the form liner and providing the required submittals.

Basis of Payment

The work will be paid for at the contract unit price per square foot for FORM LINER TEXTURED SURFACE and FORM LINER TEXTURED SURFACE, SPECIAL.

BOARDWALK STRUCTURE (SN 056-F077.2)

Description

This work shall consist of furnishing and installing the timber boardwalk decking, stringers, cross bracing, support piers, fasteners, hardware, railings, and helical pile foundations as detailed in the plans and as specified herein. No heavy equipment will be allowed within the limits of the wetlands shown on the plans.

Helical Pile Foundations

The boardwalk structure is to be supported by helical pile foundations. See special provision for Helical Piles, included herein.

Steel Cable Railing System

The boardwalk structure is to have a steel cable railing system. See special provision for Railing, included herein.

Segmental Concrete Block Wall

The boardwalk abutments shall be comprised of segmental concrete blocks as shown on the plans and as described in the Standard Specifications.

Wood Treatment By Pressure Process

Preservative Treatment for Above Ground Use, Ground Contact and Fresh Water:

1. Provide materials treated with Copper azoles and quats CA-C.
2. Kiln dried after treatment (KDAT) to 19% maximum moisture content for lumber and 18% for plywood.
3. Treat wood in contact with waterproofing, masonry, concrete, exposed to the elements, the first 18 inches of buried, and as indicated on the plans.

Lumber

1. All dimensional lumber, 2" nominal thickness and larger (except the decking), is to be Southern Pine and graded under the Southern Pine Inspection Bureau (SPIB) guidelines. All dimensional members are to be S4S, No.1 grade or better and is to have the appropriate grade stamp clearly marked.
2. Rail material to be Southern Pine, #1 gr. KDAT, or better.
3. All pedestrian railing posts, cap rails and rub rails shall be S4S, KDAT to a 19% or less moisture content, No. 1 and better, and shall have the appropriate grade stamp.
4. The decking shall be KDAT to a 19% or less moisture content, No. 1 or better, and shall have the appropriate grade stamp.
5. The decking shall be rough sawn (with an actual finished thickness of 3 inches) to create a textured walking surface.
6. The lumber shall be free from any defects including knots, warping, or checks.

Hardware And Miscellaneous Materials

1. Provide fasteners with a hot-dip zinc coating (ASTM A-153) for treated lumber and where wood is in ground contact, subjected to high relative humidity or exposed to weather, unless otherwise specified.
2. The railing steel end posts shall be HSS 4x4x5/16 with steel base plates and details as indicated on the plans.
3. All structural bolts shall be 3/4" diameter A307 hot dipped galvanized per AASHTO Specification M-232 or as shown on the plans.
4. Commercially available prefabricated steel connections shall be used for all stringer to beam connections as indicated on the plans.

5. Commercially available prefabricated steel hold-down anchors shall be used for all rail post to stringer and blocking to stringer connections as indicated on the plans.
6. Commercially available prefabricated steel column cap connectors shall be used for all pier cap beams to post connections as indicated on the plans.
7. Commercially available prefabricated steel angles shall be used for connecting rub rails and cap rails to posts as indicated on the plans.
8. Hot dip galvanize all steel shapes after fabrication per AASHTO specification M-111. Hot dip galvanize all hardware per AASHTO specification M-232. Treat all field modifications to steel parts with cold galvanizing paint.
9. All welding to be per A.W.S. specifications by certified welders.

Marking of Pressure Treated Wood: Each piece of lumber shall be marked showing compliance with specified standards.

All pressure treated material shall be stored, for the duration of the project, in a manner that will prevent damage to the lumber, or any condition that might affect treatment.

Helical Pile foundations shall be installed according to the manufacturer's recommendations. Heavy machinery is not to enter the limits of the wetlands shown on the plans. Boardwalk shall be installed utilizing a stringer-to-pile cap construction method. Stringers are to be aligned in the direction of the structures path.

Railing shall be made of timber posts, timber cap rail, timber rub rails and steel cabling, as shown on plans. The end terminal posts shall be tubular steel HSS 4x4x5/16 supported by 18" diameter drilled concrete shafts with reinforcement bars.

The intermediate posts beyond the decking shall be timber posts and shall be installed according to details shown on plans.

All exposed edges of the rail shall be routered with a ¾" radius bit. All exposed members, railings, and sharp corners shall be ground smooth to help prevent bridge users from cutting or scraping their hands. All rail material is to be KDAT to a 19% or less moisture content, No.1 Grade.

Wood Decking

Wood decking for the boardwalk shall be rough sawn (3" actual finished thickness) timber decking. Wood type shall be southern pine (pressure treated), No. 1 grade or better with a minimum allowable extreme fiber stress in bending of 1,850 PSI and minimum modulus of elasticity of 1,700,000 PSI. All screws will be recessed a minimum of 1/8" below deck surface. Pre-drilling of holes for the deck fasteners may be required. The Contractor shall be required to submit samples of the decking material for approval.

Submittals

Shop Drawings: Submit Shop Drawings for the boardwalk structure indicating all component details, hardware, materials, connection and joining methods, and the relationship to the adjoining work.

Method of Measurement and Basis of Payment

The timber boardwalk shall be measured and paid for at the contract unit price per square foot for BOARDWALK STRUCTURE, which shall include all material, labor and equipment to complete the work as described. This will include the decking, joists, piers, helical pile foundations, complete railing system from end post to end post,

reinforced concrete foundation of the end posts, intermediate posts foundation off the deck, cabling and all the hardware required. The area measured shall be the out to out dimension of the decking.

STEEL CABLE RAILING SYSTEM, SPECIAL

Description

This work shall consist of furnishing and installing the steel cable railing system as detailed in the plans and as specified herein. This work shall be closely coordinated and completed in conjunction with the work for the timber boardwalk and interfacing components as detailed in the plans, including segmental concrete block walls, and as specified in "BOARDWALK STRUCTURE." The installed steel cable railing system shall closely match that at the existing boardwalk structure located at 1202 Harnish Dr. Algonquin, Illinois 60102.

Design Requirements

Provide cable railing systems, including intermediate cable braces, cables, and cable hardware capable of withstanding both gravity loads and the following loads and stresses conforming to the International Building Code (2015).

1. Cables:
    a. Minimum load of 50 lbs/ sq ft over gross area of cable railing system of which they are a part.
    b. Loads of intermediate posts and cables and other loads do not need to be considered acting concurrently.

Quality Assurance

Regulatory Requirements:

1. Components and installation are to be in accordance with state and local code authorities.
2. Components and installation are to follow current ADA and ICC/ANSI A117.1 guidelines.

Railing frame components and cable hardware shall be designed to withstand loads encountered without excessive deflection or distortion when cables are tensioned to conform to building codes.

Materials

1. Do not change source or brands of wood during the course of the Work.
2. Obtain wood of uniform texture and color for each type required for each continuous area and visually related areas.

Coordination: Review installation procedures and coordinate with other boardwalk work that must be integrated with the steel cable railing system.

Pre-Installation Meeting:

1. Prior to the beginning of work, conduct a pre-job conference at the job site.
2. Provide seven calendar days advance written notice ensuring the attendance by competent authorized representative(s) of the fabricator/manufacturer, Owner's representative, Engineer and subcontractors whose work interfaces with the work of this Section.

3. Review the specifications to determine any potential problems, changes, scheduling, unique job site conditions, installation requirements and procedures and any other information pertinent to the installation.
4. Record the results of the conference and furnish copies to all participants.

Submittals

Certifications:

1. Furnish certification that all components and fittings are furnished by the same manufacturer or approved by the primary component manufacturer.
2. Furnish certification that components were installed in accordance to the manufacturer's engineering data and their specified design loads.

Product Data: Submit copies of manufacturer's specifications and/or product data sheets for all components including, but not limited to: steel end posts, wood posts, steel cable railing system, and all required hardware.

Shop Drawings: Submit Shop Drawings for steel cable railing system indicating all component details, hardware, materials, finishes, connection and joining methods, and the relationship to the adjoining work.

Submit manufacturer's installation instructions.

Samples:

1. Railing frame components by fabricator.
2. Intermediate cable braces by fabricator (if required by system).
3. Cables by manufacturer or fabricator.
4. Cable hardware by manufacturer or fabricator.

Test Reports: Submit test results indicating structural performance and design load for stainless steel guardrail systems demonstrating compliance with specifications.

Railing System

Timber, General: All exposed timber edges of the rail shall be routered with a ¾" radius bit. All exposed members, railings, and sharp corners shall be ground smooth to help prevent bridge users from cutting or scraping their hands. All timber material is to be KDAT to a 19% or less moisture content, No.1 Grade and in accordance with the requirements set forth in "BOARDWALK STRUCTURE."

End Posts: Tubular steel HSS 4x4x5/16 with steel base pates supported by 18" diameter drilled concrete shafts with reinforcement bars. Holes shall be pre-drilled to allow for installation of "through post" tensioning hardware. End posts shall be powder-coated painted black after fabrication.

Intermediate Posts: 4x4 timber posts.

Cap Rail: 2x4 timber cap rail.

Rub Rail: 2-2x6 timber rub rails.

Cables:

1. Material: 1 x 19 Type 316 stainless steel strand.
2. Diameter: 5/32".

Cable Hardware:

1. Material: All cable hardware for use with wood railing frame components shall be Type 316 stainless steel metal.
2. Tensioning Hardware for Steel End Posts: "Through post" tensioning hardware to fit through pre-drilled holes in steel end posts.

Fasteners and Handrail Brackets:

1. Material: All mechanical fasteners and handrail brackets used in the assembly of the cable railing shall be manufactured from stainless steel metal.

Construction Requirements

Prior to starting work the Contractor shall examine areas to receive cable railing system and notify Engineer if areas are not acceptable. Contractor shall not begin construction until unacceptable conditions have been corrected.

Install steel railing cable system in accordance with shop drawings and manufacturer's instructions at locations indicated on drawings. Erect work square and level, rigid, and free from distortion or defects detrimental to appearance or performance. Anchor cable railing system to mounting surface as indicated on drawings. Do not field weld components. Use manufacturer's supplied cable hardware. Terminate and tension cables in accordance with manufacturer's instructions. Cable shall not exceed 40'-0" in length and shall have tensioners at both ends of its run. Cables shall be tensioned from both sides of each post simultaneously. Tension cables in sequence in accordance with manufacturer's instructions. Ensure cables are clean, parallel to each other and without kinks or sags. Adjust cables and cable hardware as required to provide properly installed cable railing system as directed by Engineer and Landscape Architect.

As installation is completed, wash thoroughly using clean water and soap; rinse with clean water. Do not use acid solution, steel wool, or other harsh abrasives. Remove stained or otherwise defective work and replace with material that meets specification requirements. Contractor shall repair damaged finish and defective or damaged components as directed by Engineer.

Method of Measurement and Basis of Payment

Steel Cable Railing System shall be included in the contract unit price per square foot for BOARDWALK STRUCTURE, which shall include all material, labor and equipment to complete the work as described. Steel Cable Railing System installed beyond the limits of the Boardwalk Structure and the Sleeve-It intermediate rail post supports as indicated on the plans are included in the contract unit price per square foot for BOARDWALK STRUCTURE.

HELICAL PILES

Description

This work shall consist of furnishing and installing Helical Piles and Bracket Assemblies for support of the timber boardwalk structure shown in the plans. Each Helical Pile shall be installed at the location and to the elevation, minimum length, installation torque, and allowable capacities shown on the Plans or as established. No heavy equipment will be allowed within the limits of the wetlands shown on the plans. This work also includes load testing installed helical piles.

Referenced Codes and Standards

Codes and standards shall be as they appear in the helical pile suppliers published literature.

Qualifications

All qualifications shall be submitted to the Engineer for approval within 10 days after award of the contract.

Due to the special requirements for manufacture and quality control of Helical Piles and Brackets, all Helical Piles and Brackets shall be obtained from a company specializing in the manufacturing and distribution of these products. Manufacturer qualifications for this project shall be submitted to the Engineer for approval. The submittal shall include:

1. A product catalog and all necessary technical data sufficient to qualify the proposed product.
2. Evidence showing manufacturer has at least ten (10) years' experience in the design and manufacture of Helical Piles.
3. Current ICC-ES product evaluation report or complete description of product testing and engineering calculations used to assess product capacity.
4. Current ISO 9001:2008 certification.

Due to the special requirements for installation of Helical Piles and Brackets, all Helical Piles and Brackets shall be installed by a subcontractor specializing in the installation of those products. The Contractor shall submit qualifications of the subcontractor installing the helical piles to the Engineer for approval. The submittal must include:

1. Evidence the subcontractor has completed training in the proper methods of installation of Helical Piles and the mounting of Brackets.
2. A recent company brochure indicating experience in this type of work.
3. Evidence of having installed Helical Piles on at least ten (10) projects, including project name, number and type of Helical Piles project location, and client contact information.
4. Resume of subcontractor's foreman including experience in the oversight of Helical Pile and installation on at least five (5) projects in the last five (5) years, including project name, number and type of Helical Piles, project location, and client contact information.
5. List of installation and testing equipment and detailed description of proposed method of installation and load testing Helical Piles.
6. Current ANSI/AWS welding certificate and documentation of welder experience within the last 5 years (if welding is required).

Due to the special requirements for design of Helical Piles and Brackets, all Helical Piles and Brackets shall be designed by a Structural Engineer licensed in the State of Illinois specialized in the engineering and design of Helical

Piles. Pile Design Professional's qualifications shall be submitted to the Engineer for approval. The submittal shall include:

1. The qualifications of the designated Pile Design Professional indicating at least ten (10) years' experience in this type of work as well as graduate education in structural and/or geotechnical engineering.
2. Evidence of Pile Design Professional having designed Helical Piles on at least ten (10) projects, including project name, number and type of Helical Piles, project location, and client contact information.
3. Evidence of current license to practice Structural Engineering in Illinois.

Submittals

All submittals shall be made 30 days prior to starting work.

Contractor shall prepare and submit to the Engineer for approval, Shop Drawings and specifications for the Helical Piles intended for use on the project. The Shop Drawings shall include the following:

1. Helical Pile product identification number(s) and designation(s).
2. Maximum allowable mechanical compression and tensile strength of the Helical Piles.
3. Number of Helical Piles and respective design allowable capacities.
4. Planned installation depth and the number of lead and extension sections.
5. Preliminary helical configuration (number and diameter of helical bearing plates).
6. Manufacturer's recommended capacity to installation torque ratio.
7. Minimum final installation torque(s).
8. Product identification numbers and designations for all Bracket Assemblies and number and size of connection bolts.
9. Corrosion protection coating on Helical Piles and Bracket Assemblies.

Contractor shall submit to the Engineer design calculations for the Helical Piles and Brackets intended for use on the project. The Shop Drawings shall include the following:

1. Reduction in shaft dimension and strength by the sacrificial thickness anticipated based on corrosion loss over the design life for project soil conditions.
2. Considerations for downdrag, buckling, and expansive soils (as appropriate).
3. Minimum installation depth to reach bearing stratum and to achieve pullout capacity (if required).
4. Soil bearing and pullout capacity.
5. Lateral resistance of the shaft (if required).
6. Estimated pile head movement at design loads.

Contractor shall submit to the Engineer calibration information certified by an independent testing agency for the torque measurement device and all load testing and monitoring equipment to be used on the project. Calibration information shall have been tested within the last year of the date submitted. Calibration information shall include, but is not limited to, the name of the testing agency, identification number or serial number of device calibrated, and the date of calibration.

Contractor shall submit for review and acceptance the proposed load testing procedure. The proposal shall provide the minimum following information:

1. Type and sensitivity of load equipment

2. Type and sensitivity of load measuring equipment
3. Type and sensitivity of pile-head deflection equipment
4. General description of load reaction system, including description of reaction anchors or bearing plate
5. Calibration reports for equipment, including hydraulic jack, pressure gauges, and deflection dial gauges

Work shall not begin until all the submittals have been received and approved by the Engineer.

Shipping, Storage, and Handling

All Helical Pile and Bracket Assemblies shall be free of structural defects and protected from damage. Store Helical Piles and Bracket Assemblies on wood pallets or supports to keep from contacting the ground. Damage to materials shall be cause for rejection.

Products

All products and material used for Helical Pile and Bracket Assemblies shall be as shown in the suppliers published literature. Unless noted otherwise, it is the sucontractor's Pile Design Professional's responsibility to select the appropriate size and type of Helical Piles and Brackets to support the design loads shown on the Plans. These specifications and the Plans provide minimum requirements to aid the Contractor in making appropriate materials selections. All material replacements shall be acceptable to Engineer.

Construction Requirements

Preparation

The Contractor shall request locating of underground utilities by an underground utility location service. All efforts shall be made to protect any underground utilities encountered during the excavation and pile installation.

Mark all pile installation locations as shown on the plans or approved shop drawings. The Engineer shall be notified if the piles are relocated more than 12" from the locations shown on the plans or approved shop drawings. Relocation of the piles will not be allowed unless approved by the Engineer.

A torque indicator shall be used during helical pile/anchor installation. The torque indicator can be an integral part of the installation system or externally mounted in-line.

The Contractor shall inspect and oversee all aspects of installation of the helical piles. The items to be inspected include, but not limited to the following:

A. Verify the type of helical pile being installed is as specified on the shop drawings.
B. Verify final embedment depth of helical pile.
C. Verify final installation torque readings as specified on the shop drawings.

Installation

1. The helical pile installation technique shall be such that it is consistent with the geotechnical, logistical, environmental and load carrying conditions of the project.

2. The lead section shall be positioned at the location as shown on the approved shop drawings.

3. The helical pile sections shall be engaged and advanced into the soil in a smooth, continuous manner at a rate of rotation of 5 to 25 RPM's. Extension sections shall be provided to obtain the required

minimum overall length and installation torque as shown on the approved shop drawings. Connect sections together using coupling bot(s) and nut torqued to snug tight per AISC.

4. Sufficient down pressure shall be applied to uniformly advance the helical pile/anchor sections approximately 3-inches per revolution. The rate of down pressure (crowd) shall be adjusted for different soil conditions and depths.

5. The minimum installation torque and minimum overall length criteria as shown on the approved shop drawings shall be satisfied prior to terminating the helical pile/anchor installation.

6. If the torsional strength rating of the pile shaft and/or installation equipment has been reached prior to achieving the minimum overall length required, the Contractor shall have the following options:

    a. Terminate the installation depth obtained subject to the review and acceptance of the Engineer, or:
    b. Remove the existing helical pile/anchor and install a new one with fewer and/or smaller diameter helix plates. The new helix plate configuration shall be subject to review and acceptance of the Engineer. If re-installing in the same location, the top-most helix of the new helical pile/anchor shall be terminated at least three feet (3'-0) beyond the terminating depth of the original helical pile/anchor.

7. If the minimum installation torque as shown on the approved shop drawings is not achieved at the minimum overall length and there is no maximum length constraint, the Contractor shall have the following options:

    a. Install the helical pile deeper using additional extension sections, or:

    b. Remove the existing helical pile and install a new one with additional and/or larger diameter helix plates. The new helix plate configuration shall be subject to review and acceptance of the Engineer. If re-installing in the same location, the top-most helix of the new helical pile/anchor shall be terminated at least three feet (3'-0) beyond the terminating depth of the original helical pile.

    c. De-rate the load capacity of the helix pile/anchor and install additional helical piles/anchors. The de-rated capacity and additional helical piles location shall be subject to the review and acceptance of the Engineer.

8. If the helical pile is refused or deflected by a subsurface obstruction, the installation shall be terminated and the pile removed. The obstruction shall be removed, if feasible, and the helical pile re-installed.

9. The Contractor shall conduct his construction operations in a manner to insure the safety of persons and property in the vicinity of the work. The Contractor's personnel shall comply with safety procedures in accordance with OSHA standards and any established project safety plan.

10. The portion of the construction site occupied by the Helical Pile Contractor, his equipment and his material stockpiles shall be kept reasonably clean and orderly.

Tolerances

Helical Piles shall be installed as close to the specified installation and orientation angles as possible. Tolerance for departure from installation and orientation angles shall be +/- 5 degrees.

Helical Piles and Bracket Assemblies shall be installed at the locations shown on the approved show drawings. Tolerances for Bracket Assembly placement shall be +/- 1 inch in both directions perpendicular to the shaft and +/- 1/4 inch in a direction parallel with the shaft unless otherwise specified.

Quality Assurance

The Contractor shall provide the Engineer copies of installation records within 48 hours after each installation is completed. These installation records shall include, but are not limited to, the following information:

1. Name of project Contractor and Subcontractor
2. Name of subcontractor's supervisor during installation
3. Date and time of installation
4. Name and model of installation equipment
5. Type of torque indicator used
6. Location of Helical Pile by grid location, diagram, or assigned identification number
7. Type and configuration of Lead Section with length of shaft and number and size of helical bearing plates
8. Type and configuration of Extension Sections with length and number and size of helical bearing plates, if any
9. Installation duration and observations
10. Total length installed
11. Final elevation of top of shaft and cut-off length, if any
12. Final plumbness or inclination of shaft
13. Installation torque at minimum three-foot depth intervals
14. Final installation torque
15. Comments pertaining to interruptions, obstructions, or other relevant information
16. Verified axial load capacity

Load Testing

1. Helical Pile Compression Tests

    a. Contractor shall perform the number of compression tests noted on the Plans.
    b. Compression tests shall be performed following the "quick test" procedure described in ASTM D1143 specifications
    c. Load tests shall be observed and documented by the Engineer
    d. Unless otherwise shown on the Plans, the maximum test load shall be 200% of the allowable load shown on the Plans
    e. The locations of Helical Piles to be tested shall be determined by the Contractor, unless noted on the Plans
    f. Installation methods, procedures, equipment, products, and final installation torque shall be identical to the production Helical Piles to the extent practical except where otherwise approved by or Engineer
    g. A load test shall be deemed acceptable provided the maximum test load is applied without Helical Pile failure and the deflection of the pile head at the design load is less than 1-inch unless noted otherwise on the Plans. Failure is defined when continuous jacking is required to maintain the load.

2. If a load test fails the forgoing acceptance criteria, the Subcontractor shall modify the Helical design and/or installation methods and retest the modified pile or anchor, as directed by the Engineer. These modifications include, but are not limited to, de-rating the load capacity, modifying the installation methods and equipment, increasing the minimum final installation torque, changing the helical configuration, or changing the product (i.e., duty). Modifications that require changes to the structure shall have prior review and acceptance of the Engineer. Any modifications of design or construction procedures, and any retesting required shall be at the Contractor's expense.

3. The Contractor shall provide the Engineer copies of load test reports confirming configuration and construction details within 1 week after completion of the load tests. This written documentation will either confirm the load capacity as required on the working drawings or propose changes based upon the results of the tests. At a minimum, the documentation shall include:

    a. Name of project and Contractor and Subcontractor

    b. Date, time, and duration of test

    c. Location of test Helical Pile by grid location, diagram, or assigned identification number

    d. Test procedure (ASTM D1143, D3689, or D3966)

    e. List of any deviations from procedure

    f. Description of calibrated testing equipment and test set-up

    g. Type and configuration of Helical Pile or Helical Anchor including lead section, number and type of extension sections, and manufacturer's product identification numbers

h. Load steps and duration of each load increment

i. Cumulative pile-head movement at each load step

j. Comments pertaining to test procedure, equipment adjustments, or other relevant information

Method of Measurement and Basis of Payment
Helical Pile and Bracket Assemblies shall be included in the contract unit price per square foot for BOARDWALK STRUCTURE, which shall include all material, labor and equipment to complete the work as described.

TEMPORARY SIDEWALK

This work shall consist of constructing portions of temporary sidewalk as needed to maintain pedestrian access during stage construction.

The Contractor shall use either portland cement concrete (PCC) according to Section 424 of the Standard Specifications or hot-mix asphalt (HMA) according to Section 406 of the Standard Specifications, and other applicable PCC and HMA special provisions as contained herein. The PCC depth and materials to be used shall be equivalent to the 5" PCC sidewalk specified in the plans. The HMA depth and mixtures to be used shall be equivalent to the Bikeway / Multi-use path specified in the plans.

The temporary sidewalk shall be placed on a suitable prepared subgrade in accordance with the Standard Specifications.

The removal of the temporary sidewalk shall conform to Section 440 of the Standard Specifications.

Method of Measurement
This work will be measured for payment in place and the area computed in square feet (square meters). The preparation of subgrade, including any materials required, will not be measured separately for payment, but shall be included within the contract unit price for TEMPORARY PAVEMENT. The removal of the temporary sidewalk will not be measured separately for payment, but shall be included within the contract unit price for TEMPORARY SIDEWALK.

Basis of Payment
This work will be paid for at the contract unit price per square foot (square meter) for TEMPORARY SIDEWALK. This contract unit price shall include all labor, equipment and materials necessary to complete the work. An estimated quantity has been provided for TEMPORARY SIDEWALK. Actual locations will be determined as field conditions warrant and as directed by the Engineer.

SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE

Description
This work shall consist of constructing a stabilized construction entrance, including furnishing, installing, maintaining and removing a stabilized pad of aggregate underlain with filter fabric, as shown on the plans or directed by the Engineer.

Materials
The materials used shall meet the requirements of the following:

Aggregate: The aggregate shall be limited to IDOT Coarse Aggregate Gradation CA-1.

Filter Fabric: The filter fabric shall be made of synthetic polymers composed of at least 85 percent by weight polypropylene, polyesters, polyamides, polyethylene, polyolefins, or polyvinylidene-chlorides. The geotextile shall be free of any chemical treatment or coating that significantly reduces its porosity. Fibers shall contain stabilizers and/or inhibitors to enhance resistance to ultraviolet lights.

Construction Requirements
The aggregate shall be at least six inches thick. The aggregate shall not be placed until the entrance area has been inspected and approved by the Engineer.

The aggregate shall be dumped and spread into place in approximately horizontal layers. The layer(s) shall not exceed three feet in thickness. The aggregate shall be placed in such a manner as to produce a reasonably homogeneous stable fill that contains no segregated pockets of larger or smaller fragments or large unfilled space caused by bridging of larger fragments. No compaction shall be required beyond that resulting from the placing and spreading operations.

The construction entrance shall follow the dimensions shown on the plans and/or have a minimum width of 14 feet and a minimum length of 50 feet.

All surface water flowing or diverted toward the construction entrance shall be piped across the entrance. Any pipe used for this will be considered included in the unit price for SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE. The stabilized construction entrance shall have positive drainage away from the roadway.

The entrance shall remain in place and be maintained until the disturbed area is stabilized. Any sediment spilled onto public right-of-way(s) shall be removed immediately. All removed materials shall be disposed of outside the limits of the right-of-way according to Article 202.03 of the “Standard Specifications” and/or as directed by the Engineer.

Method of Measurement
The Stabilized Construction Entrance will be measured in place and the area computed in square yards.

Basis of Payment
The work will be paid for at the contract unit price per square yard for SEDIMENT CONTROL, STABILIZED CONSTRUCTION ENTRANCE. The unit price shall include all material, including filter fabric, labor, equipment and any other items required to complete the construction entrance.

FENCE REMOVAL

Description

This work shall consist of the removal of fence as shown in the plans or otherwise directed by the Engineer. The removal shall include post foundations, fittings, gates, posts and accessories. All holes left by the removal of the fence posts and post foundations shall be filled with crushed stone screenings The furnishing and placing of the screenings shall be included in the cost of the Fence Removal. The Contractor shall do so at locations shown on the plans or as directed by the Engineer. The existing fence shall be carefully removed and delivered to the owners or properly disposed of as directed by the Engineer. Any part of the fence that is damaged that is not called for to be removed will be replaced at the Contractor's expense.

Method of Measurement

Fence Removal will be measured per lineal foot measured along the top of the fence.

Basis of Payment

This work will be paid for at the contract unit price per linear foot for FENCE REMOVAL, which includes all equipment, labor and materials necessary to remove, deliver, furnish, place, and dispose of the fence, crushed stone screenings, and miscellaneous accessories (posts, gates, fittings, etc.).

TEMPORARY INFORMATION SIGNING

Effective: November 13, 1996
Revised: January 2, 2007

Description

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

Materials

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

	Item	Article/Section
a)	Sign Base (Notes 1 & 2)	1090
b)	Sign Face (Note 3)	1091
c)	Sign Legends	1092
d)	Sign Supports	1093
e)	Overlay Panels (Note 4)	1090.02

Note 1. The Contractor may use 5/8 inch instead of ¾ inch 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 thick.

GENERAL CONSTRUCTION REQUIREMENTS

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

Signs which are place 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' above the near edge of the pavement and shall be a minimum of 2' beyond the edge of the paved shoulder. A minimum of two (2) posts shall be used.

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

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

Method of Measurement
This work shall be measured for payment in square feet 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 feet for TEMPORARY INFORMATION SIGNING.

LUMINAIRE SAFETY CABLE ASSEMBLY

Effective: January 1, 2012

Description
This item shall consist of providing a luminaire safety cable assembly as specified herein and as indicated in the plans.

Materials
Materials shall be according to the following:

Wire Rope
Cables (wire rope) shall be manufactured from Type 304 or Type 316 stainless steel having a maximum carbon content of 0.08 % and shall be a stranded assembly. Cables shall be 3.18 mm (0.125") diameter, 7x19 Class strand core and shall have no strand joints or strand splices.

Cables shall be manufactured and listed for compliance with Federal Specification RR-W-410 and Mil-DTL-83420.

Cable terminals shall be stainless steel compatible with the cable and as recommended by the cable manufacturer. Terminations and clips shall be the same stainless steel grade as the wire rope they are connected to.

U-Bolts
U-Bolts and associated nuts, lock washers, and mounting plates shall be manufactured from Type 304 or Type 316 stainless steel.

CONSTRUCTION REQUIREMENTS

General
The safety cable assembly shall be installed as indicated in the plan details. One end of the cable assembly shall have a loop fabricated from a stainless steel compression sleeve. The other end of the cable assembly shall be connected with stainless steel wire rope clips as indicated. Slack shall be kept to a minimum to prevent the luminaire from creeping off the end of the mast arm. Unless otherwise indicated in the plans, the luminaire safety cable shall only be used in conjunction with luminaires which are directly above the traveled pavement.

Basis of Payment
This work shall be paid for at the contract price each for LUMINAIRE SAFETY CABLE ASSEMBLY, which shall be payment for the work as described herein and as indicated in the plans.

MAINTENANCE OF LIGHTING SYSTEMS

Effective: March 1, 2017

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

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

Before performing any excavation, removal, or installation work (electrical or otherwise) at the site, the Contractor shall initiate a request for a maintenance transfer and preconstruction inspection, as specified elsewhere herein, to be held in the presence of the Engineer and a representative of the party or parties responsible for maintenance of any lighting systems which may be affected by the work. During the maintenance preconstruction inspection, the party responsible for existing maintenance shall perform testing of the existing system in accordance with Article 801.13a. The Contractor shall request a date for the preconstruction inspection no less than fourteen (14) days prior to the desired date of the inspection.

The Engineer will document all test results and note deficiencies. All substandard equipment will be repaired or replaced by the existing maintenance contractor, or the Engineer can direct the Contractor to make the necessary repairs under Section109.04.

Existing lighting systems, when depicted on the plans, are intended only to indicate the general equipment installation of the systems involved and shall not be construed as an exact representation of the field conditions. It remains the Contractor's responsibility to visit the site to confirm and ascertain the exact condition of the electrical equipment and systems to be maintained. Contract documents shall indicate the circuit limits.

Maintenance of Existing Lighting Systems

Existing lighting systems. Existing lighting systems shall be defined as any lighting system or part of a lighting system in service at the time of contract Letting. The contract drawings indicate the general extent of any existing lighting, but whether indicated or not, it remains the Contractor's responsibility to ascertain the extent of effort required for compliance with these specifications and failure to do so will not be justification for extra payment or reduced responsibilities.

Extent of Maintenance.

Partial Maintenance. Unless otherwise 'indicated, if the number of circuits affected by the contract is equal to or less than 40% of the total number of circuits in a given controller and the controller is not part of the contract work, the Contractor needs only to maintain the affected circuits within the project limits. The project limits are defined as those limits indicated in the contract plans. Equipment outside of the project limits, on the affected circuits shall be maintained and paid for under Article 109.04. The affected circuits shall be isolated by means of in line waterproof fuse holders as specified elsewhere and as approved by the Engineer. The unaffected circuits and the controller will remain under the maintenance of the State.

Full Maintenance. If the number of circuits affected by the contract is greater than 40% of the total number of circuits in a given controller, or if the controller is modified in any way under the contract work, the Contractor shall maintain the entire controller and all associated circuits within the project limits. Equipment outside of the project limits shall be maintained and paid for under Article 109.04.

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

Maintenance of Proposed Lighting Systems

Proposed Lighting Systems. Proposed lighting systems shall be defined as any lighting system or part of a lighting system, temporary or permanent, which is to be constructed under this contract regardless of the project limits indicated in the plans.

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

Lighting System Maintenance Operations

The Contractor's responsibility shall include all applicable responsibilities of the Electrical Maintenance Contract, State of Illinois, Department of Transportation, Division of Highways, District One. These responsibilities shall include the maintenance of lighting units (including sign lighting), cable runs and lighting controls. In the case of a pole knockdown

or sign light damage, the Contractor shall promptly clear the lighting unit and circuit discontinuity and restore the system to service. The equipment shall then be re-set by the contractor within the time limits specified herein.

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

Responsibilities shall also include weekly night time patrol of the lighting system, with patrol reports filed immediately with the Engineer and with deficiencies corrected within 24 hours of the patrol. Patrol reports shall be presented on standard forms as designated by the Engineer. Uncorrected deficiencies may be designated by the Engineer as necessitating emergency repairs as described elsewhere herein.

The following chart lists the maximum response, service restoration, and permanent repair time the Contractor will be allowed to perform corrective action on specific lighting system equipment.

INCIDENT OR PROBLEM	**SERVICE RESPONSE TIME**	**SERVICE RESTORATION TIME**	**PERMANENT REPAIR TIME**
Control cabinet out	1 hour	4 hours	7 Calendar days
Hanging mast arm	1 hour to clear	na	7 Calendar days
Radio problem	1 hour	4 hours	7 Calendar days
Motorist caused damage or leaning light pole 10 degrees or more	1 hour to clear	4 hours	7 Calendar days
Circuit out – Needs to reset breaker	1 hour	4 hours	na
Circuit out – Cable trouble	1 hour	24 hours	21 Calendar days
Outage of 3 or more successive lights	1 hour	4 hours	na
Outage of 75% of lights on one tower	1 hour	4 hours	na
Outage of light nearest RR crossing approach, Islands and gores	1 hour	4 hours	na
Outage (single or multiple) found on night outage survey or reported to EMC	na	na	7 Calendar days
Navigation light outage	na	na	24 hours

- **Service Response Time** -- amount of time from the initial notification to the Contractor until a patrolman physically arrives at the location.

- **Service Restoration Time** – amount of time from the initial notification to the Contractor until the time the system is fully operational again (In cases of motorist caused damage the undamaged portions of the system are operational.)

- **Permanent Repair Time** – amount of time from the initial notification to the Contractor until the time the system is fully operational again (In cases of motorist caused damage the undamaged portions of the system are operational.)

Failure to provide this service will result in liquidated damages of $500 per day per occurrence. In addition, the Department reserves the right to assign any work not completed within this timeframe to the Electrical Maintenance Contractor. All costs associated to repair this uncompleted work shall be the responsibility of the Contractor. Failure to pay these costs to the Electrical Maintenance Contractor within one month after the incident will result in additional liquidated damages of $500 per month per occurrence. Unpaid bills will be deducted from any monies owed to the Contractor. Repeated failures and/or a gross failure of maintenance shall result in the State's Electrical Maintenance Contractor being directed to correct all deficiencies and the resulting costs deducted from any monies owed the contractor.

Damage caused by the Contractor's operations shall be repaired at no additional cost to the Contract.

Operation of Lighting

The lighting shall be operational every night, dusk to dawn. Duplicate lighting systems (such as temporary lighting and proposed new lighting) shall not be operated simultaneously. Lighting systems shall not be kept in operation during long daytime periods.

Method of Measurement

The contractor shall demonstrate to the satisfaction of the Engineer that the lighting system is fully operational prior to submitting a pay request. Failure to do so will be grounds for denying the pay request. Months in which the lighting systems are not maintained and not operational will not be paid. Payment shall not be made retroactively for months in which lighting systems were not operational.

Basis of Payment

Maintenance of lighting systems shall be paid for at the contract unit price per calendar month for MAINTENANCE OF LIGHTING SYSTEM, which shall include all work as described herein.

STORM SEWER ADJACENT TO OR CROSSING WATER MAIN

Effective: February 1, 1996
Revised: January 1, 2007

This work consists of constructing storm sewer adjacent to or crossing a water main, at the locations shown on the plans. The material and installation requirements shall be according to the latest edition of the "Standard Specifications for Water and Sewer Main Construction in Illinois", and the applicable portions of Section 550 of the Standard Specifications; which may include concrete collars and encasing pipe with seals if required.

Pipe materials shall meet the requirements of Sections 40 and 41-2.01 of the "Standard Specifications for Water and Sewer Main Construction in Illinois", except PVC pipe will not be allowed. Ductile-Iron pipe shall meet the minimum requirements for Thickness Class 50.

Encasing of standard type storm sewer, according to the details for "Water and Sewer Separation Requirements (Vertical Separation)" in the "STANDARD DRAWINGS" Division of the "Standard Specifications for Water and Sewer Main Construction in Illinois", may be used for storm sewers crossing water mains.

Basis of Payment
This work will be paid according to Article 550.10 of the Standard Specifications, except the pay item shall be STORM SEWER (WATER MAIN REQUIREMENTS), of the diameter specified.

TEMPORARY PAVEMENT
Effective: March 1, 2003
Revised: April 10, 2008

Description
This work shall consist of constructing a temporary pavement at the locations shown on the plans or as directed by the Engineer.

The Contractor shall use either Portland cement concrete (PCC) according to Sections 353 and 354 of the Standard Specifications or hot-mix asphalt (HMA) according to Sections 355, 356, 406 of the Standard Specifications, and other applicable PCC and HMA special provisions as contained herein. The HMA mixtures to be used shall be specified in the plans. The thickness of the Temporary Pavement shall be as described in the plans. The Contractor shall have the option of constructing either material type if both Portland cement concrete and HMA are shown in the plans. The Contractor shall furnish and construct Subgrade Granular Material, Type B, 4" under the temporary pavement in accordance with the Standard Specifications.

Articles 355.08 and 406.11 of the Standard Specifications shall not apply.

The removal of the Temporary Pavement, if required, shall conform to Section 440 of the Standard Specification.

Method of Measurement
Temporary pavement will be measured in place and the area computed in square yards (square meters). The Subgrade Granular Material, Type B, 4" will not be measured separately for payment, but shall be included within the contract unit price for TEMPORARY PAVEMENT.

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

Removal of temporary pavement will be paid for at the contract unit price per square yard (square meter) for PAVEMENT REMOVAL.

TEMPORARY PAVEMENT (VARIABLE DEPTH)

Description

This work shall consist of constructing temporary hot-mix asphalt wedges at the locations shown on the plans or as directed by the Engineer. These wedges will be necessary at various locations throughout the project, including intersections, during the course of construction to temporarily provide a ramp over grade differentials resulting from stage construction (i.e. from new pavement constructed in Stage 1 to adjacent existing pavement remaining in place until a later stage).

The Contractor shall use HMA according to Sections 355, 356, and 406 of the Standard Specifications, and other applicable HMA special provisions as contained herein. The HMA mixtures to be used shall be specified in the plans. The thickness of the Temporary Pavement will be variable and determined in the field at the time of construction. Article 406.11 of the Standard Specifications shall not apply.

All labor, equipment and materials required to remove Temporary Pavement (Variable Depth), including bond breaker, shall be included in this item and will not be measured separately for payment. The removal of the Temporary Pavement (Variable Depth), if required, shall conform to Section 440 of the Standard Specifications.

All necessary maintenance of traffic required to place and remove the Temporary Pavement (Variable Depth) shall be included in the cost of Temporary Pavement (Variable Depth).

Basis of Payment

This work will be paid for at the contract unit price per ton for TEMPORARY PAVEMENT (VARIABLE DEPTH).

Removal of Temporary Pavement (Variable Depth), will not be measured separately for payment, but shall be included within the contract unit price per ton for TEMPORARY PAVEMENT (VARIABLE DEPTH).

SELECTIVE CLEARING

Description

This work shall consist of extensive removal and disposal of shrubs, brush, debris (including rocks, bottles, etc.) and selected trees up to six (6) inches (150 mm) in diameter. All trees and shrubs to be saved shall be carefully protected as provided by Article 201.05 of the Standard Specifications. Locations for Selective Clearing and vegetation to be cleared or saved shall be as designated by the Engineer.

The undesirable trees and brush (Siberian Elm, European Buckhorn, Mulberry, etc.) shall be cut flush with the ground and all stubs or stumps shall be treated with a resprout herbicide approved by the Engineer to prevent regrowth from the stumps. Branches on remaining trees shall be pruned off up to 6 feet (2 meters) from the ground. Trees of Tree of Heaven shall not be cut off as specified above, but shall be pulled or grubbed in such a manner as to insure complete removal.

All cleared areas shall be graded, trimmed, smoothed, and finished uniformly to the satisfaction of the Engineer with equipment approved by the Engineer. Disposal of material shall be done in accordance with Article 202.03.

Method of Measurement
Selective Clearing will be measured in acres Areas not meeting the satisfaction of the Engineer shall not be measured for payment. Plan quantities are estimates only. Actual quantities will be measured in place. Agreement to plan quantities will not be allowed.

Basis of Payment
This work will be paid for at the contract unit price per acre for SELECTIVE CLEARING. Payment for Selective Clearing shall include the cost of all minor grading, debris removal and disposal, trimming, pruning, smoothing, finishing, labor, materials, tools and equipment required to complete the work as specified herein and to the satisfaction of the Engineer.

SETTLEMENT PLATFORMS

Description
This work shall consist of furnishing and placing settlement platforms at the locations shown on the plans. Settlement Platforms shall meet the requirements of Article 204.03 and Article 204.06 of the Standard Specifications and the plan details.

Project geotechnical reports note that settlement of embankment may occur in the timber pile ground improvement areas. The settlement platforms will be used by the Engineer to determine when construction of the moment slab on top of the mechanically stabilized earth retaining walls may commence.

Settlement readings shall be taken a minimum of twice each week, or more frequently, to expedite production rates, as approved by the Engineer.

Upon completion of the mechanically stabilized earth retaining wall, the settlement readings will continue to be taken by the Engineer until no more than 0.01' of settlement occurs per week for a minimum of two (2) weeks consecutively. Once this occurs and the Engineer determines, based on the applicable project geotechnical report, the total anticipated future settlement of the embankment is one (1") inch or less then approval will be given to the Contractor to commence pending construction work.

The duration of settlement monitoring is at the discretion of the Engineer.

No additional compensation or time extension will be allowed to comply with the implementation of the waiting periods for embankment settlement.

Method of Measurement
This work will be measured per each for the SETTLEMENT PLATFORMS.

Basis of Payment
This work shall be paid for at the contract unit price per each for SETTLEMENT PLATFORMS, which price shall include all labor, equipment, and materials necessary to install, maintain, and monitor the settlement platforms.

SLEEPER SLAB

This work shall be done in accordance with the plan, details and District Detail BD52 – Detail of Pavement Separation Joint for Jointed PCC Pavements at Intersections.

This work will be paid at the contract unit price per foot for SLEEPER SLAB, which price shall include all labor, materials and exvacations necessary to construct the sleepr slab.

DYNAMIC PILE MONITORING

General

This work consists of dynamic monitoring of timber test piles as indicated on the plans, both during their initial driving process and the re-strike procedure conducted after the minimum waiting period specified herein has elapsed. All pile driving operations shall follow Section 512 of the standard specifications unless otherwise indicated in this special provision.

Dynamic monitoring will be accomplished by attaching sensors near the top of the pile which transmit data by cable or wireless connection to a Pile Driving Analyzer (PDA) unit on site. The test piles should be a minimum of 10 feet longer than the length indicated on the plans.

The Contractor shall secure the services of a Dynamic Testing Consultant qualified for Pile Driving Analyzer (PDA) work. The Consultant shall submit documentation of successful completion of at least 5 PDA testing projects within the last 3 years of a scope and complexity similar to that anticipated for this project. The Dynamic Testing Consultant shall also submit documentation of experience with PDA equipment manufactured by Pile Dynamics, Inc. and the CASE Pile Wave Analysis Program (CAPWAP). The dynamic monitoring shall be performed using a PDA (Model PAK, PAX, or PAL). The Dynamic Testing Consultant shall furnish all equipment necessary for the dynamic monitoring such as sensors, cables, or wireless transmitters, etc. The equipment shall conform to the requirements of ASTM D-4945. An engineer with a minimum of 5 years of experience and who has achieved Basic Level or better on the Foundation QA Examination for Providers of PDA Testing Services shall be in charge of PDA operations and of result interpretation, either on site or by remote connection.

Submittals

The Contractor shall submit a completed "Pile Driving Equipment Data" Form (http://www.idot.illinois.gov/Assets/uploads/files/IDOT-Forms/BBS/BBS%20136.docx) included below to the Engineer and Dynamic Testing Consultant to prepare the PDA. The Contractor shall also notify the Engineer in writing of the anticipated driving and re-strike date(s) of the pile(s) to be dynamically monitored. Both the completed form and written driving and re-strike dates shall be provided to the Engineer a minimum of two weeks prior to driving the first dynamically monitored pile. Any changes to the proposed driving equipment or dates shall be submitted to the Engineer.

Construction

Dynamic monitoring will be performed during the final 10 feet of initial driving. After lifting the pile to be monitored into the leads, the Contractor shall provide labor to access to either side of the test pile within the top 8 ft to attach the sensors.

When the level of the sensors is within 1 ft of any obstruction endangering the survival of sensors and/or cables, driving shall be halted and the contractor shall remove the sensors and reattach them after passing the obstruction. When sensors are within 1 ft of the ground surface, driving shall be halted and the contractor shall remove the sensors and reattach them near the top of the next pile segment after lifting into place and splicing.

Upon completion of initial driving process of each dynamically monitored pile, the Contractor shall provide the PDA operator access to remove the sensors. Other piles in the substructure and elsewhere on the project may be driven during the waiting period but the dynamically monitored piles shall not be cut off and remain accessible for the re-strike procedure.

If the sensors are located 10ft or more above the ground at the end of initial driving, the Contractor shall provide equipment and labor to remove the sensors as well as reattach them after the waiting period, just prior to the re-strike procedure.

The Contractor shall wait a minimum of 7 days prior to re-striking piles.

After the minimum waiting period has elapsed, the Contractor shall warm up the hammer by driving another pile a minimum of an additional 20 blows and reposition the driving equipment on the restrike pile. Once the PDA operator has reattached the sensors and connections, the contractor shall apply at least 20 blows or drive the pile an additional 3 in, whichever occurs first, to allow the PDA to obtain the final pile setup data. The contractor shall remove and provide the sensors to the PDA operator after which the contractor may proceed with cutting the pile to length and normal construction.

Dynamic Testing Reports

The Dynamic Testing Consultant shall prepare and submit to the Engineer written reports of the test pile program prior to start of production pile installation in each construction stage. Separate reports will be prepared for tests performed in each construction stage. These reports shall include the results of the pile capacity obtained from the dynamic testing and CAPWAP analysis, as well as recommended driving criteria for the remaining production piles. The reports shall also discuss hammer and driving system performance, driving stress levels, and pile integrity.

Method of Measurement and Basis of Payment

This work will be measured for payment per each test pile as DYNAMIC PILE MONITORING.

INLETS, TYPE A, WITH TYPE 23 FRAME AND GRATE, SPECIAL

Description

This work shall consist of constructing a standard Type A inlet within M-6.18 curb and gutter utilizing a Type 23 Frame and Grate as shown in accordance with all applicable portions of Article 602 of the Standard Specifications and the plans except that the Inlet shall follow construction requirements outlined in the detail included with the plans.

Chimney seals shall be provided which will capture at least 4” of the frame, all adjusting rings, and 4” of the precast upper cone section.

Basis of Payment
This work will be paid for at the contract unit price per EACH for INLETS, TYPE A, 4'-DIAMETER, WITH TYPE 23 FRAME AND GRATE, SPECIAL installed.

CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE 10 FRAME AND GRATE, SPECIAL

Description
This work shall consist of constructing a standard 4' Type A catch basin within depressed driveway B-6.12 curb and gutter utilizing a Type 10 Frame and Grate of the diameter specified in accordance with all applicable portions of Article 602 of the Standard Specifications and the plans. The Inlet shall follow construction requirements outlined in the detail included with the plans.

Chimney seals shall be provided which will capture at least 4" of the frame, all adjusting rings, and 4" of the precast eccentric cone section (if used).

Basis of Payment
This work will be paid for at the contract unit price per EACH for CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE 10 FRAME AND GRATE, SPECIAL.

FIBER OPTIC CABLE IN CONDUIT, NO. 62.5/125, 12F

Add the following to Article 871.01 of the Standard Specifications:

The Fiber Optic cable shall be installed in conduit or as specified on the plans.

Add the following to Article 871.02 of the Standard Specifications:

The control cabinet distribution enclosure shall be 24 Port Fiber Wall Enclosure, unless otherwise indicated on plans. The fiber optic cable shall provide twelve fibers per tube for the amount of fibers called for in the Fiber Optic Cable pay item in the Contract. Fiber Optic cable may be gel filled or have an approved water blocking tape.

Add the following to Article 871.04 of the Standard Specifications:

A minimum of six multimode fibers from each cable shall be terminated with approved mechanical connectors at the distribution enclosure. Fibers not being used shall be labeled "spare." Fibers not attached to the distribution enclosure shall be capped. A minimum of 13.0 feet (4m) of extra cable length shall be provided for controller cabinets. The controller cabinet extra cable length shall be stored as directed by the Engineer.

Add the following to Article 871.06 of the Standard Specifications:

The distribution enclosure and all connectors will be included in the cost of the fiber optic cable.

Testing shall be in accordance with Article 801.13(d). Electronic files of OTDR signature traces shall be provided in the Final project documentation with certification from the Contractor that attenuation of each fiber does not exceed 3.5 dB/km nominal at 850nm for multimode fiber and 0.4 bd/km nominal at 1300nm for single mode fiber.

Basis of Payment
The work shall be paid for at the contract unit price for FIBER OPTIC CABLE IN CONDUIT, NO. 62.5/125, 12F per (meter) foot for the cable in place, including distribution enclosure and all connectors.

REMOVE FIBER OPTIC CABLE FROM CONDUIT

This work shall consist of removing a portion of the existing fiber optic interconnect cable as specified herein or as directed by the Engineer.

The existing fiber optic cable shall be disconnected from the traffic signal controller cabinets and removed from the existing conduits that will be reused in the permanent interconnect installation. Existing interconnect fiber optic cable in conduits to be abandoned shall not be paid for removal. The existing interconnect cable shall not be disconnected and removed until the temporary radio interconnect installation is operating to the satisfaction of the Engineer.

Basis of Payment
This work will be paid for at the contract unit price per foot for REMOVE FIBER OPTIC CABLE FROM CONDUIT which price shall be payment in full for disconnecting the existing fiber optic cable from the controller cabinets and removing the existing fiber optic cable.

REMOVE AND REPLACE TRAFFIC SIGNAL CABINET AND EQUIPMENT

This work shall consist of disconnecting and removing existing signal cabinet, all equipment contained therein, and the uninterruptable power supply, and installation of a full-actuated controller and type IV cabinet and uninterruptable power supply on existing foundation.

30 days prior to execution of this work, contractor shall submit for approval by the county, a proposed traffic control plan for maintenance of traffic operations at the intersection for the duration of this work. Traffic control plan approved with or without modification by the County shall be implemented for the duration of the work.

This work shall be included in the unit cost of FULL-ACTUATED CONTROLLER AND TYPE IV CABINET, SPECIAL. New traffic signal controller shall implement the traffic signal timing from the existing signal controller or as directed by the county.

The contractor shall complete cabinet replacement within 24 hours after de-energization of existing traffic signal. The new cabinet and all traffic signal equipment at the intersection shall be fully operational, with County approved signal timing, at the end of this period.

Should the Contractor fail to complete this work in accordance with the limitations specified above, the Contractor shall be liable to the County for the amount of **$5,000** for each day and each intersection that the signal is not fully

operational, including any day when the signal is not fully operational for a portion of the day, not as a penalty but as liquidated and ascertained damages. Such damages may be deducted by the County from any monies due the Contractor. These damages shall apply during the contract time and during any extensions of the contract time.

BASE STABILIZATION WITH CEMENT

Description

This work shall consist of pulverizing any remaining existing bituminous layers and/or, portions of the aggregate base material, and/or subgrade to a specified depth and maximum size after Hot Mix Asphalt Surface Removal is performed. Work will include chemical stabilization with cement, compaction, grading, final compaction and curing.

Materials

	Item	Article/Section
(a)	Portland Cement (Note 1)	1001
(b)	Water	1002
(c)	Cold Pulverized Material (Note 2)	
(d)	Mix Design (Note 3)	

Note 1 Limit. The type and allowable percentage will be described in the mix design.

Note 2. After pulverization, the gradation of the cold pulverized material shall meet the following requirements.

COLD PULVERIZED MATERIAL GRADATIONS				
Grad No.	Sieve Size and Percent Passing			
	3 in. (75 mm)	2 in. (50 mm)	1 1/2 in. (37.5 mm)	No 4 (4.75 mm)
PM 3		100	100 - 97	
PM 4	100	95		55

Note 3. Mix design(s) for the project have been conducted by the Engineer.

The Stabilized Base section shall be ten (10) inches thick.
Cement will be applied at a rate of 54 lbs/yd^2

FDR WITH CEMENT MIX DESIGN REQUIREMENTS	
Test Method	*Requirement*
Gradation for Design Millings, AASHTO T 27, AASHTO T 88	*Report*
Liquid Limit[1], AASHTO T 89	*Report*
Plasticity Index[1], AASHTO T 90	*Report*
Sand Equivalent[1], ASTM D2419, Method B	*Report*
Moisture Density Relationship, AASHTO T 134	*Report*
Unconfined Compressive Strength, 7-Day,[2] psi	*500 min*
Vacuum Saturation Method for Prediction Freeze-Thaw Durability of Stabilized Materials, IHR-401, psi	*350 min*
Additional Additive(s) [13] *Coarse Aggregate* *Fine Aggregate* *RAP*	 *Report* *Report* *Report*
Cement[13] Percentage by Dry Mass	*Report*

Notes: *1. Testing only required if subgrade soil is being incorporated into the mixture.*

2. Samples shall be prepared according to ASTM D 1633, Method A.

3. Report shall include type/gradation and producer/supplier.

Equipment

(a) Vibratory Roller (Note 1)…….. ……...1101.01(g)
(b) Mechanical Sweeper ……1101.03
(c) Motor Grader……..1101.05
(d) Self-Propelled Milling Machine……...1101.16(a)
(e) Mechanical Spreader (Note 2)
(f) Self-Propelled Reclaimer (Note 3)
(g) Self-Propelled Vibratory Padfoot Roller (Note 4)
(h) Water Truck (Note 5)

Note 1. The vibratory steel roller shall have a gross weight of not less than 12 tons.

Note 2. Spreaders or distributors used to apply the stabilization chemical for BSC shall be cyclone, screw type or pressure manifold type. Spreaders or distributors used shall be cyclone, screw type or pressure manifold type. Spreaders or distributors used shall be able to demonstrate a consistent and accurate application rate while minimizing dust during construction.

Note 3. The self-propelled reclaimer shall be capable of fully pulverizing the existing pavement to the depth required, incorporate the water, and mix the materials to produce a homogeneous material. The minimum power of the self-propelled reclaimer shall be 500 hp. The self-propelled reclaimer shall be capable of reclaiming not less than 8 ft wide and up to 16 in. deep in each pass. The self-propelled reclaimer shall be able of injecting water directly into the mixing chamber via an electronic control system that records the amount of moisture addition. The cutting drum should be fitted with cutting teeth capable of trimming earth, aggregate and bituminous mixtures, and so designed that they may be accurately adjusted vertically and held in place. The machine shall weigh at least 12.5 tons and shall have such strength and rigidity that it will not develop a center deflection of more than 1/8 in. Disc harrows, bucket teeth and other equipment that do not meet the above requirements shall not be used.

Note 4. The self-propelled vibratory pad foot roller shall have 84 in. wide drums and gross weight of not less than 10 tons. A front mounted blade is recommended for back-dragging. A self-propelled vibratory pad foot roller shall be required for each self-propelled reclaimer.

Note 5. Water trucks used for adding compaction shall be set up for a controlled spray.

CONSTRUCTION REQUIREMENTS

General Conditions

This work consisting of cement application, mixing, spreading, compacting, and finishing shall be continuous and completed within 2 hours from the start of mixing. Any processed material that has not been compacted and finished shall not be left undisturbed for longer than 30 minutes.

Weather Limitations

This work shall be performed when the atmospheric temperature in the shade and away from artificial heat is 50 °F and rising. Also, the weather shall not be foggy or rainy. The weather forecast shall not call for freezing temperature within 7 days with after placement of any portion of the project and the annual average low temperature within 7 days of the end of the project shall be greater than 32 °F.

Pre-pulverization and Initial Shaping

The existing pavement shall be pre-pulverized by the self-propelled reclaimer and/or shaped by the motor grader to correct for profile, crown, and contour, according to the plans, before the addition of the cement. Water may be added during this operation. The pre-pulverized and shaped material shall be compacted with a vibratory roller in static mode to support equipment and/or traffic and to provide depth control during processing. Depth of pre-pulverization and shaping shall be 1 in. to 2 in. less than the depth of final processing.

Cement Application

The quantity of cement specified in the mix design shall be spread on the finished surface of the pre-pulverized material using a mechanical spreader.

Mixing

Mixing shall begin as soon as possible after the cement has been spread; however, the time from cement placement on the finished surface of the pre-pulverized material to start of mixing shall not exceed 30 minutes. Mixing shall continue until the entire mixture is pulverized so that the mixed material passes the gradation specified. A final gradation test shall be made at the conclusion of mixing operations.

Prior to compaction, the mixture shall be at the required moisture content throughout. If using dry cement, water application shall only be done through the self-propelled reclaimer integrated fluid injection system during mixing.

Compaction

The cement treated material shall be compacted according to the following:

(a) Optimum Moisture Content. At the start of compaction, the moisture content shall be within optimum moisture content range determined by the mix design or the latest moisture-density test. No section shall be left undisturbed for longer than 30 minutes during compaction operations. All compaction operations shall be completed within 2 hours from the start of mixing.

(b) Density. The field density shall be determined by a nuclear density gauge in the direct transmission mode according to AASHTO T 310. The processed material's field density shall be uniformly compacted to a minimum of 98% of maximum dry density based on a moving average of five consecutive tests with no individual test below 96%. Optimum moisture and maximum dry density shall be determined by the mix design and verified during construction by a moisture-density test according to AASHTO T 134.

(c) Rollers. Immediately after processing and final shaping the recycled material shall be compacted with equipment meeting the following requirements.

MINIMUM ROLLER REQUIREMENTS FOR FDR			
Breakdown Roller (one of the following)	Intermediate Roller [1]	Final Roller (one or more of the following)[1]	Density Requirement
Padfoot Roller	Vibratory Steel Drum/Dynamic	Vibratory Steel Drum/Static	98 percent of the maximum target density

(d) Rolling. The breakdown roller shall be 500 ft (150 m) or less behind all self-propelled reclaimer units. The recycled material shall be compacted by the padfoot roller, applying high amplitude and low frequency, or the pneumatic-tired roller. Breakdown rolling shall be performed until the breakdown roller walks out of the material. Walking out for the padfoot roller is defined as light being clearly evident between all of the pads at the material–padfoot drum interface and being no more than 3/16 in. (5 mm) deep. Walking out for the pneumatic-tired roller is defined as no significant wheel impressions being left on the surface.

After the completion of breakdown rolling, the motor grader shall be used to cut the recycled material no deeper than necessary to remove breakdown roller marks from the initial compaction and to achieve desired cross slope.

The bladed recycled material shall be compacted by the intermediate and final rollers. The number of passes and order of rollers may be altered to meet compaction requirements. Finish rolling shall not be done in vibratory mode. Water may be lightly sprayed by a water truck to aid in improving final density and appearance. A second water truck is required if water is also being added at the reclaimer.

Curing

After completion of final finishing operations, the stabilized base shall be cured by application of a bituminous membrane. It should be applied as soon as possible but not later than 24 hours after the final compaction operations. The surface should be kept continuously moist prior to the application of the curing membrane.

The BSC should be free of all loose, extraneous materials and should be applied after compaction has been achieved and prior to opening the stabilized material to traffic. The fog seal should be composed of emulsified asphalt diluted up to 60% by volume with water. Typical fog seal application rates are 0.10 gal/yd$^{2.}$

When a sand blotter is required, it should be applied at 2 to 3 lbs/yd^2. Sand should be free from clay or organic material. Application rates of fog seal and sand blotter should be such that a stable and safe roadway surface can be maintained until the surface course is placed.

Opening to Traffic

Completed portions of BSC base may be opened immediately to low speed local traffic and to construction equipment, provided the curing materials are not impaired and provided the BSC base is sufficiently stable to withstand marring or permanent deformation. The contractor shall work with the Village to not disrupt the refuse and recycle collection day for the area. Thursday and Friday.

Micro Cracking

If a cementitious stabilizing agent is used, the surface course is thin, and the compressive strength of the BSC is not limited, micro cracking shall be used to help prevent shrinkage cracking and reduce reflective cracking in the final surface course.

A target compressive strength of 300 to 500 psi is typically selected for stabilized base strength. After the initial 24 hour cure period, the BSC should be tested to determine the stiffness modulus using an approved device. Note 1 If the initial readings are below the required stiffness the BSC section should be allowed to cure for an additional 24 hours prior to additional stiffness readings. If above the require stiffness, micro cracking of the BSC should be accomplished by a 12 ton steel drum vibratory roller. The roller should travel at a speed of approximately 2 mph and vibrating at maximum amplitude and lowest frequency, or as directed by the Engineer.

Note 1. For reference:

UCS	Stiffness, K	Micro Cracking
300 to 500 psi	50+ MN/m (285.5 k lbf/in)	Yes

The section should have 100% coverage of the micro cracking process, exclusive of the outside 1 foot, so as to induce minute cracks in the BSC section. After one pass of the vibratory roller the stiffness of the BSC section should be determined. Additional passes of the steel drum roller may be required to achieve the desired crack pattern or section modulus. After each pass the stiffness of the section should be determined and the micro cracking operations terminated when a minimum 40% reduction in the stiffness is achieved when compared to the initial readings. In the absence of measurement by a stiffness gauge, micro cracking should be terminated when the desired crack pattern is achieved. Typically 1 to 4 passes of the roller is required to achieve the required reduction in stiffness.

After the micro cracking operations, intermediate curing shall be continued.

Maintenance

The finished surface shall be maintained in good condition until all work is completed and accepted. Immediate repairs of any defects that may occur shall be done at the contractor's expense. The depth and type of repair shall be approved by the Engineer.

If it is necessary to replace any processed material, the replacement shall be for full depth, with vertical cuts, using an approved material. No skin patches shall be permitted.

Quality Control/ Quality Assurance (QC/QA)

(a) Quality Control by the Contractor. The Contractor shall perform or have performed the inspection and tests required to assure conformance to contract requirements. Control includes the recognition of obvious defects and their immediate correction. This may require increased testing, communication of test results to the job site, modification of operations, suspension of the work, or other actions as appropriate

(b) Quality Assurance by the Engineer. The Engineer will conduct independent assurance tests on split samples taken by the Contractor for quality control testing if deemed necessary. The Engineer will conduct stiffness testing to determine micro cracking operations to be conducted by the Contractor.

(c) Tests Methods and Frequency.

(1) Depth of Pulverization (Milling). The nominal depth of 4 inches at the curblines and shoulders shall be required and at a cross slope of 1.5% to the centerline. Anytime depth changes are made or equipment is idle, a depth check shall be taken.

(2) Pulverized Material Sizing and Gradation. A sample shall be obtained before cement addition and screened using a 3.0 in. sieve (or smaller sieve if required) to determine if meeting the maximum particle size requirement. Gradations shall be performed each day on the moist millings using the following sieves: 2.0, in. 1.5 in., 1.0 in., 3/4 in., 1/2 in., 3/8 in., No. 4, No. 8, No. 16, and No. 30. The resulting gradation shall be compared to the mix design gradations to determine any necessary changes to cement content.

At least 45% of the moist millings shall pass the No. 4 sieve.

Sampling procedures shall generally be in accordance with ASTM D 979 or AASHTO T 168.

(3) Cement Application Rate. The Engineer shall be notified any time cement application rate is changed. The cement application rate shall be checked and recorded for each segment in which the percentage is changed.

(4) Maximum Dry Density. The single point proctor test shall be run according to AASHTO T 134.

(5) Compacted Density. The compacted density shall be determined by a nuclear density gauge in the direct transmission mode according to AASHTO T 310.

(6) Stiffness. Stiffness shall be determined using Humboldt GeoGauge 4140 or method approved by the Engineer.

(7) Frequency. The following table provides the minimum frequency for tests; however, the Engineer may increase the testing frequency if the construction process is experiencing problems or unknown conditions are encountered.

QC/QA TESTING FREQUENCY		
Test	QC Frequency	QA Frequency
Depth of Pulverization	1 per 500 ft	1 per 1000 ft
Pulverized Material Gradation	1 per 0.5 day of production	1 per day of production
Cement Application Rate	1 per 500 ft	1 per 1000 ft
Max. Dry Density	1 per 0.5 day of production	1 per day of production
Compacted Density	1 per 1000 ft	1 per 2000 ft
Stiffness (after 2 days cure)	1 per 1000 ft	1 per 2000 ft

Note: 1. The Contractor shall perform all quality control tests within the first 500 ft (150 m) after startup or any change in the mix.

Method of Measurement

Cement incorporated in the base stabilization mixture will be measured for payment in tons, but payment will not be measured for cement in excess of 105 percent of the amount specified by the mix design or approved by the engineer.

Base stabilization will be measured in square yards of the recycled base.

Basis of Payment

The cement material will be paid for at the contract unit price per hundred weight for CEMENT.

The base stabilization will be paid for at the contract unit price per square yard for BASE STABILIZATION of the thickness specified.

VILLAGE OF ALGONQUIN WATER MAIN SPECIFICATIONS

Description

This work shall consist of furnishing and installing underground water mains and valves of the required material and dimensions complete with necessary fittings. All water mains and appurtenances shall be constructed, tested, and disinfected in accordance with Section 561 of the Standard Specifications for Road and Bridge Construction adopted January 1, 2012 and the requirements of the Standard Specifications for Water and Sewer Construction in Illinois, 2014, Seventh Edition. The Contractor shall furnish the specified materials per the Village of Algonquin details included in the plans.

The Contractor shall provide all labor, material and equipment required to furnish and install water mains and appurtenances, and all other improvements shown on the plans as required to perform the work and as specified herein.

This work shall also be done according to the specifications, Special Provisions and to the requirements of the construction permit of Illinois Environmental Protection Agency. The Engineer shall be responsible for obtaining the Illinois Environmental Protection Agency permit.

The extent of water main work as shown shall include the following: Trench excavation, backfill and cleanup, trench backfill, pipe installation, valves and fittings, connecting to existing water main, cut offs and plugs if required, bedding, testing, shoring and bracing. Fittings and mechanical joint accessories consisting of, but not limited to, gaskets, glands, retainer glands and bolt, reducers, bends and tees shall be included in the Contractors unit prices for water main. These items are called out on the drawings for engineering design but shall not be paid for separately.

No water main work shall commence until the IEPA construction permit is issued.

JOINT RESTRAINT

Megalug Mechanical Joint Restraining Glands (Series 1100 or Approved by the Engineer) shall be used for all fittings (tees, bends, etc.) and shall be included in the cost per FOOT of the DUCTILE IRON WATER MAIN [SIZE SPECIFIED]. Materials and Installation Specifications are as follows:

Material

1. Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.

Installation

1. Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly.
2. Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

EXISTING CONDITIONS

1. The location of underground utilities shown on the drawings represents the best information of the Owner. The Contractor shall determine the location of underground utilities and perform his work in a manner which will avoid damage.
    a. Should unidentified or incorrectly located piping or other utilities be encountered during the performance of the work, the Contractor shall consult the Engineer immediately for instructions on how to proceed.
    b. If existing utilities are to remain in place, the Contractor shall provide adequate means of protecting such utilities from any damage which may be caused by his construction operations. Contractor shall repair any such damage to the satisfaction of the Engineer at no additional cost to the Owner.
    c. If existing utilities are to be removed, they shall be demolished and completely removed from site. Contractor shall consult with the Engineer and Utility Owner before any utility services are shut-off or disconnected.

WATER MAIN VERTICAL SEPARATION

Whenever water mains must cross sanitary sewer services, storm drains or sanitary sewers, the water main should be laid at such an elevation that the bottom of the water main is 18" above the top of the drain of sewer. This vertical separation should be maintained for that portion of the water main located within 10' horizontally, of any sewer or drain crossed: said 10' to be measured as the normal distance from the water main to the drain or sewer.

Where conditions exist that the minimum vertical separation set forth in (A) cannot be maintained, or it is necessary for the water main to pass under a sewer or drain, the sewer should be laid with Super Bell Title Push-On Joint Ductile Iron Pipe and the pipe should extend on each side of the crossing until the normal distance from the water main to the sewer or drain line is at least 10'. In lieu of using casing pipe, Water Main Equivalent Storm Sewer quality pipe may be used. Pipe materials shall meet the requirements of Sections 40 and 41-2.01 of the “Standard Specifications for Water and Sewer Main Construction in Illinois.” Ductile Iron Pipe shall meet the minimum requirements for Thickness Class 50 and PVC pipe shall meet ASTM-2241 Specifications.

In making such crossings, it is preferable to center a length of water main pipe over the sewer to be crossed so that the joints will be equidistant from the sewer and as remote therefore as possible. Where a water main must cross under a sewer, a vertical separation of main should be maintained, along with means to support the larger sized sewer lines to prevent their settling and breaking the water main.

DESCRIPTION OF PAY ITEMS

WATER VALVES [SIZE SPECIFIED]

Description

Unit price for each valve shall include full compensation for cost of furnishing and installing valves, including masonry support blocking; concrete buttresses; rod restraints; fittings; testing; bacteria disinfection; concrete work, corporation stops; masonry blocking, and disposal of excess material; cleanup work incidental to valve installation not specifically included for payment under other unit prices. Valve installation shall be a component of the unit price cost for WATER VALVES [SIZE SPECIFIED] installation. Number of valves measured shall be equal to actual number of valves installed.

Materials
Valves up to 12" shall be open left resilient edge gate valves "Mueller A-2360".

Method of Measurement
This work will be measured for payment in place as EACH for WATER VALVES [SIZE SPECIFIED].

Basis of Payment
This work will be paid for as EACH for WATER VALVES [SIZE SPECIFIED].

FIRE HYDRANTS TO BE REMOVED

Description
This item shall include full compensation for cost of removal and onsite storage (for Village pickup) of the complete fire hydrant and auxiliary valve assembly, excavation, hauling, disposal of excess material, backfill, temporary restoration of disturbed area but not including permanent restoration, cleanup and work incidental to fire hydrant removal but not specifically included in other unit prices. All removed fire hydrants and valve assemblies shall be stored onsite for Village of Algonquin pickup and all pickups shall be coordinated with the Engineer.

Materials
Valves up to 12" shall be open left resilient edge gate valves "Mueller A-2360".

Method of Measurement
This work will be measured for payment in place as EACH for FIRE HYDRANTS TO BE REMOVED.

Basis of Payment
This work will be paid for as EACH for FIRE HYDRANTS TO BE REMOVED.

FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX

Description
Fire hydrant assemblies, appurtenances and installation shall be in accordance with the Village of Algonquin standards and shown on FIRE HYDRANT detail in the plans. Hydrant shall have two (2) 2-1/2" hose ports and one (1) 4-1/2" pumper port connections with National Standard Threads. Hydrant shall be set on a concrete block to ensure firm bearing for the hydrant base. Hydrant shall have fresh coat of red paint.

Materials
All hydrants shall be Waterous Pacer WB67-250 with oil reservoir and breakaway flange and shall be equipped with a 6" auxiliary valve (resilient wedge gate valve) and cast iron valve box (Tyler 6860 series) and cover. Valve box stabilizer (American Flow Control Trench Adapter) shall be provided. All hydrant bolts shall be stainless steel. A minimum of 1 cubic yard of 3/4" to 1-1/2" washed river stone shall be placed at and around the base of the hydrant and covered with geotextile fabric per detail, to ensure proper drainage of the hydrant after use.

Method of Measurement
This work will be measured for payment in place as EACH for FIRE HYDRANTS WITH AUXILIARY VALVE AND VALVE BOX.

Basis of Payment
This work will be paid for as EACH for FIRE HYDRANTS WITH AUXILIARY VALVE AND VALVE BOX.

VALVE VAULTS, TYPE A, [DIAMETER SPECIFIED], TYPE 1 FRAME, CLOSED LID

Description
Unit price for each vault shall include full compensation for cost of furnishing and installing vaults with concentric cone, including concrete work, masonry work, corporation stops; specified manhole frame and cover (per MANHOLE COVER W/LOGO detail in the plans); masonry blocking, excavation, hauling, and disposal of excess material; designated backfill; 4" bedding material; compaction; temporary restoration of disturbed area, but not including permanent restoration, cleanup and work incidental to valve vault installation not specifically included for payment under other unit prices. Designated backfill and work incidental to vault installation shall be a component of the unit price cost for VALVE VAULTS, TYPE A, [DIAMETER SPECIFIED], TYPE 1 FRAME, CLOSED LID. Number of valve vaults measured shall be equal to actual number of valve vaults furnished and installed.

Materials
Vaults shall have 8” poly wrap on seams, butyl rubber joint sealant between precast elements and frames, flexible rubber connections, and have chimney seals in accordance. Vaults shall be bituminous seal coated. All shall be in accordance with the VLAVE AND VAULT detail in the plans.

Method of Measurement
This work will be measured for payment in place as EACH for VALVE VAULTS, TYPE A, [DIAMETER SPECIFIED], TYPE 1 FRAME, CLOSED LID.

Basis of Payment
This work will be paid for as EACH for VALVE VAULTS, TYPE A, [DIAMETER SPECIFIED], TYPE 1 FRAME, CLOSED LID

STEEL CASING PIPE IN TRENCH, 24”

Description
This work shall be in accordance with Section 23 of the latest edition of the Standard Specifications for Water and Sewer Construction in Illinois, the detail drawings and the following special provision.

Casing chocks or spacers shall be used to aid in the installation and properly positioning of water main in the casing. Casing spacers shall have a bolt-on shell which is manufactured in 2- sections.

Materials
Shell shall have an elastomeric liner to isolate shell from the water main and plastic runners shall be attached to the shell to support the water main from bottom of casing and maintain a clearance from the top of the casing.

Shell shall be comprised of Type 304 stainless steel, liner of neoprene rubber and spacers of high density polyethylene (HDPE). Casing shock width shall be a minimum of 8-inches with spacing at 2 per full length section of water main pipe. Spacers shall be Cascade – CCS, PSI – Model S or BWM-SS-8-CR. Casing pipe shall be ¼" continuously welded smooth interior steel pipe of at least two inches (2") in diameter larger than bell diameter. Casing pipe shall have end seals, 1-Piece EPDM 60 band tightened seal, PSI-Model C or BWM-PO.

Method of Measurement
This work will be measured for payment in place per FOOT for STEEL CASING PIPE IN TRENCH, 24".

Basis of Payment
This work will be paid for per FOOT for STEEL CASING PIPE IN TRENCH, 24 INCH. Materials and labor for providing casing in an open trench construction scenario with appropriate casing spacers for support shall be included in the cost per FOOT of STEEL CASING PIPE IN TRENCH, 24 INCH.

WATER MAIN IN CASING, 12"

Description
The work pertaining to the water main will be the same as DUCTILE IRON WATER MAIN [SIZE SPECIFIED]. The water main shall be encased in a 24" diameter steel casing pipe. The materials and installation shall conform to the CASING PIPE DETAIL in the plan set. All joints located inside of casing pipe must be restrained with restrained joint pipe.

Materials
The restrained joint pipe and fittings shall be ductile iron pipe with locking gaskets, American Flow Control – Fast Grip. Work shall include all labor, materials, and equipment, bedding, excavation, hauling, and disposal of excess material necessary to complete this work.

Method of Measurement
This work will be measured for payment in place per FOOT for WATER MAIN IN CASING, 12".

Basis of Payment
This work will be paid for per FOOT for WATER MAIN IN CASING, 12"

INSERTION VALVES, 10"

Description
Unit price for each insertion valve shall include full compensation for cost of furnishing and installing valves, removal and disposal of existing watermain required for valve installation, including masonry support blocking; concrete buttresses; rod restraints; fittings; testing; bacteria disinfection; concrete work, corporation stops; masonry blocking, and disposal of excess material; cleanup work incidental to valve installation not specifically included for payment under other unit prices. Valve installation shall be a component of the unit price cost for INSERTION VALVES, 10" installation. Number of valves measured shall be equal to actual number of valves installed.

Materials
Insertion valves shall be of type approved by the Village of Algonquin and shop drawings shall be submitted to Village for review and approval prior to work.

Method of Measurement
This work will be measured for payment in place as EACH for INSERTION VALVES, 10"

Basis of Payment
This work will be paid for as EACH for INSERTION VALVES, 10"

INSERTION VALVES, 12"

Description
Unit price for each insertion valve shall include full compensation for cost of furnishing and installing valves, removal and disposal of existing watermain required for valve installation, including masonry support blocking; concrete buttresses; rod restraints; fittings; testing; bacteria disinfection; concrete work, corporation stops; masonry blocking, and disposal of excess material; cleanup work incidental to valve installation not specifically included for payment under other unit prices. Valve installation shall be a component of the unit price cost for INSERTION VALVES, 12" installation. Number of valves measured shall be equal to actual number of valves installed.

Materials
Insertion valves shall be of type approved by the Village of Algonquin and shop drawings shall be submitted to Village for review and approval prior to work.

Method of Measurement
This work will be measured for payment in place as EACH for INSERTION VALVES, 12"

Basis of Payment
This work will be paid for as EACH for INSERTION VALVES, 12"

CAP EXISTING WATERMAIN

Description
Work includes materials, equipment and labor, excavation, hauling, and disposal of excess material, cutting and removal of portions of existing water main required in areas indicated in the plans to facilitate a water tight existing main before the proposed water main is approved. In each case this involves installing a plug of like size to the main which is being abandoned or existing main returned to service. In all cases a plug will be required with restrained joints and thrust blocking which shall be included with this pay item. Valve closures (by the Village) are all included in this pay item.

Method of Measurement
This work will be measured for payment in place as EACH for CAP EXISTING WATERMAIN

Basis of Payment
This work will be paid for as EACH for CAP EXISTING WATERMAIN

DUCTILE IRON WATER MAIN [SIZE SPECIFIED]

Description
Work includes furnishing and installing DUCTILE IRON WATER MAIN [SIZE SPECIFIED] as shown on the plans. Cutting of water main to facilitate construction shall be considered included in the unit price per foot of water main. Trench backfill under pavement areas and when watermain is within 2.0 feet of pavement areas, shall be included in the cost of this item. In areas where the water main is in non-paved areas, backfilling the trench with native materials is included in the cost of this pay item. Water main shall follow lines and grades per the plan. Testing shall be performed according to the requirements set forth in these specifications, Village of Algonquin general notes and as directed by the Engineer. Included in the unit price shall be testing, fittings, tees, mechanical restraining joints, mechanical joint accessories consisting of, but not limited to, gaskets, glands, retainer glands and bolts and all vertical and horizontal bends shall be included in the unit price of DUCTILE IRON WATER MAIN [SIZE SPECIFIED]

Materials
The pipe shall be Class 52 Cement-Lined Ductile Iron Water Main, pressure class 200 in conformance of ANSI/AWWA standards. All pipe furnished shall be in 18 and 20 foot nominal lengths. Cement mortar lining shall conform with the latest revision of ANSI/AWWA standards. All pipe fittings shall be mechanical joint class 350 compact fittings in accordance to ANSI/AWWA. Fittings shall be cement lined in accordance to accordance to ANSI/AWWA. Fittings shall have distinctly cast on them pressure ratings, nominal diameters of openings and the number of degrees or fraction of the circle on the bends. Ductile Iron fittings shall have the letters “DI” or “Ductile” cast on them. Cast letters and figures shall be on the outside body of the fitting set forth in the latest revision of ANSI/AWWA specifications. All jointing materials shall be as furnished by manufacturer of pipe and fittings and as specified above. All jointing materials shall be in accordance with ANSI/AWWA. Bedding, haunching and initial backfill to a height of one foot above the pipe, excavation, hauling, and disposal of excess material is included in the cost of this item.

Method of Measurement
This work will be measured for payment in place per FOOT for DUCTILE IRON WATER MAIN [SIZE SPECIFIED].

Basis of Payment
This work will be paid for per FOOT for DUCTILE IRON WATER MAIN [SIZE SPECIFIED].

CONNECTION TO EXISTING WATERMAIN [SIZE SPECIFIED]

Description
Unit price per each for connection to existing water mains shall include full compensation for labor, materials and equipment for locating, tapping, pipe cutting, plug removal, fittings, sleeves, temporary plugs, plugging and capping of water main to be abandoned, temporary flushing and sampling vents, excavation, concrete pedestals, hauling and

disposal of excess materials, sheeting, bedding, backfill, trench backfill, compaction, dewatering, temporary restoration of roadways, cleanup and all work incidental to connection to existing mains. Existing water mains will be shut down for the connection process with 24 hour notice provided by contractor to affected residents and or commercial businesses by notice provided by Engineer. Shut downs will be one day between the hours of 9am-2pm. See plan for connection detail.

Method of Measurement
This work will be measured for payment in place as EACH for CONNECTION TO EXISTING WATERMAIN [SIZE SPECIFIED]

Basis of Payment
This work will be paid for as EACH for CONNECTION TO EXISTING WATERMAIN [SIZE SPECIFIED]

VALVE VAULTS TO BE REMOVED

Description
This work shall consist of the removal of existing valve vaults, frames and lids at the locations shown on the plans and as directed by the Engineer and in accordance with the Standard Specifications for Water and Sewer Construction in Illinois, current edition. The valve and vault shall be removed and disposed of offsite. All work shall conform to Section 605 with the addition that the existing water main shall be cut on both sides of the valve vault to facilitate removal of entire structure. Existing pipe ends shall be grouted if not removed as part of plan. Existing frame and lids shall be stockpiled onsite for pickup by the Village of Algonquin and cost shall be considered incidental to this item.

Method of Measurement
This work will be measured for payment in place as EACH for VALVE VAULTS TO BE REMOVED.

Basis of Payment
This work will be paid for as EACH for VALVE VAULTS TO BE REMOVED.

WATER MAIN TESTING

Contractor shall submit a testing schedule and procedure to Engineer for review three days prior to initiating testing program. Submittal shall include type of equipment and location of its connection to new system. Testing shall be included in the bid items and shall be considered included in the cost of performing the work.

a) Testing shall be in accordance with ANSI/AWWA C600-93, and shall also comply with Village of Algonquin requirements specified in the Water Main General Notes in the plans and IEPA rules and regulations.

TESTS REQUIRED

1. All new water main work shall be tested for pressure and leakage.
2. Contractor shall notify Engineer and Utility Owner 48 hours prior to initiation of testing.
3. Contractor shall not perform any testing without Engineer and Utility Owner present.
4. New water main shall not be connected to an existing main until after safe water samples have been obtained from new water main system addition.
5. Where a new main is to be connected to an existing main, the following method shall be used prior to performance of a pressure/leakage test of new main.
    a. New main may be connected to existing water main with a valved connection. Said connection valve shall be shut tight and locked by Utility Owner to prevent a completed connection between existing and new sections of water main. Upon completion, new main shall be filled and disinfected. Upon receipt of safe water samples, new main shall be pressure and leakage tested.

PRESSURE TESTING

1. After pipe has been laid, all newly laid pipe or any valved section thereof shall be subjected to a hydrostatic pressure of at least 1.5 times working pressure at point of testing.
2. Tests pressures for DIP and PVC pipes shall:
    a. Pipe shall be pressurized to be not less than 1.25 times working pressure at highest point along test section.
    b. Not exceed pipe or thrust restraint design pressures.
    c. Be of at least 2 hour duration.
    d. Not vary by more than plus or minus 5 psi for duration of test.
    e. Not exceed twice rated pressure of valves or hydrants when pressure boundary of test section includes closed gate valves or hydrants.
    f. Not exceed rated pressure of valves when pressure boundary of test section included closed, resilient seated gate valves or butterfly valves.
3. Each valved section of pipe shall be filled with water slowly and specified test pressure, based on elevation of lowest point of line or section under test and corrected to elevation of test gage, shall be applied by means of a pump connected to pipe acceptable to Engineer.
4. Valves shall not be operated in either opening or closing direction at differential pressures above rated pressure.
5. Before applying specified test pressure, air shall be expelled completely from section of pipe under test.
6. If permanent air vents are not located at all high points, Contractor shall install corporation cocks at such points so that air can be expelled as line is filled with water.
7. After all air has been expelled, corporation cocks shall be closed and test pressure applied. At conclusion of pressure test, corporation cocks shall be removed and plugged or left in place at discretion of Utility.

8. All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during test.
9. Any damage or defective pipe, fittings, valves, or hydrants that are discovered following pressure test shall be repaired or replaced with sound material, and test shall be repeated until it is satisfactory to Owner.
10. Per Village of Algonquin, all water mains shall be subjected to a pressure test and a separate leakage test at system pressure for 24 hours by the Contractor. Hydrostatic pressure test and leakage shall be based on 125 psi for two (2) hours.

Water mains shall be chlorinated in accordance with the Standard Specifications.

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

Effective: August 1, 2012 Revised: February 1, 2014

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

It is the policy of IDOT to fund IDOT pre-apprenticeship training programs throughout Illinois to provide training and skill-improvement opportunities to assure the increased participation of minority groups, disadvantaged persons and women in all phases of the highway construction industry. The intent of this IDOT Training Program Graduate (TPG) Special Provision is to place certified graduates of these IDOT funded pre-apprentice training programs on IDOT project sites when feasible, and provide the graduates with meaningful on-the-job training intended to lead to journey-level employment. IDOT and its sub-recipients, in carrying out the responsibilities of a state contract, shall determine which construction contracts shall include "Training Program Graduate Special Provisions." To benefit from the incentives to encourage the participation in the additional on-the-job training under this Training Program Graduate Special Provision, the Contractor shall make every reasonable effort to employ certified graduates of IDOT funded Pre-apprenticeship Training Programs to the extent such persons are available within a reasonable recruitment area.

Participation pursuant to IDOT's requirements by the Contractor or subcontractor in this Training Program Graduate (TPG) Special Provision entitles the Contractor or subcontractor to be reimbursed at $15.00 per hour for training given a certified TPG on this contract. As approved by the Department, reimbursement will be made for training persons as specified herein. This reimbursement will be made even though the Contractor or subcontractor may receive additional training program funds from other sources for other trainees, provided such other source does not specifically prohibit the Contractor or subcontractor from receiving other reimbursement. For purposes of this Special Provision the Contractor is not relieved of requirements under applicable federal law, the Illinois Prevailing Wage Act, and is not eligible for other training fund reimbursements in addition to the Training Program Graduate (TPG) Special Provision reimbursement.

No payment shall be made to the Contractor if the Contractor or subcontractor fails to provide the required training. It is normally expected that a TPG will begin training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project through completion of the contract, so long as training opportunities exist in his work classification or until he has completed his training program. Should the TPG's employment end in advance of the completion of the contract, the Contractor shall promptly notify the designated IDOT staff member under this Special Provision that the TPG's involvement in the contract has ended and supply a written report of the reason for the end of the involvement, the hours completed by the TPG under the Contract and the number of hours for which the incentive payment provided under this Special Provision will be or has been claimed for the TPG.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting its performance under this Special Provision.

METHOD OF MEASUREMENT: The unit of measurement is in hours.

BASIS OF PAYMENT: This work will be paid for at the contract unit price of $15.00 per hour for certified TRAINEES TRAINING PROGRAM GRADUATE. The estimated total number of hours, unit price and total price have been included in the schedule of prices.

The Contractor shall provide training opportunities aimed at developing full journeyworker in the type of trade or job classification involved. The initial number of TPGs for which the incentive is available under this contract is 6. During the course of performance of the Contract the Contractor may seek approval from the Department for additional incentive eligible TPGs. In the event the Contractor subcontracts a portion of the contract work, it shall determine how many, if any, of the TPGs are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this Special Provision. The Contractor shall also insure that this Training Program Graduate Special Provision is made applicable to such subcontract if the TPGs are to be trained by a subcontractor and that the incentive payment is passed on to each subcontractor.

For the Contractor to meet the obligations for participation in this TPG incentive program under this Special Provision, the Department has contracted with several entities to provide screening, tutoring and pre-training to individuals interested in working in the applicable construction classification and has certified those students who have successfully completed the program and are eligible to be TPGs. A designated IDOT staff member, the Director of the Office of Business and Workforce Diversity (OBWD), will be responsible for providing assistance and referrals to the Contractor for the applicable TPGs. For this contract, the Director of OBWD is designated as the responsible IDOT staff member to provide the assistance and referral services related to the placement for this Special Provision. For purposes of this Contract, contacting the Director of OBWD and interviewing each candidate he/she recommends constitutes reasonable recruitment.

Prior to commencing construction, the Contractor shall submit to the Department for approval the TPGs to be trained in each selected classification. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. No employee shall be employed as a TPG in any classification in which he/she has successfully completed a training course leading to journeyman status or in which he/she has been employed as a journeyman. Notwithstanding the on-the-job training purpose of this TPG Special Provision, some offsite training is permissible as long as the offsite training is an integral part of the work of the contract and does not comprise a significant part of the overall training.

Training and upgrading of TPGs of IDOT pre-apprentice training programs is intended to move said TPGs toward journeyman status and is the primary objective of this Training Program Graduate Special Provision. Accordingly, the Contractor shall make every effort to enroll TPGs by recruitment through the IDOT funded TPG programs to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that it has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance and entitled to the Training Program Graduate Special Provision $15.00 an hour incentive.

The Contractor or subcontractor shall provide each TPG with a certificate showing the type and length of training satisfactorily completed.

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION FOR INSURANCE

Effective: February 1, 2007
Revised: August 1, 2007

All references to Sections or Articles in this specification shall be construed to mean specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

The Contractor shall name the following entities as additional insured under the Contractor's general liability insurance policy in accordance with Article 107.27:

_____

_____

_____

_____

_____

_____

_____

The entities listed above and their officers, employees, and agents shall be indemnified and held harmless in accordance with Article 107.26.

State of Illinois
DEPARTMENT OF TRANSPORTATION
Bureau of Local Roads and Streets

SPECIAL PROVISION FOR PORTLAND CEMENT CONCRETE PAVEMENT (SPECIAL)

Effective May 12, 1964
Revised January 2, 2007

All references to Sections or Articles in this specification shall be construed to mean a specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

All work shall be according to Section 420 and applicable provisions of Section 606 except as follows:

420.01 Description. Revise Article 420.01 to read:

"Description. This work shall consist of a pavement with an integral concrete curb composed of portland cement concrete with or without reinforcement, constructed on a prepared subgrade, or subbase, with or without forms."

420.03 Equipment. The following equipment will not be required:

(c) Mechanical Concrete Spreader
(e) Mechanical Longitudinal Float

Add the following paragraph to this Article:

"The integral concrete curb shall be formed with a moving finishing template or "mule" of a design approved by the Engineer. The template may be either a part of or separate from the pavement finishing machine and shall be designed so as to produce uniform curb of the exact dimensions required by the plans. It shall incorporate a means of consolidation of the concrete in the curb either by hand spreading or other method approved by the Engineer. If separate from the pavement finishing machine, the template shall be so designed as to cause a minimum displacement of the plastic pavement concrete.

The subgrade template shall be of a design approved by the Engineer and shall be capable of accurately indicating high and low spots in the subgrade with relation to the side forms."

420.04 Preparation of Subgrade or Subbase. Revise the third paragraph of Article 301.06 to read:

"The subgrade shall be brought to true shape by means of a subgrade planer, subgrade machine, and/or other methods approved by the Engineer according to the following:"

Add the following subparagraph (c) to Article 301.07:

"(c) Other methods when approved by the Engineer."

420.06 Forms and Form Setting. Add the following paragraph to Article 420.06:

"Forms for the integral concrete curb with a base width less than the height may be used provided they are stable while the finishing equipment is operated upon them and do not settle under the weight of the finishing machine. If additional form height is added to accommodate the curb template after the passage of the pavement finishing equipment, the form arrangement shall meet with the approval of the Engineer.

420.07 Placing. Add the following paragraphs to Article 420.07:

"An integral concrete curb shall be cast monolithically with the pavement. It shall be formed either as a part of, or immediately following, the placing of the concrete pavement or by other methods approved by the Department.

When the curb is formed in a separate operation from the pavement, it shall be placed immediately following the longitudinal floating operation. Curb concrete shall be thoroughly rodded or spaded into the surface of the pavement concrete while the latter is still in a completely plastic state."

420.05 Joints. Add the following to subparagraph (a) and (b) of Article 420.05:

"Longitudinal construction joints conforming to the details shown on the plans will be permitted at any longitudinal joint location."

Add the following paragraph to subparagraph (c)(2) of this Article:

"The requirement for load transfer assemblies will be as shown on the plans."

Revise subparagraph (e) of this Article to read:

"Transverse Construction Joints. Transverse construction joints shall be constructed in accordance with the details shown on the plans. Transverse construction joints that occur at regular construction joints shall be keyed but not tied, and the thickness of the pavement for a distance of 600 mm (2 feet) in each direction from the joint shall be not less than 200 mm (8 inch). Joints that the contractor makes within the limits of a contraction panel shall be tied with deformed tiebars."

Add the following subparagraph (f) to this Article:

"Integral Concrete Curb Contraction Joint. Contraction joints shall be constructed in the curb in prolongation of the joints in the pavement and shall be constructed in accordance with the plans or as directed by the Engineer."

420.09 Strike Off, Consolidation, and Finishing, Longitudinal Floating, Straitedging, Edging, and Final Finish.

Revise the first sentence of subparagraph (b)(3) of this Article to read:

"This method may be used when approved by the Engineer."

420.19 Method of Measurement. Revise the first paragraph of subparagraph (b) of Article 420.19 to read:

"Portland cement concrete pavement (special) will be measured in place and the area computed in square meters (square yards) completed and accepted. The width for measurement shall be the width from the outsides of the completed pavement, including integral curb when required, as shown on the plans or as directed by the Engineer."

420.20 Basis of Payment. Revise the first paragraph of Article 420.23 to read:

"This work will be paid for at the contract unit prices per square meter (square yard) for PORTLAND CEMENT CONCRETE PAVEMENT (SPECIAL), PORTLAND CEMENT CONCRETE PAVEMENT (SPECIAL) WITH INTEGRAL CURB, HIGH EARLY STRENGTH PORTLAND CEMENT CONCRETE PAVEMENT (SPECIAL), HIGH EARLY STRENGTH PORTLAND CEMENT CONCRETE PAVEMENT (SPECIAL), WITH INTEGRAL CURB of the thickness specified; and at the contract unit price per square meter (square yard) for PAVEMENT FABRIC."

Article 1103.13 Finishing Machine. Revise Article 1103.13 to read:

"The finishing machine shall be of a type approved by the Engineer, shall be self-propelled and shall be capable of striking off, consolidating and finishing concrete of the consistency required by the specifications to the proper crown and grade."

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Illinois Department of Transportation

Storm Water Pollution Prevention Plan

Route	Marked Route	Section
FAP 336	Randall Road	06-00329-01-PW
Project Number	**County**	**Contract Number**
PW2V(306)	McHenry	61E53

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issues by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name	Title	Agency
Benjamin Redding	Design Manager	McHenry County DOT

Signature: Ben Redding

Date: 2018.01.16

I. Site Description

A. Provide a description of the project location (include latitude and longitude):

This project begins at a point on the centerline of Randall Road, approximately 10 feet north of Harnish Drive, at Station 2139+35.00 and extends in a northerly direction for a distance of 8,915.00 feet (1.69 miles) to Station 2228+50, approximately 1,500 feet north of Polaris Drive/Acorn Lane. Additionally, the project begins on the centerline of Algonquin Road, approximately 10' east of Harvest Gate/Talaga Drive at Station 1331+00.00 and extends in a easterly direction for a distance of 4,278.00 feet (0.81 miles) to Station 1373+78.00, approximately 1,118 feet east of Crystal Lake Avenue. The project is within the Villages of Lake in the Hills and Algonquin in McHenry County. The total project gross and net length is 13,193.00 feet (2.50 miles). (Latitude 42 deg 10 min 32.5 sec Longitude -88 deg 20 min 7.1 sec)

B. Provide a description of the construction activity which is subject of this plan:

Construction includes the widening and reconstruction of Randall Road from a 4-lane section to a 6-8 lane section divided by a median. The improvements include widening and reconstruction of Algonquin Road, Bunker Hill Drive/Huntington Drive, Polaris Drive/Acorn Lane, Crystal Lake Road, Commercial Drive (Costco), and Commercial Drive (Life Storage). The improvements will use a combination of enclosed drainage with curb and gutter and open swale drainage systems. Stormwater detention is provided in compliance with McHenry County requirements. Water quality runoff volume retention is also provided in compliance with McHenry County requirements. Temporary and permanent soil erosion and sediment control are provided for all phases of construction. There are four (4) anticipated construction stages which includes a prestage.

C. Provide the estimated duration of this project:

Estimated duration of this project is three years (36 months)

D. The total area of the construction site is estimated to be 71 acres.

The total area of the site estimated to be disturbed by excavation, grading or other activities is 66 acres.

E. The following is a weighted average of the runoff coefficient for this project after construction activities are completed:

Existing C: 0.75, Proposed C: 0.80

F. List all soils found within project boundaries. Include map unit name, slope information and erosivity:

67A - Harpster silty clay loam, 0 to 2 percent slopes, 0.24
87A - Dickinson sandy loam, 0 to 2 percent slopes, 0.17
87B - Dickinson sandy loam, 2 to 5 percent slopes, 0.20
87B2 - Dickinson sandy loam, 2 to 5 percent slopes, eroded, 0.20
103A - Houghton muck, 0 to 2 percent slopes, (no K)
146A - Elliot silt loam, 0 to 2 percent slopes, 0.32
146B - Elliot silt loam, 2 to 4 percent slopes, 0.32
149A - Brenton silt loam, 0 to 2 percent slopes, 0.32
153A - Pella silty clay loam, 0 to 2 percent slopes, 0.28
172A - Hoopeston sandy loam, 0 to 2 percent slopes, 0.10
223B - Varna silt loam, 2 to 4 percent slopes, 0.32
223C2 - Varna silt loam, 4 to 6 percent slopes, eroded, 0.32
223D2 - Varna silt loan, 6 to 12 percent slopes, eroded, 0.32
232A - Ashkum silty clay loam, 0 to 2 percent slopes, 0.20
290B - Warsaw loam, 2 to 4 percent slopes, 0.28
318C2 - Lorenzo loam, 4 to 6 percent slopes, eroded, 0.28
318D2 - Lorenzo loam, 6 to 12 percent slopes, eroded, 0.28
330A - Peotone silty clay loam, 0 to 2 percent slopes, 0.24
343A - Kane silt loam, 0 to 2 percent slopes, 0.24
369B - Waupecan silt loam, 2 to 4 percent slopes, 0.37
488A - Hooppole loam, 0 to 2 percent slopes, 0.20
526A - Grundelein silt loam, 0 to 2 percent slopes, 0.37
527B - Kidami silt loam, 2 to 4 percent slopes, 0.43
527C - Kidami silt loam, 4 to 6 percent slopes, 0.43
527C2 - Kidami loam, 4 to 6 percent slopes, eroded, 0.37
527D2 - Kidami loam, 6 to 12 percent slopes, eroded, 0.37
528A - Lahoguess loam, 0 to 2 percent slopes, 0.28
530E - Ozaukee silt loam, 12 to 20 percent slopes, 0.43
618F - Senachwine silt loam, 20 to 30 percent slopes, 0.32
626A - Kish loam, 0 to 2 percent slopes, 0.24
969F - Casco-Rodman complex, 20 to 30 percent slopes, 0.32
8082A - Millington silt loam, 0 to 2 percent slopes, occasionally flooded, 0.28

G. Provide an aerial extent of wetland acreage at the site:

Wetlands are depicted on the project plans. Aerial attached at end of this document.

Wetlands Site 1: Total Wetlands = 8.96 acres; Impacted Area = 0.49 acres
Wetlands Site 2: Total Wetlands = 25.07 acres; Impacted Area = 0.82 acres
Wetlands Site 4: Total Wetlands = 0.29 acres; Impacted Area = 0.00 acres (no impact)
Wetlands Site 5: Total Wetlands = 0.43 acres; Impacted Area = 0.27 acres
Wetlands Site 17: Total Wetlands = 0.77 acres; Impacted Area = 0.04 acres

H. Provide a description of potentially erosive areas associated with this project:

Potentially erosive soils are present at Ratt Creek and at Woods Creek due to significant flows through the wetlands and floodplain

I. The following is a description of soil disturbing activities by stages, their locations, and their erosive factors (e.g. steepness of slopes, length of scopes, etc.):

1) Installation of construction fencing, sediment control, silt fence and vegetation

2) Clearing of the project site as shown in the staging plan

3) Grading of detention ponds; this work is to be completed concurrently with the construction of sump pits, sediment basins, and temporary aggregate berms

4) Storm sewer installation

5) Roadway construction

6) Topsoil spreading with temporary or permanent soil stabilization measures and the construction of permanent soil erosion and sediment control measures

7) Removal of temporary soil erosion and sediment control measures

J. See the erosion control plans and/or drainage plans for this contract for information regarding drainage patterns, approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent off site sediment tracking (to be added after contractor identifies locations), areas of soil disturbance, the location of major structural and non-structural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands) and locations where storm water is discharged to surface water including wetlands.

K. Identify who owns the drainage system (municipality or agency) this project will drain into:

McHenry County Division of Transportation
Village of Lake in the Hills
Village of Algonquin

L. The following is a list of General NPDES ILR40 permittees within whose reporting jurisdiction this project is located.

McHenry County Division of Transportation
Village of Lake in the Hills
Village of Algonquin

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:

Ratt Creek
Wood's Creek

The receiving waters are not listed as biologically significant streams by the IDNR.

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.

All areas outside of the grading limits of the proposed roadway, and all areas outside of the proposed ROW, shall be protected and remain undisturbed.

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):

Woods Creek

a. The name(s) of the listed water body, and identification of all pollutants causing impairment:

Woods Creek - Mercury, Phosphorus

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:

Perimeter erosion barrier, erosion control blanket, inlet filters, inlet & pipe protection, temporary ditch checks, and riprap will be installed. Water quality basins are also proposed for the cleaning of the 2-year storm event. These varieties of SESC measures and BMPs in combination will prevent pollutant discharge in the 25yr-24hr storm event.

c. Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:

At approximate station 2220+80 (RT) a proposed pond will discharge through a restricted release manhole into a large wetland area (Wetland Site 2) which is tributary to Woods Creek

d. Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

Water naturally discharges to this water body. In this particular location, a detention basin is being constructed for roadway and tributary area stormwater runoff. Water will discharge at a restricted release back into the waterway in the final condition. A water quality/sediment storage volume of 1.23 acres is being provided below the NWL of the basin for sediment and pollutants to filter out below the discharge elevation. During construction, dewatering will consist of the use of silt bags for bypass pumping any groundwater.

2. TMDL (fill out this section if checked above)

a. The name(s) of the listed water body:

Woods Creek

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:

A water quality/sediment storage volume of 1.23 acres is being provided below the NWL of the basin for sediment and pollutants to filter out below the discharge elevation.

c. If a specific numeric waste load allocation has been established that would apply to the project's discharges, provide a description of the necessary steps to meet the allocation:

TBD

P. The following pollutants of concern will be associated with this construction project:

- ☒ Soil Sediment
- ☒ Concrete
- ☒ Concrete Truck waste
- ☒ Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids)
- ☒ Antifreeze / Coolants
- ☒ Waste water from cleaning construction equipment

- [x] 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:

- [x] Preservation of Mature Vegetation
- [x] Erosion Control Blanket / Mulching
- [ ] Vegetated Buffer Strips
- [x] Sodding
- [x] Protection of Trees
- [x] Geotextiles
- [x] Temporary Erosion Control Seeding
- [x] Other (specify) DUST CONTROL WATERING
- [ ] Temporary Turf (Seeding, Class 7)
- [x] Other (specify) RIPRAP
- [x] Temporary Mulching
- [x] Other (specify) INLET FILTERS/PIPE PROTECTION
- [x] Permanent Seeding
- [ ] Other (specify) _____

Describe how the stabilization practices listed above will be utilized during construction:

Stabilization controls runoff volume and velocity, peak runoff rates, and volumes of discharge to minimize exposed soil, disturbed slopes, sediment discharges from construction, and provides for natural buffers and minimization of soil compaction. Existing vegetated areas where disturbance can be avoided will not require stabilization. Where possible, stabilization of initial Stage should be completed before work is moved to subsequent stages.

1) Protection of Trees/Temporary Fence: All trees designated to be saved, or outside the limits of construction, shall be protected prior to beginning any clearing or removal work and shall remain protected during subsequent construction work. Protection of trees shall be as shown on the plans or directed by the Engineer and in accordance with Article 201.05 of the Illinois Department of Transportation's Standard Specifications for Road and Bridge, latest edition.

2) Temporary Seed: This item will be applied to all bare areas to minimize the amount of exposed surface areas and shall be applied as needed for stabilization. Temporary seed shall be placed in areas as shown on the plans, areas disturbed during the removal of Soil and Erosion measures, or directed by the Engineer and in accordance with the Illinois Department of Transportation's Standard Specifications for Road and Bridge, latest edition. Temporary seed is primarily a ryegrass/oats mixture.

3) Permanent Seeding: This item will be utilized in small areas where sodding has failed as an interim remedy until sod can be replaced or as designated in rural areas where sod is not a prudent alternative, All disturbed areas, identified to receive seeding, will be stabilized via seeding immediately following final grading.

4) Erosion Control Blanket: This item will be used within 24 hours after seeding operations have been completed, in ditches/swales and sloped areas that require protection from erosion. Erosion control blankets shall be installed over fill slopes, high velocity areas and slopes steeper that 3:1that have been brought to final grade. Erosion Control Blanket will be installed in accordance to IDOT Specification 251.04.

5) Dust Control Watering - This item will be provided for areas exposed during the mass grading/ excavation to control the discharge of sediment through wind erosion during dry periods of construction, areas that are exposed during excavation shall receive dust control watering to minimize dust.

6) Geotextiles - In locations where ditching is present, urethane foam/geotextile ditch checks will be used as a means of trapping sediment. Flow will pass over the top of a dike section and loose sediment trapped in the geotextile.

7) Riprap - Riprap will be used to provide energy dissipation at upstream and downstream ends of open-ended flared-end structures and/or other downstream discharge structures.

8) Inlet Filters/Inlet & Pipe Protection - These items will be provided to prevent sediment from entering the storm sewer system while construction operations are occuring. These will be cleaned regularly to prevent excess buildup.

9) Sodding - Sodding will be utilized in ditch bottoms with steeper slopes as seed will simply wash away during rainfall events.

Describe how the stabilization practices listed above will be utilized after construction activities have been completed:

The erosion control practices listed above shall be removed upon final stabilization or incorporated into the final stabilization of the site.

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 stabilization 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) CULVERT INLET PROTECTION
☒ Permanent Check Dams	☒ Other (specify) STABILIZED FLOW LINE
☐ Permanent Sediment Basin	☒ Other (specify) IN-WETLAND WORK PLAN
☐ Aggregate Ditch	☐ Other (specify)
☐ Paved Ditch	☐ Other (specify)

Describe how the structural practices listed above will be utilized during construction:

1) Perimeter Erosion Barrier: This item will be used to demarcate the perimeter of the project location and for the prevention of silt/sediment from leaving the site. Perimeter erosion barrier will be modified as necessary to accommodate the construction and repaired/replaced as necessary. Silt fence/perimeter erosion barrier should only be used in areas where the work area is higher than the perimeter. The use of silt fence at the top of slope/elevations higher than the work area should always be avoided. If necessary, temporary fence should be utilized in locations (where the top of slope/elevation is higher than the work area in lieu of silt fence.

2) Temporary Ditch Checks - These items will be used throughout the project limits as shown on the plans to reduce the runoff velocity and to trap silt before drains outside the project limit.

3) Storm Drain Inlet Protection: This item will be utilized at all manholes, catch basins and inlets with open grates. Inlet filters will be installedunder the grate of the drainage structure resting on the lip of the frame. Inlet filters will be checked on a regular basis and any sediment/debris will be removed to maintain inlet protection. Pipe protection will be implemented at outfalls.

4) Stabilized Construction Exists - Stabilized Construction Exists shall be used at the locations indicated on the plans for all construction traffic entering or exiting the construction site, Stabilized Construction Exits shall be continuously maintained during construction operations.

5) Rock Check Dams - This item will be provided for the proposed swales in areas with step slopes. Rock check dams will be placed at regular intervals as shown on the plans during construction and will be cleaned on a regular basis.

6) Stone Riprap: Stone Riprap of size and class as indicated on the plans will be placed to prevent erosion and scouring at the flared end sections at the upstream and downstream of storm sewer and culvert systems as shown on the plans and maintained as directed by the engineer.

8) Retaining Walls - Retaining Walls shall be used as indicated on the plans to limit the areas of excavation. Please refer to the structural drawings for detail and the plans for general layout of retaining walls

9) Culvert Inlet Protection - This item will be provided at locations where surface water is intercepted by a storm sewer culvert as indicated on the plans, this item will consist of stone placed in front of the culvert to prevent the discharge of transported sediment.

10) Stabilized Flow Line - The Contractor shall provide to the Resident Engineer a plan to ensure that the stabilized flow line between installed storm sewer open disturbance will reduce the potential for offsite discharge of sediment bearing waters, particularly when rain is forecast so that flow will not erode. Lack of an approved plan or failure to comply will result in an ESC Deficiency Deduction.

All work associated with work within wetland shall be included in the cost of contract pay items which reflect the work being performed (i.e. Earth Excavation, Removal and Disposal of Unsuitable Materials, Temporary/Permanent stabilization measures, etc.).

Straw bales and silt fence per Highway Standard 280001 shall not be used as inlet and pipe protection.

Describe how the structural practices listed above will be utilized after construction activities have been completed:

Temporary structural features including perimeter erosion barrier, temporary ditch checks, storm drain inlet protection, culvert inlet protection, and stabilized construction exits shall be removed upon completion of construction and final grade stabilization. Permanent structural features including rock check dams, stone riprap, and retaining walls shall be maintained throughout construction and shall become permanent features of the proposed improvements.

D. **Treatment Chemicals**

Will polymer flocculents or treatment chemicals be utilized on this project: ☒ Yes ☐ No

If yes above, identify where and how polymer flocculents or treatment chemicals will be utilized on this project.

Polymer flocculants may be used in conjunction with dewatering operations. At the discretion of the contractor and the direction of the engineer, polymer flocculants may be used to remove suspended solids from water pumped from excavations as required by construction operations. All pumping/ dewatering shall follow the dewatering plan. All treated material resulting from the use of polymer flocculants shall be removed by the contractor.

E. **Permanent Storm Water Management Controls:** Provided below is a description of measures that will be installed during the construction process to control volume and pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water act.

1. Such practices may include but are not limited to: storm water detention structures (including wet ponds), storm water retention structures, flow attenuation by use of open vegetated swales and natural depressions, infiltration of runoff on site, and sequential systems (which combine several practices).

   The practices selected for implementation were determined on the basis of the technical guidance in Chapter 41 (Construction Site Storm Water Pollution Control) of the IDOT Bureau of Design & Environment Manual. If practices other than those discussed in Chapter 41 are selected for implementation or if practices are applied to situations different from those covered in Chapter 41, the technical basis for such decisions will be explained below.
2. Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g. maintenance of hydrologic conditions such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

Description of permanent storm water management controls:

Stormwater management facilities are provided throughout the proposed improvements as required by the McHenry County Stormwater Ordinance. Compensatory storage basins have been designed in compliance with the McHenry County Stormwater Ordinance and provide both stormwater detention storage and water quality runoff volume retention. Outlet protection in the form of riprap is proposed at storm sewers outletting to bodies of water or channels.

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:

The management practices, controls, and other provisions contained in this plan are at least as protective as the requirements contained in the Illinois Environmental Protection Agency's Illinois Urban Manual Standards and Specifications which was used as a guide in designing the erosion and sediment control features. Procedures and requirements specified in applicable soil erosion and sediment control plans or storm water management plans approved by local officials shall be described or incorporated by reference below. Requirements specified in soil erosion and sediment control plans, site permits, storm water management site plans, or site permits approved by county, state, or local officials that are applicable to protecting surface water resources are, upon submittal of a Notice of Intent (NOI), incorporated and enforceable under this permit even if they are not specifically included in the plan.

The soil erosion and sediment control for this site must meet the requirements of the following agencies:

McHenry-Lake County Soil and Water Conservation District
McHenry County Division of Transportation
Village of Lake in the Hills
Village of Algonquin
Illinois Department of Transportation
Illinois Environmental Protection Agency
U.S. Army Corps of Engineers

G. **Contractor Required Submittals:** Prior to conducting any professional services at the site covered by this plan, the Contractor and each subcontractor responsible for compliance with the permit shall submit to the Resident Engineer a Contractor Certification Statement, BDE 2342a.

1. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:
    - Approximate duration of the project, including each stage of the project
    - Rainy season, dry season, and winter shutdown dates
    - Temporary stabilization measures to be employed by contract phases
    - Mobilization time frame
    - Mass clearing and grubbing/roadside clearing dates
    - Deployment of Erosion Control Practices
    - Deployment of Sediment Control Practices (including stabilized 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
    - Time frame 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 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 Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

The following is a description of procedures that will be used to maintain, in good and effective operating conditions, vegetation, soil erosion and sediment control measures, and other protective measures identified in this plan and standard specifications:

The contractor will identify an Erosion Control Representative for the project. His duties will be to supervise the maintenance of the soil erosion and sediment control measures and implementation of this plan.

The following shall be the minimum maintenance required:

A. Vegetative soil erosion measures - the vegetative growth of permanent seeding, vegetative filters, etc, shall be maintained periodically and supplied adequate watering and fertilizer. The vegetative cover shall be removed and reseeded as necessary.
B. Aggregate ditch checks / Rock Check Dams shall be cleaned of sediment when the sediment has reached a depth of 50% of the height of the aggregate berm.
C. Sediment control, silt fence will be examined regularly and repaired as necessary. Sediment shall be removed when it reaches a height equal to 50% of the height of the barrier.
D. Temporary seeding for erosion control will be reapplied when bare stops and washout occur.
E. Stabilized construction entrances shall have sediment build up removed as necessary.
F. Inlet filters shall be cleaned on a regular basis.
G. Temporary and permanent erosion control measures shall be inspected weekly or after any rainfall event in excess of 0.50”.

IDOT SESC Field Guide for Construction Inspection and BMP Maintenance Guide can be found at www.idot.illinois.gov/transportation-system/environment/erosion-and-sediment-control

IV. Inspections

Qualified personnel shall inspect disturbed areas of the construction site which have not yet been finally stabilized, structural control measures, and locations where vehicles and equipment enter and exit the site using IDOT Storm Water Pollution Prevention Plan Erosion Control Inspection Report (BC 2259). Such inspections shall be conducted at least once every seven (7) calendar days and within twenty-four (24) hours of the end of a storm or by the end of the following business or work day that is 0.5 inch or greater or equivalent snowfall.

Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities are conducted, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.

If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer shall notify the appropriate IEPA Field Operations Section office by e-mail at: 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:

The contractor will designate an Erosion Control Representative for the project. His duties will be to supervise the maintenance of the soil erosion & sediment control measures and implementation of this plan. The engineer will be responsible for conducting soil erosion and sediment control inspections. The contractor's SESCM shall be notified when the inspections are to take place and is expected to be present during the inspections. A maintenance inspection report will be completed after each inspection. A copy of the report is to be completed by the inspector and stored on-site with a copy given to the contractor. The inspection shall include all disturbed areas of the construction site which have not been finally stabilized, the structural control measures, locations where vehicles enter or exit the site and all major outfalls. Such inspection shall be conducted at least once every seven calendar days and within 24 hours of the end of a rain storm (or equivalent snowfall) that is 0.5 inches or greater. Depth of rain fall will be determined by an on-site rain gauge. The engineer shall read the rain gauge daily and after each rain storm.

A. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system and waterways. Soil erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly. If repair is necessary, it will be initiated within 24 hours of the completion of the inspection report. Where discharge locations or points are accessible, they shall be inspected to ascertain whether the measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site tracking.
B. Based on the results of the inspection, the description of potential pollutant sources and pollution prevention measures shall be evaluated. The storm water pollution prevention plan shall be revised as appropriate as soon as practicable after such inspection. Any changes to this plan resulting from the required inspection shall be implemented within seven calendar days following the inspection.
C. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of this Stormwater Pollution Prevention Plan, and action taken and retained as part of the plan for at least three years after the date of inspection. The report shall be signed in accordance with the general permit.
D. If any violations of the provisions of this plan are identified during the conduct of the construction work covered by this plan, the engineer shall complete and file an "incidence of noncompliance” (ion) report for the identified violation.

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 Contractors/subcontractor completing this form.

Route	Marked Route	Section
FAP 336	Randall Road	06-00329-01-PW
Project Number	**County**	**Contract Number**
PW2V(306)	McHenry County	61E53

This certification statement is a part of SWPPP for the project described above, in accordance with the General NPDES Permit No. ILR10 issued by the Illinois Environmental Protection Agency.

I certify under penalty of law that I understand the terms of the Permit No. ILR10 that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

In addition, I have read and understand all of the information and requirements stated in SWPPP for the above mentioned project; I have received copies of all appropriate maintenance procedures; and, I have provided all documentation required to be in compliance with the Permit ILR10 and SWPPP and will provide timely updates to these documents as necessary.

☐ Contractor

☐ Sub-Contractor

Print Name	Signature
Title	**Date**
Name of Firm	**Telephone**
Street Address	**City/State/Zip**

Items which the Contractor/subcontractor will be responsible for as required in Section II.G. of SWPPP:

IEPA NOTICE OF INTENT (NOI)

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

Division of Water Pollution Control
Notice of Intent (NOI) for General Permit
to Discharge Storm Water Associated with Construction Site Activities

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at the above address.

For Office Use Only

Permit No. ILR10 _____

OWNER INFORMATION

Company/Owner Name: McHenry County Division of Transportation

Mailing Address: 16111 Nelson Road Phone: 815-334-4980

City: Woodstock State: IL Zip: 60098 Fax: 815-334-4989

Contact Person: Ben Redding E-mail: baredding@co.mchenry.il.us

Owner Type (select one) County

MS4 Community: ◯ Yes ◯ No

CONTRACTOR INFORMATION

Contractor Name:

Mailing Address: Phone:

City: State: Zip: Fax:

CONSTRUCTION SITE INFORMATION

Select One: ◉ New ◯ Change of information for: ILR10 _____

Project Name: Randall Road Reconstruction County: McHenry

Street Address: Harnish Dr. to Acorn Lane City: Algonquin IL Zip: 60102

Latitude: 42 (Deg) 10 (Min) 32.5 (Sec) Longitude: -88 (Deg) 20 (Min) 7.1 (Sec) _____ Section T43N Township **R8E** Range

Approximate Construction Start Date June 1, 2018 Approximate Construction End Date June 30, 2021

Total size of construction site in acres: 66

If less than 1 acre, is the site part of a larger common plan of development?

◯ Yes ◯ No

Fee Schedule for Construction Sites:
Less than 5 acres - $250
5 or more acres - $750

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Has the SWPPP been submitted to the Agency? ☑ Yes ◯ No

(Submit SWPPP electronically to: epa.constilr10swppp@illinois.gov)

Location of SWPPP for viewing: Address: 16111 Nelson Rd, Woodstock, IL 60098 City: Woodstock

SWPPP contact information:

Contact Name: Kevin Kenniff

Inspector qualifications: P.E.

Phone: 630-438-6400 Fax: 630-438-6444 E-mail: Kkenniff@bollingerlach.com

Project inspector, if different from above

Inspector's Name:

Inspector qualifications:

Phone: Fax: E-mail:

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed $50,000 for the violation and an additional civil penalty of not to exceed $10,000 for each day during which the violation continues (415 ILCS 5/42) and may also prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

TYPE OF CONSTRUCTION (select one)

Construction Type Reconstruction

SIC Code: _____

Type a detailed description of the project:

Construction includes the widening and reconstruction of Randall Road from a 4-lane section to a 6-8 lane section divided by a median. The improvements include widening and reconstruction of Algonquin Road, Bunker Hill Drive/ Huntington Drive, Polaris Drive/Acorn Lane, Crystal Lake Road, Commercial Drive (Costco), and Commercial Drive (Life Storage). The improvements will use a combination of enclosed drainage with curb and gutter and open swale drainage systems. Stormwater detention is provided in compliance with McHenry County requirements. Water quality runoff volume retention is also provided in compliance with McHenry County requirements.

HISTORIC PRESERVATION AND ENDANGERED SPECIES COMPLIANCE

Has the project been submitted to the following state agencies to satisfy applicable requirements for compliance with Illinois law on:

Historic Preservation Agency	☑ Yes	○ No
Endangered Species	☑ Yes	○ No

RECEIVING WATER INFORMATION

Does your storm water discharge directly to: ☐ Waters of the State or ☑ Storm Sewer

Owner of storm sewer system: McHenry County, Villages of Algonquin, and Lake in the Hills

Name of closest receiving water body to which you discharge: Rat Creek, Woods Creek

Mail completed form to: Illinois Environmental Protection Agency
Division of Water Pollution Control
Attn: Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610
FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this 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. In addition, I certify that the provisions of the permit, including the development and implementation of a storm water pollution prevention plan and a monitoring program plan, will be complied with.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Ben Redding
Owner Signature:

2018.01.16
Date:

Benjamin A. Redding
Printed Name:

Design Manager
Title:

INSTRUCTIONS FOR COMPLETION OF CONSTRUCTION ACTIVITY NOTICE OF INTENT (NOI) FORM

Submit original, electronic or facsimile copies. Facsimile and/or electronic copies should be followed-up with submission of an original signature copy as soon as possible. Please write "copy" under the "For Office Use Only" box in the upper right hand corner of the first page.

This fillable form may be completed online, a copy saved locally, printed and signed before it is submitted to the Permit Section at:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610

FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

Reports must be typed or printed legibly and signed.

Any facility that is not presently covered by the General NPDES Permit for Storm Water Discharges From Construction Site Activities is considered a new facility.

If this is a change in your facility information, renewal, etc., please fill in your permit number on the appropriate line, changes of information or permit renewal notifications do not require a fee.

NOTE: FACILITY LOCATION IS NOT NECESSARILY THE FACILITY MAILING ADDRESS, BUT SHOULD DESCRIBE WHERE THE FACILITY IS LOCATED.

Use the formats given in the following examples for correct form completion.

	Example	Format
Section	12	1 or 2 numerical digits
Township	12N	1 or 2 numerical digits followed by "N" or "S"
Range	12W	1 or 2 numerical digits followed by "E" or "W"

For the Name of Closest Receiving Waters, do not use terms such as ditch or channel. For unnamed tributaries, use terms which include at least a named main tributary such as "Unnamed Tributary to Sugar Creek to Sangamon River."

Submission of initial fee and an electronic submission of Storm Water Pollution Prevention Plan (SWPPP) for Initial Permit prior to the Notice of Intent being considered complete for coverage by the ILR10 General Permits. Please make checks payable to: Illinois EPA at the above address.

Construction sites with less than 5 acres of land disturbance - fee is $250.

Construction sites with 5 or more acres of land disturbance - fee is $750.

SWPPP should be submitted electronically to: epa.constilr10swppp@illinois.gov. When submitting electronically, use Project Name and City as indicated on NOI form.

PERMITS

IEPA 401 Permit
Army Corps of Engineering 404 Permit

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

217/782-3362

MAR 26 2018

U.S. Army Corps of Engineers, Chicago District
ATTN: Regulatory Branch
231 South LaSalle, Suite 1500
Chicago, IL 60604

Re: McHenry County Division of Transportation (Kane and McHenry County)
Randall Road Improvements - Crystal Lake
Log # C-0033-16 [CoE appl. # LRC-2011-00025]

Sir or Madam:

This Agency received a request on January 21, 2016 from McHenry County Division of Transportation requesting necessary comments concerning the proposed reconstruction and widening of 1.6 miles of Randall Road between intersections with Harnish Drive and Polaris Drive near Crystal Lake. We offer the following comments.

Based on the information included in this submittal, it is our engineering judgment that the proposed project may be completed without causing water pollution as defined in the Illinois Environmental Protection Act, provided the project is carefully planned and supervised.

These comments are directed at the effect on water quality of the construction procedures involved in the above described project and are not an approval of any discharge resulting from the completed facility, nor an approval of the design of the facility. These comments do not supplant any permit responsibilities of the applicant toward the Agency.

This Agency hereby issues certification under Section 401 of the Clean Water Act (PL 95-217), subject to the applicant's compliance with the following conditions:

1. The applicant shall not cause:

   a. violation of applicable water quality standards of the Illinois Pollution Control Board, Title 35, Subtitle C: Water Pollution Rules and Regulations;

   b. water pollution defined and prohibited by the Illinois Environmental Protection Act;

   c. interference with water use practices near public recreation areas or water supply intakes; or

   d. violation of applicable provisions of the Illinois Environmental Protection Act.

2. The applicant shall provide adequate planning and supervision during the project construction period for implementing construction methods, processes and cleanup procedures necessary to prevent water pollution and control erosion.

3. Any spoil material excavated, dredged or otherwise produced must not be returned to the waterway but must be deposited in a self-contained area in compliance with all state statutes, regulations and permit requirements with no discharge to waters of the State unless a permit has been issued by this Agency. Any backfilling must be done with clean material and placed in a manner to prevent violation of applicable water quality standards.

4. All areas affected by construction shall be mulched and seeded as soon after construction as possible. The applicant shall undertake necessary measures and procedures to reduce erosion during construction. Interim measures to prevent erosion during construction shall be taken and may include the installation of staked straw bales, sedimentation basins and temporary mulching. All construction within the waterway shall be constructed during zero or low flow conditions. The applicant shall be responsible for obtaining an NPDES Storm Water Permit prior to initiating construction if the construction activity associated with the project will result in the disturbance of 1 (one) or more acres, total land area. An NPDES Storm Water Permit may be obtained by submitting a properly completed Notice of Intent (NOI) form by certified mail to the Agency's Division of Water Pollution Control, Permit Section.

5. The applicant shall implement erosion control measures consistent with the "Illinois Urban Manual" http://www.aiswcd.org/illinois-urban-manual/.

6. Asphalt, bituminous material and concrete with protruding material such as reinforcing bar or mesh shall not be 1) used for backfill, 2) placed on shorelines/streambanks, or 3) placed in waters of the State.

7. The proposed work shall be constructed with adequate erosion control measures (i.e., silt fences, straw bales, etc.) to prevent transport of sediment and material downstream.

8. The fill material used for temporary work areas in waters of the State shall be predominantly sand or larger size material, with <20% passing a #230 U. S. sieve.

9. The fill material used in Lake Michigan shall be predominantly sand or larger size material, with <20% passing a #230 U. S. sieve.

10. Temporary work pads, cofferdams, access roads and other temporary fills shall be constructed of clean coarse aggregate or non-erodible non-earthen fill material that will not cause siltation. Material excavated or dredged from the surface water or wetland shall not be used to construct the temporary facility.

11. The applicant shall use adequate measures (i.e. flumes, culverts, etc.) to maintain normal stream flow during construction.

12. The wetland mitigation plan to compensate for the permanent loss of 1.62 acres of wetlands and consists of the "Wetland Mitigation Commitment Letter" dated January 3, 2017 outlining the proposed wetland restoration in cooperation with McHenry County Conservation Department (MCCD) and the document titled "Alden Sedge Meadow West Wetland Restoration And Randall Road Mitigation" dated February 23, 2018, shall be implemented. Modifications to the wetland mitigation plan must be submitted to the Agency for approval. The permittee shall submit annual reports by July 1 of each calendar year on the status of the mitigation. The first annual report shall include a hydric soils determination that represents the soils at the completion of initial construction for the wetland mitigation site(s). The permittee shall monitor the mitigation for 5 years after the completion of initial construction. A final report shall be submitted within 90 days after completion of a 5-year monitoring period. Each annual report and the final report shall include the following: IEPA Log No., date of completion of initial construction, representative photographs, floristic quality index, updated topographic maps, description of work in the past year, the performance standards for the mitigation as stated in the mitigation plan, and the activities remaining to complete the mitigation plan. For wetland mitigation sites containing non-hydric soils at the time of initial construction, the final report shall include a hydric soils determination that represents the soils at the end of the 5-year monitoring period. For wetland mitigation provided by purchase of wetland mitigation banking credits, in lieu of the above monitoring and reporting, the permittee shall submit written proof from the wetland mitigation bank that the wetland credits have been purchased within thirty (30) days of said purchase. The subject reports and proof of purchase of mitigation credits shall be submitted to:

Illinois Environmental Protection Agency
Bureau of Water
Division of Water Pollution Control
Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

13. The applicant is advised that the following permit(s) must be obtained from the Agency: the applicant must obtain permits to construct sanitary sewers, water mains and related facilities prior to construction.

This certification becomes effective when the Department of the Army, Corps of Engineers, includes the above conditions # 1 through # 13 as conditions of the requested permit issued pursuant to Section 404 of PL 95-217.

This certification does not grant immunity from any enforcement action found necessary by this Agency to meet its responsibilities in prevention, abatement, and control of water pollution.

Sincerely,

Darin E. LeCrone, P.E.
Manager, Industrial Unit, Permit Section
Division of Water Pollution Control

DRG:C-0033-16_401 WQ Certification_21Jan16.docx

cc: IEPA, Records Unit
IEPA, DWPC, FOS,
IDNR, Bartlett
USEPA, Region 5
McHenry County Division of Transportation, 16111 Nelson Road, Woodstock, IL 60098
Huff & Huff, Inc./GZA, Attn: Evan Markowitz, 915 HargerRoad, Suite 330, Oak Brook, IL 60523
DRG

DEPARTMENT OF THE ARMY

PERMIT

PERMITTEE: Jeffrey Young
McHenry County Division of Transportation

APPLICATION: LRC-2011-00025

ISSUING OFFICE: U.S. Army Corps of Engineers, Chicago District

DATE:

You are hereby authorized to perform work in accordance with the terms and conditions specified below.

Note: The term "you" and its derivatives, as used in this authorization, means the permittee or any future transferee. The term "this office" refers to the U.S. Army Corps of Engineers, Chicago District.

PROJECT DESCRIPTION: Reconstruction and Widening of Randall Road from Harnish Drive (north of County Line Road) to Polaris Drive/Acorn Lane, including intersecting streets in the Villages of Algonquin and Lake in the Hills, McHenry County, Illinois, as described in your notification and as shown on the plans titled, "FAP Route 336: Randall Road Harnish Drive to Polaris Drive/West Acorn Lane, Section: 06-00329-01-PW, Project: PW2V(306), Roadway Reconstruction, Additional Lanes, Retaining Walls, Box Culvert, Traffic Signal Modernization, Interconnect and Lighting, McHenry County, C-91-212-14" dated 1/19/2018, prepared by Transystem Corp.

The approved mitigation plan is entitled "Alden Sedge Meadow West Wetland Restoration and Randall Road Mitigation" dated February 23, 2018.

PROJECT LOCATION: Randall Road from Harnish Drive (north of County Line Road) to Polaris Drive/Acorn Lane, including intersecting streets in the Villages of Algonquin and Lake in the Hills, McHenry County, Illinois (Starting at Lat: 42.16119 & Long: -88.33562 and ending at Lat: 42.18458 & Long: -88.33551).

GENERAL CONDITIONS:

1. The time limit for completing the authorized work ends five (5) years from when the Federal official, designated to act for the Secretary of the Army, has signed below. If you find that you need more time to complete the authorized activity(s), submit your request for a time extension to this office for consideration at least 60 days before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. Please note that this site is within the aboriginal homelands of several American Indian Tribes. If any cultural, archaeological or historical resources are unearthed during activities authorized by this permit, work in that area must be stopped immediately and the Corps, State Historic Preservation Office and/or Tribal Historic Preservation Office must be contacted for further instruction. The Corps will initiate the coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing on the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. You shall comply with the water quality certification issued under Section 401 of the Clean Water Act by the Illinois Environmental Protection Agency for the project. Conditions of the certification are conditions of this authorization. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being accomplished in accordance with the terms and conditions of your permit.

The following special conditions are a requirement of your authorization:

1. This authorization is based on the materials submitted as part of application number LRC-2011-00025. Failure to comply with the terms and conditions of this authorization may result in suspension and revocation of your authorization.

2. You shall undertake and complete the project as described in the plans titled, “FAP Route

336: Randall Road Harnish Drive to Polaris Drive/West Acorn Lane, Section: 06-00329-01-PW, Project: PW2V(306), Roadway Reconstruction, Additional Lanes, Retaining Walls, Box Culvert, Traffic Signal Modernization, Interconnect and Lighting, McHenry County, C-91-212-14" dated 1/19/2018, prepared by Transystem Corp. and, including all relevant documentation to the project plans as proposed.

3. You shall fully implement the Project Mitigation Document titled, "Alden Sedge Meadow West Wetland Restoration and Randall Road Mitigation" dated February 23, 2018, prepared by McHenry County Conservation District, within the first year of project construction. All (created, enhanced, restored) wetlands shall meet the performance standards in accordance with the approved mitigation document. Your responsibility to complete the required compensatory mitigation will not be considered fulfilled until you have demonstrated compensatory mitigation project success and have received written verification of that success from the U.S. Army Corps of Engineers.

4. This permit does not authorize temporary construction activities, such as the use of earth moving machinery in non-impacted waters of the U.S. or temporarily stockpiling material within waters of the US.

5. This authorization is contingent upon implementing and maintaining soil erosion and sediment controls in a serviceable condition throughout the duration of the project. You shall comply with the project's soil erosion and sediment control (SESC) plans and the installation and maintenance requirements of the SESC practices on-site. You shall notify this office any changes or modifications to the approved plan set. Please be aware that field conditions during project construction may require the implementation of additional SESC measures for further protection of aquatic resources. If you fail to implement corrective measures, this office may require more frequent site inspections to ensure the installed SESC measures are acceptable. You shall comply with the McHenry-Lake Soil and Water Conservation District's (SWCD) written and verbal recommendations regarding the soil erosion and sediment control (SESC) plan and the installation and maintenance requirements of the SESC practices on-site.

   a. You shall schedule a preconstruction meeting with SWCD to discuss the SESC plan and the installation and maintenance requirements of the SESC practices on the site. You shall contact the SWCD at least 10 calendar days prior to the preconstruction meeting so that a representative may attend.
   b. You shall notify the SWCD of any changes or modifications to the approved plan set. Field conditions during project construction may require the implementation of additional SESC measures. If you fail to implement corrective measures, this office may require more frequent site inspections to ensure the installed SESC measures are acceptable.
   c. Prior to commencement of any in-stream work, you shall submit constructions plans and a detailed narrative to the SWCD that disclose the contractor's preferred method of cofferdam and dewatering method. Work in the waterway shall NOT commence until the SWCD notifies you, in writing, that the plans have been approved.

6. Under no circumstances shall the Contractor prolong final grading and shaping so that the entire project can be permanently seeded at one time. Permanent stabilization within the wetland and stream buffers identified in the plans shall be initiated immediately following the completion of work. Final stabilization of these areas should not be delayed due to utility work to be performed by others.

7. You shall fully implement the practices identified in the Best Management Practices (BMP) Maintenance and Monitoring (M&M) Plan titled, "Best Management Practices Management and Monitoring Plan McHenry Division of Transportation Randall Road County Line Road to Polaris Drive/Acorn Lane Villages of Algonquin and Lake in the Hills, McHenry County, Illinois – USACE# LRC-2011-25 – IEPA# C-0033-16", dated April 4, 2018 prepared by Huff & Huff within the first year of project construction. All BMPs shall meet performance criteria in accordance with the approved document. Your responsibility to complete the plan will not be considered fulfilled until you have demonstrated BMP success and have received written verification of that success from the U.S. Army Corps of Engineers.

   You are responsible for all work authorized herein and for ensuring that all contractors are aware of the terms and conditions of this authorization.

   A copy of this authorization must be present at the project site during all phases of construction.

   You shall notify this office of any proposed modifications to the project, including revisions to any of the plans or documents cited in this authorization. You must receive approval from this office before work affected by the proposed modification is performed.

   You shall notify this office prior to the transfer of this authorization and liabilities associated with compliance with its terms and conditions. The transferee must sign the authorization in the space provided and forward a copy of the authorization to this office.

Further Information:

1. Congressional Authorities. You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this Authorization.

a. This permit does not obviate the need to obtain other federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. The Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on the behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modifications, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in the reliance on the information you provided.

5. Reevaluation of Permit Decision. The office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and

conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations
(such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General Condition 1 established a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this authorization.

Apr. 30, 2018

PERMITTEE
Jeffrey Young
McHenry County Division of Transportation

DATE

LRC-2011-00025

Corps Authorization Number

Edward Collins

OFF-SITE MITIGATION SPONSOR
McHenry County Conservation District

April 30, 2018

DATE

This authorization becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

May 1, 2018

For and on behalf of
Aaron W. Reisinger
Colonel, U.S. Army
District Commander

DATE

If the structures or work authorized by this authorization are still in existence at the time the property is transferred, the terms and conditions of this authorization will continue to be binding on the new owner(s) of the property. To validate the transfer of this authorization and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below. The document shall be attached to a copy of the permit and submitted to the Corps.

_____
CORPS PROJECT NUMBER

_____ _____
TRANSFEREE DATE

_____
ADDRESS

_____
TELEPHONE

IEPA LPC 663 CCDD FORMS

Huff & Huff incorporated
A Subsidiary of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

915 Harger Road
Suite 330
Oak Brook, IL 60523
T: 630.684.9100
F: 630.684.9120
www.huffnhuff.com
www.gza.com

To: Mr. Benjamin Redding, P. E.–Design Manager–McHenry County Division of Transportation

From: Jeremy J. Reynolds, P.G.

Date: April 12, 2017

Re: CCDD LPC-663 Randall Road Improvements Project

Huff & Huff, Inc. provided services in support of a Form LPC-663 for the Randall Road Improvements Project. Fourteen (14) potentially impacted properties (PIPs) were determined to exist in close proximity to the Project Corridor, which consists of Randall Road from Harnish Drive to 0.5 miles north of Algonquin Road and Algonquin Road from Oakland Road to 0.3 miles west of Randall Road. Therefore, the LPC-663 form was utilized, and on November 18 and November 21, 2016, Eighteen (18) soil borings were advanced within the Project Area in proximity to the PIPs. Soils were screened in the field using a photoionization detector (PID). Fifteen (15) representative soil samples were submitted for the analysis of one or more of the following contaminants of concern associated with the identified PIPs including: volatile organic compounds (VOCs); benzene, toluene, ethylbenzene, and total xylenes (BTEX, a subset of the VOC list); polynuclear aromatic hydrocarbons (PNAs); and total lead. Thirty-six samples were analyzed for soil pH using a digital Hanna direct soil pH meter (HI99121) to assess CCDD suitability.

Low concentrations of benzene, toluene, ethyl benzene, and total xylenes were detected in sample B-9 from 5-7 feet below the maximum allowable concentrations (MACs). Low concentrations of Naphthalene were detected in sample B-9 from 5-7 feet below the MAC. Low concentrations of lead were detected in multiple samples below the MAC. The soil pH results ranged from 7.00 to 8.85, within the required range for CCDD disposal (6.25 to 9.0).

A proposed Highway Authority Agreement (HAA) area in the vicinity of 10 S. Randall Road (at the southwest corner of the intersection of Randall Road and Algonquin Road) has been identified as a Preliminary Exclusion Zone (PEZ) and will need to be managed with a Soil Management Plan consistent with Section 669.08 (Contaminated Soil and/or Groundwater Management) from IDOT Standard Specifications for Road and Bridge Construction (SSRBC). Soils generated from near this PEZ and from within the PEZ itself are considered clean based on the analytical results, but may be excluded from CCDD disposal based on the proposed HAA.

Soil management oversight is recommended during construction near and within this PEZ. Soil management includes on-site engineering screening of spoils using a PID meter, and segregation of non-impacted materials, to ensure that only non-impacted materials are loaded for CCDD facility disposal when working near and within the PEZ. Currently, the vertical limits are from ground surface to 25 feet bgs (below ground surface) and the horizontal limits are depicted on a figure found in **Attachment A**. Impacted soils are **not** certified for CCDD disposal and if design cannot avoid these soils, they require disposal at a Subtitle D sanitary landfill as non-special waste.

Based on the findings contained within this document, soils achieve the CCDD requirements and are certified for disposal using the attached LPC-663 form with exception of the PEZ. Refer to the attached narrative for a full description of the Project Corridor, identified sites, and the analytical testing.

Should conditions within the Project Corridor change, such as unusual staining, odors, or if loads become rejected, additional analytical assessment may be required for final disposition of spoils from this Project Corridor. If you have any questions regarding this matter, please contact us at 630-684-9100.

_____

Jeremy J. Reynolds, P.G.
Associate Principal

Illinois Environmental Protection Agency

Bureau of Land • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

Uncontaminated Soil Certification by Licensed Professional Engineer or Licensed Professional Geologist for Use of Uncontaminated Soil as Fill in a CCDD or Uncontaminated Soil Fill Operation LPC-663 Revised in accordance with 35 Ill. Adm. Code 1100, as amended by PCB R2012-009 (eff. Aug. 27, 2012)

This certification form is to be used by professional engineers and professional geologists to certify, pursuant to 35 Ill. Adm. Code 1100.205(a)(1)(B), that soil (i) is uncontaminated soil and (ii) is within a pH range of 6.26 to 9.0. If you have questions about this form, please telephone the Bureau of Land Permit Section at 217/524-3300.

This form may be completed online, saved locally, printed and signed, and submitted to prospective clean construction or demolition debris (CCDD) fill operations or uncontaminated soil fill operations.

I. Source Location Information

(Describe the location of the source of the uncontaminated soil)

Project Name: Randall Road Improvements Project Office Phone Number, if available: 815-334-4960

Physical Site Location (address, incldluding number and street):

Randall Rd from Harnish Dr to 0.5 miles north of Algonquin Rd, Algonquin Rd from Oakland Rd to 0.3 miles west of Randall Rd

City: Algonquin/LakeintheHi State: IL Zip Code: 60102/60156

County: McHenry Township: Algonquin

Lat/Long of approximate center of site in decimal degrees (DD.ddddd) to five decimal places (e.g., 40.67890, -90.12345):

Latitude: 42.1616992 (Decimal Degrees) Longitude: -88.3347439 (-Decimal Degrees)

Identify how the lat/long data were determined:

☐ GPS ☐ Map Interpolation ☐ Photo Interpolation ☒ Survey ☐ Other

ISGS Public Land Survey System. Lat/long above refer to the approximate center of the Project Area

IEPA Site Number(s), if assigned: BOL: BOW: BOA:

II. Owner/Operator Information for Source Site

Site Owner		Site Operator	
Name:	McHenry County Division of Transportation	Name:	McHenry County Division of Transportation
Street Address:	16111 Nelson Road	Street Address:	16111 Nelson Road
PO Box:		PO Box:	
City:	Woodstock State: IL	City:	Woodstock State: IL
Zip Code:	60098 Phone: 815-334-4960	Zip Code:	60098 Phone: 815-334-4960
Contact:	Benjamin Redding, P.E. - Design Manager	Contact:	Benjamin Redding, P.E. - Design Manager
Email, if available:	BARedding@co.mchenry.il.us	Email, if available:	BARedding@co.mchenry.il.us

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed $50,000 for the violation and an additional civil penalty of not to exceed $10,000 for each day during which the violation continues (415 ILCS 5/42). This form has been approved by the Forms Management Center.

Project Name: Randall Road Improvements Project

Latitude: 42.1616992 Longitude: -88.3347439

Uncontaminated Site Certification

III. Basis for Certification and Attachments

For each item listed below, reference the attachments to this form that provide the required information.

a. A Description of the soil sample points and how they were determined to be sufficient in number and appropriately located 35 Ill. Adm. Code 1100.610(a)]:

A database review was completed in the 2015 H&H PESA for the Project Corridor, which consists of commercial properties. Fourteen potentially impacted properties (PIPs) were identified in connection with the Project Corridor through the database review and site visit. Refer to the attachments for additional information.

b. Analytical soil testing results to show that soil chemical constituents comply with the maximum allowable concentrations established pursuant to 35 Ill. Adm. Code Part 1100, Subpart F and that the soil pH is within the range of 6.25 to 9.0,including the documentation of chain of custody control, a copy of the lab analysis; the accreditation status of the laboratory performing the analysis; and certification by an authorized agent of the laboratory that the analysis has been performed in accordance with the Agency's rules for the accreditation of environmental and the scope of the accreditation [35 Ill. Adm. Code 1100.201(g), 1100.205(a), 1100.610]:

Eighteen (18) soil borings were advanced within the Project Corridor on November 18 and November 21, 2016. Samples were analyzed for one or more of the following: VOCs, BTEX, PNAs, total lead, and pH. All results achieve the CCDD requirements. Refer to the attachments for additional information.

IV. Certification Statement, Signature and Seal of Licensed Professional Engineer or Licensed Professional Geologist

I, Jeremy J. Reynolds, P.G. (name of licensed professional engineer or geologist) certify under penalty of law that the information submitted, including but not limited to, all attachments and other information, is to the best of my knowledge and belief, true, accurate and complete. In accordance with the Environmental Protection Act [415 ILCS 5/22.51 or 22.51a] and 35 Ill. Adm. Code 1100.205(a), I certify that the soil from this site is uncontaminated soil. I also certify that the soil pH is within the range of 6.25 to 9.0. In addition, I certify that the soil has not been removed from the site as part of a cleanup or removal of contaminants. All necessary documentation is attached.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Company Name: Huff & Huff, Inc.

Street Address: 915 Harger Rd Suite 330

City: Oak Brook State: IL Zip Code: 60523

Phone: (630) 684-9100

Jeremy J. Reynolds, P.G.
Printed Name:

Licensed Professional Engineer or
Licensed Professional Geologist Signature:

4/12/17
Date:

P.E. or L.P.G. Seal:

Uncontaminated Soil Certification
by Licensed Professional Engineer or Licensed Professional Geologist for Use of Uncontaminated Soil as Fill in a CCDD or Uncontaminated Soil Fill Operation.
LPC-663
Owner: McHenry County, IL
Project Name: Randall Road Improvements Project

III. Basis for Certification and Attachments

Explain the basis upon which you are certifying that the soil from this site is uncontaminated soil.

This form pertains to soils excavated from the Randall Road Improvements Project. The Project Corridor consists of Randall Road from Harnish Drive to approximately 0.5 miles north of Algonquin Road and Algonquin Road from Oakland Road. The Project Corridor is approximately 2.25 linear miles in Algonquin and Lake in the Hills, IL with present-day land use consisting of commercial properties. The maximum excavation depth for the proposed improvements is approximately 25 feet deep. Specifically, the improvements consist of ROW acquisition, new curb and gutter, installation of a multi-use path, retaining wall installation, drainage improvements, and detention pond installation at two locations (east side of Randall Road between Harnish Drive and Bunker Hill Drive/Huntington Drive and east side of Randall Road approximately 800 feet north of Polaris Drive/Acorn Lane). A map depicting the Project Corridor location, identified sites, and sample locations is included in **Attachment A**, and a photo log of site reconnaissance is included in **Attachment B**.

The following information presents a summary of the records review, the identified PIPs, and other nearby sites. Database excerpts are included in **Attachment C**. The analyses conducted and results are summarized at the end of this narrative. The laboratory analytical report is included in **Attachment D**.

Historic Aerials

Per the 2015 PESA, A review of historic aerial photographs with coverage of the Project Area for the years 1939, 1946, 1954, 1961, 1967, 1974, 1980, 1988, 1994, 1999, 2005, 2009, and 2014 indicates the following:

1939 In 1939, several farm residences can be seen along the Project Corridor. Most of the Project Corridor consists of farmland. Randall Road is not a continuous road in these aerial photographs and the alignment of Randall Road at the north end of the Project Corridor does not match its current configuration.

1946 Between 1939 and 1946, new buildings have been added to the property on the east side of Randall Road at the north end of the Project Corridor. There are no other significant changes between 1939 and 1946.

1954 Between 1946 and 1954, new residential development can be seen along the east side of Randall Road, in the vicinity of Polaris Drive/Acorn Lane. There are no other significant changes between 1946 and 1954.

1961 The 1961 aerial photograph shows an increase in the residential development on the east side of Randall Road, near Polaris Drive/Acorn Lane. There are no other significant changes between 1954 and 1961.

1967 The 1967 aerial photograph shows one new building on the east side of Randall Road, near Bunker Hill Drive. There are no other significant changes between 1961 and 1967.

1974 The 1974 aerial photograph shows a change in the alignment of Randall Road at the north end of the Project Corridor. There is an increase in residential development on the east side of Randall Road, near Polaris Drive/Acorn Lane.

1980 The 1980 aerial photograph shows a school building west of Randall Road and south of Bunker Hill Drive. There are also some new commercial buildings near the northeast corner of the intersection of Randall Road and County Line Road.

1988 In the 1988 aerial photograph, a new building is visible at the northeast corner of Randall Road and Algonquin Road. There are no other significant changes between 1980 and 1988.

1994 The 1994 aerial photograph shows an increase in residential development on the west side of Randall Road from near Polaris Drive/Acorn Lane to Algonquin Road. There are also new buildings present at the south east and southwest corners of Randall Road and Algonquin Road, and new buildings on the east side of Randall Road, both north and south of Bunker Hill Drive.

1999 The 1999 aerial photograph shows a general increase in residential and commercial development all along the Project Corridor, especially near the intersection of Randall Road and Algonquin Road.

2005 The 2005 aerial photograph shows a general increase in residential and commercial development all along the Project Corridor, especially near the intersection of Randall Road and County Line Road.

2009 The 2009 aerial photograph shows a new commercial development at the southwest corner of Randall Road and Harnish Drive, and a new commercial development at the southeast corner of Randall Road and County Line Road. There are no other significant changes to the Project Corridor from 2005 and 2009.

2014 There are no other significant changes to the Project Corridor between 2009 and 2014.

Records Search

Per the 2015 PESA, the following site descriptions and table summarizes the identified PIPs that are adjacent to the Project Area.

Map ID	Name	Address	Database[1]	Distance & Direction	PIP?
20	Duro-Life Corporation	2401 N Huntington Drive, Algonquin, IL	RCRA	Adjacent, east	Yes
21	Meijer Store and Gas Station #206	400-490 S. Randall Road, Algonquin, IL	RCRA, UST	Adjacent, west	Yes
27	Vogue Cleaners	136-138 S. Randall Road, Algonquin, IL	RCRA, SRP, INST CONTROL	Adjacent, south and west	Yes
29	Village Cleaners	2545 W. Algonquin Road, Algonquin, IL	RCRA, SRP	Adjacent, south	Yes
30	Phillips 66/ Phillips Petroleum Company #27523	10 S. Randall Road, Algonquin, IL	RCRA, UST, LUST, SPILLS, HAA	Adjacent, south and west	Yes
31	KS Cleaners	1 S. Randall Road, Algonquin, IL	RCRA, SRP, INST CONTROL	Adjacent, south and east	Yes
33	Dry Cleaners	2401 W. Algonquin Road, Algonquin, IL	N/A	Adjacent, south	Yes
34	Thornton's #119	2265 W. Algonquin Road, Lake in the Hills, IL	UST, SPILLS	Adjacent, south	Yes
35	Megha Food Corporation/Clark Gas Station	2126 W. Algonquin Road, Lake in the Hills, IL	UST	Adjacent, north	Yes
39	Signature Cleaners	144 N. Randall Road, Lake in the Hills, IL	SRP, INST CONTROL	Adjacent, north	Yes
40	Amoco #2276	2450 Algonquin Road, Lake in the Hills, IL	RCRA, UST, LUST, SPILLS	Adjacent, north and east	Yes
43	Costco Gas Station #774	250 N. Randall Road, Lake in the Hills, IL	RCRA, UST	Adjacent, west	Yes
45	Acorn Cleaners	441 N. Randall Road, Lake in the Hills, IL	N/A	Adjacent, east	Yes
46	Mega Cleaners	55 W. Acorn Lane, Lake in the Hills, IL	N/A	Adjacent, east	Yes

[1]Note that only the pertinent database listings associated with the PIPs are listed

Duro-Life Corporation (Site ID 20)

Duro-Life Corporation is located at 2401 N. Huntington Drive, at the southeast corner of the intersection of Randall Road and Huntington Drive. This site is listed in the RCRA database as a conditionally exempt small quantity generator (CESQG). A CESQG is defined as one who generates 100 kilograms or less per month of hazardous waste, or 1 kilogram or less per month of acutely hazardous waste. The site is listed with USEPA ID IL0000018861. Hazardous wastes generated on site are listed as ignitable waste (D001), benzene (D018), and tetrachloroethylene (D039). There are no violations listed in the database.

The site is listed as having the following North American Industry Classification System (NAICS) code description: "All other miscellaneous fabricated metal product manufacturing, precision turned product manufacturing." The company's web site describes the Duro-Life Corporation as "a precision, production machining facility that utilizes the latest CNC turning, vertical milling, and horizontal milling technology to produce high quality metal components for a variety of industries, including hydraulics, heavy equipment, and automotive." At the time of the site visit, the site was occupied by the Duro-Life Corporation. According to the historic aerial photographs, the current building configuration has been on this site since 1994. Another building with a different layout was present on the site from 1961 to 1988, and prior to 1961, the site was vacant farmland. Based on these findings and the site's location along the Project Corridor, **this site is considered a PIP.**

Meijer Store and Gas Station #206 (Site ID 21)

Meijer Store and Gas Station #206 is located at 400-490 S. Randall Road, on the west side of Randall Road between Stonegate Road and Bunker Hill Drive. This site is listed in the RCRA database as a SQG; this means they generate more than 100 kilograms but less than 1,000 kilograms of hazardous waste per month. The site is listed as having USEPA RCRA ID #ILR000106880. The database identifies the hazardous waste on site as arsenic (D004), silver (D011), reactive waste (D003), corrosive waste (D002), and ignitable waste (D001). There are no violations listed in the database.

The site is also listed in the UST database with facility ID #2040346. The site is listed as having one 8,000-gallon gasoline UST, one 20,000-gallon gasoline UST, one 8,000-gallon diesel fuel UST, and one 3,000-gallon kerosene UST currently in use. No spills or releases have been reported. At the time of the site visit, the USTs were found to be located on the east side of the property, adjacent to Randall Road. Based on these findings and the site's location along the Project Corridor, **this site is considered a PIP**.

Vogue Cleaners (site ID 27)

Vogue Cleaners is located at 136-138 S. Randall Road, on the west side of Randall Road between Algonquin Road and Stonegate Road. This site is listed in the RCRA database as a SQG; this means they generate more than 100 kilograms but less than 1,000 kilograms of hazardous waste per month. The site is listed as having USEPA RCRA ID #ILR000001370. The database identifies the hazardous waste on site as tetrachloroethylene (D039), spent halogenated solvents (F002), chromium (D007), and trichloroethylene (D040). There are no violations listed in the database.

The site is also listed in the IEPA Site Remediation Program (SRP) database. The site was enrolled in the SRP on January 14, 2005 with IEPA ID #1114055053 and is not listed as an active site. A Focused NFR letter was issued by IEPA on March 20, 2006, with an industrial/commercial land use restriction and an on-site groundwater use restriction as institutional controls. Based on these findings and the site's location along the Project Corridor, **this site is considered a PIP**.

Village Cleaners (Site ID 29)

Village Cleaners is located at 2545 W. Algonquin Road, on the south side of Algonquin Road approximately 1,600 feet west of Randall Road. The design plans show that construction extends west along Algonquin Road approximately 1,500 feet. Therefore, this site is adjacent to the Project Corridor. This site is listed in the RCRA database as a SQG; this means they generate more than 100 kilograms but less than 1,000 kilograms of hazardous waste per month. The site is listed as having USEPA RCRA ID #ILR000028498. The database identifies the hazardous waste on site as spent halogenated solvents (F002). There are no violations listed in the database. This site is also listed in the IEPA SRP database. The database states that a Remedial Objectives Report was submitted and approved by IEPA in 2008 listing the contaminants of concern (COC) as tetrachloroethene (PCE), trichloroethene (TCE), and cis-1,2-dichloroethene (cis-1,2-DCE). According to the most recent design plans for the Project Corridor received on November 19, 2015, the nearest planned excavation is a shallow excavation (less than 5 feet) and is located approximately 100 feet northeast of this site's proposed remediation boundary. Based on this information, **this site is considered a PIP**.

Phillips 66/Phillips Petroleum Company #27523 (Site ID 30)

Phillips 66/ Phillips Petroleum Company #27523 is located at 10 S. Randall Road, located at the southwest corner of the intersection of Randall Road and Algonquin Road. This site is listed in the RCRA, UST, LUST and SPILLS databases. This site is listed in the RCRA database as a SQG; this means they generate more than 100 kilograms but less than 1,000 kilograms of hazardous waste per month. The site is listed as having USEPA RCRA ID #ILR000054825. The database identifies the hazardous waste on site as benzene (D018) and ignitable waste (D001). There are no violations listed in the database.

The site is listed in the LUST and SPILLS databases regarding a gasoline and diesel release with Incident #20031631. A FOIA request was completed and reviewed for this site. The release was first discovered in November 2003 during a Phase II Investigation. Gasoline and diesel constituents were detected and identified as COCs at concentrations that exceeded the most stringent IEPA Tiered Approach to Corrective Action Objectives (TACO) Tier 1 Soil Remediation Objectives (SROs) and Class 1 Groundwater Remediation Objectives (GROs). The COCs were detected on the northeast portion of the property and Air Sparging/Dual Phase Extraction remediation was conducted at the site between March 2014 and January 2015 as part of an IEPA approved Amended Corrective Action Plan. In order to obtain closure for this incident, it was proposed that the residual COCs be addressed with the use of the following institutional controls: on-site groundwater use restriction and an HAA related to soil and/or groundwater contamination along portions of West Algonquin Road and Randall Road adjacent to the north and east sides of the site. Although closure of this site is still on-going and the proposed institutional controls have not been finalized, this information should be taken into consideration when planning work along this portion of the Project Corridor. At the time of the site visit, this site was observed to be a vacant/closed gasoline station. Several groundwater monitoring wells were observed on the site. According to the historic aerial photographs, this site was vacant from 1939 until 1988, and contained the current site configuration from 1994 to the present. Based on these findings and the site's location along the Project Corridor, **this site is considered a PIP**.

KS Cleaners (Site ID 31)

KS Cleaners is listed in the database with an address of 1 S. Randall Road, which is near the southeast corner of the intersection of Randall Road and Algonquin Road. At the time of the site visit, no such address was found. This site is listed in the RCRA database as a CESQG; this means that they generate 100 kilograms or less per month of hazardous waste, or 1 kilogram or less per month of acutely hazardous waste. The site is listed with USEPA ID ILR000008789. Hazardous wastes generated on site are listed as ignitable waste (D001), tetrachloroethylene (D039), and spent halogenated solvents (F002). There are no violations listed in the database.

The site is also listed in the IEPA SRP database. The site was enrolled in the SRP on July 25, 2008 with IEPA ID #1114055007 and is not listed as an active site. A Focused NFR letter was issued on November 5, 2008, with an on-site groundwater use restriction and an industrial/commercial land use restriction as institutional controls. Based on these findings and the site's location along the Project Corridor, **this site is considered a PIP**.

Dry Cleaners (Site ID 33)

This dry cleaner is located at 2401 W. Algonquin Road, on the south side of Algonquin Road approximately 750 feet east of Randall Road. An address search for this site lists this address as "KS Cleaners." This may be the same as Site ID 31, or it may be a new location. This site was noticed during the site visit and this address is not listed in any databases; however, due to potential chemical use and the site's location along the Project Corridor, **this site is considered a PIP**.

Thornton's #119 (Site ID 34)

Thornton's #119 is located at 2265 W. Algonquin Road, on the south side of Algonquin Road approximately 1,400 feet east of Randall Road. The design plans show that construction extends east along Algonquin Road to Oakleaf Road located approximately 2,000 feet east of Randall Road. Therefore, this site is adjacent to the Project Corridor. The site is listed in the UST database with facility ID #2034070. The site is listed as having two 12,000-gallon gasoline USTs; one 12,000-gallon E-85 UST; one 6,000-gallon diesel fuel UST; and one 6,000-gallon kerosene UST currently in use. A gasoline spill of unknown quantity was reported at this site on July 19, 2008. The SPILLS database states that "some of the gasoline went into the storm sewers and possibly a creek." No other information was available about this spill. At the time of the site visit, the USTs were found to be located on the east side of the property. Based on these findings and the site's location along the Project Corridor, **this site is considered a PIP**.

Megha Food Corporation/Clark Gas Station (Site ID 35)

Megha Food Corporation/Clark Gas Station is located at 2126 W. Algonquin Road, at the northeast corner of the intersection of Algonquin Road and Oakleaf Road. The design plans show that construction extends east along Algonquin Road to Oakleaf Road, adjacent to this site. The site is listed in the UST database with facility ID#2018481. The site is listed as having one 12,000-gallon gasoline UST; two 6,000-gallon gasoline USTs; and two 2,000-gallon diesel fuel USTs currently in use. No spills or releases have been reported. At the time of the site

visit, the USTs were found to be located on the south side of the property, adjacent to Algonquin Road. Based on these findings and the site's location along the Project Corridor, **this site is considered a PIP**.

Signature Cleaners (Site ID 39)

Signature Cleaners is listed in the database with an address of 144 N. Randall Road, which is located near the northwest corner of the intersection of Randall Road and Algonquin Road. At the time of the site visit, this address was found to contain Dotty's Video Gambling Cafe. The site is listed in the IEPA SRP database. The site was enrolled in the SRP on July 22, 2008 with IEPA ID #1110405065 and is not listed as an active site. A Focused NFR letter was issued by IEPA on November 5, 2008, with an industrial/commercial land use restriction and an on-site groundwater use restriction as institutional controls. Based on these findings and the site's location along the Project Corridor, **this site is considered a PIP**.

Amoco #2276 (Site ID 40)

Amoco #2276 is located at 2450 Algonquin Road, at the northeast corner of the intersection of Randall Road and Algonquin Road. This site is listed in the RCRA, UST, LUST and SPILLS databases. This site is listed in the RCRA database as a SQG; this means they generate more than 100 kilograms but less than 1,000 kilograms of hazardous waste per month. The site is listed as having USEPA RCRA ID #IL0000014548 and #ILD984853820. The database identifies the hazardous waste on site as lead (D008), benzene (D018), ignitable waste (D001), and corrosive waste (D002). There are no violations listed in the database.

The site is listed in the LUST and SPILLS databases regarding two gasoline releases with Incident #970689 and #20031108. Incident #970689 occurred on April 22, 1997, and is listed in the database as a gasoline leak of unknown quantity. A NFR letter with no site restrictions was issued by IEPA for this incident on February 3, 1998. Incident #20031108 occurred on July 2, 2003, during a UST removal and is listed in the database as a gasoline leak or spill of unknown quantity. The database states that one 12,000-gallond gasoline UST and two 10,000-gallon gasoline USTs were removed from the site in July 2003. A NFR letter with no site restrictions was issued by IEPA for this incident on July 22, 2008. At the time of the site visit, this site was found to be a vacant/former Bank of America building. No groundwater monitoring wells were observed on the site, the site was paved and the pavement was in good condition. According to the historic aerial photographs, this site was vacant from 1939 until 1980, contained a gasoline station from 1988 to 1999, and contained the bank building from 2005 until the present. Based on these findings and the site's location along the Project Corridor, **this site is considered a PIP**.

Costco Gas Station #774 (Site ID 43)

Costco Gas Station #774 is located at 250 N. Randall Road, on the west side of Randall Road between Algonquin Road and Polaris Drive. The site is listed in the UST database with facility ID#2042053. The site is listed as having three 20,000-gallon gasoline USTs and one 1,500-gallon Lubrizol-fuel additive UST currently in use. No spills or releases have been reported. At the time of the site visit, the USTs were found to be located on the northeast corner of the property, adjacent to Randall Road. Based on these findings and the site's location along the Project Corridor, **this site is considered a PIP**.

Acorn Cleaners (Site ID 45)

Acorn Cleaners is located at 441 N. Randall Road, at the northeast corner of the intersection of Randall Road and Acorn Lane. This site was noticed during the site visit and is not listed in any databases, however, due to potential chemical use and the site's location along the Project Corridor and adjacent to proposed excavation according to the design plans, **this site is considered a PIP**.

Mega Cleaners (Site ID 46)

Mega Cleaners is located at 55 W. Acorn Lane, near the northeast corner of the intersection of Randall Road and Acorn Lane. This site was noticed during the site visit and is not listed in any databases, however, due to potential chemical use and the site's location along the Project Corridor and adjacent to proposed excavation according to the design plans, **this site is considered a PIP**.

Analytical Summary

In order to assess impacts to Project Area soils from the identified PIPs, and to determine CCDD suitability of soils for pH, eighteen soil borings were advanced within the Project Area to depths of 8 to 25 feet below ground surface. Soils were screened continuously using a PID meter and representative soil samples were collected. The highest PID reading was encountered in sample B-9 from 5-7 feet (8.7 ppm). Odors were also observed from this sample interval.

TABLE 2-2
PHOTOIONIZATION DETECTOR SCREENING RESULTS SUMMARY

Soil Boring	Depth (ft)	PID Reading (ppm)
B-1	0-2	0.4
	2-5	NR
	5-8	0.2
	8-10	NR
B-2	0-1	0.7
	1-3.5	0.7
	5-10	NR
	10-12	0.6
	12-14	0.6
B-3	1-1.5	0.7
	1.5-5	NR
	5-7	0.5
	7-9.5	**1.0**
	10-12	0.2
	12-15	0.0
	15-16	0.5
	16-18	0.8
B-4	0-2	0.0
	2-5	NR
	5-7	0.5
	7-8.5	**0.5**
	10-12	0.2
	12-14.5	0.5
B-5	0-1	0.0
	1-3	0.0
	3-5	NR
	5-7	0.1
	7-10	NR
	10-12	0.1
	12-14	0.2
	15-16.5	0.1
	16.5-18.5	0.1
	20-23	0.1
	23-25	0.1
B-6	**0-1**	**0.6**
	1-5	NR
	5-7	0.2
	7-8	0.3
	8-10	NR
	10-12	0.3
	12-13	0.0
	13-15	NR
B-7	**0-1**	**3.8**
	1-3	0.6
	3-5	NR
	5-8	0.1
	8-10	0.5
	10-12	0.6
	12-15	NR
B-8	0-1	0.6
	1-5	NR
	5-7	0.0
	7-10	NR
	10-12	0.0
	12-14	0.2
	14-15	NR
	15-18	0.0
	18-19.5	**0.6**
	20-23	0.1
	23-25	0.6
B-9	0-1	2.6
	1-5	NR
	5-7	**8.7**
	7-10	NR
	10-11	1.7
	11-15	NR
	15-16	1.6
	16-17.5	0.4
	17.5-20	NR
	20-23	0.4
	23-25	0.3
B-10	1-2.5	0.3
	3.5-5	0.1
	6-7.5	0.1
	8.5-10	0.0
B-11	0-2	0.1
	2-5	NR
	5-7	**0.2**
	7-10	0.0
	10-13	0.0
B-12	0-2	0.2
	2-5	NR
	5-7	**0.3**
	7-10	NR
	10-12	0.2
	12-13.5	0.2
B-13	0-1.5	0.3
	1.5-5	NR
	5-7	0.5
	7-9	**0.7**
B-14	0-1	0.0
	1-5	NR
	5-7	0.0
	7-9	0.4
	10-12	**0.4**
	12-14	0.3
	15-17	0.3
	17-19	0.3
	19-20	NR
	20-22	0.4
	22-25	0.3
B-15	0-1	0
	1-5	NR
	5-6	0.0
	6-10	NR
	10-12	0.0
	12-15	0.0
	15-17	0.0
	17-19	0.0
	19-20	NR
	20-22	**0.0**
	22-25	0.0
B-16	0-2.5	0
	2.5-5	NR
	5-7	0.0
	7-9	0.0
	9-10	NR
	10-12	**0.0**
	12-14	0.0
	15-17	0.0
	17-20	NR
	20-22	0.0
	22-24	0.0
B-17	**0-2**	**0.6**
	2-5	NR
	5-7	0.2
	7-10	0.4
	10-12	0.5
	12-15	0.5
B-18	0-2.5	0.0
	2.5-5	NR
	5-7	**0.0**
	7-9	0.0
	10-12	0.0
	12-15	0.0

Bold indicates sample submitted for analytical testing or placed on hold
NR or missing interval indicates no recovery

VOCS (and subset BTEX)

Six samples (B-3 from 7-9.5 feet, B-6 from 0-1 feet, B-7 from 0-1 feet, B-10 from 5-7 feet, B-11 from 5-7 feet, and B-18 from 5-7 feet) were analyzed for volatile organic compounds (VOCs). Nine additional samples (B-4 from 7-8.5 feet, B-8 from 18-19.5 feet, B-9 from 5-7 feet, B-12 from 5-7 feet, B-13 from 7-9 feet, B-14 from 10-12 feet, B-15 from 20-22 feet, B-16 from 10-12 feet, and B-17 from 0-2 feet) were analyzed for benzene, toluene, ethyl benzene, and total xylenes (BTEX).

Sample B-9 from 5-7 feet had reportable detections of BTEX compounds below their respective MACs. All other VOC (and subset BTEX) results were below detection limits, achieving their respective MACs.

PNAs

Nine samples (B-4 from 7-8.5 feet, B-8 from 18-19.5 feet, B-9 from 5-7 feet, B-12 from 5-7 feet, B-13 from 7-9 feet, B-14 from 10-12 feet, B-15 from 20-22 feet, B-16 from 10-12 feet, and B-17 from 0-2 feet) were analyzed for PNAs. Sample B-9 from 5-7 feet had a reportable detection of Naphthalene (0.073 mg/kg). However, the result is below the MAC (1.8 mg/kg). All other PNA results were below detection limits, achieving their respective MACs.

TABLE 3-2
VOC SOIL RESULTS COMPARED TO THE MACs FOR CCDD DISPOSAL

Soil Boring	*Maximum Allowable*	**B-3**	**B-4**	**B-6**	**B-7**	**B-8**	**B-9**	**B-10**	**B-11**	**B-12**	**B-13**	**B-14**	**B-15**	**B-16**	**B-17**	**B-18**
Depth, ft	*Concentration* [a/]	7-9.5	7-8.5	0-1	0-1	18-19.5	5-7	5-7	5-7	5-7	7-9	10-12	20-22	10-12	0-2	5-7
Constituent	----------	----------	----------	----------	----------	----------	----------	*mg/kg*	----------	----------	----------	----------	----------	----------	----------	----------
Acetone	*25*	<0.200	--	<0.200	<0.200	--	--	<0.200	<0.200	--	--	--	--	--	--	<0.200
Benzene	*0.03*	<0.005	<0.005	<0.005	<0.005	<0.005	0.0093	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bromodichloromethane	*0.6*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Bromoform	*0.8*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Bromomethane	*0.2*	<0.010	--	<0.010	<0.010	--	--	<0.010	<0.010	--	--	--	--	--	--	<0.010
2-Butanone (MEK)	*17*	<0.100	--	<0.100	<0.100	--	--	<0.100	<0.100	--	--	--	--	--	--	<0.100
Carbon disulfide	*9*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Carbon tetrachloride	*0.07*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Chlorobenzene	*1*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Chlorodibromomethane	*0.4*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Chloroform	*0.3*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
1,1-Dichloroethane	*23*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
1,2-Dichloroethane	*0.02*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
1,1-Dichloroethene	*0.06*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
cis-1,2-Dichloroethene	*0.4*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
trans-1,2-Dichloroethene	*0.7*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
1,2-Dichloropropane	*0.03*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
cis-1,3-Dichloropropene	*0.005*	<0.004	--	<0.004	<0.004	--	--	<0.004	<0.004	--	--	--	--	--	--	<0.004
trans-1,3-Dichloropropene	*0.005*	<0.004	--	<0.004	<0.004	--	--	<0.004	<0.004	--	--	--	--	--	--	<0.004
Ethylbenzene	*13*	<0.005	<0.005	<0.005	<0.005	<0.005	0.0359	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Methyl-tert-butylether (MTBE)	*0.32*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Methylene chloride	*0.02*	<0.020	--	<0.020	<0.020	--	--	<0.020	<0.020	--	--	--	--	--	--	<0.020
Styrene	*4*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Tetrachloroethene	*0.06*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Toluene	*12*	<0.005	<0.005	<0.005	<0.005	<0.005	0.0056	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
1,1,1-Trichloroethane	*2*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
1,1,2-Trichloroethane	*0.02*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Trichloroethene	*0.06*	<0.005	--	<0.005	<0.005	--	--	<0.005	<0.005	--	--	--	--	--	--	<0.005
Vinyl acetate	*10*	<0.010	--	<0.010	<0.010	--	--	<0.010	<0.010	--	--	--	--	--	--	<0.010
Vinyl chloride	*0.01*	<0.010	--	<0.010	<0.010	--	--	<0.010	<0.010	--	--	--	--	--	--	<0.010
Xylene, Total	*5.6*	<0.005	<0.005	<0.005	<0.005	<0.005	0.0108	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

[a/] Refers to Maximum Allowable Concentration (MAC) of Chemical Constituents in Uncontaminated Soil Used As Fill Material At Regulated Fill Operations (35 IAC 1100.Subpart F)

TABLE 3-4
PNA SOIL RESULTS COMPARED TO THE MACs FOR CCDD DISPOSAL

Soil Boring	*Maximum Allowable*	**B-4**	**B-8**	**B-9**	**B-12**	**B-13**	**B-14**	**B-15**	**B-16**	**B-17**
Depth, ft	*Concentration* [a/]	7-8.5	18-19.5	5-7	5-7	7-9	10-12	20-22	10-12	0-2
Constituent	----------*mg/kg*----------									
Acenaphthene	*570*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	*85*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	*12,000*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)anthracene	*1.8* [b/]	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087
Benzo(a)pyrene	*2.1* [b/]	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Benzo(b)fluoranthene	*2.1* [b/]	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(k)fluoranthene	*9*	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(ghi)perylene	*2,300*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	*88*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenzo(a,h)anthracene	*0.42* [b/]	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	*3,100*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	*560*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	*1.6* [b/]	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029
Naphthalene	*1.8*	<0.025	<0.025	0.073	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Phenanthrene	*210*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	*2,300*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

[a/] Refers to Maximum Allowable Concentration (MAC) of Chemical Constituents in Uncontaminated Soil Used As Fill Material At Regulated Fill Operations (35 IAC 1100.Subpart F)

[b/] Refers to MAC value within a populated area in a MSA excluding Chicago - All results also achieve most stringent MAC values.

Total Lead

Five samples (B-8 from 18-19.5 feet, B-9 from 5-7 feet, B-14 from 10-12 feet, B-15 from 20-22 feet, and B-16 from 10-12 feet) were analyzed for total lead. The five samples each had a reportable detection of lead below the MAC.

Soil Boring Depth, ft	***Maximum Allowable Concentration*** [a/]	**B-8** 18.5-19	**B-9** 5-7	**B-14** 10-12	**B-15** 20-22	**B-16** 10-12
Constituent	----------*mg/kg*----------					
Lead	*107*	8.2	3.9	4.0	3.6	4.2

[a/] Refers to Maximum Allowable Concentration (MAC) of Chemical Constituents in Uncontaminated Soil Used As Fill Material At Regulated Fill Operations (35 IAC 1100.Subpart F).

The laboratory analytical report is included in **Attachment D** of this narrative for reference.

Soil pH

Thirty-six samples were submitted for analysis of soil pH, as summarized in the pH sampling report found in **Attachment D**. The soil pH results range from 7.00 to 8.85, achieving the soil pH required range for CCDD disposal (6.25 to 9.0).

CCDD Determination

Based on the due diligence and analytical testing conducted, soils generated from the Randall Road Improvements Project meet the requirements for CCDD disposal with the exception of a proposed Highway Authority Agreement (HAA) area in the vicinity of 10 S. Randall Road (at the southwest corner of the intersection of Randall Road and Algonquin Road), which has been identified as a Preliminary Exclusion Zone (PEZ) and will need to be managed with a Soil Management Plan consistent with Section 669.08 (Contaminated Soil and/or Groundwater Management) from IDOT Standard Specifications for Road and Bridge Construction (SSRBC).

Soil management oversight is recommended during construction near and within this PEZ. Soil management includes on-site engineering screening of spoils using a PID meter, and segregation of non-impacted materials, to ensure that only non-impacted materials are loaded for CCDD facility disposal when working near and within the PEZ. Currently, the vertical limits are from ground surface to 25 feet bgs (below ground surface) and the horizontal limits are depicted on a figure found in **Attachment A**. Impacted soils are **not** certified for CCDD disposal and if design cannot avoid these soils, they require disposal at a Subtitle D sanitary landfill as non-special waste

Should conditions within the Project Corridor change, such as unusual staining, odors, or if loads become rejected, additional analytical assessment may be required for final disposition of spoils from this Project Corridor. If you have any questions regarding this matter, please contact us at 630-684-9100.

ATTACHMENT A

Site ID	Address	Status
20	2401 N Huntington Drive, Algonquin, IL	PIP
21	400-490 S. Randall Road, Algonquin, IL	PIP
27	136-138 S. Randall Road, Algonquin, IL	PIP
29	2545 W. Algonquin Road, Algonquin, IL	PIP
30	10 S. Randall Road, Algonquin, IL	PIP
31	1 S. Randall Road, Algonquin, IL	PIP
33	2401 W. Algonquin Road, Algonquin, IL	PIP
34	2265 W. Algonquin Road, Lake in the Hills, IL	PIP
35	2126 W. Algonquin Road, Lake in the Hills, IL	PIP
39	144 N. Randall Road, Lake in the Hills, IL	PIP
40	2450 Algonquin Road, Lake in the Hills, IL	PIP
43	250 N. Randall Road, Lake in the Hills, IL	PIP
45	441 N. Randall Road, Lake in the Hills, IL	PIP
46	55 W. Acorn Lane, Lake in the Hills, IL	PIP

0 600 1,200
Feet

N W E S

Aerial Source: ESRI Online World Imagery

Legend

- Project Limits
- PIP
- Soil Boring

Huff & Huff, Inc.

Figure 2-1
Soil Boring Location Map
Randall Road PSI
Algonquin and Lake in the Hills,
McHenry County, Illinois

K:\dwgs\TRANSYSTEMS\Randall_Road\TS_Randall_Rd_PSI_SBLM.mxd

Huff & Huff, Inc.

Figure 4-1
Preliminary Exclusion Zone (HAA) Map
Randall Road PSI
Algonquin and Lake in the Hills,
McHenry County, Illinois

K:\dwgs\TRANSYSTEMS\Randall_Road\TS_Randall_Rd_PSI_EZ.mxd

ACCESSIBLE PEDESTRIAN SIGNALS (APS) (BDE)

Effective: April 1, 2003
Revised: January 1, 2014

Description. This work shall consist of furnishing and installing accessible pedestrian signals (APS). Each APS shall consist of an interactive vibrotactile pedestrian pushbutton with speaker, an informational sign, a light emitting diode (LED) indicator light, a solid state electronic control board, a power supply, wiring, and mounting hardware. The APS shall meet the requirements of the MUTCD and Sections 801 and 888 of the Standard Specifications, except as modified herein.

Electrical Requirements. The APS shall operate with systems providing 95 to 130 VAC, 60 Hz and throughout an ambient air temperature range of -29 to +160 °F (-34 to +70 °C).

The APS shall contain a power protection circuit consisting of both fuse and transient protection.

Audible Indications. A pushbutton locator tone shall sound at each pushbutton.

If two accessible pedestrian pushbuttons are placed less than 10 ft (3 m) apart or placed on the same pole, the audible walk indication shall be a speech walk message.

A clear, verbal message shall be used to communicate the pedestrian walk interval. This message shall sound throughout the WALK interval only. The verbal message shall be modeled after: "'Street Name.' Walk Sign is on to cross "Street Name'." No other messages shall be used to denote the WALK interval.

Where two accessible pedestrian pushbuttons are separated by at least 10 ft (3 m), the walk indication shall be an audible percussive tone. It shall repeat at 8 to 10 ticks per second with a dominant frequency of 880 Hz.

Automatic volume adjustments in response to ambient traffic sound level shall be provided up to a maximum volume of 100 dBA. Locator tone and verbal messages shall be no more than 5 dB louder than ambient sound.

Pedestrian Pushbutton. Pedestrian pushbuttons shall be at least 2 in. (50 mm) in diameter or width. The force required to activate the pushbutton shall be no greater than 3.5 lb (15.5 N).

A red LED shall be located on or near the pushbutton which, when activated, acknowledges the pedestrians request to cross the street.

Signage. A sign shall be located immediately above the pedestrian pushbutton and parallel to the crosswalk controlled by the pushbutton. The sign shall be one of the following standard MUTCD designs:

R10-3

R10-3a

R10-4

R10-4a

Tactile Arrow. A tactile arrow, pointing in the direction of travel controlled by a pushbutton, shall be provided either on the pushbutton or its sign.

Vibrotactile Feature. The pushbutton shall pulse when depressed and shall vibrate continuously throughout the WALK interval.

Method of Measurement. This work will be measured for payment as each, per pushbutton.

Basis of Payment. This work will be paid for at the contract unit price per each for ACCESSIBLE PEDESTRIAN SIGNALS.

80099

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./°F	2.80E-06 in./in./°F
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."

80382

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:

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.

80173

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."

80366

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."

80384

CONCRETE END SECTIONS FOR PIPE CULVERTS (BDE)

Effective: January 1, 2013
Revised: April 1, 2016

Description. This work shall consist of constructing cast-in-place concrete and precast concrete end sections for pipe culverts. These end sections are shown on the plans as Highway Standard 542001 or 542011. This work shall be according to Section 542 of the Standard Specifications except as modified herein.

Materials. Materials shall be according to the following Articles of Division 1000 – Materials of the Standard Specifications.

Item	Article/Section
(a) Portland Cement Concrete (Note 1)	1020
(b) Precast Concrete End Sections (Note 2)	
(c) Coarse Aggregate (Note 3)	1004.05
(d) Structural Steel (Note 4)	1006.04
(e) Anchor Bolts and Rods (Note 5)	1006.09
(f) Reinforcement Bars	1006.10(a)
(g) Nonshrink Grout	1024.02
(h) Chemical Adhesive Resin System	1027
(i) Mastic Joint Sealer for Pipe	1055
(j) Hand Hole Plugs	1042.16

Note 1. Cast-in-place concrete end sections shall be Class SI, except the 14 day mix design shall have a compressive strength of 5000 psi (34,500 kPa) or a flexural strength of (800 psi) 5500 kPa and a minimum cement factor of 6.65 cwt/cu yd (395 kg/cu m).

Note 2. Precast concrete end sections shall be according to Articles 1042.02 and 1042.03(b)(c)(d)(e) of the Standard Specifications. The concrete shall be Class PC according to Section 1020, and shall have a minimum compressive strength of 5000 psi (34,000 kPa) at 28 days.

Joints between precast sections shall be produced with reinforced tongue and groove ends according to the requirements of ASTM C 1577.

Note 3. The granular bedding placed below a precast concrete end section shall be gradation CA 6, CA 9, CA 10, CA 12, CA 17, CA 18, or CA 19.

Note 4. All components of the culvert tie detail shall be galvanized according to the requirements of AASHTO M 111 or M 232 as applicable.

Note 5. The anchor rods for the culvert ties shall be according to the requirements of ASTM F 1554, Grade 105 (Grade 725).

CONSTRUCTION REQUIREMENTS

The concrete end sections may be precast or cast-in-place construction. Toe walls shall be either precast or cast-in-place, and shall be in proper position and backfilled according to the applicable paragraphs of Article 502.10 of the Standard Specifications prior to the installation of the concrete end sections. If soil conditions permit, cast-in-place toe walls may be poured directly against the soil. When poured directly against the soil, the clear cover of the sides and bottom of the toe wall shall be increased to 3 in. (75 mm) by increasing the thickness of the toe wall.

(a) Cast-In-Place Concrete End Sections. Cast-in-place concrete end sections shall be constructed according to the requirements of Section 503 of the Standard Specifications and as shown on the plans.

(b) Precast Concrete End Sections. When the concrete end sections will be precast, shop drawings detailing the slab thickness and reinforcement layout shall be submitted to the Engineer for review and approval.

The excavation and backfilling for precast concrete end sections shall be according to the requirements of Section 502 of the Standard Specifications, except a layer of granular bedding at least 6 in. (150 mm) in thickness shall be placed below the elevation of the bottom of the end section. The granular bedding shall extend a minimum of 2 ft (600 mm) beyond each side of the end section.

Anchor rods connecting precast sections shall be brought to a snug tight condition followed by an additional 2/3 turn on one of the nuts. Match marks shall be provided on the bolt and nut to verify relative rotation between the bolt and the nut.

When individual, precast end sections are placed side-by-side for a multi-pipe culvert installation, a 3 in. (75 mm) space shall be left between adjacent end section walls and the space(s) filled with Class SI concrete.

Method of Measurement. This work will be measured for payment as each, with each end of each culvert being one each.

Basis of Payment. This work will be paid for at the contract unit price per each for CONCRETE END SECTION, STANDARD 542001 or CONCRETE END SECTION, 542011, of the pipe diameter and slope specified.

80311

CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE)

Effective: June 1, 2010
Revised: November 1, 2014

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

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

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

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

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

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

a) Included on the U.S. Environmental Protection Agency (USEPA) *Verified Retrofit Technology List* (http://www.epa.gov/cleandiesel/verification/verif-list.htm), or verified by the California Air Resources Board (CARB) (http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm); or

b) Retrofitted with a non-verified diesel retrofit emission control device if verified retrofit emission control devices are not available for equipment proposed to be used on the project, and if the Contractor has obtained a performance certification from the retrofit

device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

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

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

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

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

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

Any costs associated with retrofitting any diesel powered off-road equipment with emission control devices shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed. The Contractor's compliance with this notice and any associated regulations shall not be grounds for a claim.

Diesel Retrofit Deficiency Deduction

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

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

If a Contractor accumulates three diesel retrofit deficiency deductions for the same piece of equipment in a contract period, the Contractor will be shutdown until the deficiency is corrected.

Such a shutdown will not be grounds for any extension of the contract time, waiver of penalties, or be grounds for any claim.

80261

CONTRAST PREFORMED PLASTIC PAVEMENT MARKING (BDE)

Effective: November 1, 2017

Revise the first paragraph of Article 780.07(b) of the Standard Specifications to read:

"(b) Type B or C - Standard Application. Standard application of conventional preformed plastic pavement markings shall consist of applying the markings to the pavement surface or to the bottom of a groove recessed in the pavement surface as specified on the plans. Standard application of contrast preformed plastic pavement markings shall consist of applying the markings to the bottom of a groove recessed in the pavement surface. Both conventional and contrast preformed plastic pavement markings shall only be applied when the air temperature is at least 50 °F (10 °C) and rising and the pavement temperature is at least 70 °F (21 °C). However, application of the markings will not be allowed after October 15."

Add the following paragraph after the fourth paragraph of Article 780.14 of the Standard Specifications:

"The applied line width specified for contrast pavement markings shall include both the white/yellow reflective portion and the black nonreflective portion of the marking."

Revise the first paragraph of Article 1095.03 of the Standard Specifications to read:

"**1095.03 Preformed Plastic Pavement Markings.** The material shall consist of a white or yellow (as specified) weather resistant, reflective film meeting the requirements specified herein. Where contrast markings are specified, the white or yellow reflective film shall be bordered along both the left and right edges by a 1 1/2 in. (38 mm) wide black weather resistant, nonreflective film also meeting the requirements specified herein."

Revise the table in Article 1095.03(a) of the Standard Specifications to read:

"Components	Minimum Percent By Weight	
	White or Yellow	Black
Resins and Plasticizers	20 %	20 %
Pigment and Fillers	30 %	30 %
Graded Glass Beads	25 %	- - "

Revise the first paragraph of Article 1095.03(h) of the Standard Specifications to read:

"Glass beads shall be uniformly distributed throughout the white or yellow portions of the material only. A top coating of beads shall be bonded to or directly embedded into the surface of the markings in order to produce immediate retroreflectivity."

80387

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)

Effective: September 1, 2000
Revised: April 2, 2018

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 20.00 % 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 reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the

Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

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

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

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

(c) DBE as a subcontractor: 100 percent goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subcontractor from the 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) FINAL PAYMENT. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than 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.

80029

DOWEL BAR INSERTER (BDE)

Effective: January 1, 2017
Revised: January 1, 2018

Add the following to Article 420.03 of the Standard Specifications.

"(l) Mechanical Dowel Bar Inserter .....1103.20"

Revise the first paragraph of Article 420.05(b)(1) of the Supplemental Specifications to read:

"Preformed or Drilled Holes. If applicable, the tie bars shall be installed after the dowel bars have been tested with the MIT Scan-2 device according to Article 420.05(c)(2)b.2. The tie bars shall be installed with a nonshrink grout or chemical adhesive providing a minimum pull-out strength as follows."

Revise Article 420.05(c) of the Standard Specifications to read:

"(c) Transverse Contraction Joints. Transverse contraction joints shall consist of planes of weakness created by sawing grooves in the surface of the pavement and shall include load transfer devices consisting of dowel bars. Transverse contraction joints shall be according to the following."

Revise Article 420.05(c)(2) of the Standard Specifications to read:

"(2) Dowel Bars. Dowel Bars shall be installed parallel to the centerline of the pavement and parallel to the proposed pavement surface. Installation shall be according to one of the following methods.

a. Dowel Bar Assemblies. The assembly shall act as a rigid unit with each component securely held in position relative to the other members of the assembly. The entire assembly shall be held securely in place by means of nails which shall penetrate the stabilized subbase. At least ten nails shall be used for each 10, 11, or 12 ft (3, 3.3, or 3.6 m) section of assembly.

Metal stakes shall be used instead of nails, with soil or granular subbase. The stakes shall loop over or attach to the top parallel spacer bar of the assembly and penetrate the subgrade or subbase at least 12 in. (300 mm).

At the location of each dowel bar assembly, the subgrade or subbase shall be reshaped and re-tamped when necessary.

Prior to placing concrete, any deviation of the dowel bars from the correct horizontal or vertical alignment (horizontal skew or vertical tilt) greater than 3/8 in. in 12 in (9 mm in 300 mm) shall be corrected and a light coating of oil shall be uniformly applied to all dowel bars.

Care shall be exercised in depositing the concrete at the dowel bar assemblies so the horizontal and vertical alignment will be retained.

b. Dowel Bar Insertion. The dowel bars may be placed in the pavement slab with a mechanical dowel bar inserter (DBI) attached to a formless paver for pavements ≥ 7.0 in. (175 mm) in thickness. A light coating of oil shall be uniformly applied to all dowel bars.

The DBI shall insert the dowel bars with vibration into the plastic concrete after the concrete has been struck off and consolidated without deformation of the slab. After the bars have been inserted, the concrete shall be refinished and no voids shall exist around the dowel bars. The forward movement of the paver shall not be interrupted by the inserting of the dowel bars.

The location of each row of dowel bars shall be marked in a manner to facilitate where to insert the bars, and where to saw the transverse joint.

1. Placement Tolerances for Dowel Bars. The DBI shall place the dowel bars in the concrete pavement within the following tolerances.

(a.) Longitudinal Translation (Mislocation). Longitudinal translation (mislocation) shall be defined as the position of the center of the dowel bar along the longitudinal axis, in relation to the sawed joint.

The quality control tolerance for longitudinal translation shall not exceed 2.0 in (50 mm). If this tolerance is exceeded, adjustments shall be made to the paving operation.

Any joint having two or more dowel bars with an embedment length less than 4.0 in. (100 mm) within 12 in. (300 mm) of the same wheelpath will be considered unacceptable. The left and right wheelpaths shall be determined by excluding the middle 2.5 ft (0.8 m) of the pavement lane, and by excluding the outer 1.0 ft (0.3 m) measured from each pavement lane edge. Any joint having an average dowel bar embedment length less than 5.25 in. (130 mm) will also be considered unacceptable. Embedment length shall be defined as the length of dowel bar embedded on the short side of the sawed joint. An unacceptable joint shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

(b.) Horizontal Translation (Mislocation). Horizontal translation (mislocation) shall be defined as the difference in the actual dowel bar location parallel to the longitudinal or edge joint from its theoretical position as shown on the plans.

The quality control tolerance for horizontal translation shall not exceed 2.0 in. (50 mm). If this tolerance is exceeded, adjustments shall be made to the paving operation.

Any joint having a dowel bar with a translation greater than 4.0 in. (100 mm) will be considered unacceptable, but may remain in place unless the Engineer determines the joint will not function. If the joint is unable to remain in place, the joint shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

(c.) Vertical Translation (Mislocation). Vertical translation (mislocation) shall be defined as the difference in the vertical position of the dowel bar relative to the theoretical midpoint of the slab.

The quality control tolerance for vertical translation shall be as shown in the following table. If these tolerances are exceeded, adjustments shall be made to the paving operation.

Pavement Thickness	Dowel Bar Diameter	Vertical Translation Tolerance Above Midpoint	Vertical Translation Tolerance Below Midpoint
≥7 in. to <8 in. (≥175 mm to <200 mm)	1.25 in. (31 mm)	0.25 in. (6 mm)	0.5 in. (13 mm)
≥8 in. to <9 in. (≥200 mm to <225 mm)	1.50 in. (38 mm)	0.25 in. (6 mm)	0.5 in. (13 mm)
≥9 in. to <10 in. (≥225 mm to <250 mm)	1.50 in. (38 mm)	0.75 in. (19 mm)	0.75 in. (19 mm)
≥10 in. (≥250 mm)	1.50 in. (38 mm)	0.75 in. (19 mm)	1.0 in. (25 mm)

Any joint having a dowel bar with top concrete cover less than T/3, where T is slab thickness, will be considered unacceptable. Any joint having 2 or more dowel bars with bottom concrete cover less than 2.0 in. (50 mm) will also be considered unacceptable. An unacceptable joint shall be replaced with a minimum of 6 ft (1.8 m) of pavement according to Section 442 for Class B patches.

(d.) Vertical Tilt or Horizontal Skew (Misalignment). Vertical tilt or horizontal skew (misalignment) shall be defined as the difference in position of the dowel bar ends with respect to each other. Vertical tilt is measured in the vertical axis whereas horizontal skew is measured in the horizontal axis. Misalignment shall be measured in terms of a joint score. The joint score shall be defined as the degree of misalignment evaluated for a single

transverse joint for each lane of pavement. The joint score shall be determined as follows:

$$Joint\ Score = \left(1 + \left(\frac{x}{x-n}\right)\sum_{i=1}^{x-n} W_i\right)$$

where:

W_i = weighting factor (Table 1) for dowel *i*
x = number of dowels in a single joint
n = number of dowels excluded from the joint score calculation due to measurement interference

Single Dowel Misalignment – The degree of misalignment applicable to a single dowel bar, calculated as:

$$Single\ Dowel\ Misalignment = \sqrt{(Horizontal\ Skew)^2 + (Vertical\ Tilt)^2}$$

Table 1. Weighting Factors in Joint Score Determination	
Single Dowel Bar Misalignment (SDM)	W, Weighting Factor
SDM ≤ 0.6 in. (15 mm)	0
0.6 in. (15 mm) < SDM ≤ 0.8 in. (20 mm)	2
0.8 in. (20 mm) < SDM ≤ 1 in. (25 mm)	4
1 in. (25 mm) < SDM ≤ 1.5 in. (38 mm)	5
1.5 in. (38 mm) < SDM	10

The quality control tolerance for vertical tilt or horizontal skew shall not exceed 0.6 in. (15 mm). If the tolerance is exceeded for either one, adjustments shall be made to the paving operation.

Any joint having a dowel bar with a vertical tilt or horizontal skew greater than 1.5 in. (38 mm) shall be cut. If more than one dowel bar is required to be cut in the joint, the joint will be considered unacceptable and shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

Single dowel bar misalignment shall be controlled to provide the joint scores shown in the following table.

Number of Dowel Bars in the Joint	Maximum Joint Score
< 5	4
≥ 5 but ≤ 9	8
> 9	12

A joint score greater than the specified maximum will be considered locked. Three consecutive joints with a score greater than the specified maximum total score will all be considered unacceptable.

Three consecutive locked joints shall be corrected by selecting one joint and cutting a dowel bar. Preference shall be given to cutting a dowel bar within the middle 2.5 ft (0.8 m) of the pavement lane to avoid the wheelpaths. If none of the three locked joints will have a joint score less than or equal to the specified maximum after selecting one dowel bar to cut, one of the joints shall be replaced with a minimum of 6 ft (1.8 m) of pavement centered over the joint according to Section 442 for Class B patches.

(e.) For unacceptable work, the Contractor may propose alternative repairs for consideration by the Engineer.

2. Testing of Dowel Bar Placement. The placement of the dowel bars shall be tested within 24 hours of paving with a calibrated MIT Scan-2 device according to "Use of Magnetic Tomography Technology to Evaluate Dowel Placement" (Publication No. FHWA-IF-06-006) by the Federal Highway Administration.

   A trained operator shall perform the testing, and all testing shall be performed in the presence of the Engineer. The device shall be calibrated to the type and size dowel bar used in the work according to the manufacturer's instructions. Calibration documentation shall be provided to the Engineer prior to construction. The device shall be recalibrated and/or validate readings as required by the Engineer. The device may be utilized as a process control and make necessary adjustments to ensure the dowel bars are placed in the correct location.

   (a.) Test Section. Prior to start of production paving, a test section consisting of 30 transverse joints shall be constructed. The test section may be performed on the actual pavement, but production paving shall not begin until an acceptable test section has been constructed. The test section will be considered acceptable when all of the following are met:

      (1.) 90 percent of the dowel bars meet the quality control tolerance for longitudinal, horizontal, or vertical translation (mislocation);

      (2.) 90 percent of the dowel bars meet the quality control tolerance for vertical tilt or horizontal skew deviation (misalignment); and

      (3.) none of the joints are considered unacceptable prior to a corrective measure for mislocation or misalignment.

If the test section fails, another test section consisting of 30 joints shall be constructed.

The test section requirement may be waived by the Engineer if the Contractor has constructed an acceptable test section and successfully used the DBI on a Department contract within the same calendar year.

(b.) Production Paving. After the test section is approved, production paving may begin. The mislocation and misalignment of each dowel bar for the first ten joints constructed, and every tenth joint thereafter, shall be tested.

If two consecutive days of paving result in 5 percent or more of the joints on each day being unacceptable prior to a corrective measure, production paving shall be discontinued and a new test section shall be constructed.

If any joint is found to be unacceptable prior to a corrective measure, testing of additional joints on each side of the unacceptable joint shall be performed until acceptable joints are found.

(c.) Test Report. Test reports shall be provided to the Engineer within two working days of completing each day's testing. The test report shall include the following.

(1.) Contract number, placement date, county-route-section, direction of traffic, scan date, Contractor, and name of individual performing the tests.

(2.) Provide the standard report generated from the on-board printer of the imaging technology used for every dowel and joint measured.

(3.) For every dowel measured, provide the joint identification number, lane number and station, dowel bar number or x-location, direction of testing and reference joint location/edge location, longitudinal translation, horizontal translation, vertical translation, vertical tilt, and horizontal skew.

(4.) Identify each dowel bar with a maximum longitudinal, horizontal, or vertical translation that has been exceeded. Identify each dowel bar with a maximum vertical tilt or horizontal skew deviation that has been exceeded.

(5.) Joint Score Details: Provide the joint identification number, lane number, station, and calculated joint score for each joint.

(6.) Locked Joint Identification: Identify each joint where the maximum joint score is exceeded.

(d.) Exclusions. Exclude the following from dowel bar mislocation and misalignment measurements.

(1.) Transverse construction joints (headers).

(2.) Dowel bars within 24 in. (610 mm) of metallic manholes, inlets, metallic castings, or other nearby or underlying steel reinforced objects.

(3.) The outside dowel bar when tie bars are installed with mechanical equipment in fresh concrete. For tie bar installations involving preformed or drilled holes, installation of the tie bar shall be performed after testing with the MIT Scan-2 device.

(4.) Joints located directly under high voltage power lines.

(5.) Subject to the approval of the Engineer, any other contributors to magnetic interference.

(e.) Deficiency Deduction. When the Contractor has cut 25 dowel bars to correct unacceptable joints, the Contractor shall be liable and shall pay to the Department a deficiency deduction of $500.00 for the cost of the bars. Thereafter, an additional deficiency deduction of $20.00 for each additional bar cut will be assessed."

Add the following to Section 1103 of the Standard Specifications.

"**1103.20 Mechanical Dowel Bar Inserter.** The mechanical dowel bar inserter (DBI) shall be self-contained and supported on the formless paver with the ability to move separately from the paver. The DBI shall be equipped with insertion forks along with any other devices necessary for finishing the concrete the full width of the pavement. The insertion forks shall have the ability to vibrate at a minimum frequency of 3000 VPM."

80378

EQUIPMENT PARKING AND STORAGE (BDE)

Effective: November 1, 2017

Replace the first paragraph of Article 701.11 of the Standard Specifications with the following.

"**701.11 Equipment Parking and Storage.** During working hours, all vehicles and/or nonoperating equipment which are parked, two hours or less, shall be parked at least 8 ft (2.5 m) from the open traffic lane. For other periods of time during working and for all nonworking hours, all vehicles, materials, and equipment shall be parked or stored as follows.

(a) When the project has adequate right-of-way, vehicles, materials, and equipment shall be located a minimum of 30 ft (9 m) from the pavement.

(b) When adequate right-of-way does not exist, vehicles, materials, and equipment shall be located a minimum of 15 ft (4.5 m) from the edge of any pavement open to traffic.

(c) Behind temporary concrete barrier, vehicles, materials, and equipment shall be located a minimum of 24 in. (600 mm) behind free standing barrier or a minimum of 6 in. (150 mm) behind barrier that is either pinned or restrained according to Article 704.04. The 24 in. or 6 in. measurement shall be from the base of the non-traffic side of the barrier.

(d) Behind other man-made or natural barriers meeting the approval of the Engineer."

80388

FUEL COST ADJUSTMENT (BDE)

Effective: April 1, 2009
Revised: August 1, 2017

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

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

(a) Categories of Work.

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

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

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

(4) Category D: Portland Cement Concrete (PCC) Bases, Pavements and Shoulders. Contract pay items constructed under Sections 353, 420, 421 and 483 including any

modified standard or nonstandard items where the character of the work to be performed is considered PCC base, pavement or shoulder. The cumulative total of all applicable item plan quantities shall exceed 7500 sq yd (6000 sq m). Included in the fuel usage factor is 1.20 gal/cu yd (5.94 liters/cu m) factor for trucking.

(5) Category E: Structures. Structure items having a cumulative bid price that exceeds $250,000 for pay items constructed under Sections 502, 503, 504, 505, 512, 516 and 540 including any modified standard or nonstandard items where the character of the work to be performed is considered structure work when similar to that performed under these sections and not included in categories A through D.

(b) Fuel Usage Factors.

English Units

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

Metric Units

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

(c) Quantity Conversion Factors.

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

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

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

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

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

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

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

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

80229

GROOVING FOR RECESSED PAVEMENT MARKINGS (BDE)

Effective: November 1, 2012
Revised: November 1, 2017

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) Preformed Plastic Pavement Marking 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 2 in. (50 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 10 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."

80304

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%"

80246

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."

80376

LIGHTS ON BARRICADES (BDE)

Effective: January 1, 2018

Revise Article 701.16 of the Standard Specifications to read:

"**701.16 Lights.** Lights shall be used on devices as required in the plans, the traffic control plan, and the following table.

Circumstance	Lights Required
Daylight operations	None
First two warning signs on each approach to the work involving a nighttime lane closure and "ROUGH GROOVED SURFACE" (W8-I107) signs	Flashing mono-directional lights
Devices delineating isolated obstacles, excavations, or hazards at night (Does not apply to patching)	Flashing bi-directional lights
Devices delineating obstacles, excavations, or hazards exceeding 100 ft (30 m) in length at night (Does not apply to widening)	Steady burn bi-directional lights
Channelizing devices for nighttime lane closures on two-lane roads	None
Channelizing devices for nighttime lane closures on multi-lane roads	None
Channelizing devices for nighttime lane closures on multi-lane roads separating opposing directions of traffic	None
Channelizing devices for nighttime along lane shifts on multilane roads	Steady burn mono-directional lights
Channelizing devices for night time along lane shifts on two lane roads	Steady burn bi-directional lights
Devices in nighttime lane closure tapers on Standards 701316 and 701321	Steady burn bi-directional lights
Devices in nighttime lane closure tapers	Steady burn mono-directional lights
Devices delineating a widening trench	None
Devices delineating patches at night on roadways with an ADT less than 25,000	None
Devices delineating patches at night on roadways with an ADT of 25,000 or more	None

Batteries for the lights shall be replaced on a group basis at such times as may be specified by the Engineer."

Delete the fourth sentence of the first paragraph of Article 701.17(c)(2) of the Standard Specifications.

Revise the first paragraph of Article 603.07 of the Standard Specifications to read:

"**603.07 Protection Under Traffic.** After the casting has been adjusted and Class SI concrete has been placed, the work shall be protected by a barricade for at least 72 hours."

80392

MANHOLES, VALVE VAULTS, AND FLAT SLAB TOPS (BDE)

Effective: January 1, 2018
Revised: March 2, 2018

Description. Manholes, valve vaults, and flat slab tops manufactured according to the current or previous Highway Standards listed below will be accepted on this contract:

Product	Current Standard	Previous Standard
Precast Manhole Type A, 4' (1.22 m) Diameter	602401-04	602401-03
Precast Manhole Type A, 5' (1.52 m) Diameter	602402	602401-03
Precast Manhole Type A, 6' (1.83 m) Diameter	602406-08	602406-07
Precast Manhole Type A, 7' (2.13 m) Diameter	602411-06	602411-05
Precast Manhole Type A, 8' (2.44 m) Diameter	602416-06	602416-05
Precast Manhole Type A, 9' (2.74 m) Diameter	602421-06	602421-05
Precast Manhole Type A, 10' (3.05 m) Diameter	602426	n/a
Precast Valve Vault Type A, 4' (1.22 m) Diameter	602501-03	602501-02
Precast Valve Vault Type A, 5' (1.52 m) Diameter	602506	602501-02
Precast Reinforced Concrete Flat Slab Top	602601-05	602601-04

When manufacturing to the current standards, the following revisions to the Standard Specifications shall apply:

Revise Article 602.02(g) of the Standard Specifications to read:

"(g) Structural Steel (Note 4) 1006.04

Note 4. All components of the manhole joint splice shall be galvanized according to the requirements of AASHTO M 111 or M 232 as applicable."

Add the following to Article 602.02 of the Standard Specifications:

"(s) Anchor Bolts and Rods (Note 5) 1006.09

Note 5. The threaded rods for the manhole joint splice shall be according to the requirements of ASTM F 1554, Grade 55, (Grade 380)."

Add the following paragraph after the first paragraph of Article 602.07 of the Standard Specifications:

"Threaded rods connecting precast sections shall be brought to a snug tight condition."

Revise the second paragraph of Article 1042.10 of the Standard Specifications to read:

"Catch basin Types A, B, C, and D; Manhole Type A; Inlet Types A and B; Drainage Structures Types 1, 2, 3, 4, 5, and 6; Valve Vault Type A; and reinforced concrete flat slab top

(Highway Standard 602601) shall be according to AASHTO M 199 (M 199M), except the minimum wall thickness shall be 3 in. (75 mm). Additionally, catch basins, inlets, and drainage structures shall have a minimum concrete compressive strength of 4500 psi (31,000 kPa) at 28 days and manholes, valve vaults, and reinforced concrete flat slab tops shall have a minimum concrete compressive strength of 5000 psi (34,500 kPa) at 28 days."

80393

PAVEMENT MARKING REMOVAL (BDE)

Effective: July 1, 2016

Revise Article 783.02 of the Standard Specifications to read:

"**783.02 Equipment.** Equipment shall be according to the following.

Item	Article/Section
(a) Grinders (Note 1)	
(b) Water Blaster with Vacuum Recovery	1101.12

Note 1. Grinding equipment shall be approved by the Engineer."

Revise the first paragraph of Article 783.03 of the Standard Specifications to read:

"**783.03 Removal of Conflicting Markings.** Existing pavement markings that conflict with revised traffic patterns shall be removed. If darkness or inclement weather prohibits the removal operations, such operations shall be resumed the next morning or when weather permits. In the event of removal equipment failure, such equipment shall be repaired, replaced, or leased so removal operations can be resumed within 24 hours."

Revise the first and second sentences of the first paragraph of Article 783.03(a) of the Standard Specifications to read:

"The existing pavement markings shall be removed by the method specified and in a manner that does not materially damage the surface or texture of the pavement or surfacing. Small particles of tightly adhering existing markings may remain in place, if in the opinion of the Engineer, complete removal of the small particles will result in pavement surface damage."

Revise the first paragraph of Article 783.04 of the Standard Specifications to read:

"**783.04 Cleaning.** The roadway surface shall be cleaned of debris or any other deleterious material by the use of compressed air or water blast."

Revise the first paragraph of Article 783.06 of the Standard Specifications to read:

"**783.06 Basis of Payment.** This work will be paid for at the contract unit price per each for RAISED REFLECTIVE PAVEMENT MARKER REMOVAL, or at the contract unit price per square foot (square meter) for PAVEMENT MARKING REMOVAL – GRINDING and/or PAVEMENT MARKING REMOVAL – WATER BLASTING."

Delete Article 1101.13 from the Standard Specifications.

80371

PAYMENTS TO SUBCONTRACTORS (BDE)

Effective: November 2, 2017

Add the following to the end of the fourth paragraph of Article 109.11 of the Standard Specifications:

"If reasonable cause is asserted, written notice shall be provided to the applicable subcontractor and/or material supplier and the Engineer within five days of the Contractor receiving payment. The written notice shall identify the contract number, the subcontract or material purchase agreement, a detailed reason for refusal, the value of payment being withheld, and the specific remedial actions required of the subcontractor and/or material supplier so that payment can be made."

80390

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."

80377

PORTLAND CEMENT CONCRETE (BDE)

Effective: November 1, 2017

Revise the Air Content % of Class PP Concrete in Table 1 Classes of Concrete and Mix Design Criteria in Article 1020.04 of the Standard Specifications to read:

"TABLE 1. CLASSES OF CONCRETE AND MIX DESIGN CRITERIA		
Class of Conc.	Use	Air Content %
PP	Pavement Patching Bridge Deck Patching (10)	
	PP-1	4.0 - 8.0"
	PP-2	
	PP-3	
	PP-4	
	PP-5	

Revise Note (4) at the end of Table 1 Classes of Concrete and Mix Design Criteria in Article 1020.04 of the Standard Specifications to read:

"(4) For all classes of concrete, the maximum slump may be increased to 7 in (175 mm) when a high range water-reducing admixture is used. For Class SC, the maximum slump may be increased to 8 in. (200 mm). For Class PS, the maximum slump may be increased to 8 1/2 in. (215 mm) if the high range water-reducing admixture is the polycarboxylate type."

80389

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."

80385

PROGRESS PAYMENTS (BDE)

Effective: November 2, 2013

Revise Article 109.07(a) of the Standard Specifications to read:

"(a) Progress Payments. At least once each month, the Engineer will make a written estimate of the quantity of work performed in accordance with the contract, and the value thereof at the contract unit prices. The amount of the estimate approved as due for payment will be vouchered by the Department and presented to the State Comptroller for payment. No amount less than $1000.00 will be approved for payment other than the final payment.

Progress payments may be reduced by liens filed pursuant to Section 23(c) of the Mechanics' Lien Act, 770 ILCS 60/23(c).

If a Contractor or subcontractor has defaulted on a loan issued under the Department's Disadvantaged Business Revolving Loan Program (20 ILCS 2705/2705-610), progress payments may be reduced pursuant to the terms of that loan agreement. In such cases, the amount of the estimate related to the work performed by the Contractor or subcontractor, in default of the loan agreement, will be offset, in whole or in part, and vouchered by the Department to the Working Capital Revolving Fund or designated escrow account. Payment for the work shall be considered as issued and received by the Contractor or subcontractor on the date of the offset voucher. Further, the amount of the offset voucher shall be a credit against the Department's obligation to pay the Contractor, the Contractor's obligation to pay the subcontractor, and the Contractor's or subcontractor's total loan indebtedness to the Department. The offset shall continue until such time as the entire loan indebtedness is satisfied. The Department will notify the Contractor and Fund Control Agent in a timely manner of such offset. The Contractor or subcontractor shall not be entitled to additional payment in consideration of the offset.

The failure to perform any requirement, obligation, or term of the contract by the Contractor shall be reason for withholding any progress payments until the Department determines that compliance has been achieved."

80328

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."

80340

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:

$SCA = Q \times D$

Where: SCA = steel cost adjustment, in dollars
Q = quantity of steel incorporated into the work, in lb (kg)
D = price factor, in dollars per lb (kg)

$D = MPI_M - MPI_L$

Where: MPI_M = The Materials Cost Index for steel as published by the Engineering News-Record for the month the steel is shipped from the mill. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

MPI_L = The Materials Cost Index for steel as published by the Engineering News-Record for the month prior to the letting for work paid for at the contract price; or for the month the agreed unit price letter is submitted by the Contractor for extra work paid for by agreed unit price,. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

The unit weights (masses) of steel that will be used to calculate the steel cost adjustment for the various items are shown in the attached table.

No steel cost adjustment will be made for any products manufactured from steel having a mill shipping date prior to the letting date.

If the Contractor fails to provide the required documentation, the method of adjustment will be calculated as described above; however, the MPI_M will be based on the date the steel arrives at the job site. In this case, an adjustment will only be made when there is a decrease in steel costs.

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

$$\text{Percent Difference} = \{(MPI_L - MPI_M) \div MPI_L\} \times 100$$

Steel cost adjustments will be calculated by the Engineer and will be paid or deducted when all other contract requirements for the items of work are satisfied. Adjustments will only be made for fluctuations in the cost of the steel as described herein. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, storage, etc.

The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

Attachment

Item	Unit Mass (Weight)
Metal Piling (excluding temporary sheet piling)	
Furnishing Metal Pile Shells 12 in. (305 mm), 0.179 in. (3.80 mm) wall thickness)	23 lb/ft (34 kg/m)
Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness)	32 lb/ft (48 kg/m)
Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness)	37 lb/ft (55 kg/m)
Other piling	See plans
Structural Steel	See plans for weights (masses)
Reinforcing Steel	See plans for weights (masses)
Dowel Bars and Tie Bars	6 lb (3 kg) each
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)

80127

SUBCONTRACTOR AND DBE PAYMENT REPORTING (BDE)

Effective: April 2, 2018

Add the following to Section 109 of the Standard Specifications.

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

(a) first tier subcontractors;

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

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

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

80397

SUBCONTRACTOR MOBILILATION PAYMENTS (BDE)

Effective: November 2, 2017

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

"This mobilization payment shall be made at least 14 days prior to the subcontractor starting work. The amount paid shall be at the following percentage of the amount of the subcontract reported on form BC 260A submitted for the approval of the subcontractor's work.

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

80391

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."

80298

TRAINING SPECIAL PROVISIONS (BDE) 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 6 . 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 will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

METHOD OF MEASUREMENT The unit of measurement is in hours.

BASIS OF PAYMENT This work will be paid for at the contract unit price of 80 cents per hour for TRAINEES. The estimated total number of hours, unit price and total price have been included in the schedule of prices.

20338

TRAVERSABLE PIPE GRATE FOR CONCRETE END SECTIONS (BDE)

Effective: January 1, 2013
Revised: January 1, 2018

Description. This work shall consist of constructing a traversable pipe grate on a concrete end section.

Materials. Materials shall be according to the following Articles of Division 1000 – Materials of the Standard Specifications.

Item	Article/Section
(a) Traversable Pipe Grate Components (Note 1)	
(b) Chemical Adhesive Resin System	1027
(c) High Strength Steel Bolts, Nuts, and Washers (Note 2)	1006.08

Note 1. All steel pipe shall be according to ASTM A 53 (Type E or S), Grade B, or ASTM A 500 Grade B, standard weight (SCH. 40). Structural steel shapes and plates shall be according to AASHTO M270 Grade 50 (M 270M Grade 345) and the requirements of Article 1006.04 of the Standard Specifications. All steel components of the grating system shall be galvanized according to AASHTO M 111 or ASTM F 2329 as applicable.

Anchor rods shall be according to ASTM F 1554, Grade 36 (Grade 250).

Note 2. Threaded rods conforming to the requirements of ASTM F 1554, Grade 105 (Grade 725) may be used for the thru bolts.

CONSTRUCTION REQUIREMENTS

Fabrication of the traversable pipe grate shall be according to the requirements of Section 505 of the Standard Specifications and as shown on the plans.

Anchor rods shall be set according to Article 509.06 of the Standard Specifications. Bolts and anchor rods shall be snug tightened by a few impacts of an impact wrench or the full force of a worker using an ordinary spud wrench. Thru bolts shall be snug tightened and shall be brought to a snug tight condition followed by an additional 2/3 turn on one of the nuts. Match marks shall be provided on the bolt and nut to verify relative rotation between the bolt and the nut.

Splicing of pipes shall be made by utilizing full penetration butt welds according to Article 505.04(q) of the Standard Specifications. In lieu of welding, bolted or sleeve type splices may be utilized, provided the splices are located over intermediate supports with no more than one splice per pipe run with the exception that no splice may occur in pipe runs under 30 ft (9 m) in length.

Method of Measurement. This work will be measured for payment in place in feet (meters). The length measured shall be along the pipe grate elements from end to end for both longitudinal and intermediate support pipes.

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for TRAVERSABLE PIPE GRATE FOR CONCRETE END SECTION.

80318

WARM MIX ASPHALT (BDE)

Effective: January 1, 2012
Revised: April 1, 2016

Description. This work shall consist of designing, producing and constructing Warm Mix Asphalt (WMA) in lieu of Hot Mix Asphalt (HMA) at the Contractor's option. Work shall be according to Sections 406, 407, 408, 1030, and 1102 of the Standard Specifications, except as modified herein. In addition, any references to HMA in the Standard Specifications, or the special provisions shall be construed to include WMA.

WMA is an asphalt mixture which can be produced at temperatures lower than allowed for HMA utilizing approved WMA technologies. WMA technologies are defined as the use of additives or processes which allow a reduction in the temperatures at which HMA mixes are produced and placed. WMA is produced by the use of additives, a water foaming process, or combination of both. Additives include minerals, chemicals or organics incorporated into the asphalt binder stream in a dedicated delivery system. The process of foaming injects water into the asphalt binder stream, just prior to incorporation of the asphalt binder with the aggregate.

Approved WMA technologies may also be used in HMA provided all the requirements specified herein, with the exception of temperature, are met. However, asphalt mixtures produced at temperatures in excess of 275 °F (135 °C) will not be considered WMA when determining the grade reduction of the virgin asphalt binder grade.

Equipment.

Revise the first paragraph of Article 1102.01 of the Standard Specifications to read:

"**1102.01 Hot-Mix Asphalt Plant.** The hot-mix asphalt (HMA) plant shall be the batch-type, continuous-type, or dryer drum plant. The plants shall be evaluated for prequalification rating and approval to produce HMA according to the current Bureau of Materials and Physical Research Policy Memorandum, "Approval of Hot-Mix Asphalt Plants and Equipment". Once approved, the Contractor shall notify the Bureau of Materials and Physical Research to obtain approval of all plant modifications. The plants shall not be used to produce mixtures concurrently for more than one project or for private work unless permission is granted in writing by the Engineer. The plant units shall be so designed, coordinated and operated that they will function properly and produce HMA having uniform temperatures and compositions within the tolerances specified. The plant units shall meet the following requirements."

Add the following to Article 1102.01(a) of the Standard Specifications.

"(11) Equipment for Warm Mix Technologies.

a. Foaming. Metering equipment for foamed asphalt shall have an accuracy of ± 2 percent of the actual water metered. The foaming control system shall be electronically interfaced with the asphalt binder meter.

b. Additives. Additives shall be introduced into the plant according to the supplier's recommendations and shall be approved by the Engineer. The system for introducing the WMA additive shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes."

Mix Design Verification.

Add the following to Article 1030.04 of the Standard Specifications.

"(e) Warm Mix Technologies.

(1) Foaming. WMA mix design verification will not be required when foaming technology is used alone (without WMA additives). However, the foaming technology shall only be used on HMA designs previously approved by the Department.

(2) Additives. WMA mix designs utilizing additives shall be submitted to the Engineer for mix design verification."

Construction Requirements.

Revise the second paragraph of Article 406.06(b)(1) of the Standard Specifications to read:

"The HMA shall be delivered at a temperature of 250 to 350 °F (120 to 175 °C). WMA shall be delivered at a minimum temperature of 215 °F (102 °C)."

Basis of Payment.

This work will be paid at the contract unit price bid for the HMA pay items involved. Anti-strip will not be paid for separately, but shall be considered as included in the cost of the work.

80288

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012
Revised: April 2, 2015

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

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

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

80302

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.

WEEP HOLE DRAINS FOR ABUTMENTS, WINGWALLS, RETAINING WALLS AND CULVERTS
Effective: April 19, 2012
Revised: October 22, 2013

Delete the last paragraphs of Articles 205.05 and 502.10 and replace with the following.

"If a geocomposite wall drain according to Section 591 is not specified, a prefabricated geocomposite strip drain according to Section 1040.07 shall be placed at the back of each drain hole. The strip drain shall be 24 inches (600 mm) wide and 48 inches (1.220 m) tall. The strip drain shall be centered over the drain hole with the bottom located 12 inches (300 mm) below the bottom of the drain hole. All form boards or other obstructions shall be removed from the drain holes before placing any geocomposite strip drain."

Revise the last sentence of the first paragraph of Article 503.11 to read as follows.

"Drain holes shall be covered to prevent the leakage of backfill material according to Article 502.10."

Revise the title of Article 1040.07 to Geocomposite Wall Drains and Strip Drains.

MEMBRANE WATERPROOFING SYSTEM FOR BURIED STRUCTURES
Effective: October 4, 2016
Revised: April 13, 2018

Description. This work shall consist of furnishing and placing a membrane waterproofing system on the top slab and sidewalls, or portions thereof, for buried structures as detailed on the contract plans.

All membrane waterproofing systems shall be supplied by qualified producers. The Department will maintain a list of qualified producers.

Materials. The materials used in the waterproofing system shall consist of the following.

(a) Cold-applied, self-adhering rubberized asphalt/polyethylene membrane sheet with the following properties:

Physical Properties	
Thickness ASTM D 1777 or D 3767	60 mils (1.500 mm) min.
Width	36 inches (914 mm) min.
Tensile Strength, Membrane ASTM D 412 (Die C)	325 lb./in^2 (2240 kPa) min.
Tensile Strength, Film ASTM D 882	5000 lb./in^2 (34.5 MPa) min.
Elongation (Ultimate Failure of Rubberized Asphalt) ASTM D 412	300% min.
Pliability [180° bend over 1" inch (25 mm) mandrel @ -20 °F (-29 °C)] ASTM D 146 (Modified) or D1970	No Effect
Puncture Resistance-Membrane ASTM E 154	40 lb. (178 N) min.
Permeability (Perms) ASTM E 96, Method B	0.1 max.
Water Absorption (% by Weight) ASTM D 570	0.2 max.
Peel Strength ASTM D 903	9 lb./in (1576 N/m) min.

(b) Protective geocomposite drainage sheet composed of a woven monofilament or nonwoven geotextile fabric bonded to a dimpled/ridged drainage core with a smooth backing film providing cushioning for the membrane sheet. The protective drainage sheet shall be suitable for horizontal applications with heavy loads and vehicular traffic with the following properties:

Physical Properties	
Core	
Compressive Strength ASTM D 1621	18,000 (862 kPa) psf Min.
Flow Rate ASTM D 4716	17 gal/min./ft. (211 L/min./m^2) min.
Geotextile Fabric	
Woven Monofilament Fabric	
Water Flow Rate ASTM D 4491	145 gal/min./ft2 (5907 L/Min./m min.
Grab tensile Strength ASTM D 4632 (MARV - Weakest Principal Direction)	200 lb. (890 N) min.
CBR Puncture Strength ASTM D 6241 (MARV)	675 lb. (3004 N) min
Apparent Opening Size	Sieve No. 40 (0.430 mm) or Smaller Opening
Nonwoven fabric	
Water Flow Rate ASTM D 4491	90 gal/min./ft2 (3668 L/Min./m min
Grab tensile Strength ASTM D 4632 (MARV – Weakest Principal Direction)	205 lb. (912 N) min.
CBR Puncture Strength ASTM D 6241 (MARV)	500 lb. (2224 N) min
Apparent Opening Size	Sieve No. 80 (0.180 mm) or Smaller Opening

(c) Ancillary Materials: Adhesives, Conditioners, Primers, Mastic, Two-Part Liquid Membranes, and Sealing Tapes as required by the manufacturer for use with the respective membrane waterproofing system.

Construction. The areas requiring waterproofing shall be prepared and the waterproofing shall be installed in accordance with the manufacturer's instructions. The Contractor shall not install any part of a membrane waterproofing system in wet conditions, or if the ambient or concrete surface temperature is below 40° (4° C), unless allowed by the Engineer.

Surfaces to be waterproofed shall be smooth and free from projections which might damage the membrane sheet. Projections or depressions on the surface that may cause damage to the membrane shall be removed or filled as directed by the Engineer. The surface shall be power washed and cleaned of dust, dirt, grease, and loose particles, and shall be dry before the waterproofing is applied.

The Contractor shall uniformly apply primer to the entire area to be waterproofed, at the rate stated in the manufacturer's instructions, by brush, or roller. The Contractor shall brush out primer that tends to puddle in low spots to allow complete drying. The primer shall be cured according to the manufacturer's instructions. Primed areas shall not stand uncovered overnight. If membrane sheets are not placed over primer within the time recommended by the manufacturer, the Contractor shall recoat the surfaces at no additional cost to the Department.

The installation of the membrane sheet to primed surfaces shall be such that all joints are shingled to shed water by commencing from the lowest elevation of the buried structure's top slab and progress towards the highest elevation. The membrane sheets shall be overlapped as required by the manufacturer. The Contractor shall seal with mastic any laps that were not thoroughly sealed. The membrane shall be smooth and free of wrinkles and there shall be no depressions in horizontal surfaces of the finished waterproofing. After placement, exposed edges of membrane sheets shall be sealed with a troweled bead of a manufacturer's recommended mastic, or two-part liquid membrane, or with sealing tape.

The Contractor shall install protective geocomposite drainage sheet after application of the membrane sheet per the manufacturer's instructions.

Sealing bands at joints between precast segments shall be installed prior to the waterproofing system being applied. Where the waterproofing system and sealing band overlap, the installation shall be planned such that water will not be trapped or directed underneath the membrane or sealing band.

Care shall be taken to protect and to prevent damage to the waterproofing system prior to and during backfilling operations. The waterproofing system shall be removed as required for the installation of slab mounted guardrails and other appurtenances. After the installation is complete, the system shall be repaired and sealed against water intrusion according to the manufacturer's instructions and to the satisfaction of the Engineer.

Replace the last paragraph of Article 540.06 Precast Concrete Box Culverts and replace with:

> Handling holes shall be filled with a polyethylene plug. The plug shall not project beyond the inside surface after installation nor project above the outside surface to the extent that may cause damage to the membrane. When metal lifting inserts are used, their sockets shall be filled with mastic or mortar compatible with the membrane.

Method of Measurement. The waterproofing system will be measured in place, in square yards (square meters) of the concrete surface to be waterproofed.

Basis of Payment. This will work will be paid for at the contract unit price, per square yard (square meter) for MEMBRANE WATERPROOFING SYSTEM FOR BURIED STRUCTURES.

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Governmentwide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection

for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each

classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

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

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

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

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

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

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

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

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

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

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

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

* * * * *

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

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

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

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

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

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

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

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

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

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

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

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

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

Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

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

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

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

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

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

* * * * *

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

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

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

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

Contract Provision - Cargo Preference Requirements

In accordance with Title 46 CFR § 381.7 (b), the contractor agrees—

"(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract."

Provisions (1) and (2) apply to materials or equipment that are acquired solely for the project. The two provisions do not apply to goods or materials that come into inventories independent of the project, such as shipments of Portland cement, asphalt cement, or aggregates, when industry suppliers and contractors use these materials to replenish existing inventories.

MINIMUM WAGES FOR FEDERAL AND FEDERALLY ASSISTED CONSTRUCTION CONTRACTS

This project is funded, in part, with Federal-aid funds and, as such, is subject to the provisions of the Davis-Bacon Act of March 3, 1931, as amended (46 Sta. 1494, as amended, 40 U.S.C. 276a) and of other Federal statutes referred to in a 29 CFR Part 1, Appendix A, as well as such additional statutes as may from time to time be enacted containing provisions for the payment of wages determined to be prevailing by the Secretary of Labor in accordance with the Davis-Bacon Act and pursuant to the provisions of 29 CFR Part 1. The prevailing rates and fringe benefits shown in the General Wage Determination Decisions issued by the U.S. Department of Labor shall, in accordance with the provisions of the foregoing statutes, constitute the minimum wages payable on Federal and federally assisted construction projects to laborers and mechanics of the specified classes engaged on contract work of the character and in the localities described therein.

General Wage Determination Decisions, modifications and supersedes decisions thereto are to be used in accordance with the provisions of 29 CFR Parts 1 and 5. Accordingly, the applicable decision, together with any modifications issued, must be made a part of every contract for performance of the described work within the geographic area indicated as required by an applicable DBRA Federal prevailing wage law and 29 CFR Part 5. The wage rates and fringe benefits contained in the General Wage Determination Decision shall be the minimum paid by contractors and subcontractors to laborers and mechanics.