

# 65

**Letting August 3, 2018**

## **Notice to Bidders, Specifications and Proposal**



**Illinois Department  
of Transportation**

**Springfield, Illinois 62764**

**Contract No. 61E29  
COOK County  
Section 14-00115-00-PV (Schaumburg)  
Route FAU 2582 (Plum Grove Road)  
Project 3JJ1-866 ()  
District 1 Construction Funds**

Prepared by

Checked by

F

(Printed by authority of the State of Illinois)



## NOTICE TO BIDDERS

- 1. TIME AND PLACE OF OPENING BIDS.** Electronic bids are to be submitted to the electronic bidding system (iCX-Integrated Contractors Exchange). All bids must be submitted to the iCX system prior to 10:00 a.m. August 3, 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. 61E29  
COOK County  
Section 14-00115-00-PV (Schaumburg)  
Project 3JJ1-866 ()  
Route FAU 2582 (Plum Grove Road)  
District 1 Construction Funds**

**Roadway reconstruction with traffic signal installation/replacement on Plum Grove Road, from IL 72 (Higgins Road) to IL 58 (Golf Road) in the Village of Schaumburg.**

- 3. INSTRUCTIONS TO BIDDERS.** (a) This Notice, the invitation for bids, proposal and letter of award shall, together with all other documents in accordance with Article 101.09 of the Standard Specifications for Road and Bridge Construction, become part of the contract. Bidders are cautioned to read and examine carefully all documents, to make all required inspections, and to inquire or seek explanation of the same prior to submission of a bid.  
  
(b) State law, and, if the work is to be paid wholly or in part with Federal-aid funds, Federal law requires the bidder to make various certifications as a part of the proposal and contract. By execution and submission of the proposal, the bidder makes the certification contained therein. A false or fraudulent certification shall, in addition to all other remedies provided by law, be a breach of contract and may result in termination of the contract.
- 4. AWARD CRITERIA AND REJECTION OF BIDS.** This contract will be awarded to the lowest responsive and responsible bidder considering conformity with the terms and conditions established by the Department in the rules, Invitation for Bids and contract documents. The issuance of plans and proposal forms for bidding based upon a prequalification rating shall not be the sole determinant of responsibility. The Department reserves the right to determine responsibility at the time of award, to reject any or all proposals, to readvertise the proposed improvement, and to waive technicalities.

By Order of the  
Illinois Department of Transportation

Randall S. Blankenhorn,  
Secretary

INDEX  
FOR  
SUPPLEMENTAL SPECIFICATIONS  
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 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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## BDE SPECIAL PROVISIONS

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

<u>File Name</u>	<u>Pg.</u>	<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80099		Accessible Pedestrian Signals (APS)	April 1, 2003	Jan. 1, 2014
80382	280	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		Bituminous Materials Cost Adjustments	Nov. 2, 2006	Aug. 1, 2017
80241		Bridge Demolition Debris	July 1, 2009	
50261		Building Removal-Case I (Non-Friable and Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50481		Building Removal-Case II (Non-Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50491		Building Removal-Case III (Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50531		Building Removal-Case IV (No Asbestos)	Sept. 1, 1990	April 1, 2010
80366	282	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	283	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		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	287	X Construction Air Quality – Diesel Retrofit	June 1, 2010	Nov. 1, 2014
80387		Contrast Preformed Plastic Pavement Marking	Nov. 1, 2017	
* 80029	290	X Disadvantaged Business Enterprise Participation	Sept. 1, 2000	April 2, 2018
80378		Dowel Bar Inserter	Jan. 1, 2017	Jan. 1, 2018
80388	301	X Equipment Parking and Storage	Nov. 1, 2017	
80229		Fuel Cost Adjustment	April 1, 2009	Aug. 1, 2017
80304		Grooving for Recessed Pavement Markings	Nov. 1, 2012	Nov. 1, 2017
* 80246	302	X Hot-Mix Asphalt – Density Testing of Longitudinal Joints	Jan. 1, 2010	Aug. 1, 2018
* 80398		Hot-Mix Asphalt – Longitudinal Joint Sealant	Aug. 1, 2018	
* 80399	304	X Hot-Mix Asphalt – Oscillatory Roller	Aug. 1, 2018	
* 80347		Hot-Mix Asphalt – Pay for Performance Using Percent Within Limits - Jobsite Sampling	Nov. 1, 2014	Aug. 1, 2018
80383		Hot-Mix Asphalt – Quality Control for Performance	April 1, 2017	Nov. 1, 2017
80376	306	X Hot-Mix Asphalt – Tack Coat	Nov. 1, 2016	
80392	307	X Lights on Barricades	Jan. 1, 2018	
80336		Longitudinal Joint and Crack Patching	April 1, 2014	April 1, 2016
* 80393	309	X Manholes, Valve Vaults, and Flat Slab Tops	Jan. 1, 2018	March 2, 2018
* 80400	311	X Mast Arm Assembly and Pole	Aug. 1, 2018	
80045		Material Transfer Device	June 15, 1999	Aug. 1, 2014
80394		Metal Flared End Section for Pipe Culverts	Jan. 1, 2018	April 1, 2018
80165		Moisture Cured Urethane Paint System	Nov. 1, 2006	Jan. 1, 2010
80349	312	X Pavement Marking Blackout Tape	Nov. 1, 2014	April 1, 2016
80371	314	X Pavement Marking Removal	July 1, 2016	
80390	315	X Payments to Subcontractors	Nov. 2, 2017	
80377	316	X Portable Changeable Message Signs	Nov. 1, 2016	April 1, 2017
80389	317	X Portland Cement Concrete	Nov. 1, 2017	
80359		Portland Cement Concrete Bridge Deck Curing	April 1, 2015	Nov. 1, 2017
* 80401		Portland Cement Concrete Pavement Connector for Bridge Approach Slab	Aug. 1, 2018	

<u>File Name</u>	<u>Pg.</u>		<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80385	318	X	Portland Cement Concrete Sidewalk	Aug. 1, 2017	
80300			Preformed Plastic Pavement Marking Type D - Inlaid	April 1, 2012	April 1, 2016
80328	319	X	Progress Payments	Nov. 2, 2013	
34261			Railroad Protective Liability Insurance	Dec. 1, 1986	Jan. 1, 2006
80157			Railroad Protective Liability Insurance (5 and 10)	Jan. 1, 2006	
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			Speed Display Trailer	April 2, 2014	Jan. 1, 2017
80127			Steel Cost Adjustment	April 2, 2014	Aug. 1, 2017
* 80397	320	X	Subcontractor and DBE Payment Reporting	April 2, 2018	
80391	321	X	Subcontractor Mobilization Payments	Nov. 2, 2017	
80317			Surface Testing of Hot-Mix Asphalt Overlays	Jan. 1, 2013	April 1, 2016
80298	322	X	Temporary Pavement Marking (NOTE: This special provision was previously named "Pavement Marking Tape Type IV".)	April 1, 2012	April 1, 2017
20338			Training Special Provision	Oct. 15, 1975	
80318			Traversable Pipe Grate for Concrete End Sections (Note: This special provision was previously named "Traversable Pipe Grate".)	Jan. 1, 2013	Jan. 1, 2018
80288	325	X	Warm Mix Asphalt	Jan. 1, 2012	April 1, 2016
80302	327	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.

<u>File Name</u>	<u>Special Provision Title</u>	<u>New Location</u>	<u>Effective</u>	<u>Revised</u>
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	

Special Provisions  
150615

Village of Schaumburg  
FAU 2582 (Plum Grove Rd)  
Section No.: 14-00115-00-PV  
County: Cook

STATE OF ILLINOIS  
SPECIAL PROVISIONS

CONTRACT NO: 61E29

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," adopted April 1, 2016, the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways," and the "Manual of Test Procedures for Materials" in effect on the date of invitation for bids, and the Supplemental Specifications and Recurring Special Provisions indicated on the Check Sheet included herein which apply to and govern the construction of Route: FAU 2582 (Plum Grove Road); Section: 14-00115-00-PV; Project: 3JJ1(866), Job: C-91-060-16; County: Cook; and in case of conflict with any part or parts of said Specifications, the said Special Provisions shall take precedence and shall govern.

**LOCATION OF PROJECT:**

The project is located on FAU 2582 (Plum Grove Road), from IL Route 72 (Higgins Road) to IL Route 58 (Golf Road), in the Village of Schaumburg, Cook County. The gross and net length of the project is 3,186 feet (0.603 miles).

**DESCRIPTION OF WORK:**

The work consists of furnishing all labor, materials, equipment, and other incidentals necessary for the completion of reconstruction of hot-mix asphalt roadway, hot-mix asphalt resurfacing, driveway replacement, aggregate base repairs. Curb and gutter, sidewalk, pavement markings, lighting, traffic signal installation, drainage improvements, parkway restoration and other incidental and miscellaneous items of work in accordance with the Plans, Standard Specifications, and these Special Provisions.

**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)

Special Provisions  
150615

Village of Schaumburg  
FAU 2582 (Plum Grove Rd)  
Section No.: 14-00115-00-PV  
County: Cook

- Soils/Geotechnical Report
- Boring Logs
- Pavement Cores
- Location Drainage Study (LDS)
- Hydraulic Report
- Noise Analysis
- Other: \_\_\_\_\_

Those seeking these reports should request access from:

Baxter & Woodman, Inc.  
8678 Ridgefield Road  
Crystal Lake, IL 60012  
815-459-1260  
Hours 7:30 AM to 5 PM Monday through Thursday, 7:30 AM to 12:30 PM Friday

**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.

**UTILITIES TO BE ADJUSTED**

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

Pre-Stage

<b>STAGE / LOCATION</b>	<b>TYPE</b>	<b>DESCRIPTION</b>	<b>RESPONSIBLE AGENCY</b>	<b>ACTION</b>
Plum Grove Road	Underground conduit & aerial	Existing facilities in conflict w/ pavement widening, prop. storm sewer or prop. traffic signals.	AT&T	Contractor for AT&T to relocate facilities. Approx. <b>120 days</b> for cable replacements and cutovers.
Plum Grove Road	Underground and aerial	Existing facilities in conflict with pavement widening, proposed storm sewer or proposed traffic signals.	Comcast	Contractor for Comcast to relocate underground facilities. When ComEd relocates poles, Comcast will follow with aerial relocation. Approx. <b>6 weeks</b> of work.
1	Relocation	1,184 LF of new conduit installed via open cut trench with associated cable cut overs	ComEd	~30 Days Total Installation

<b>STAGE / LOCATION</b>	<b>TYPE</b>	<b>DESCRIPTION</b>	<b>RESPONSIBLE AGENCY</b>	<b>ACTION</b>
1	Relocation	510 LF of new conduit installed via directional bore with associated cable cut overs	ComEd	~20 Days Total Installation
1	Relocation	Approx 100 LF of 6-5" PVC shifted 2.0' vertically	ComEd	~5 Days Total Installation
1	Relocation	Approx 100 LF of 1-5" PVC shifted approx. 2.0' vertically & 3.0' horizontally	ComEd	~6 Days Total Installation
1	Relocation	Approx 100 LF of 6-5" PVC shifted 1.5' vertically	ComEd	~5 Days Total Installation
1	Relocation	13 new ComEd poles installed, 16 existing ComEd poles removed	ComEd	~20 Days Total Installation
2	Relocation	256 LF of new conduit installed via open cut trench with associated cable cut overs	ComEd	~15 Days Total Installation
2	Relocation	Approx 100 LF of 1-5" PVC shifted 2.0' vertically	ComEd	~5 Days Total Installation
STA 17+04	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe

<b>STAGE / LOCATION</b>	<b>TYPE</b>	<b>DESCRIPTION</b>	<b>RESPONSIBLE AGENCY</b>	<b>ACTION</b>
STA 18+04	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 19+50	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 21+56	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 23+07	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 25+00	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 28+50	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 29+77	Modification to existing facilities	Expose & reinforce ex. transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe

<b>STAGE / LOCATION</b>	<b>TYPE</b>	<b>DESCRIPTION</b>	<b>RESPONSIBLE AGENCY</b>	<b>ACTION</b>
STA 33+77	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 34+50	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 35+30	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 38+00	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 40+35	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
STA 41+95	Modification to existing facilities	Expose and reinforce existing transmission line pipe at proposed utility crossing location	ComEd Transmission	5 days for ComEd contractor to expose and reinforce transmission line pipe
Plum Grove Road	Underground	Existing facilities in conflict w/ pavement widening, prop. storm sewer or prop. traffic signals.	Nicor	60 days for Nicor Contractor to relocate facilities

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
Plum Grove Road	Underground north of Whalom Ln crossing Plum Grove and aerial	Existing facilities in conflict with pavement widening, proposed storm sewer or proposed traffic signals.	WOW	Contractor for WOW relocate underground facilities. When ComEd relocates poles, WOW will follow with aerial relocation.

Stage 1

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
Sta 16+50 to Sta 18+50 RT	Duct adjustments	Existing facilities in conflict w/ prop. storm sewer	AT&T	4 Days for Contractor for AT&T to adjust facilities..
Sta 21+00 to Sta 23+50 RT	Duct, copper & pedestal adjustments	Existing facilities in conflict w/ prop. storm sewer	AT&T	6 Days for Contractor for AT&T to adjust facilities.
At Sta 36+51 43' RT	Frame and Cover adjustment	Existing facilities in conflict w/ prop. curb and gutter	AT&T	0.5 Days for Contractor for AT&T to adjust facilities.
Sta 40+00 to Sta 41+00 RT	Duct adjustments	Existing facilities in conflict w/ prop. storm sewer	AT&T	4 Days for Contractor for AT&T to adjust facilities.
Sta 41+50 to Sta 43+50 RT	Duct adjustments	Existing facilities in conflict w/ prop. storm sewer	AT&T	6 Days for Contractor for AT&T to adjust facilities.

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
MH #s 434143003 434144002 434144001 434142004 434142003 434142002 434142001	ComEd Manholes	Lid Adjustment	ComEd	Contact Pete Kratzer for ComEd Manhole Lid Adjustments; 2 days to lower; 2 days to raise.

Stage 2

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
Sta 36+00 to Sta 39+00 Lt	Directional Bore for new conduit	Existing facilities in conflict w/ prop. storm sewer	AT&T	1 Days for Contractor for AT&T to adjust facilities.
Sta 40+50 to Sta 41+50 LT	Cable adjustments	Existing facilities in conflict w/ prop. storm sewer	AT&T	4 Days for Contractor for AT&T to adjust facilities.
MH #s 434143001	ComEd Manholes	Lid Adjustment	ComEd	Contact Pete Kratzer for ComEd Manhole Lid Adjustments; 1 day to lower, 1 day to raise.
STA 20+00	Frame and cover adjustments	Lid adjustments needed for existing ComEd Transmission manhole	ComEd Transmission	1 day for ComEd contractor to complete frame and cover adjustments
STA 39+00	Frame and cover adjustments	Lid adjustments needed for existing ComEd Transmission manhole	ComEd Transmission	1 day for ComEd contractor to complete frame and cover adjustments

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Stage 3

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
Sta 18+00 to Sta 19+50 LT	Duct Adjustments	Existing facilities in conflict w/ prop. storm sewer	AT&T	4 Days for Contractor for AT&T to adjust facilities.

**Pre-Stage:   306   Days Total Installation**  
**Stage 1:   24.5   Days Total Installation**  
**Stage 2:    9    Days Total Installation**  
**Stage 3:    4    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
ComEd Transmission	Joe Lureau	Two Lincoln Centre, Oakbrook Terrace, IL 60181	630-437-2803	joseph.lureau@ComEd.com
AT&T Distribution	Bruce Robbins	1000 Commerce Dr. Oak Brook, IL 60523	630-573-6471	br1831@att.com
ComEd	Hugo Silva	1500 Franklin Boulevard, Libertyville, IL 60048	630-437-3182	Hugo.silva@comed.com

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.

Stage 1

<b>STAGE / LOCATION</b>	<b>TYPE</b>	<b>DESCRIPTION</b>	<b>OWNER</b>	<b>ACTION</b>
Plum Grove Road; Sta 21+56 Rt near east ROW	24 Fiber conduit	During storm sewer construction, proposed vertical separation minimal	AT&T	Facilities to be located and protected during construction.
Sta 28+00 to Sta 29+00 RT	9-MCD & AFMW-600	Close proximity for proposed sewer	AT&T	AT&T Contractor to expose and protect existing facilities
Plum Grove Road; NW corner with American Lane	Existing 9- MCD	Close proximity for proposed sewer and traffic pole and handhole installation	AT&T	Facilities to be located and protected during construction.

Stage 2

<b>STAGE / LOCATION</b>	<b>TYPE</b>	<b>DESCRIPTION</b>	<b>OWNER</b>	<b>ACTION</b>
Plum Grove Road; Sta 21+90 to Sta 21+25 Lt near west ROW	12 Fiber and cable	During storm sewer construction, facilities in close proximity	AT&T	Facilities to be located and protected during construction.
Plum Grove Road; Sta 43+26 Lt	AFMW-600	During storm sewer construction, facilities in close proximity	AT&T	Facilities to be located and protected during construction.
Plum Grove Road; Sta 12+00 to Sta 44+00 Lt	Transmission pipes to watch and protect	During storm sewer construction, facilities in close proximity. ComEd Transmission watch person to be onsite during work during this stage	ComEd Transmission	Contractor to coordinate with ComEd Transmission when working in this area

Stage 3

<b>STAGE / LOCATION</b>	<b>TYPE</b>	<b>DESCRIPTION</b>	<b>OWNER</b>	<b>ACTION</b>
Plum Grove Road; NE corner at Higgins Road	Existing MH 430	MH to be adjusted to final pavement grade	AT&T	Facilities to be located and protected during construction.
Plum Grove Road; NE corner at Woodfield Road; Sta 19+13 47' Rt	Existing MH 491	MH to be adjusted to final grade outside proposed curb line	AT&T	Facilities to be located and protected during construction.
Plum Grove Road; Sta 28+26 40' Rt	Existing MH 428	MH to be adjusted to final pavement grade	AT&T	Facilities to be located and protected during construction.

<b>STAGE / LOCATION</b>	<b>TYPE</b>	<b>DESCRIPTION</b>	<b>OWNER</b>	<b>ACTION</b>
Plum Grove Road; Sta 17+40; 38' Rt	Existing MH 434144001	MH to be adjusted to final pavement grade	ComEd	Facilities to be located and protected during construction.
Plum Grove Road; Sta 31+31; 35' Rt	Existing MH 434142003	MH to be adjusted to final sidewalk grade	ComEd	Facilities to be located and protected during construction.
Plum Grove Road; Sta 38+05; 40' Rt	Existing MH 434142002	MH to be adjusted to final grade	ComEd	Facilities to be located and protected during construction.
Plum Grove Road; Sta 44+07; 35' Rt	Existing MH 434142001	MH to be adjusted to final sidewalk grade	ComEd	Facilities to be located and protected during construction.
Plum Grove Road; Sta 44+40; 91' Rt	Fiber Optic	Close proximity to proposed curb and gutter	Level 3	Facilities to be located and protected during construction.
Plum Grove Road; Sta 12+00 to Sta 44+00 Rt along east ROW	Fiber Optic	During sidewalk construction and final grading, facilities in close proximity	VinaKom Communications	Facilities to be located and protected 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
<b>AT&amp;T Distribution</b>	Bruce Robbins	1000 Commerce Dr. Oak Brook, IL 60523	630-573-6471	br1831@att.com
<b>AT&amp;T T-TCG (Teleport)</b>	Bruce Knight		331-302-9341	bk367y@att.com
<b>Chicago Metropolitan Water Reclamation District</b>	Joseph Schuessler	111 East Erie St., Chicago, IL 60611	312-751-3154	schuesslerj@mwr.org
<b>Comcast</b>	Robert Schulter, Jr  Construction: Pat Goheen	688 Industrial Drive, Elmhurst, IL 60126	Schulter: 630-600-6213 Goheen: 224-229-4453	Bob_schulter@cable.Comcast.com
<b>ComEd</b>	Hugo Silva	1500 Franklin Boulevard, Libertyville, IL 60048	630-437-3182	Hugo.silva@comed.com
<b>ComEd</b>	<b>Pete Kratzer</b>		708-518-6209	<a href="mailto:Peter.Kratzer@ComEd.com">Peter.Kratzer@ComEd.com</a>  MH lids adjustments only
<b>ComEd Transmission</b>	David Kulb	1500 Franklin Boulevard, Libertyville, IL 60048	630-437-2842	David.kulb@comed.com

Agency/Company Responsible to Resolve Conflict	Name of contact	Address	Phone	e-mail address
<b>Hoffman Estates</b>	Sean Diatte	1900 Hassel Road, Hoffman Estates, IL 60169	847-781-2723	Sean.diatte@Hoffmanestates.org
<b>Level 3 Communications</b>	Xan Marie Rypkema / Reece Conrad / Vince Skau	1305 E. Algonquin Rd, Arlington Heights, IL 60005	720-888-1089 / 847-954-8204 / 847-954-8212	xan.rypkema@level3.com / Reece.conrad@Level3.com / Vince.skau@level3.com
<b>Nicor</b>	Bruce Koppang	1844 Ferry Road, Naperville, IL 60563	630-388-3046	bkoppang@aglresources.com
<b>VinaKom Communications</b>	Dicky Patel	860 Remington Rd, Schaumburg, IL 60173	847-592-5785	Dicky.patel@Vinakom.com
<b>West Shore Pipe Line</b>	Bill O'Malley		847-878-3428	womalley@buckeye.com
<b>Wide Open West</b>	Chris Kasallis / Jared Trombetta	1674 Frontenac Road, Naperville, IL 60563	630-486-9038 / 630-219-3216	Christopher.kasallis@Wowinc.com / <a href="mailto:Jared.trombetta@wowinc.com">Jared.trombetta@wowinc.com</a>
<b>Windstream</b>	Andres Bravo	3765 Lexington Drive, Hoffman Estates, IL 60192	847-345-4024	Andres.bravo@Windstream.com

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Agency/Company Responsible to Resolve Conflict	Name of contact	Address	Phone	e-mail address
<b>XO Illinois Inc</b>	Mel Conn	810 Jorie Blvd, Oak Brook, IL 60523	630-371- 3108	Mel.conn@xo.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.

**WORKING HOURS:**

Per Village of Schaumburg Ordinance, the Contractor shall perform all work in the Village of Schaumburg as follows:

7:00 A.M. to 7:00 P.M. Monday through Friday  
8:00 A.M. to 7:00 P.M. Saturday and Sunday

No work will be permitted on holidays or at other times outside the above working hours without permission of the Engineer.

**PLUM GROVE ROAD WORK RESTRICTION:**

Work shall not begin prior to April 1, 2019.

**COOPERATION WITH OTHER CONTRACTORS:**

The Contractor shall cooperate with other Contractors that are working on or near any portion of the project site. The Contractor shall schedule his construction to minimize conflicts in common work areas and to maintain continuity in construction and traffic management. The Contractor will be given the names of other contractors who will work on or near the project site. The Contractor shall contact each contractor and coordinate the sequence of work with them.

Other contractors will be working with Versailles on the Lakes Apartment Complex to rebuild their entrance concurrently with the Plum Grove Road improvements. Other contractors will also be working on roadway improvements along Plum Grove Road from Golf Road to Wiley Road, state contract number (61E16). This work may require revisions to the maintenance of traffic. Utility relocations will be performed as shown in the Status of Utilities.

**SHOP DRAWINGS:**

Shop drawings and/or samples shall be submitted for the following items in accordance with Article 105.04 of the Standard Specifications as required by the Plans, Details, and these Special Provisions. Shop drawings shall be approved in writing by the Engineer before ordering materials. No extension of contract time will be allowed for delays in obtaining shop drawing approval or procurement lead time.

<b>Pay item(s)</b>	<b>Requirements</b>
Street Lighting Items	See Special Provision
Traffic Signal Items	See Special Provisions
Sign Panels	See Specifications

**HIGHWAY PERMIT:**

A Cook County Department of Transportation permit is required for the work on Plum Grove Road south of Higgins Road. The Contractor shall execute all necessary permit forms, provide and pay for any fee and bond requirements, and execute and comply with all insurance and performance guarantee requirements. Work required to comply with these permit requirements shall be included as part of the contract.

**COMPLETION DATE PLUS WORKING DAYS:**

This contract shall be substantially completed by the specified dates plus the specified number of working days for final completion as outlined below and in accordance with Article 108.05 (b) of the Standard Specifications except as modified herein.

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

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

The Contractor will be allowed to complete restoration, traffic signal poles and mast arms by 11:59 PM on November 15, 2019. The Contractor will be allowed to complete all clean-up work and punch list items within 5 working days after this completion date. 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 these working days allowed for cleanup work and punch list items. Temporary lane closures for this work may be allowed at the discretion of the Engineer.

Article 108.09 shall apply to both the specified completion dates listed for each stage and the number of working days.

**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.”

**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

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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.

**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.”

**TRAFFIC CONTROL AND PROTECTION (ARTERIALS):**

Effective: February 1, 1996

Revised: March 1, 2011

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

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remove all applicable traffic control devices along the detour route according to the details shown in the plans.

Method of Measurement: All traffic control (except "Traffic Control and Protection (Expressways)" and temporary pavement markings) indicated on the traffic control plan details and specified in the Special Provisions will be measured for payment on a lump sum basis.

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

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

**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.”

**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  $\pm 2.0$  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

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

**COARSE AGGREGATE FOR BACKFILL, TRENCH BACKFILL AND BEDDING (D-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  $\pm 2.0$  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.

**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 $\pm$ 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 $\pm$ 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."

**FRICITION 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	<u>Allowed Alone or in Combination</u> <sup>5/</sup> : 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	<u>Allowed Alone or in Combination</u> <sup>5/</sup> : Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag <sup>1/</sup> Crushed Concrete
HMA High ESAL Low ESAL	Binder IL-19.0 or IL-19.0L  SMA Binder	<u>Allowed Alone or in Combination</u> <sup>5/ 6/</sup> : Crushed Gravel Carbonate Crushed Stone <sup>2/</sup> Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Concrete <sup>3/</sup>
HMA High ESAL Low ESAL	C Surface and Leveling Binder IL-9.5 or IL-9.5L  SMA Ndesign 50 Surface	<u>Allowed Alone or in Combination</u> <sup>5/</sup> : Crushed Gravel Carbonate Crushed Stone <sup>2/</sup> Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag <sup>4/</sup> Crushed Concrete <sup>3/</sup>

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

Use	Mixture	Aggregates Allowed	
		75% Dolomite <sup>2/</sup>	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone
		75% Crushed Gravel <sup>2/</sup> or Crushed Concrete <sup>3/</sup>	Crushed Sandstone, Crystalline Crushed Stone, Crushed Slag (ACBF), or Crushed Steel Slag
HMA High ESAL	F Surface IL-9.5  SMA Ndesign 80 Surface	<u>Allowed Alone or in Combination</u> <sup>5/ 6/</sup> :	
		Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag No Limestone.	
		<u>Other Combinations Allowed:</u>	
		<i>Up to...</i>	<i>With...</i>
		50% Crushed Gravel <sup>2/</sup> , Crushed Concrete <sup>3/</sup> , or Dolomite <sup>2/</sup>	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.”

**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 $\mu$ m)	95 $\pm$ 5
No. 50 (300 $\mu$ m)	> 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  $\pm$  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.

**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 <sup>1/</sup> CA 16, CA 13 <sup>3/</sup>
HMA Low ESAL	IL-19.0L IL-9.5L Stabilized Subbase or Shoulders	CA 11 <sup>1/</sup> CA 16
SMA <sup>2/</sup>	1/2 in. (12.5mm) Binder & Surface IL 9.5 Surface	CA13 <sup>3/</sup> , CA14 or CA16  CA16, CA 13 <sup>3/</sup>

- 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  $\leq 2.0$  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 steel 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) <sup>1/</sup> ; HMA Shoulders <sup>2/</sup>

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) <sup>1/</sup>										
Sieve Size	IL-19.0 mm		SMA <sup>4/</sup> IL-12.5 mm		SMA <sup>4/</sup> 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 <sup>5/</sup>	16	32 <sup>5/</sup>	34 <sup>6/</sup>	52 <sup>2/</sup>	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 <sup>3/</sup>	7.5	9.5 <sup>3/</sup>	4	6	7	9 <sup>3/</sup>
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 N<sub>design</sub> = 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 <sup>1/</sup>	
50	13.5	15.0	18.5	65 – 78 <sup>2/</sup>
70				
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 <sup>1/</sup>			
Ndesign	Design Air Voids Target %	Voids in the Mineral Aggregate (VMA), % min.	Voids Filled with Asphalt (VFA), %
80 <sup>4/</sup>	3.5	17.0 <sup>2/</sup>	75 - 83
		16.0 <sup>3/</sup>	

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  $\geq 2.760$ .
- 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 <sup>1/</sup>

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  $275 \pm 5$  °F ( $135 \pm 3$  °C) or less, loose Warm Mix Asphalt shall be oven aged at  $270 \pm 5$  °F ( $132 \pm 3$  °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  $N_{design}$  specified; and POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, STONE MATRIX ASPHALT, of the mixture composition and  $N_{design}$  specified.”

**RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES (D-1):**

Effective: November 1, 2012

Revise: 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  $\leq 1000$  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)	$\pm 6 \%$
No. 8 (2.36 mm)	$\pm 5 \%$
No. 30 (600 $\mu\text{m}$ )	$\pm 5 \%$
No. 200 (75 $\mu\text{m}$ )	$\pm 2.0 \%$
Asphalt Binder	$\pm 0.3 \%$
$G_{mm}$	$\pm 0.03$ <sup>1/</sup>

- 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	
	FRAP	RAS
% Passing: <sup>1/</sup>		
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 <sub>mm</sub>	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 <sup>1/ 2/ 4/</sup>	Maximum % ABR		
	Binder/Leveling Binder	Surface	Polymer Modified <sup>3/</sup>
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  $\mu$ m) sieve shall not apply. The sample for the RAP material shall be air dried to constant weight prior to being tested for gradation."

**TEMPORARY PAVEMENT:**

Description. This work shall consist of constructing a temporary pavement on aggregate base course at the locations shown on the plans or as directed by the engineer.

The contractor shall use either Portland cement concrete according to Sections 353 and 354 of the Standard Specifications or HMA according to Sections 355, 356, 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 shall be as described in the plans. The contractor shall have the option of constructing either

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material type if both Portland cement concrete and HMA are shown in the plans.

Articles 355.08 and 406.11 of the Standard Specifications shall not apply.

Aggregate base course shall be constructed in accordance with Section 351 of the Standard Specifications to minimum thickness of four inches. Aggregate base course shall be included in the cost of TEMPORARY PAVEMENT.

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.

Basis of Payment. This work will be paid for at the contract unit price per square yard for TEMPORARY PAVEMENT.

Removal of temporary pavement will be paid for at the contract unit price per square yard for PAVEMENT REMOVAL.

**TEMPORARY PAVEMENT (VARIABLE DEPTH):**

Description. This work shall consist of constructing variable depth temporary pavement on aggregate base course at the locations shown on the plans or as determined by the engineer.

The contractor shall use HMA according to Sections 355, 356, 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 shall be determined in the field as determined by the engineer to match existing and proposed pavements for staged construction. Aggregate base course shall be constructed in accordance with Section 351 of the Standard Specifications to minimum thickness of four inches.

Aggregate base course shall be included in the cost of TEMPORARY PAVEMENT (VARIABLE DEPTH).

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 weighed in trucks at the place of loading, unloading, or at such other place as the Engineer may designate.

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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 will be paid for at the contract unit price per square yard for PAVEMENT REMOVAL.

**TEMPORARY ACCESS WALK:**

Revise Article 402.10 of the Standard Specifications to read:

“402.10 For Temporary Access Walk. The contractor shall construct and maintain aggregate surface course for temporary pedestrian access 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.

The minimum width shall be 7 ft (2.2 m). The minimum compacted thickness shall be 4 in. (100 mm). The grade and elevation shall be the same as the removed pavement, except as required to meet ADA requirements and meet the grade of any new pavement constructed.

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

When use of the temporary access walk 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:

TEMPORARY ACCESS WALK will be measured for payment as each pedestrian access location. If a pedestrian access walk 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:

TEMPORARY ACCESS WALK will be paid for at the contract unit price per each.

Partial payment of the each amount bid for temporary access walk, of the type specified, will be

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paid according to the following schedule:

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

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

**MIXTURE FOR CRACKS, JOINTS AND FLANGWAYS:**

This work shall be done in accordance with Section 406 of the Standard Specifications except as modified herein.

406.05 (a) Add the following to the beginning of this Article:  
“All cracks and joints shall be cleaned prior to filling.”

Basis of Payment. This work will be paid for at the contract unit price per ton (metric ton) for MIXTURE FOR CRACKS, JOINTS AND FLANGWAYS.

**SITE OBJECTS:**

This work shall be done in accordance with Section 201 and 202 of the Standard Specifications except as modified herein.

Description. This work shall consist of removal of miscellaneous parkway improvements and site objects at the locations shown on the plans or as determined by the engineer.

Removal of miscellaneous parkway improvements including, but not limited to, block retaining walls, landscape timbers, landscape rocks, planters, vegetation, brick or brick paver walkways within right-of-way limits shall be completed as shown on the plans or as determined by the engineer. Every effort shall be made by the contractor when removing these items to preserve them from harm. The contractor shall contact the owner of the items to determine if such items shall be returned to the property owner, stockpiled for re-use or disposed of properly.

Method Of Measurement.

This work will not be measured for payment.

Basis of Payment. This work will not be paid for as a separate item, but shall be included in the bid price for EARTH EXCAVATION.

**IN-STREAM WORK:**

The cost of all materials, equipment, and labor necessary to comply with the plans, general notes and special provisions to prepare and implement an in-stream work plan will not be paid for separately but shall be considered as included in the contract unit price for the work for which it is required and no additional compensation will be allowed.

**AGGREGATE SUBGRADE IMPROVEMENT DAMAGES:**

Any aggregate subgrade improvement contaminated and/or damaged by the Contractor's vehicles and/or equipment is to be removed and replaced by the engineer at the Contractor's expense.

**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:

	<b><u>Item</u></b>	<b><u>Article/Section</u></b>
a.)	Sign Base (Notes 1 & 2)	1090
b.)	Sign Face ( Note 3)	1091
c.)	Sign Legends	1092
d.)	Sign Supports	1093
e.)	Overlay Panels (Note 4)	1090.02

Note 1. The Contractor may use 5/8 inch (16 mm) instead of 3/4 inch (19 mm) thick plywood.

Note 2. Type A sheeting can be used on the plywood base.

Note 3. All sign faces shall be Type A except all orange signs shall meet the requirements of Article 1106.01.

Note 4. The overlay panels shall be 0.08 inch (2 mm) thick.

**GENERAL CONSTRUCTION REQUIREMENTS**

Installation.

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

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

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

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

Method Of Measurement.

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

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

Basis Of Payment.

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

**EXPLORATION TRENCH, SPECIAL:**

This work shall consist of constructing a trench for the purpose of verifying clearances and locations of existing private and public utilities and storm sewers prior to constructing proposed utilities. The exploration trench shall be constructed at the locations as determined by the Engineer and in accordance with Article 213.02 of the Standard Specifications, except as modified herein.

The depth of the trench shall be variable, but shall be deep enough to locate all potential conflicts. The width of the trench shall be sufficient to allow proper investigation of the entire trench.

Method of Measurement. This work will be measured for payment per lineal foot of actual trench constructed.

Basis of Payment. This work will be paid for at the contract unit price per foot for EXPLORATION TRENCH, SPECIAL, regardless of depth.

**SANITARY MANHOLE, SPECIAL:**

This work shall be done in accordance with Section 602 of the Standard Specifications and the Details provided in the Plans. Non-hardening butyl rubber mastic sealant; minimum thickness ¼-inch, shall be used between adjusting rings in place of mortar, or as required by the Owner of the Sanitary Sewer. An internal and external frame seal shall be installed. The installation of both the internal and external frame seal will not be paid for separately and will be considered included in this pay item. All proposed sanitary manholes shall be installed with a type 1 frame and closed lid. The frame and lid shall be included in the cost of the proposed sanitary manhole.

The Internal Frame seal shall consist of the following:

- A. Provide rubber gasket consisting of flexible synthetic rubber sleeve and stainless steel expansion bands.
  - 1. Sleeve material conforming to ASTM C923 with a hardness of 45 durometer, 3/16-inch minimum thickness, double pleated sleeve capable of vertical expansion of 2 inches when installed.
  - 2. Expansion bands to compress sleeve in place: 16 gauge minimum thickness, Type 304, ASTM A2740 stainless steel construction.
    - a. Minimum bank width: 1-3/4 inches.
    - b. All screw and bolt fasteners: Type 304, ASTM A276, stainless steel.
    - c. Rubber gasket capable of removal and adjustment in the field after initial installation without damage to the rubber sleeve, extensions, and bands.
- B. Provide accessories when required by each application.
  - 1. Tapered sleeve for sloped sealing surfaces.
  - 2. Wedge inserts of same construction as sleeve.
  - 3. Sleeve extension of synthetic rubber construction, height as necessary to seal manhole frame and all existing adjusting rings to the cone section/corbel.
- C. Acceptable manufacturers:
  - 1. Cretex Specialty Products
- D. Compression band:
  - 1. Provide compression band to compress the sleeve against the manhole.
  - 2. Use 16 gauge stainless steel conforming to ASTM A240 Type 304 with no welded attachments and having a minimum width of 1-inch.
  - 3. Make a watertight seal having a minimum adjustment range of 2 diameter inches.

4. Provide stainless steel screws, bolts, and nuts conforming to ASTM F593 and 594, Type 304.
- E. Acceptable products:
  1. Cretex Specialty Products.

The Internal Frame Seal shall be installed as follows:

- A. Install internal rubber gasket in the manhole chimney.
  1. Provide watertight gasket to eliminate leakage between the frame and each adjusting ring down to and including cone section.
    - a. Install rubber gasket in accordance with manufacturer's recommendations.
    - b. Field verify for suitable dimensions and layout before installation.
    - c. Provide chimney seal extensions as required.

The External Frame seal shall consist of the following:

- A. Provide frame seals consisting of a flexible external rubber sleeve and extension and stainless steel compression bands.
- B. Rubber sleeve and extension:
  1. Provide rubber sleeve and extension complying with ASTM C923.
  2. Comply with a minimum 1500 psi tensile strength, maximum 18 percent compression set and a hardness (durameter) of 48±5.
  3. Provide sleeve with a minimum thickness of 3/16-inch and unexpanded vertical heights of 6 or 9 inches.
- C. Provide extension having a minimum thickness of 3/16-inch.
- D. Compression band:
  1. Provide compression band to compress the sleeve against the manhole.
  2. Use 16 gauge stainless steel conforming to ASTM A240 Type 304 with no welded attachments and having a minimum width of 1-inch.
  3. Make a watertight seal having a minimum adjustment range of 2 diameter inches.
  4. Provide stainless steel screws, bolts, and nuts conforming to ASTM F593 and 594, Type 304.
- E. Acceptable products:
  1. Cretex Specialty Products.

The External Frame Seal shall be installed as follows:

- A. Install external rubber gasket on the manhole frame and chimney.
  1. Provide watertight gasket to eliminate leakage between the frame and each adjusting ring down to and including cone section.
- B. Clean surface and prepare the lower 2 inches of the manhole frame and exterior of all adjusting rings and cone section/corbel surfaces.
  1. Realign frame on adjusting rings or corbel as required.

- C. Repair and apply mortar grout to the adjusting rings as required to provide a smooth, circular surface for the rubber gasket.
- D. Install rubber gasket in accordance with manufacturer's recommendations.
  - 1. Field verify for suitable dimensions and layout before installation.
  - 2. Utilize sealing caulk where required.

For Metropolitan Water Reclamation Manholes to be installed, use the following additional guidelines as determined by the Engineer:

#### SprayWall Repair Procedure Large Repair:

Abrade the overlap repair area, a twelve (12) inch border around the repair area producing a profile of ICR1<sup>1</sup> CSP 3-4 (or at a minimum to match a 60 grit sand paper). Coating termination keys (grooves ¼" w x ¼" d) will be cut around the perimeter edges of the entire repair area. Cross cutting grooves within the repair area may also be added to insure a "locking in" of the repair materials. The prepared area shall be wiped with Lord 7701 Adhesion Enhancer/Surface Modifier, manufactured by Lord Corporation. The repair material shall be SR6100 Epoxy or SprayWall; manufactured by Sprayroq, Inc. Spark testing shall be performed after repairs are completed.

#### Additional Topcoat (s) of SprayWall/ SG 1/ SG 2:

If a top coat is required after the recoat window has expired, the surface of the existing SprayWall/ SG 1/ SG 2 shall be abraded (glaze removed) and then wiped with Lord 7701 Adhesion Enhancer/Surface Modifier manufactured by Lord Corporation. Coating termination keys (grooves ¼" w x ¼" d or to substrate) will be cut around the perimeter edges of the entire repair area. Cross cutting grooves within the topcoat area may also be added to insure a "locking in" of the additional topcoat.

#### Terminator Keys or "Flat Wall" Grooves:

If keys or grooves are not filled with the minimum mil thickness specified for the SprayWall/ SG 1/ SG 2 application, abrade the area with a minimum 60 grit sandpaper or diamond disk to remove glaze and open the area to allow repair material to penetrate into the groove. Remove dust, wipe clean with Lord 7701 Adhesion Enhancer/Surface Modifier and fill the repair area with SR 6100 Epoxy/ SprayWall/SG 1/SG 2, as manufactured by Sprayroq, Inc. **Note: Keys, grooves and or an irregular substrate surface will typically reflect through the initial spray applied coating, including repairs that are spray applied. This does not indicate thinner than specified mils or "unfilled" keys or grooves.**

<sup>1</sup>International Concrete Repair Institute -January 1997, Guideline No. 03732

Basis of Payment. This work will be paid for at the contract unit price per each for SANITARY MANHOLE, SPECIAL, which price shall include all of the above.

**SANITARY MANHOLES TO BE ADJUSTED OR RECONSTRUCTED:**

This work shall be done in accordance with Section 602 of the Standard Specifications and the Details provided in the Plans and shall consist of the adjustment or reconstruction of sanitary manholes. Non-hardening butyl rubber mastic sealant; minimum thickness ¼-inch, shall be used between adjusting rings in place of mortar. In locations where existing external frame seals exist, it shall be removed and reinstalled. In locations where internal frame seals exist, it shall be removed and reinstalled. An internal and external frame seal shall be required at each location. The installation of the internal and external frame seal will not be paid for separately and will be considered included in this pay item.

The Internal Frame seal shall consist of the following:

- A. Provide rubber gasket consisting of flexible synthetic rubber sleeve and stainless steel expansion bands.
  - 1. Sleeve material conforming to ASTM C923 with a hardness of 45 durometer, 3/16-inch minimum thickness, double pleated sleeve capable of vertical expansion of 2 inches when installed.
  - 2. Expansion bands to compress sleeve in place: 16 gauge minimum thickness, Type 304, ASTM A2740 stainless steel construction.
    - a. Minimum bank width: 1-3/4 inches.
    - b. All screw and bolt fasteners: Type 304, ASTM A276, stainless steel.
    - c. Rubber gasket capable of removal and adjustment in the field after initial installation without damage to the rubber sleeve, extensions, and bands.
- B. Provide accessories when required by each application.
  - 1. Tapered sleeve for sloped sealing surfaces.
  - 2. Wedge inserts of same construction as sleeve.
  - 3. Sleeve extension of synthetic rubber construction, height as necessary to seal manhole frame and all existing adjusting rings to the cone section/corbel.
- C. Acceptable manufacturers:
  - 1. Cretex Specialty Products
- D. Compression band:
  - 1. Provide compression band to compress the sleeve against the manhole.
  - 2. Use 16 gauge stainless steel conforming to ASTM A240 Type 304 with no welded attachments and having a minimum width of 1-inch.
  - 3. Make a watertight seal having a minimum adjustment range of 2 diameter inches.

4. Provide stainless steel screws, bolts, and nuts conforming to ASTM F593 and 594, Type 304.
- E. Acceptable products:
  1. Cretex Specialty Products.

The Internal Frame Seal shall be installed as follows:

- A. Install internal rubber gasket in the manhole chimney.
  1. Provide watertight gasket to eliminate leakage between the frame and each adjusting ring down to and including cone section.
    - a. Install rubber gasket in accordance with manufacturer's recommendations.
    - b. Field verify for suitable dimensions and layout before installation.
    - c. Provide chimney seal extensions as required.

The External Frame seal shall consist of the following:

- A. Provide frame seals consisting of a flexible external rubber sleeve and extension and stainless steel compression bands.
- B. Rubber sleeve and extension:
  1. Provide rubber sleeve and extension complying with ASTM C923.
  2. Comply with a minimum 1500 psi tensile strength, maximum 18 percent compression set and a hardness (durameter) of  $48 \pm 5$ .
  3. Provide sleeve with a minimum thickness of 3/16-inch and unexpanded vertical heights of 6 or 9 inches.
- C. Provide extension having a minimum thickness of 3/16-inch.
- D. Compression band:
  1. Provide compression band to compress the sleeve against the manhole.
  2. Use 16 gauge stainless steel conforming to ASTM A240 Type 304 with no welded attachments and having a minimum width of 1-inch.
  3. Make a watertight seal having a minimum adjustment range of 2 diameter inches.
  4. Provide stainless steel screws, bolts, and nuts conforming to ASTM F593 and 594, Type 304.
- E. Acceptable products:
  1. Cretex Specialty Products.

The External Frame Seal shall be installed as follows:

- A. Install external rubber gasket on the manhole frame and chimney.
  1. Provide watertight gasket to eliminate leakage between the frame and each adjusting ring down to and including cone section.
- B. Clean surface and prepare the lower 2 inches of the manhole frame and exterior of all adjusting rings and cone section/corbel surfaces.
  1. Realign frame on adjusting rings or corbel as required.

- C. Repair and apply mortar grout to the adjusting rings as required to provide a smooth, circular surface for the rubber gasket.
- D. Install rubber gasket in accordance with manufacturer's recommendations.
  - 1. Field verify for suitable dimensions and layout before installation.
  - 2. Utilize sealing caulk where required.

For Metropolitan Water Reclamation Manholes to be adjusted, use the following additional guidelines as determined by the Engineer:

#### SprayWall Repair Procedure Large Repair:

Abrade the overlap repair area, a twelve (12) inch border around the repair area producing a profile of ICRI<sup>1</sup> CSP 3-4 (or at a minimum to match a 60 grit sand paper). Coating termination keys (grooves ¼" w x ¼" d) will be cut around the perimeter edges of the entire repair area. Cross cutting grooves within the repair area may also be added to insure a "locking in" of the repair materials. The prepared area shall be wiped with Lord 7701 Adhesion Enhancer/Surface Modifier, manufactured by Lord Corporation. The repair material shall be SR6100 Epoxy or SprayWall; manufactured by Sprayroq, Inc. Spark testing shall be performed after repairs are completed.

#### Additional Topcoat (s) of SprayWall/ SG 1/ SG 2:

If a top coat is required after the recoat window has expired, the surface of the existing SprayWall/ SG 1/ SG 2 shall be abraded (glaze removed) and then wiped with Lord 7701 Adhesion Enhancer/Surface Modifier manufactured by Lord Corporation. Coating termination keys (grooves ¼" w x ¼" d or to substrate) will be cut around the perimeter edges of the entire repair area. Cross cutting grooves within the topcoat area may also be added to insure a "locking in" of the additional topcoat.

#### Terminator Keys or "Flat Wall" Grooves:

If keys or grooves are not filled with the minimum mil thickness specified for the SprayWall/ SG 1/ SG 2 application, abrade the area with a minimum 60 grit sandpaper or diamond disk to remove glaze and open the area to allow repair material to penetrate into the groove. Remove dust, wipe clean with Lord 7701 Adhesion Enhancer/Surface Modifier and fill the repair area with SR 6100 Epoxy/ SprayWall/SG 1/SG 2, as manufactured by Sprayroq, Inc. **Note: Keys, grooves and or an irregular substrate surface will typically reflect through the initial spray applied coating, including repairs that are spray applied. This does not indicate thinner than specified mils or "unfilled" keys or grooves.**

<sup>1</sup>International Concrete Repair Institute -January 1997, Guideline No. 03732

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Basis of Payment. This work will be paid for at the contract unit price per each for SANITARY MANHOLES TO BE ADJUSTED or SANITARY MANHOLES TO BE RECONSTRUCTED, which price shall include all of the above.

**SANITARY MANHOLES TO BE REMOVED:**

This work shall be done in accordance with Section 605 of the Standard Specifications except as modified herein.

605.03 Removing Existing Manholes, Catch Basins, and Inlets. Replace the following in this Article:

Replace all references to “storm sewer” or “storm sewer system” with “sanitary sewer” or “sanitary sewer system”.

Basis of Payment. Add the following to the end of this Article.

“The work of removing existing sanitary manholes will be paid for at the contract unit price per each for SANITARY MANHOLES TO BE REMOVED.

**HOT-MIX ASPHALT DRIVEWAY PAVEMENT:**

Description. This work shall consist of furnishing, placing and compacting hot-mix asphalt driveway pavement at locations shown on the plans and as determined by the Engineer.

This work shall conform to the applicable Sections of Articles 355 and 406 of the MOT Standard Specifications and the Maintenance of Traffic plans and specifications.

Commercial parking lots shall be constructed to a nominal thickness of 3 inches which shall consist of a minimum 1.5 inch thick surface course (HMA Surface Course, Mix “D”, N50) with the balance constructed using hot mix asphalt binder course (HMA Base Course, 2-1/4”). Aggregate and bituminous material prime coats shall be applied according to Article 406 and as determined by the Engineer.

Method of Measurement. Hot-Mix Asphalt driveway pavement will be measured in place and the area computed in square yards. The pavement materials and aggregate and bituminous material prime coats will not be measured for payment separately but shall be considered included in payment for Hot-Mix Asphalt Driveway Pavement.

Basis of Payment. The work will be paid at the contract unit price per square yard for HOT-MIX ASPHALT DRIVEWAY PAVEMENT, 3” which price shall be full payment for all materials, labor, and equipment necessary to construct the driveways or parking lot.

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**PORTLAND CEMENT CONCRETE DRIVEWAY PAVEMENT, SPECIAL:**

Description. This work shall be done in accordance with Section 423 of the Standard Specifications and the Details provided in the Plans and shall consist of the furnishing and placing Portland cement concrete driveway pavement at locations shown on the plans and as determined by the Engineer.

Method of Measurement. PORTLAND CEMENT CONCRETE DRIVEWAY PAVEMENT, SPECIAL will be measured in place and the area computed in square yards. The pavement materials and rigid wire mesh will not be measured for payment separately but shall be considered included in payment for PORTLAND CEMENT CONCRETE DRIVEWAY PAVEMENT, SPECIAL.

Basis of Payment. The work will be paid at the contract unit price per square yard for PORTLAND CEMENT CONCRETE DRIVEWAY PAVEMENT, SPECIAL, of the thickness specified which price shall be full payment for all materials, labor, and equipment necessary to construct the driveways or parking lot.

**UNDERGROUND CONDUIT, PVC:**

Description. This work shall consist of furnishing and placing underground PVC conduit as shown in the driveway detail on the plans and as determined by the Engineer.

Materials. Underground PVC conduit shall be SDR 26.

Method of Measurement. UNDERGROUND CONDUIT, PVC shall be measured for payment in place in feet (meters).

Basis of Payment. The work will be paid for at the contract unit price per foot (meter) for UNDERGROUND CONDUIT, PVC, of the diameter specified.

**TRAFFIC CONTROL PLAN:**

This work shall be done in accordance with applicable portions of Section 701 of the Standard Specifications, the Supplemental Specifications, the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways", and any details and Highway Standards contained in the Plans and Special Provisions, and the Special Provisions contained herein, except as modified herein.

Special Attention is called to Article 107.09 of the Standard Specifications and the following Highway Standards, Details, Recurring Local Roads and Streets Special Provisions, and Special Provisions contained herein, relating to traffic control.

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HIGHWAY STANDARDS: 701011, 701101, 701106, 701301, 701311, 701427, 701501, 501502,  
701601, 701602, 701606, 701611, 701701, 701801, 701901, 704001

**DETAILS:**

- 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 (Included in these Special Provisions):**

- Traffic Control and Protection (Arterials)
- Maintenance of Roadways
- Public Safety and Convenience (DIST 1)
- Temporary Information Signing
- Pavement and Shoulder Resurfacing
- Aggregate for Temporary Access
- Temporary Pavement
- Temporary Pavement (Variable Depth)
- Hot-Mix Asphalt Surface Removal, Variable Depth
- Temporary Pavement Marking (BDE)
- Pavement Marking Removal (BDE)
- Lights on Barricades (BDE)
- Equipment Parking and Storage (BDE)
- Black Out Tape (BDE)
- PCMS (BDE)

The Contractor shall contact the Village at least 72 hours in advance of beginning work. Construction operations shall be conducted in a manner such that streets will be open to emergency traffic and accessible as required to local traffic.

**VALVE VAULTS:**

**Description:**

This work shall consist of furnishing and installing a 5-foot diameter precast concrete valve vault at locations shown on the Plans and as determined by the Engineer.

**Materials:**

Valve vaults are required for all valves greater than 6 inches or as otherwise called out on the plans. All casting for Valve Vaults shall be "Neenah" and stamped, "Village of Schaumburg —

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Water". If a valve controls the water supply to a sprinkler system, it shall be stamped "Village of Schaumburg — Water/Fire". All castings shall be heavy duty type. Manhole steps will not be required, except for those valve vaults where the depth (finish grade to top of water main) exceeds seven (7) feet.

Construction Methods:

Vaults shall be built up so the cover and frame, when placed, will conform to the proper grade. Frame castings shall be set in full mortar beds on top of masonry. If the frame casting must be adjusted to meet the finished grade line requiring an adjustment of 2 inches or less, the final adjustment shall be provided with a High Density Polyethylene Manhole Adjusting Ring. All adjusting rings must be mortared together and must be mortared to the casting, as well as to the cone section of the structure. The maximum height of adjusting rings shall be 12 inches with no more than two total adjusting rings.

Measurement and Basis of Payment:

The cost for valve vaults will not be paid for separately but shall be considered INCLUDED in the cost of INSERTING VALVES. Payment shall be full compensation for the valve, precast concrete vault, frame and lid, hardware, all materials, labor, equipment, and other appurtenant items to complete this item as specified.

The cost of the frame and lid and final adjustment will not be paid for separately but shall be considered INCLUDED in the cost of the valve vault. Granular backfill compacted around the valve vault will not be paid for separately but shall be considered INCLUDED in the cost of the valve vault and installation.

**INSERTING VALVES:**

Description:

This work shall consist of installing an insertion valve on an existing water main. All insertion valves shall be in minimum 5-foot diameter concrete vault or as specified on the plans.

Materials:

Valves and appurtenances used for valve insertions shall be EZ System manufactured by Advanced Valve Technologies, Inc, Elk Grove Village, IL, and shall be installed per manufacturer's requirements.

Valve vaults and castings shall be provided in accordance with that previously specified for Valve Vaults.

Measurement and Basis of Payment:

Payment for the valve insertion shall be paid for at the contract unit price per Each for INSERTING VALVES of the size specified. Payment shall be full compensation for furnishing and installing the insertion valve, thrust blocking, valve vault, casting, all materials, labor, equipment, and other appurtenant items to complete this item as specified.

**FIRE HYDRANTS TO BE REMOVED AND REPLACED:**

This work shall be done in accordance with Section 564 of the Standard Specifications and the Details provided in the Plans, except as modified herein.

564.01 Description. Revise this Article to read:

“564.01 Description. This work shall include excavation, trench dewatering; removal of concrete thrust block, if required; removal of the existing fire hydrant (and adjacent piping, if necessary); adjustment and/or relocation of the existing fire hydrant valve box; furnishing and installing the necessary pipe and fittings; furnishing and installing a new fire hydrant; flushing and swabbing; constructing new concrete thrust blocks; backfilling the entire excavation with trench backfill up to the proposed subgrade; and disposal of all surplus materials.”

564.03 General. Revise the first paragraph of this Article to read:

“564.03 General. The hydrant shall be installed vertically so that the lowest hose connection is not less than 18 inches nor more than 26 inches above the finished grade ground level. The hydrant base shall be set on a precast concrete block of adequate area and thickness to provide firm support for the base, and shall be securely braced with solid concrete blocking between the base and undisturbed trench wall to counteract the reaction thrust of water pressure at the base. The hydrant barrel shall be braced in such a manner to hold it plumb during backfilling. A minimum of 0.50 cubic yards of washed coarse stone shall be placed at and around the hydrant base for proper drainage of the hydrant barrel after use.”

564.03 General. Add the following to the fourth paragraph of this Article:

“Trench backfill material shall be carefully placed and compacted in 6-inch layers around the hydrant to ensure protection and plumbness of the hydrant barrel.”

564.03 General. Add the following paragraphs to this Article:

“The Contractor shall provide ductile iron pipe complying with ANSI A21.51, thickness Class 52, with joints complying with ANSI A21.11. Ductile iron mechanical joint fittings shall be

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in accordance with ANSI A21.10 or A21.53. Cement linings complying with ANSI 21.4 or AWWA C104, standard thickness shall be used.

Swab the piping, valves, and fittings with a 5% solution of calcium hypochlorite prior to assembly and flush thoroughly.

Any water main pipe laid between the existing water main and the proposed hydrant location shall have a minimum of 6-feet of cover over the top of the pipe to prevent freezing.”

Valve boxes shall be Mueller 1H-10360 or Clow 1F-2454.

564.04 Basis of Payment. Revise this Article to read:

“564.04 Basis of Payment. This work will be paid for at the contract unit price each for FIRE HYDRANTS TO BE REMOVED AND REPLACED.”

**ADJUSTING WATER MAIN:**

Description:

This item consists of a vertical adjustment of water main when crossing under storm and sanitary sewers and where the use of fittings is utilized to adjust the depth of the water main.

Materials:

This item includes all elements necessary to construct a water main crossing under a sewer including but not limited to all fittings, retaining glands, casing, thrust blocking, etc.

Method of Construction:

Where water mains cross under storm sewers or sanitary sewers, the sewer must be constructed of slip-on or mechanical joint ductile iron pipe meeting water main standards. This protection must extend on each side of the crossing until the normal discharge from the water main to the sewers is at least ten (10) feet. In addition, a vertical separation of eighteen (18) inches between the invert of the sewer and the crown of the water main shall be maintained, and the sewer line shall be adequately supported to prevent settling. A length of water main shall be centered under the sewer to be crossed so that the joints will be equidistant from the sewer.

Measurements and Basis of Payment:

This work shall be measured and paid for at the contract unit price per foot for ADJUSTING WATER MAIN, of the diameter specified, which price shall be considered payment in full for adjusting a water main as specified, including all necessary pipe, fittings, retainer glands, thrust blocks, excavation, labor, equipment, and materials.

**BIKE PATH REMOVAL:**

This work shall be done in accordance with Section 440 and 606 of the Standard Specifications and the Detail provided in the Plans, except as modified herein.

440.08 Basis of Payment. Add the following to the end of this Article:

“Removal of bike path will be paid for at the contract unit price per square yard (square meter) for BIKE PATH REMOVAL.”

**REMOVE SIGN (SPECIAL):**

This work shall be done in accordance with Section 737 of the Standard Specifications except as modified herein.

737.01 Description. Replace this Article with the following:

“This work shall consist of removing a ground mounted sign and sign support and/or foundations.”

737.02 Removal. Add the following to the end of this Article.

“(c) Masonry Sign. All components of the masonry sign, including the foundation, reinforcing, and electrical items shall be removed completely from the right-of-way.

The use of explosives of any kind will not be permitted in removing masonry signs.

The entire masonry sign and foundation shall be removed in the same day.

The hole shall be backfilled with suitable material approved by the Engineer. The surface of the filled hole shall be treated to match the surrounding area.

All debris resulting from this operation shall be removed from the right-of-way.”

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737.03 Basis of Payment. Replace this Article with the following:

“This work will be paid for at the contract unit price per each for REMOVE SIGN (SPECIAL).”

**COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT:**

This work shall be done in accordance with Section 440 and 606 of the Standard Specifications and the Detail provided in the Plans, except as modified herein.

Method of Measurement.

“The Engineer will measure the curb and gutter as marked for removal and replacement prior to the removal of the existing curb and gutter. The measurement, as marked, will be the final payment quantity and should be verified by the Contractor prior to the removal.”

Basis of Payment.

“This work will be paid for at the contract unit price per foot for COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT.

**CONCRETE RETAINING WALL REMOVAL:**

This work shall be done in accordance with Section 501 of the Standard Specifications except as modified herein.

501.06 Method of Measurement. Add the following to the end of this Article:

“Removal of existing concrete retaining wall will be measured for payment in place, in feet (meters) along the base of the retaining wall.”

501.07 Basis of Payment. Add the following to the end of this Article:

“Removal of concrete retaining wall will be paid for at the contract unit price per FOOT (meter) for CONCRETE RETAINING WALL REMOVAL.”

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**SEGMENTAL CONCRETE BLOCK WALL:**

This work shall be done in accordance with Section 522 of the Standard Specifications except as modified herein.

- A. Acceptable block manufacturers:
  - a. Unilock, with style Pisa2 and color Nevada.

522.16 Basis of Payment. Add the following to the end of this Article:

“This work will be paid for at the contract unit price per SQUARE FOOT (meter) for SEGMENTAL CONCRETE BLOCK WALL.”

**TRENCH BACKFILL, SPECIAL:**

This work shall be done in accordance with Section 208 of the Standard Specifications and the detail in the Plans except as modified herein.

Materials. Replace this Article with the following:

Trench backfill material shall be provided by ComEd. ComEd will be on-site during construction and trench backfill material shall be installed according to the detail in the Plans or as determined by the Engineer and ComEd. The point of contact for ComEd shall be Jim Gregory, who can be reached at 773-401-4000.

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**GRANULAR THERMAL BACKFILL**  
(3/8" MATERIAL SI# 391082)  
(#4 MATERIAL SI# 391083)

1. SCOPE

- 1.1 THIS SPECIFICATION CONSTITUTES TWO TYPES OF MATERIALS COMMONLY KNOWN AS "PROCESSED CONCRETE" SUITABLE FOR FILLING AROUND UNDERGROUND CONDUITS, DIRECT BURIED CABLES, AND PIPE TYPE CABLE INSTALLATIONS.

2. IDEAL BACKFILL

- 2.1 AN IDEAL BACKFILL WOULD BE ONE HAVING A HEAVY AGGREGATE RANGING IN SIZE FROM LARGE TO SMALL, WITH JUST ENOUGH OF EACH SMALLER SIZE MATERIAL TO FILL THE VOIDS LEFT BY THE NEXT LARGER SIZE. IN ADDITION, IT SHOULD HAVE SUFFICIENT CEMENTING MATERIAL, LIKE CLAY, TO BIND THE PARTICLES TOGETHER, AND TO ACT LIKE A WICK TO DRAW IN THE MOISTURE NEEDED FOR GOOD THERMAL CONTACTS BETWEEN PARTICLES.
- 2.2 THE RELATIONSHIP BETWEEN DENSITY, MOISTURE CONTENT AND THERMAL RESISTIVITY IS MUCH THE SAME FOR MOST SOILS. THAT IS FOR ANY ONE MATERIAL AND ANY ONE DENSITY IF THE MOISTURE IS INCREASED THE THERMAL RESISTIVITY IS DECREASED. IF THE MOISTURE REMAINS CONSTANT AND THE MATERIAL IS COMPACTED TO INCREASE ITS DENSITY THE THERMAL RESISTIVITY IS DECREASED. HOWEVER AT HIGH MOISTURE CONTENTS THE REDUCTION IN RESISTIVITY WITH THE SAME VARIATION IN DENSITY IS NOT SO MARKED AS IT IS AT LOW OR ZERO MOISTURE CONTENT. PRACTICALLY THIS MEANS THAT AT HIGH SOIL DENSITIES ADDITIONAL WATER WILL HAVE A LESSER EFFECT ON THE THERMAL RESISTIVITY THAN AT LOOSE DENSITIES.
- 2.3 FOR BENCH MARKING, OTTAWA SAND IS USED. SEE EXHIBIT VI.
- 2.4 SEE EXHIBIT VIII FOR SAMPLE MECHANICAL ANALYSIS AND GRAPH FOR TWO MATERIALS FOUND IN THE CHICAGO AREA AND SHOULD BE USED FOR BENCH MARKING.
- 2.5 THE VENDOR SHALL SUPPLY ALL BACKFILL TO COMPLY WITH THE PERFORMANCE REQUIREMENTS OF THIS SPECIFICATION AND WITH THE REQUIREMENTS OF EACH SPECIFIC PURCHASE REQUISITION.
- 2.6 THE VENDOR SHALL PROVIDE THE PERFORMANCE TESTS TO THE OWNER PRIOR TO SHIPPING MATERIALS.
- 2.7 THE PERFORMANCE MEASUREMENTS ARE:
- A) SIEVE ANALYSIS OF BACKFILL, ITEM 1, OR ITEM 2 WITH GRAPHS AND WEIGHTS.
  - B) PROCTER TEST WITH MAXIMUM MOISTURE CONTENT AND WEIGHT FOR BOTH ITEM 1, OR ITEM 2.
  - C) THERMAL RESISTIVITY AT VARIOUS MOISTURE CONTENTS FROM 2% TO 20% IN A LABORATORY ENVIRONMENT FOR BOTH ITEM 1 OR ITEM 2. SEE PARAGRAPH 14.2 FOR THERMAL RESISTIVITY REQUIREMENT FOR THERMAL BACKFILL. VENDOR TO PROVIDE GRAPHS.

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### 3. CHARACTERISTICS OF BACKFILL

- 3.1 THE CHARACTERISTIC OF THE BACKFILL THAT ARE MOST SIGNIFICANT IN DETERMINING THE STABILITY OF THE BACKFILL CAN BE ADEQUATELY DESCRIBED BY A SIEVE ANALYSIS, A PROCTOR CURVE FOR THE SAMPLE AND A PLOT OF THE THERMAL RESISTIVITY OF THE BACKFILL AS A FUNCTION OF MOISTURE CONTENT. WHILE THESE CHARACTERISTICS ARE BY NO MEANS THE SOLE FACTORS WHICH INFLUENCE THE STABILITY OF A BACKFILL, THEY ARE AN IMPORTANT KEY TO DESCRIBING HOW A SAMPLE WILL THERMALLY REACT WHEN HEATED BY A ENERGY SOURCE.
- 3.2 THE SIEVE ANALYSIS IS AN IMPORTANT AID IN PREDICTING THE THERMAL STABILITY OF A SAMPLE. IN GENERAL, THOSE BACKFILL SAMPLES THAT HAVE A RELATIVELY EVEN DISTRIBUTION OF GRAIN SIZES WILL BE MORE THERMALLY STABLE THAN A SIMILAR SAMPLE HAVING ONLY A SINGLE OR RELATIVELY FEW GRAIN SIZES. THE SAMPLE WITH A LARGE VARIETY OF GRAIN SIZES WILL BE LESS POROUS, BECAUSE THE SMALLER GRAIN SIZES TEND TO BLOCK THE PASSAGE OF WATER IN BOTH THE LIQUID AND VAPOR PHASES. A BACKFILL SAMPLE WITH ONLY A FEW GRAIN SIZES WILL BE MORE POROUS, BECAUSE IT LACKS THE DISTRIBUTION OF PARTICLES TO FILL THE VOIDS BETWEEN THE LARGER GRAINS. THE RESULTING STRUCTURE IS QUITE POROUS AND THE MOBILITY OF WATER WITHIN THE STRUCTURE IS UNINHIBITED. AS A RESULT, THE SAMPLE WITH ONLY A FEW GRAIN SIZES TENDS TO BE THERMALLY UNSTABLE.
- 3.3 THE PROCTOR CURVE DATA IS HELPFUL IN SELECTING THE MAXIMUM DENSITY THAT CAN BE OBTAINED FOR A GIVEN BACKFILL SAMPLE. THE PROCTOR CURVE DATA IS OBTAINED BY COMPACTING THE SAMPLE WITH A REPRODUCIBLE ENERGY OF COMPACTION AT VARIOUS MOISTURE CONTENTS. ALL PROCTOR CURVE DATA WERE MEASURED ACCORDING TO ASTM STANDARD D698. THIS TYPE OF DATA REVEALS THE MAXIMUM DENSITY THAT CAN BE OBTAINED FROM A SAMPLE USING REASONABLE COMPACTION FORCES. IT THEREFORE HELPS TO PREDICT THE DENSITIES CAN BE OBTAINED IN THE FIELD WHEN USING TYPICAL CABLE INSTALLATION PRACTICES. THE MAXIMUM ACHIEVABLE DENSITY VALUES ARE ALSO IMPORTANT, BECAUSE THE BACKFILL BECOMES MORE THERMALLY STABLE AS THE DENSITY OF THE SOIL INCREASES.
- 3.4 THE CURVE THERMAL RESISTIVITY OF THE BACKFILL AS A FUNCTION OF THE MOISTURE CONTENT IS VALUABLE INFORMATION WHEN PREDICTING THE THERMAL STABILITY OF THE BACKFILL. ALL BACKFILL SAMPLES TESTED THUS FAR HAVE SHOWN AN INCREASE IN THERMAL RESISTIVITY AS THE MOISTURE CONTENT DECREASES. IN FACT, THE RATIO OF THE THERMAL RESISTIVITY OF A MOIST SOIL TO THAT OF A COMPLETELY DRY SAMPLE CAN BE AS HIGH AS A FACTOR OF 10. FURTHERMORE ALL SAMPLES TESTED TO DATE HAVE SHOWN A REGION IN THE RESISTIVITY VS. MOISTURE CONTENT CURVE BEYOND WHICH AN INCREASE IN MOISTURE CONTENT HAS LITTLE OR NO EFFECT ON THE THERMAL RESISTIVITY OF THE SAMPLE.
- 3.5 THE PRECISE SHAPE OF THE THERMAL RESISTIVITY - MOISTURE CONTENT CURVE HAS A SIGNIFICANT INFLUENCE ON THE THERMAL STABILITY OF THE BACKFILL. SAMPLES THAT HAVE A RATHER STEEP RESISTIVITY CURVE WITH A LARGE INCREASE IN THERMAL RESISTIVITY FOR A SMALL CHANGE IN MOISTURE CONTENT TEND TO BE THERMALLY UNSTABLE SAMPLES. OTHER SAMPLES THAT HAVE A RELATIVELY FLAT RESISTIVITY VS. MOISTURE CONTENT CURVE MIGHT INDICATE POTENTIALLY GOOD THERMAL BACKFILLS, BECAUSE CHANGES IN MOISTURE CONTENT DUE TO MOISTURE MIGRATION PRODUCE ONLY VERY SMALL CHANGES IN THE THERMAL RESISTIVITY OF THE SAMPLE. IN ALL CASES, THE AMPACITY VALUE COULD SAFELY BE CALCULATED ON THE BASIS OF THE THERMAL RESISTIVITY OF A COMPLETELY DRY SAMPLE AS A CONSERVATIVE CONDITION.

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4. PHYSICAL PROPERTIES

4.1 GRADING

BACK-FILL GRAVEL WHICH SHOULD MEET THIS SPECIFICATION MAY BE MADE UP OF STANDARD STOCK AGGREGATES.

PERCENTAGES PASSING SIEVES

4.2 SIEVING

THE MATERIAL FURNISHED SHALL BE GRADED BETWEEN THE FOLLOWING LIMITS PER ASTM D421 AND ASTM D422.

ITEM 1: SI# 391082

3/8" MATERIALS  
PERCENTAGE PASSING SIEVES

3/8"	#4	#10	#30	#50	#100	#200
100	75-100	52-68	24-35	14-23	8-15	5-11

ITEM 2: SI# 391083

#4 MATERIALS  
PERCENTAGE PASSING SIEVES

3/8"	#4	#10	#30	#50	#100	#200
100	100	67-100	28-48	16-32	12-22	8-15

SIEVE ANALYSIS SHALL BE MADE IN ACCORDANCE WITH THE AMERICAN SOCIETY FOR TESTING AND MATERIALS AND SECTION 5 AND 16 OF THIS SPECIFICATION.

APPROX. WEIGHT = 121 LBS./CU. FT. FOR ITEM 1  
APPROX. WEIGHT = 118 LBS./CU. FT. FOR ITEM 2  
VERIFY BY PROCTOR TEST.

4.3 TYPE OF MATERIAL

THESE MATERIALS REFERRED TO AS "GRANULAR THERMAL BACKFILLS" SHOULD BE COMPOSED OF HARD, WELL GRADED, NATURAL OR CRUSHED MINERAL AGGREGATE SUCH AS LIME STONE, DOLOMITE, GRANITE, QUARTZ, RE-PROCESSED CONCRETE OR OTHER SIMILAR ROCK. RE-PROCESSED AND CRUSHED CONCRETE SHALL BE ACCEPTED IF IT IS FREE OF ANY FOREIGN MATTER SUCH AS STEEL, RUBBLE, CINDERS, ASPHALT, AND OTHER ORGANIC MATTER SUCH AS PEAT, VEGETATION AND TOP SOIL. HOWEVER, POROUS CONCRETE WITH AIR CONTENT OF MORE THAN 4% SHALL NOT BE ACCEPTED.

4.4 SILT AND ORGANIC IMPURITIES

MATERIALS SHOULD BE FREE FROM SILT, CLAY, ORGANIC IMPURITIES AND OTHER DELETERIOUS SUBSTANCES SUCH AS ASPHALT, OIL, ETC.

4.5 SEE SECTIONS 10, 11, 12, 13, 14 AND 15 FOR THERMAL REQUIREMENTS OF BACKFILL.

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## 5. SAMPLES AND SAMPLING

5.1 ACCURATE SAMPLING IS OF THE GREATEST IMPORTANCE AND IS THE BASIC REQUIREMENT FOR RELIABLE SIEVE ANALYSES. GREAT CARE SHOULD BE TAKEN TO OBTAIN SAMPLES THAT ARE TRULY REPRESENTATIVE OF THE BATCH OR LOT BEING TESTED. THE GREATEST CAUSE OF INCONSISTENCIES IN TEST RESULTS IS IMPROPER SAMPLING THAT DOES NOT TRULY REPRESENT THE MATERIAL. THEREFORE, ONCE THE SAMPLING PROCEDURE IS ESTABLISHED, THIS SAME PROCEDURE SHOULD ALWAYS BE FOLLOWED.

### 5.2 HOW TO TAKE SAMPLES

IT IS NOT PRACTICABLE TO SPECIFY A SINGLE METHOD OF SAMPLING SINCE THE CHARACTER OF THE MATERIAL AND THE FORM IN WHICH IT IS AVAILABLE WILL AFFECT THE SELECTION OF THE PROCEDURE TO BE USED. FOR EXAMPLE, THE MATERIAL MAY BE FINE, MEDIUM, OR COARSE, AND IT MAY BE IN A PILE, RAILROAD CARS, BAGS, OR A CONTINUOUS STREAM. SAMPLING PROCEDURES FOR A VARIETY OF MATERIALS ARE DESCRIBED IN THE ASTM STANDARDS LISTED AND SHOULD BE USED FOR ALL MATERIALS WHICH THEY COVER.

### 5.3 SIZE OF GROSS SAMPLE

THE SIZE OF A GROSS SAMPLE WILL DEPEND NOT ONLY ON THE CHARACTER OF THE MATERIAL AND THE FORM IN WHICH IT IS AVAILABLE BUT ALSO ON WHETHER THE TEST IS TO DETERMINE THE PARTICLE SIZE DISTRIBUTION OF A PILE, BATCH, SHIPMENT, DAY'S PRODUCTION, OR SHORT SPAN OF TIME FOR PRODUCTION CONTROL. THE RANGE OF SIZE OF A GROSS SAMPLE IS VERY WIDE. IT MAY BE AS MUCH AS SEVERAL THOUSAND POUNDS (OR KILOGRAMS) AND MAY BE AS LITTLE AS A FRACTION OF A POUND (OR KILOGRAM). FOR DETAILED SAMPLING INSTRUCTIONS AND SUGGESTED GROSS SAMPLE SIZES FOR SPECIFIC MATERIALS, SEE LISTED ASTM SPEC'S.

### 5.4 SAMPLING FROM A PILE

IN SAMPLING FROM A PILE, PARTICULARLY MATERIAL LIKE CRUSHED STONE CONTAINING LARGE PARTICLES, IT IS EXTREMELY DIFFICULT TO SECURE SAMPLES THAT ARE TRULY REPRESENTATIVE. AT THE APEX OF A CONICAL PILE, THE PROPORTION OF FINES WILL BE GREATER, WHILE AT THE BASE, THE PERCENTAGE OF COARSE PARTICLES WILL BE GREATER. THEREFORE, NEITHER LOCATION WILL BE REPRESENTATIVE OF THE WHOLE. IN A SHOVELING PROCESS, EVERY FIFTH OR TENTH SHOVEL, ETC., SHOULD BE TAKEN DEPENDING ON THE AMOUNT OF THE SAMPLE DESIRED. THE SAMPLE SHOULD CONSIST OF SMALL QUANTITIES TAKEN AT RANDOM FROM AS MANY PARTS OF THE PILE AS ARE ACCESSIBLE AND TAKEN IN A MANNER THAT THE COMPOSITE WILL HAVE THE SAME GRADING AS THE LARGER AMOUNT.

### 5.5 REDUCTION OF GROSS SAMPLE TO TEST SIZE FOR SIEVE ANALYSIS

AFTER THE GROSS SAMPLE HAS BEEN PROPERLY TAKEN, THE NEXT STEP IS TO REDUCE IT TO A SUITABLE SIZE FOR THE SIEVE ANALYSIS TEST WITHOUT IMPAIRING IN ANY WAY THE PARTICLE SIZE DISTRIBUTION CHARACTERISTICS OF THE ORIGINAL SAMPLE. THIS PHASE OF THE OPERATION SHOULD FOLLOW THE APPLICABLE ASTM PUBLISHED STANDARDS, OR THE PROCEDURES DESCRIBED IN THE SUCCEEDING SECTIONS, AND SHOULD BE PERFORMED WITH AS MUCH CARE AS WAS USED IN THE COLLECTION OF THE GROSS SAMPLE AND IN MAKING SIEVE TEST.

### 5.6 CONING AND QUARTERING

PILE THE GROSS SAMPLE IN A CONE (FIG.1), PLACE EACH SHOVELFUL AT THE APEX OF THE CONE, AND ALLOW IT TO RUN DOWN EQUALLY IN ALL DIRECTIONS. THIS WILL MIX THE SAMPLE. THEN SPREAD THE SAMPLE IN A CIRCLE AND WALK AROUND THE PILE, GRADUALLY WIDENING THE CIRCLE WITH A SHOVEL UNTIL THE MATERIAL IS SPREAD TO A UNIFORM THICKNESS. MARK THE FLAT PILE INTO QUARTERS, AND REJECT TWO OPPOSITE QUARTERS. MIX AGAIN INTO A CONICAL PILE, TAKING ALTERNATE SHOVELFULS FROM THE TWO QUARTERS SAVED. CONTINUE THE PROCESS OF PILING, FLATTENING, AND REJECTING TWO QUARTERS UNTIL THE SAMPLE IS REDUCED TO THE REQUIRED SIZE.

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### 5. SAMPLES AND SAMPLING (CONT.)

#### 5.6 (CONT.)

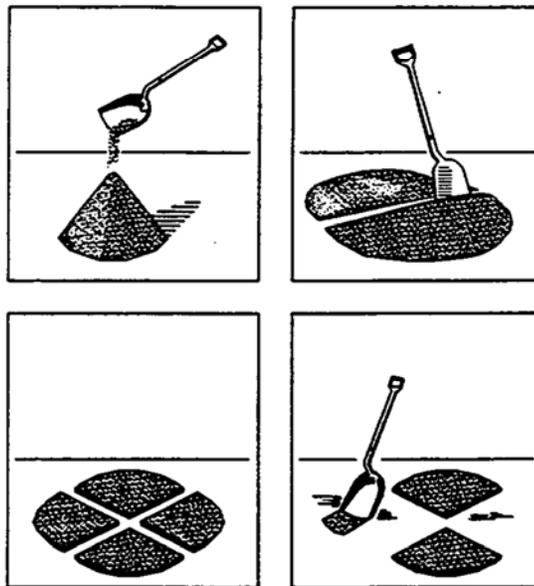


FIG. 1 - CONING AND QUARTERING OF SAMPLE

### 6. GENERAL TEST SIEVING PROCEDURES

- 6.1** IF THE TEST SAMPLE IS NOT DRY AND FREE FLOWING BECAUSE OF MOISTURE, IT SHOULD BE DRIED TO A CONSTANT WEIGHT USUALLY AT A TEMPERATURE OF  $230 \pm 9F$  ( $110 \pm 5C$ ), EXCEPT IN CASES WHERE SUCH TEMPERATURE MIGHT HAVE SOME ADVERSE EFFECT ON THE MATERIAL.
- 6.2** WEIGH AND RECORD THE WEIGHT OF THE TEST SAMPLE TO AN ACCURACY (IN GENERAL) OF 0.1 PERCENT.
- 6.3** SELECT THE SIEVES TO BE USED IN THE TEST FROM THE ASTM STANDARD SIEVE SERIES LISTED IN THE APPENDIX. MOST SIEVES ANALYSES ARE MADE WITH A NEST OF SIEVES, AND IT IS DESIRABLE THAT THIS NEST CONSIST OF AS FEW SIEVES AS POSSIBLE AND STILL GIVE ADEQUATE INFORMATION ON THE SIZE DISTRIBUTION OF THE MATERIAL BEING TESTED. FOR EXAMPLE, FOR A MINUS 1-IN. (25-MM) MATERIAL, EVERY OTHER SIEVE OR EVERY THIRD SIEVE COULD BE USED, PROVIDED SUCH A SELECTION GIVES THE DESIRED INFORMATION AND DOES NOT RESULT IN THE OVERLOADING OF ANY OF THE SIEVES. IN SOME CASES, COARSER SIEVES ARE USED IN THE NEST TO PROTECT THE FINER SIEVES FROM EXCESSIVE WEAR OR OVERLOADING. FOR GRADED MATERIALS WITH A NARROW PARTICLE SIZE RANGE, SUCH AS ABRASIVES, FILTER SAND, ETC., EVERY SIEVE IN THE FOURTH ROOT OF TWO RATIO IN THE SERIES SHOULD BE USED. IN OTHER CASES, SUCH AS A TEST FOR PRODUCTION CONTROL, IT MAY BE THAT ONLY ONE SIEVE IS NEEDED. WHERE HIGH PRECISION AND CLOSE COMPARABILITY OF TEST RESULTS ARE DESIRED, MATCHED SIEVES (SEE SECTION 4) SHOULD BE USED.

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6. GENERAL TEST SIEVING PROCEDURES (CONT.)

6.4 NEST THE SELECTED SIEVES IN SEQUENCE WITH THE COARSEST SIEVE AT THE TOP AND THE SOLID PAN AT THE BOTTOM. PLACE THE TEST SAMPLE ON THE TOP SIEVE AND CLOSE THE NEST WITH A COVER. PROCEED WITH THE TEST USING EITHER THE HAND SIEVING METHOD (SEE SECTION 7) OR THE MECHANICAL SIEVE SHAKER METHOD (SEE SECTION 8)

6.5 GRAIN-SIZE ANALYSIS OF SOILS

MAKING SIEVE ANALYSIS TEST OF SOILS IS A HIGHLY SPECIALIZED PROCEDURE, AND IT IS RECOMMENDED THAT SUCH TESTS BE MADE USING THE PROCEDURES OUTLINED IN ASTM METHOD FOR DRY PREPARATION OF SOIL SAMPLES FOR GRAIN-SIZE ANALYSIS AND DETERMINATION OF SOIL CONSTANTS (D421); METHOD FOR GRAIN-SIZE ANALYSIS OF SOILS (D422); TEST FOR AMOUNT OF MATERIAL IN SOILS FINER THAN THE NO. 200 SIEVE (D1140); AND METHOD FOR WET PREPARATION OF SOIL SAMPLES FOR GRAIN-SIZE ANALYSIS AND DETERMINATION OF SOIL CONSTANTS (D2217).

7. HAND SIEVING METHOD

7.1 HAND SIEVING IS THE ORIGINAL BASIC METHOD OF MAKING SIEVE ANALYSES. IN HAND SIEVING, THE TESTS ARE MADE, OR AT LEAST COMPLETED, ON ONE SIEVE AT A TIME. THE BEST PROCEDURE IS TO PLACE THE TEST SAMPLE ON A CLEAN DRY SIEVE WITH THE PAN ATTACHED. WHILE HOLDING THE UNCOVERED SIEVE AND PAN IN BOTH HANDS, SIEVE WITH A GENTLE ROTARY MOTION UNTIL MOST OF THE FINE MATERIAL HAS PASSED THROUGH AND THE RESIDUE LOOKS FAIRLY CLEAN. THIS OPERATION USUALLY TAKES ONLY 1 OR 2 MIN. FOR SIEVES COARSER THAN NO. 100 AND 3 OR 4 MIN. FOR SIEVES NO. 100 AND FINER. WHEN THE RESIDUE APPEARS CLEAN, PLACE THE COVER ON THE SIEVE, TURN IT UPSIDE DOWN, AND REMOVE THE PAN. THEN, WITH THE SIEVE AND COVER HELD FIRMLY IN ONE HAND, GENTLY TAP THE SIDE OF THE SIEVE WITH THE HANDLE OF THE BRUSH USED FOR CLEANING SIEVES. DUST ADHERING TO THE SIEVE AND PARTICLES IN THE MESH WILL BE DISLODGED, AND THE UNDERSIDE ON THE SIEVE MAY BE BRUSHED CLEAN. EMPTY THE PAN AND THOROUGHLY WIPE IT WITH A CLOTH OR WASTE, REPLACE IT ON THE SIEVE, RESTORE THE ASSEMBLY TO AN UPRIGHT POSITION, AND CAREFULLY REMOVE THE COVER. REPLACE ON THE SIEVE ANY COARSE MATERIAL THAT HAS BEEN CAUGHT IN THE COVER DURING THE TAPPING. CONTINUE THE SIEVING WITHOUT THE COVER, AS DESCRIBED ABOVE, UNTIL NOT MORE THAN 1 PERCENT BY WEIGHT OF THE RESIDUE PASSES ANY SIEVE DURING 1 MIN. THE GENTLE SIEVING MOTION INVOLVES NO DANGER OF SPILLING THE RESIDUE, WHICH SHOULD BE KEPT WELL SPREAD OUT IN THE SIEVE. CONTINUOUSLY ROTATE THE SIEVE DURING THE SIEVING.

7.2 "END-POINT" TESTS

SIEVE DURING THE SIEVING. HOLD THE SIEVE, WITH PAN AND COVER ATTACHED, IN ONE HAND AT AN ANGLE OF ABOUT 20 DEG FROM THE HORIZONTAL. MOVE THE SIEVE UP AND DOWN IN THE PLANE OF INCLINATION AT THE RATE OF ABOUT 150 TIMES PER MINUTE, AND STRIKE THE SIEVE AGAINST THE PALM OF THE OTHER HAND AT THE TOP OF EACH STROKE. PERFORM THE SIEVING OVER A WHITE PAPER TO AVOID LOSING PARTICLES THAT MAY PASS BETWEEN THE LID AND THE SIEVE. RETURN ANY MATERIAL COLLECTING ON THE PAPER TO THE SIEVE. AFTER EVERY 25 STROKES, TURN THE SIEVE ABOUT ONE SIXTH OF A REVOLUTION IN THE SAME DIRECTION. AS AN AID TO PROPER SIEVE ROTATION, THE SIEVE COVER MAY BE MARKED WITH THREE STRAIGHT LINES, INTERSECTING AT 60 DEG THROUGH THE CENTER, WITH ONE OF THE LINES MARKED WITH AN ARROWHEAD TO INDICATE THE STARTING POINT. CONTINUE THE SIEVING OPERATION UNTIL THE ADDITIONAL MATERIAL WHICH PASSES THROUGH 1 MIN OF CONTINUOUS SIEVING FAILS TO CHANGE THE AMOUNT ON THAT SIEVE BY MORE THAN 1.0 PERCENT. IN REPORTING SIEVE TESTS, CALCULATIONS SHOULD BE CARRIED OUT TO 0.1 PERCENT.

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7. HAND SIEVING METHOD (CONT.)

7.3 PROCEDURE WITH A STACK OF SIEVES

IN HAND SIEVING, WHEN A NUMBER OF SIEVES ARE TO BE USED IN THE TEST, ARRANGE THE SIEVES IN A STACK (INCLUDE A BOTTOM PAN) WITH THE COARSEST SIEVE AT THE TOP, AND PLACE THE SAMPLE TO BE SIEVED ON THE TOP SIEVE. GIVE THE WHOLE NEST OF SIEVES A PRELIMINARY SHAKING FOR 2 OR 3 MIN. THE MOST PRACTICAL WAY TO DO THIS IS TO PLACE THE STACK ON A TABLE AND SHAKE THE SIEVES WITH A CIRCULAR MOTION ACCOMPANIED BY A TAPPING ACTION. AFTER THIS PRELIMINARY SHAKING, SHAKE EACH SIEVE SEPARATELY STARTING WITH THE COARSEST, TO COMPLETE THE SEPARATION. ADD ALL MATERIAL PASSING IN EACH INDIVIDUAL SIEVE TO THE NEXT SMALLER SIEVE IN THE SEQUENCE.

7.4 CONSISTENCY IMPORTANT IN HAND SIEVING

THE OPERATOR SHOULD TRY TO BE CONSISTENT WITH THE HAND SIEVING METHOD TO ALWAYS REPRODUCE THE SAME CIRCULAR MOTION AND TAPPING ACTION. IF HAND SIEVING IS TO BE USED FOR REPEATED TESTS BY MORE THAN ONE LABORATORY, IT IS IMPORTANT THAT A DETAILED HAND SIEVING PROCEDURE BE ESTABLISHED AND SPECIFIED.

7.5 HAND SIEVING AS A REFEREE

IN GENERAL, IN CASE OF DOUBT OR DISPUTE ON THE CORRECTNESS OF THE RESULTS OF A SIEVE ANALYSIS, THE QUESTIONED FIGURES SHOULD BE CHECKED AGAINST RESULTS OBTAINED BY HAND SIEVING, USING THE PROCEDURES DESCRIBED WHICH SHALL BE FINAL.

8. MECHANICAL SIEVE SHAKER METHOD

8.1 MECHANICAL SIEVE SHAKERS ARE USED IN PRACTICALLY ALL LABORATORIES WHERE FREQUENT TESTS ARE MADE. THEY NOT ONLY ELIMINATE MUCH TEDIOUS HAND LABOR, BUT, WHEN PROPERLY USED, WILL PRODUCE MORE CONSISTENT RESULTS. SEE ASTM STP 447-B FOR DETAILS.

9. WEIGHING

9.1 AFTER COMPLETION OF THE AGITATION OF THE SIEVES, THE ENTIRE NEST OF SIEVES SHOULD BE BROUGHT TO THE WEIGHING STATION FOR RECORDING OF THE ANALYSIS. WEIGHING SHOULD ALWAYS BE DONE, IN GRAMS FOR MOST TESTS, ON A BALANCE ACCURATE TO 0.1 PERCENT OF THE WEIGHT OF THE TEST SAMPLE. ONE SUITABLE TYPE OF BALANCE FOR SIEVE ANALYSIS WORK IS SHOWN IN FIG. 11. THE MATERIAL RETAINED ON EACH SIEVE SHOULD BE WEIGHED SEPARATELY. THE MATERIAL PASSING THROUGH THE FINEST SIEVE INTO THE PAN SHOULD ALSO BE WEIGHED TO PROVIDE AN OVERALL CHECK. SINCE THE WEIGHT OF EACH FRACTION IS DETERMINED TO WITHIN 0.1 PERCENT OF THE TOTAL SAMPLE WEIGHT, THE MAXIMUM ERROR FOR THE TEST SHOULD NOT EXCEED 0.1 PERCENT TIMES THE NUMBER OF WEIGHINGS. IF THE SUM OF THE WEIGHTS OF THE MATERIAL RETAINED ON THE VARIOUS SIEVES PLUS THAT IN THE PAN DOES NOT DEVIATE FROM THE WEIGHT OF THE ORIGINAL SAMPLE BY MORE THAN THE ABOVE TOLERANCE, THE SUM OF THE WEIGHTS, RATHER THAN THE ORIGINAL SAMPLE WEIGHT, CAN BE USED AS 100 PERCENT FOR CALCULATION OF THE SIEVE ANALYSIS PERCENTAGES. ANOTHER COMMON PRACTICE IS TO ASSUME THAT A DEFICIENCY OF UP TO A MAXIMUM OF 0.5 PERCENT IN THE SUM OF THE FRACTION WEIGHTS COMPARED TO THE WEIGHT OF THE ORIGINAL SAMPLE IS "DUST LOSS" AND CAN BE ADDED TO THE PAN FRACTION. IF THE VARIATION IS GREATER THAN THE ABOVE TOLERANCE, THE FIGURES SHOULD BE RECHECKED FOR POSSIBLE ERRORS IN WEIGHING, CALCULATION, BLINDING OF THE SIEVE APERTURES, OR ACCIDENTAL SPILLAGE LOSS. (IN WET SIEVING, THE MATERIAL THROUGH THE FINEST SIEVE IS USUALLY LOST, AND THIS CHECK IS NOT POSSIBLE.)

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### 9. WEIGHING (CONT.)

- 9.2 WHEN WORKING WITH SMALL SAMPLES AND USING 3-IN. (76-MM) SIEVES, IT IS OFTEN DESIRABLE TO DETERMINE A TARE WEIGHT FOR EACH SIEVE AND PAN TO PERMIT DETERMINATION OF WEIGHTS WITHOUT REMOVAL OF THE RETAINED FRACTIONS. WITH SMALL FRACTIONS THERE IS GREAT DANGER THAT LOSS OF MATERIAL DURING REMOVAL FROM THE SIEVE WILL UPSET THE ACCURACY OF THE TEST.

### 10. CALCULATION

- 10.1 THE WEIGHTS OF THE MATERIAL RETAINED ON EACH SIEVE AND THE WEIGHT OF THE ORIGINAL TEST SAMPLE ARE THE BASIC DATA FROM WHICH PERCENTAGES ARE CALCULATED. THESE WEIGHTS ARE NOT USUALLY REPORTED. THE RESULTS ARE PRESENTED IN THE FORM OF PERCENTAGES OF THE TOTAL TEST SAMPLE RETAINED ON, OR PASSING THROUGH, EACH SIEVE.
- 10.2 THE PERCENTAGE RETAINED ON EACH SIEVE IS CALCULATED BY DIVIDING THE "TOTAL WEIGHT COARSER" THAN THAT SIEVE BY THE TOTAL WEIGHT OF THE TEST SAMPLE. THE TOTAL WEIGHT COARSER INCLUDES THE MATERIAL RETAINED ON THAT PARTICULAR SIEVE PLUS ALL MATERIAL ON ALL COARSER SIEVES. THIS CUMULATIVE PERCENTAGE IS VERY USEFUL AS IT REPRESENTS THE TOTAL PERCENTAGE OF THE TEST SAMPLE COARSER THAN THE APERTURE OF THAT PARTICULAR SIEVE. MOST SIEVE TEST TABULATIONS ARE SET UP ON THE BASIS OF THE PERCENTAGE OF MATERIAL RETAINED ON EACH SIEVE; HOWEVER, IT IS ALSO ACCEPTABLE TO SET UP THE SPECIFICATIONS AND REPORT TEST RESULTS ON THE BASIS OF THE PERCENTAGE PASSING EACH SIEVE. SEE EXHIBIT II.

### 11. GRAPHIC PRESENTATION OF TEST RESULTS

- 11.1 SIEVE ANALYSES OFTEN ARE PRESENTED GRAPHICALLY FOR COMPARISON WITH SPECIFICATION REQUIREMENTS, OR FOR GENERAL EVALUATION. BY INTERPOLATION ON THE SIEVE ANALYSIS GRAPH, PERCENTAGE RETAINED ON OR PASSING SIEVES NOT ACTUALLY USED IN THE TEST CAN BE ESTIMATED. SIMILARLY, THE SIZE OF APERTURE WHICH WOULD THEORETICALLY RETAIN OR PASS A SELECTED PERCENTAGE CAN BE ESTIMATED EVEN THOUGH THAT SIEVE SIZE WAS NOT USED IN THE TEST OR, FOR THAT MATTER DOES NOT EVEN EXIST.
- 11.2 THE ABSCISSA OF THE SIEVE ANALYSIS GRAPH USUALLY REPRESENTS THE SIEVE SIZES AND THE ORDINATE THE PERCENTAGES RETAINED OR PASSING. SCALES USED FOR THE COORDINATES DEPEND UPON THE USE TO BE MADE OF THE RESULTS AND THE PREFERENCES OF THE USER. THE SCALE FOR SIEVE SIZES MAY BE LOGARITHMIC. THE LATTER HAS THE ADVANTAGE OF REPRESENTING STANDARD SIEVE SIZES, WHICH RELATE TO ONE ANOTHER BY POWERS OF THE FOURTH ROOT OF TWO ON AN EQUALLY SPACED SCALE (FOR EXAMPLE, THE DISTANCES BETWEEN THE NO. 4 AND NO. 8, THE NO. 8 AND NO. 16 AND THE 3/4 IN. AND 3/8 IN. ARE ALL THE SAME SINCE THE LARGER SIEVE IN EACH CASE HAS AN APERTURE TWICE THAT OF THE SMALLER.) THE SCALE FOR PERCENTAGES IS USUALLY LINEAR BUT MAY OCCASIONALLY BE LOGARITHMIC. ON THE LINEAR SCALE, EQUAL DIFFERENCES IN PERCENTAGE ARE DEPICTED AS THE SAME DISTANCE. SEE EXHIBIT III AND IV.

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## SOIL THERMAL RESISTIVITY MEASUREMENTS

### 12. SCOPE

- 12.1 THIS PORTION OF THE SPECIFICATION COVERS THE MEASUREMENT OF SOIL THERMAL RESISTIVITY. A THOROUGH KNOWLEDGE OF THE THERMAL PROPERTIES OF A SOIL WILL ENABLE EDISON TO PROPERLY INSTALL AND LOAD UNDERGROUND CABLES. THE METHOD USED IS BASED ON THE THEORY THAT THE RATE OF TEMPERATURE RISE OF A LINE HEAT SOURCE IS DEPENDENT UPON THE THERMAL CONSTANTS OF THE MEDIUM IN WHICH IT IS PLACED.

THE USE OF THERMAL NEEDLES AND THEIR USE ARE COVERED IN SECTIONS 16 AND 17 OF THIS SPECIFICATION AND IN DETAIL IN IEEE STANDARD 442.

THE USE OF THE SOIL THERMAL PROPERTY ANALYZER IS TO BE USED TO DETERMINE THE LABORATORY OR FIELD THERMAL RESISTIVITY OF THE SOIL. THE THERMAL PROPERTY ANALYZER (T.P.A.) COMES WITH NEEDLES OR PROBES TO DO BOTH TYPES OF TESTS.

### 13. PURPOSE

- 13.1 THE PURPOSE OF THIS SPECIFICATION IS TO PROVIDE SUFFICIENT INFORMATION TO ENABLE THE VENDOR TO TEST THE BACKFILL MATERIAL, WHICH IS READILY AVAILABLE ON THE MARKET, AND TO MAKE MEANINGFUL RESISTIVITY MEASUREMENTS. MEASUREMENTS MAY BE MADE IN THE FIELD OR IN THE LABORATORY ON SOIL SAMPLES OR BOTH.
- 13.2 IF THE NATIVE SOIL IS TO BE TAMPED BACK INTO THE TRENCH AT THE SAME DENSITY AT WHICH IT WAS REMOVED, IT MAY BE DESIRABLE TO MAKE IN-SITU RESISTIVITY MEASUREMENTS ALONG THE ROUTE OF THE CABLE.
- 13.3 IF THE NATIVE SOIL IS TO BE PLACED IN THE TRENCH AT A DENSITY DIFFERENT THAN UNDISTURBED SOIL IN THE SAME VICINITY, LABORATORY MEASUREMENTS ARE REQUIRED ON SOIL SAMPLES RECOMPACTED TO THE DESIRED DENSITY.
- 13.4 IN ORDER TO DRAW MEANINGFUL COMPARISONS ON SELECTED FOREIGN BACKFILL MATERIALS, THERMAL RESISTIVITY MEASUREMENTS SHOULD BE MADE IN THE LABORATORY ON SOILS WHICH ARE COMPACTED SO AS TO PROVIDE MAXIMUM DRY DENSITIES.

### 14. FACTORS INFLUENCING SOIL THERMAL RESISTIVITY

- 14.1 THE THERMAL RESISTIVITY OF SOIL DEPENDS ON THE TYPE OF SOIL ENCOUNTERED AS WELL AS THE PHYSICAL CONDITIONS OF THE SOIL. THE CONDITIONS WHICH MOST INFLUENCE THE RESISTIVITY OF A SPECIFIC SOIL ARE THE MOISTURE CONTENT AND DRY DENSITY. AS THE MOISTURE CONTENT OR DRY DENSITY OR BOTH OF A SOIL INCREASES, THE RESISTIVITY DECREASES. THE STRUCTURAL COMPOSITION OF THE SOIL ALSO AFFECTS THE RESISTIVITY. THE SHAPE OF THE SOIL PARTICLES DETERMINES THE SURFACE CONTACT AREA BETWEEN PARTICLES WHICH AFFECTS THE ABILITY OF THE SOIL TO CONDUCT HEAT.

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14. FACTORS INFLUENCING SOIL THERMAL RESISTIVITY (CONT.)

14.2 THE THERMAL RESISTIVITY ( $\rho$ ) OF VARIOUS SOIL MATERIALS AND EDISON BACKFILL ARE LISTED BELOW:

SOIL MATERIAL	( $\rho$ )(°C-cm/W)
QUARTZ GRAINS	11
GRANITE GRAINS	26
LIMESTONE GRAINS	45
SANDSTONE GRAINS	58
MICA GRAINS	170
WATER	165
ORGANIC	400 WET-700 DRY
AIR	4000
GRANULAR THERMAL BACKFILL	50-70 2%-5% MOISTURE

14.3 FROM THE ABOVE LIST, ONE CAN GENERALLY CONCLUDE THAT THE SOIL WITH THE LOWEST THERMAL RESISTIVITY HAS A MAXIMUM AMOUNT OF SOIL GRAINS AND WATER. IT ALSO HAS A MINIMUM AMOUNT OF AIR. SEE EXHIBIT VII FOR ADDITIONAL VALUES.

14.4 DURING THE MEASUREMENT OF SOIL THERMAL RESISTIVITY, THE FOLLOWING FACTORS 14.5, 14.6 AND 14.7 MAY ADVERSELY AFFECT THE ACCURACY OF THE TEST MEASUREMENT.

14.5 MIGRATION OF THE SOIL MOISTURE AWAY FROM THE NEEDLE DURING THE TEST CAN RESULT IN HIGHER OR LOWER RESISTIVITY MEASUREMENTS. THIS MIGRATION MAY BE SIGNIFICANT, AND NORMALLY TAKES PLACE WHEN THE INPUT POWER PER UNIT AREA OF THE NEEDLE IS TOO HIGH. MOISTURE MIGRATION ASSOCIATED WITH PRELIMINARY MASS TRANSFER MAY LOWER RESISTIVITY MEASUREMENTS WHEN INITIAL SOIL MOISTURE CONTENT IS LESS THAN 5% IN SOME SOILS, PARTICULARLY SANDS. MOISTURE MIGRATION CAN TAKE PLACE TOWARD THE END OF THE TEST RESULTING IN INCREASING THE APPARENT SOIL THERMAL RESISTIVITY.

14.6 LABORATORY MEASUREMENTS OF SOIL THERMAL RESISTIVITY MAY BE AFFECTED BY THE REDISTRIBUTION OF MOISTURE DUE TO GRAVITY. IF GRAVITY INDUCED MOISTURE REDISTRIBUTION TAKES PLACE DURING THE MEASUREMENT, THE RESISTIVITY MEASUREMENT NORMALLY GOES UP. THE ERROR CAN BE SIGNIFICANT IF THE RESISTIVITY IS SENSITIVE TO THE CHANGE IN MOISTURE CONTENT AT THE DRY SOIL DENSITY SELECTED FOR THE TEST.

14.7 POWER SUPPLY STABILITY MUST BE MAINTAINED THROUGHOUT THE TEST. THE POWER DISSIPATED IN THE NEEDLE MUST BE CONTROLLED SO THAT VARIATION IN THE MAGNITUDE OF HEAT FLUX IS KEPT WITHIN  $\pm 1\%$ .

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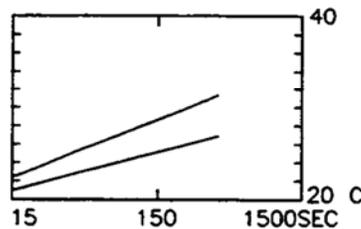
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### 15. TEST EQUIPMENT

#### SOIL THERMAL PROPERTY ANALYZER

##### 15.1 DESCRIPTION

THERMAL CHARACTERISTICS OF SOIL IN WHICH UNDERGROUND POWER CABLES ARE BURIED ARE DETERMINING FACTORS IN CABLE DESIGN AND RATING. SPECIFICALLY, THE PARAMETERS OF THERMAL RESISTIVITY AND THERMAL DIFFUSIVITY DETERMINE THE EFFECTIVENESS OF A GIVEN SOIL TYPE TO DISSIPATE HEAT UNDER STEADY AND TRANSIENT THERMAL CONDITIONS. THE TPA IS DESIGNED TO MEASURE THESE PARAMETERS ON SITE, QUICKLY AND ACCURATELY, USING THE PROVEN TRANSIENT PROBE METHOD. THE TPA 6000+ IS A SOPHISTICATED MICROCOMPUTER CONTROLLED SYSTEM THAT SUPPLIES PRECISELY CONTROLLED POWER TO THE UNDERGROUND PROBE AND MEASURES ITS THERMAL RESPONSE OVER A PROGRAMMED INTERVAL. PRIOR TO A TEST RUN, THE TPA TESTS PROBE INTEGRITY AND WAITS FOR THERMAL EQUILIBRIUM. UPON INITIATING A TEST, THE THERMAL RESPONSE OF THE PROBE IS GRAPHICALLY DISPLAYED, ALONG WITH A SIMULTANEOUS TEXT DISPLAY OF TEMPERATURE RESISTIVITY, DIFFUSIVITY AND COEFFICIENT OF DETERMINATION FOR AS MANY AS 6 SENSORS. AFTER COMPLETING THE TEST, DATA IS AUTOMATICALLY STORED AND IDENTIFIED FOR POST-PROCESSING. ON-SITE POST-PROCESSING IS AUTOMATIC, CONSISTING OF A STANDARD ANALYSIS WITH GRAPHIC PRESENTATION WHICH OCCURS WITHIN SECONDS, GIVING THE OPERATOR CONFIDENCE IN THE VALIDITY OF THE TEST. PROBLEMS DURING THE TEST RUN, SUCH AS POOR PROBE CONTACT, ARE IMMEDIATELY FLAGGED AND THE OPERATOR WILL BE PROMPTED TO REDO THE TEST. AT A LATER TIME THE TEST DATA CAN BE REEVALUATED USING DIFFERENT ALGORITHMS OR CRITERIA. UNLOADING DATA TO A DESKTOP PC WITH ITS SUPERIOR GRAPHICS AND DATA STORAGE CAPACITY IS FACILITATED VIA FILE TRANSFER SOFTWARE.



16:00 03-23-1989

	TEMP	RHO	DIFF	CD
1:	31.2	92.4	2.79	.999
2:	27.1	72.9	3.12	.998
3:				
4:				
5:				
6:				

ELAPSED TIME : 1238 s  
TOTAL TIME : 1400 s  
PROBE POWER : .29 W/OM

HIT ESC TO QUIT

TPA = THERMAL PROPERTY ANALYZER

##### 15.2 PROBE AND SOFTWARE COMPATIBILITY

THE STANDARD CONFIGURATION OF THE TPA 6000+ IS COMPATIBLE WITH MOST EXISTING PROBES. THE OPTIONAL EXTERNAL POWER SUPPLY IS NECESSARY TO USE CERTAIN EXISTING HIGH-RESISTANCE PROBES. ANALYTICALLY, THE 6000+ DEFAULTS TO THE STANDARDIZED EPRI ALGORITHM, THUS PROVIDING A DIRECT COMPARISON TO PREVIOUSLY OBTAINED DATA. FLEXIBLE PROGRAMMING CAPABILITY (MS DOS) PROVIDES THE PATH TO PURSUE ADVANCED CONCEPTS, SUCH AS TIME TO DRYOUT AND STABILITY ANALYSIS.

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15. TEST EQUIPMENT (CONT.)

15.3 ACCESSORIES

USI SUPPORTS THE TPA 6000+ WITH A FULL COMPLEMENT OF STANDARD AND CUSTOM ACCESSORIES, INCLUDING FIELD AND LAB PROBES, INSTALLATION TOOLS AND CABLING.

15.4 SPECIFICATIONS (SOIL THERMAL PROPERTY ANALYZER - 6000+)

SIZE:

HEIGHT . . . . . 33 CM. (13 IN.)  
WIDTH . . . . . 46 CM. (18 IN.)  
DEPTH . . . . . 15 CM. (6 IN.)

WEIGHT . . . . . 10 KG. (22 LBS.)

POWER  
REQUIREMENTS . . . . . 115V AC, 12V DC,  
4-8 TEST CAPABILITY  
WITH STANDARD BATTERIES

SENSOR TYPES . . . . . THERMOCOUPLE  
THERMISTOR

15.5 VENDOR OF THE SOIL THERMAL PROPERTY ANALYZER

UNDERGROUND SYSTEM INC. (U.S.I.)  
500 MAIN STREET  
P.O. BOX 27  
ARINONK, NY 10504  
(914)273-8727

16. METHODS FOR LABORATORY MEASUREMENTS

16.1 SAMPLE PREPARATION AND INSTALLATION OF LABORATORY NEEDLE OR PROBE.

THE LABORATORY NEEDLE IS USED PRIMARILY TO DETERMINE THE EFFECTS OF CHANGES IN DENSITY AND MOISTURE CONTENT ON THE RESISTIVITY OF SOIL AND SPECIAL BACKFILL MATERIALS. IT IS USUALLY ADVANTAGEOUS TO TEST SOILS THAT HAVE BEEN RECOMPACTED IN THE LABORATORY TO A DENSITY THAT CORRESPONDS TO THE MAXIMUM DENSITY THAT CAN BE ACHIEVED IN THE FIELD. IF THE SOIL IS TO BE TESTED AT THE MAXIMUM DENSITY, ANSI/ASTM D698-78 [1], ANSI/ASTM D1557-78 [2], ANSI/ASTM D2049-69 [3], OR SHOULD BE FOLLOWED TO DETERMINE THE MOISTURE CONTENT REQUIRED AT WHICH THE MAXIMUM DENSITY CAN BE OBTAINED. FOR MOST SOILS, THE SAMPLE IS MIXED TO THE DESIRED MOISTURE CONTENT AND THEN COMPACTED TO THE DESIRED DENSITY. SILTY SOILS ARTIFICIALLY MOISTENED SHOULD BE ALLOWED TO EQUILIBRATE FOR AT LEAST 12 HOURS IN AN AIRTIGHT CONTAINER PRIOR TO SAMPLE PREPARATION AND TEST. THE SOIL SHOULD BE COMPACTED IN ONE INCH INTERVALS SO THAT THE DENSITY OF THE SOIL IN THE CONTAINER REMAINS RELATIVELY UNIFORM. THE SAMPLE SHOULD BE PLACED IN A RIGID CYLINDRICAL CONTAINER WITH A MINIMUM INSIDE DIAMETER OF 10 CM. THE HEIGHT OF THE CONTAINER WOULD VARY DEPENDING ON THE LENGTH OF THE LABORATORY NEEDLE USED.

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16. METHODS FOR LABORATORY MEASUREMENTS (CONT.)

- 16.2 THERE ARE SOME SANDS WHICH CONTAIN CHEMICAL DEPOSITS WHICH FORM LIGHT BONDS BETWEEN SAND PARTICLES AS THE SAND DRIES. THESE BONDS MAY LOWER THE THERMAL RESISTIVITY OF THE SAND DUE TO THE REDUCTION IN CONTACT RESISTANCE BETWEEN SAND PARTICLES. THUS A SAND THAT IS COMPACTED AT ZERO PERCENT MOISTURE COULD HAVE A HIGHER RESISTIVITY THAN SAND THAT IS COMPACTED AT A HIGH MOISTURE CONTENT AND THEN DRIED TO ZERO PERCENT MOISTURE. DISCRETION IS REQUIRED IN THE SELECTION OF THE TECHNIQUE TO BE USED TO MEASURE THE RESISTIVITY OF SANDS AT LOW MOISTURE CONTENTS.
- 16.3 CARE SHOULD BE TAKEN IN INSERTING THE LABORATORY NEEDLE INTO THE SAMPLE. IF INSERTION OF THE NEEDLE IS DIFFICULT, THEN A PROBE OF SLIGHTLY SMALLER DIAMETER MAY BE INSERTED INTO THE SOIL TO MAKE A PILOT HOLE.

16.4 TEST PROCEDURE FOR LABORATORY NEEDLE OR PROBE.

AN INPUT POWER BETWEEN 0.2 AND 0.5 W/CM IS USUALLY APPLIED TO THE LABORATORY NEEDLE. THE HEAT INPUT SELECTION DEPENDS ON THE RESISTIVITY OF THE SOIL. IF A SOIL WITH A HIGH MOISTURE CONTENT HAS BEEN COMPACTED TO A HIGH DENSITY, A HIGH HEAT INPUT IS NEEDED TO PRODUCE AN ACCEPTABLE TEMPERATURE CHANGE OVER THE INTERVAL OF THE TEST. IF A SOIL WITH A LOW MOISTURE CONTENT HAS BEEN COMPACTED IN THE CONTAINER TO A VERY LOW DRY DENSITY, THE RESISTIVITY WILL BE HIGH AND A LOW HEAT INPUT IS REQUIRED. THE TEMPERATURE OF THE THERMOCOUPLE IS RECORDED AT 25 SECOND INTERVALS FOR 10 MIN. IF, AT ANY TIME, THE NEEDLE TEMPERATURE REACHES 95° C, THE TEST SHOULD BE TERMINATED. SEE EXHIBIT I.

17. ANALYSIS OF TEST RESULTS

- 17.1 THE ANALYTICAL MODEL USED TO CALCULATE THERMAL RESISTIVITY WAS DERIVED ASSUMING THAT A LINE HEAT SOURCE OF INFINITE LENGTH DISSIPATES HEAT IN AN INFINITE MEDIUM. UNDER THESE CONDITIONS THE FOLLOWING IS VALID:

$$p = 4\pi \frac{(T_2 - T_1)}{2.303 q \log \left( \frac{t_2}{t_1} \right)} \quad (\text{Eq 1})$$

WHERE

p = RESISTIVITY C° cm/W

T<sub>1</sub> = TEMPERATURE MEASURED AT SOME ARBITRARY ELAPSED TIME, CELSIUS

T<sub>2</sub> = TEMPERATURE MEASURED AT ANOTHER ARBITRARY ELAPSED TIME, CELSIUS

q = HEAT DISSIPATED PER UNIT LENGTH W/CM

t<sub>1</sub> = ELAPSED TIME AT WHICH A TEMPERATURE MEASUREMENT WAS RECORDED, MIN

t<sub>2</sub> = ELAPSED TIME AT WHICH ANOTHER TEMPERATURE MEASUREMENT WAS RECORDED, MIN

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17. ANALYSIS OF TEST RESULTS (CONT.)

17.2 INITIAL TRANSIENTS EXIST DUE TO THE FINITE DIAMETER OF THE NEEDLE. BOUNDARY EFFECTS ARE POSSIBLE DUE TO THE FINITE MEDIUM OF THE SOIL. A CONVENIENT WAY OF DETERMINING WHEN THE INITIAL TRANSIENTS ARE OVER AND WHEN THE FINITE BOUNDARY BEGINS TO EFFECT MEASUREMENTS, IS TO PLOT TEMPERATURES VERSUS THE LOG OF TIME FOR THE DURATION OF THE TEST. ON SEMILOG PAPER THE DATA POINTS LOCATED ON THE LINEAR SECTION OF THE CURVE CAN BE USED TO COMPUTE THE RESISTIVITY OF THE SOIL. IF THE TEMPERATURES PLOTTED AT THE BEGINNING OF THE TEST DEVIATE FROM THE STRAIGHT LINE, THE INITIAL TRANSIENTS HAVE NOT YET SETTLED OUT. IF THE TEMPERATURES DEVIATE FROM THE STRAIGHT LINE AT THE END OF THE TEST, THE FINITE BOUNDARY OR MOISTURE MIGRATION IS AFFECTING THE TEST. IN EITHER CASE THESE DATA SHOULD NOT BE USED IN RESISTIVITY COMPUTATIONS. TO SIMPLIFY THE RESISTIVITY CALCULATIONS, EXTEND THE STRAIGHT LINE SECTION OF THE CURVE TO INTERSECT AT LEAST ONE CYCLE ON THE SEMILOG PAPER. BY RECORDING THE TEMPERATURE CHANGE OVER ONE LOGARITHMIC CYCLE, THE RESISTIVITY COMPUTATION REDUCES TO:

$$p = \frac{4\pi\Delta T}{2.303 \times q} \quad (\text{Eq 2})$$

17.3 SAMPLE CALCULATION

DATA, INCLUDING TIMES AND TEMPERATURES, SHOULD BE TABULATED DURING THE TEST ON AN APPROPRIATE DATA SHEET. SUBSEQUENTLY, THE TEMPERATURES VERSUS LOG TIME SHOULD BE PLOTTED FOR EACH THERMOCOUPLE UNTIL A STRAIGHT LINE CAN BE FITTED. A SAMPLE CALCULATION FOLLOWS FOR A TEST PERFORMED WITH A LABORATORY NEEDLE. THE DATA HAVE BEEN PLOTTED IN FIG. 2.

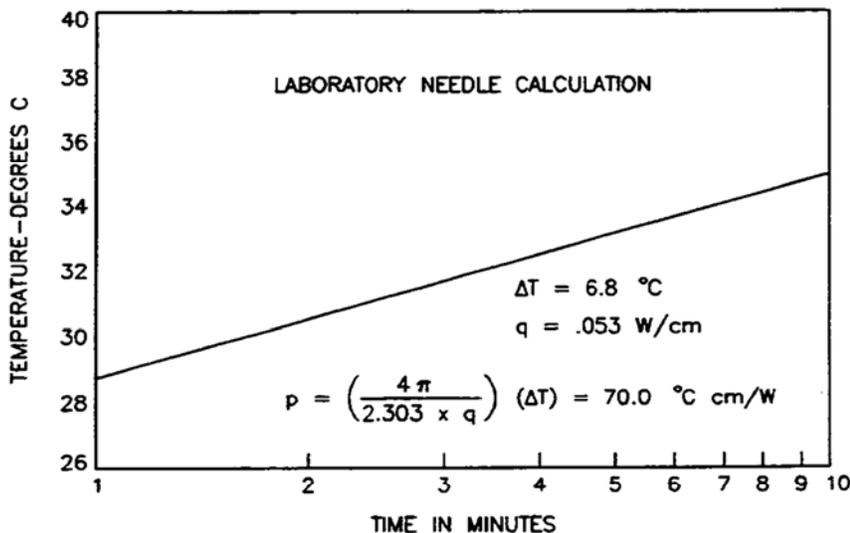


FIG. 2.  
TEMPERATURE VERSUS LOG OF TIME

17.4 A SIMILAR PROCEDURE IS FOLLOWED WHEN CALCULATING THE IN SITU RESISTIVITY OF A SOIL USING THE FIELD NEEDLE. IT SHOULD BE NOTED THAT SINCE THE TIME SPAN REQUIRED TO MAKE A FIELD RESISTIVITY MEASUREMENT IS GREATER, THE TIME ELAPSED SHOWN ON THE X-AXIS SHOULD BE INCREASED TO AT LEAST 30 MIN.

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17. ANALYSIS OF TEST RESULTS (CONT.)

17.5 INTERPRETATION OF RESULTS

TO JUDGE THE RELIABILITY OF THE THERMAL RESISTIVITY DATA GATHERED IN THE FIELD OR LABORATORY, ONE MUST MAKE COMPARISONS TO EXISTING DATA GATHERED IN PREVIOUS TESTS FOR SIMILAR TYPES OF SOIL. FIGURE 3 SHOWS SOME CHARACTERISTIC THERMAL RESISTIVITY VERSUS MOISTURE CONTENT CURVES FOR SOILS INCLUDING SANDS, CLAYS, AND SILTS.

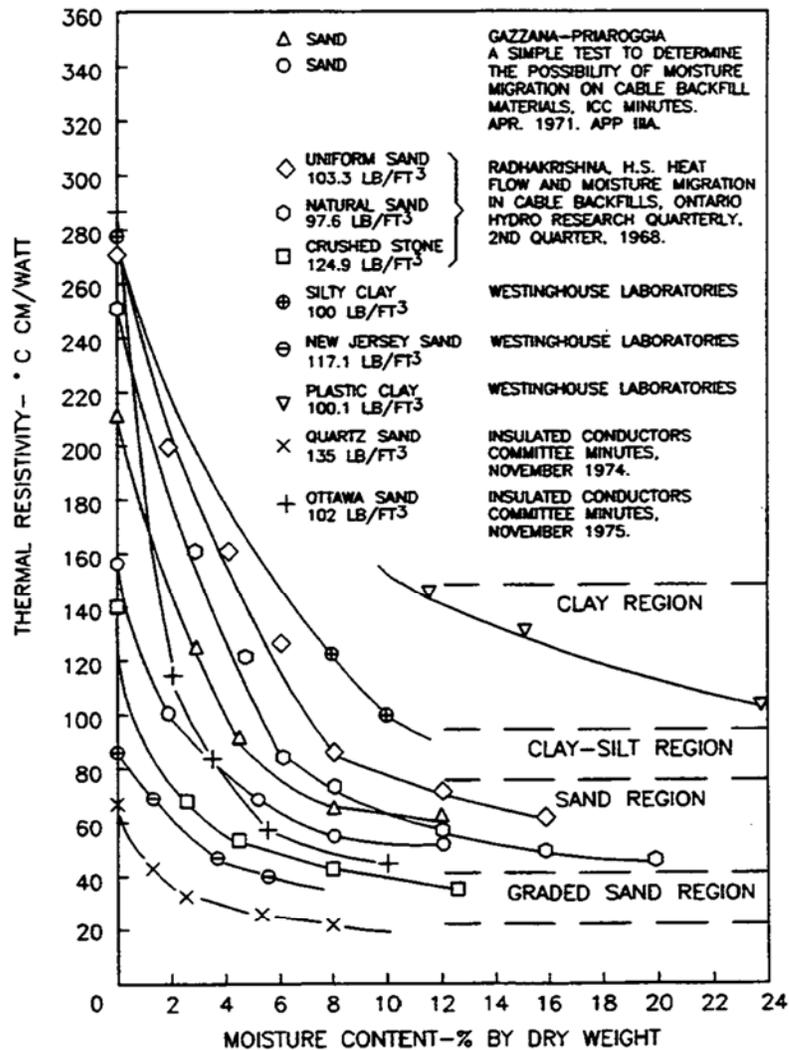


FIG. 3  
THERMAL PROPERTY CHARACTERISTICS OF SOILS

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### 18. SUPPLEMENTARY SPECIFICATIONS

THE FOLLOWING LIST OF SUPPLEMENTARY SPECIFICATIONS OF LATEST REVISIONS, FORM A PART OF AND ARE INCLUDED IN THIS SPECIFICATION:

EXHIBIT "A" - GENERAL CONDITIONS (C.E. CO.)

ASTM C136	METHOD FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATE.
ASTM D421	PRACTICE FOR DRY PREPARATION OF SOIL SAMPLES FOR PARTICLE SIZE ANALYSIS AND DETERMINATION OF SOIL CONSTANTS.
ASTM D422	STANDARD TEST METHOD FOR PARTICLE-SIZE ANALYSIS OF SOILS.
ASTM D1140	TEST FOR AMOUNT OF MATERIAL IN SOILS FINER THAN THE NO. 200 SIEVE FINER.
ASTM D2217	METHOD FOR WET PREPARATION OF SOIL SAMPLES FOR GRAIN SIZE ANALYSIS AND DETERMINATION OF SOIL CONSTANTS.
ASTM D2487	STANDARD TEST METHOD FOR CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES.
ASTM D2488	PRACTICE FOR DESCRIPTION AND IDENTIFICATION OF SOILS (VISUAL-MANUAL PROCEDURE).
ASTM STP 447B	TEST SIEVING METHODS
ANSI/ASTM D698-78	STANDARD TEST METHODS FOR MOISTURE-DENSITY RELATIONS OF SOILS AND SOIL-AGGREGATE MIXTURES USING 5.5 LB (2.49 KG) RAMMER AND 12 IN (305 MM) DROP.
ANSI/ASTM D1557-78	STANDARD TEST METHODS FOR MOISTURE-DENSITY RELATIONS OF SOILS AND SOIL-AGGREGATE MIXTURES USING 10 LB (4.54 KG) RAMMER AND 18 IN (457 MM) DROP.
ANSI/ASTM D2049-69	STANDARD TEST METHOD FOR RELATIVE DENSITY OF COHESIONLESS SOILS.
ASTM A698	PROCTOR TEST
IEEE STD 442	GUIDE FOR SOIL THERMAL RESISTIVITY MEASUREMENTS

### 19. TEST REPORT

THE VENDOR SHALL FURNISH A TEST REPORT FOR EACH PROJECT. THE TEST REPORT SHALL INCLUDE THE METHOD OF TEST, GRAPHS, THERMAL RESISTIVITY, WEIGHT, CONSTANTS, PROCTOR TEST AND THE SIEVE ANALYSIS. AGGREGATE VENDOR TO PROVIDE PHOTOGRAPHS OF THE FILL UNDER TEST AND OBSERVATIONS OF ANY UNUSUAL CONDITIONS.

### 20. INSPECTION

A VISUAL CHECK SHALL BE MADE AT THE YARD OF ALL FILL MATERIALS FOR COMPLETENESS OF MIX.

### 21. SUBMITTAL

VENDORS SUPPLYING BACKFILL IN ACCORDANCE WITH THIS SPECIFICATION SHALL SUBMIT AT LEAST TWO CERTIFIED TEST REPORTS, DETAIL DRAWINGS, WEIGHTS, AND A STATEMENT OF COMPLIANCE TO THE TRANSMISSION RELIABILITY AND STANDARDS DEPT., P.O. BOX 767, 125 SOUTH CLARK ST., ROOM 836, CHICAGO, ILLINOIS 60690. IF THE BACKFILL MEETS THE SPECIFICATION AND IS APPROVED BY THE PURCHASER, THE VENDOR'S NAME WILL BE ADDED TO THE LIST OF ACCEPTABLE SUPPLIERS OF BACKFILL IN ACCORDANCE WITH THIS SPECIFICATION.

### 22. APPROVED VENDORS

- 1) MATERIAL SERVICE INC., 262 NORTH LA SALLE
- 2) BEVERLY STONE INC., ELGIN IL.

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**EXHIBIT I**  
**MINIATURE NEEDLE DATA SHEET**

TEST NO. 1 SOIL TYPE RED CLAY  
 DATE MARCH 12, 1978 AMBIENT TEMPERATURE 20 °C  
 MOISTURE CONTENT 24.7 % WATTS/CM 0.53  
 DRY DENSITY 77.2 PCF RESISTIVITY 70.0 °C cm/w  
 NEEDLE NO. 4 CONTAINER VOLUME 1/30 FT<sup>3</sup>

TIME	MILLIVOLTS	TEMP °C
1.00	1.184	28.89
1.25	1.210	28.52
1.50	1.233	30.09
1.75	1.251	30.53
2.00	1.265	30.87
2.25	1.280	31.23
2.50	1.294	31.58
2.75	1.306	31.87
3.00	1.317	32.14
3.25	1.325	32.33
3.50	1.334	32.55
3.75	1.343	32.77
4.00	1.351	32.97
4.25	1.359	33.16
4.50	1.365	33.31
4.75	1.372	33.48
5.00	1.378	33.63
5.25	1.385	33.80
5.50	1.390	33.92

TIME	MILLIVOLTS	TEMP °C
5.75	1.395	34.04
6.00	1.400	34.16
6.25	1.405	34.29
6.50	1.410	34.41
6.75	1.412	34.53
7.00	1.419	34.63
7.25	1.422	34.70
7.50	1.427	34.82
7.75	1.431	34.92
8.00	1.435	35.02
8.25	1.439	35.12
8.50	1.442	35.19
8.75	1.446	35.29
9.00	1.449	35.36
9.25	1.453	35.46
9.50	1.456	35.53
9.75	1.460	35.63
10.00	1.462	35.68
10.25	1.465	35.75

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LABORATORY SAMPLE NO. _____ FEATURE <u>EXAMPLE</u> AREA <u>A</u> EXC. NO. <u>203</u> DEPTH <u>0.0 TO 5.0'</u>							
<b>SAMPLE PREPARATION</b>							
PREPARED BY _____ % MOIST + NO. 4 <u>1.8</u> WET WT. TOTAL SAMPLE <u>47.75</u> DATE _____ % MOIST - NO. 4 <u>5.2</u> DRY WT. TOTAL SAMPLE <u>45.47</u>							
SIEVE SIZE	5"	3"	1 1/2"	3/4"	3/8"	NO. 4	TOTAL WT. PASSING NO. 4
WT. PAN + RETAINED MATERIAL							
WT. PAN							
WET WT. RETAINED		0	1.68	0.25	0.43	0.27	45.12 WET
DRY WT. RETAINED		0	1.65	0.25	0.42	0.26	42.89 DRY
DRY WT. PASSING		45.47	43.82	43.57	43.15	42.89	
% OF TOTAL PASSING		100.0	96.4	95.8	94.9	94.3	-W%
<b>SIEVE AND HYDROMETER ANALYSIS</b>							
DISH NO. <u>18</u> DRY WT. OF SAMPLE (W) = <u>50.0 GMS</u> FACTOR (F) = $\frac{W\%}{W} = \frac{94.3}{50.0} = 1.886$							
DRY WT. OF SAMPLE (SIEVED) <u>21.4 GMS.</u> SIEVING TIME <u>15 MIN.</u> DATE _____							
SIEVE NO.	WEIGHT RETAINED	WEIGHT PASSING	F X WEIGHT PASSING % OF TOTAL PASSING	% OF TOTAL PASSING	PARTICLE DIA. (MM)	REMARKS	
8	0.2	49.8		93.9	2.380		
16	0.4	49.6		93.5	1.190		
30	1.1	48.9		92.2	0.590		
50	3.3	46.7		88.1	0.297		
100	11.6	38.4		72.4	0.149		
200	21.4	28.6		53.9	0.074		
PAN	0.0	TESTED AND COMPUTED BY _____ CHECKED BY _____ DATE _____					
TOTAL	21.4						

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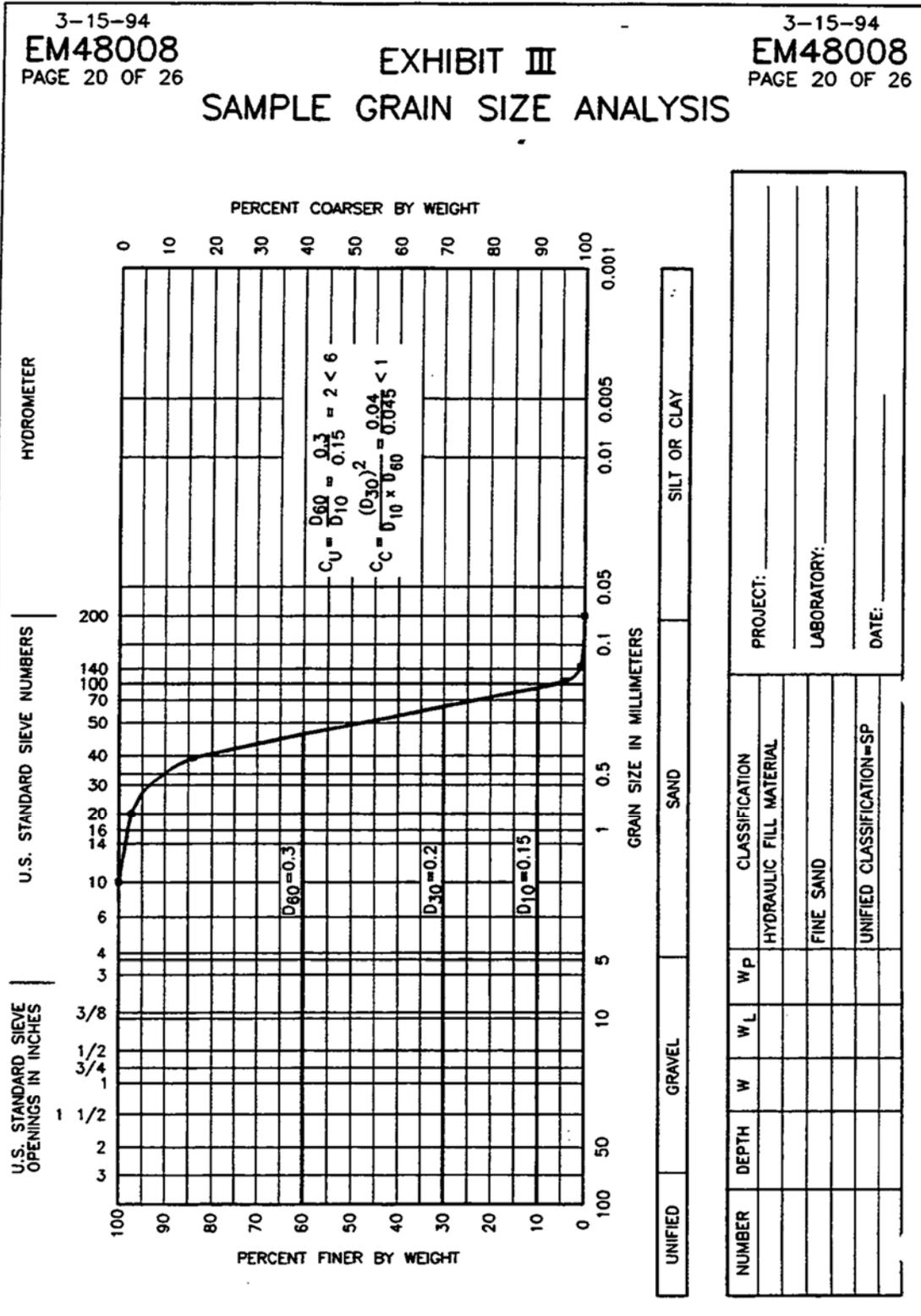
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**EXHIBIT II (CONTINUED)**

(SAMPLE PREPARATION AND GRADATION ANALYSIS CONT.)

HYDROMETER ANALYSIS									
HYDROMETER NO. <u>320584</u>			DISPERSING AGENT <u>SODIUM METAPHOSPHATE</u>			STARTING TIME <u>8:00</u>			DATE _____
						AMOUNT <u>125</u> ml			
TIME	TEMP C	HYD READ	HYD CORR	CORR READ	F X CORRECT READ = % OF TOTAL PASSING	% OF TOTAL PASSING	PARTICLE DIA. (MM)	REMARKS	
.5 MIN*								0.050	
1 MIN		16.4	+3.2	19.6			37.0	0.037	
4 MIN	26.8	10.1	+3.2	13.3			25.1	0.019	
19 MIN	26.8	6.9	+3.2	10.1			19.0	0.009	
60 MIN	27.0	4.9	+3.2	8.1			15.3	0.005	
7 HR. 15 MIN*								0.002	
25 HR. 45 MIN*								0.001	
TESTED AND COMPUTED BY _____			CHECKED BY _____			DATE _____			

SAMPLE PREPARATION AND GRADATION ANALYSIS DATA FORM.



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EXHIBIT IV  
DEFINITION OF SAMPLE  
GRAIN SIZE ANALYSIS

NUMBER = SAMPLE NUMBER

WEIGHT = SAMPLE SIZE

W = WATER CONTENT VALUE OF SOIL IN NATURAL STATE

$$W = \frac{W_w}{W_d} \times 100$$

WL = LIQUID LIMIT AND IS EXPRESSED AS PERCENT OF THE WATER CONTENT VALUE

WP = PLASTIC LIMIT AND IS EXPRESSED AS PERCENT OF THE WATER CONTENT VALUE

UNIFIED = UNIFIED CLASSIFICATION SYSTEM

COARSE-GRAINED SOILS ARE SUBDIVIDED INTO GRAVEL AND SAND BY REFERRING TO THE GRADATION CURVE INSTEAD OF VISUALLY ESTIMATING THE PERCENTAGE OF VARIOUS SIZED PARTICLES PRESENT IN THE SOIL.

GRAVELLY OR SANDY SOILS. - GRAVELS OR SANDS ARE FURTHER IDENTIFIED AS BEING CLEAN OR DIRTY BY DETERMINING THE AMOUNT OF MATERIAL FINER THAN THE NO. 200 SIEVE. IF LESS THAN 5 PERCENT IS FINER THAN THE NO. 200 SIEVE, THE SOIL WILL BE CLASSIFIED AS EITHER:

(1) WELL-GRADED (GW OR SW) IF THE COEFFICIENT OF UNIFORMITY  $C_u$  IS GREATER THAN 4 FOR GRAVELS AND 6 FOR SANDS, AND THE COEFFICIENT OF CURVATURE  $C_c$  IS BETWEEN 1 AND 3; OR

(2) POORLY-GRADED (GP OR SP) IF EITHER ONE OR BOTH THE  $C_u$  AND  $C_c$  CRITERIA FOR (1) ABOVE ARE NOT SATISFIED.

THE COEFFICIENT OF UNIFORMITY  $C_u$  AND COEFFICIENT OF CURVATURE  $C_c$  ARE EXPRESSED AS FOLLOWS:

$$C_u = \frac{(D_{60})}{(D_{10})} \quad C_c = \frac{(D_{30})^2}{(D_{10}) \times (D_{60})}$$

WHERE:

D10, D30, AND D60 ARE THE GRAIN-SIZE DIAMETERS CORRESPONDING RESPECTIVELY TO 10, 30, AND 60 PERCENT PASSING ON THE CUMULATIVE GRAIN-SIZE CURVE.

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**EXHIBIT V**  
**TABLE 1**  
**GRADATION**

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**U.S. STANDARD SIEVE SERIES (ASTM DESIGNATION E11)**

<b>8" DIAMETER BRASS SIEVES (WIRE CLOTH SIEVES)</b>		
<b>U.S.S.-ASTM SIEVE SIZE OR NUMBER</b>	<b>SIEVE OPENING MILLIMETERS</b>	<b>SIEVE OPENING INCHES</b>
4"	100	4.00
3 1/2"	90	3.50
3"	75	3.00
2 1/2"	63	2.50
2"	50	2.00
1 3/4"	45	1.75
1 1/2"	37.5	1.50
1 1/4"	31.5	1.25
1"	25.0	1.00
7/8"	22.4	0.875
3/4"	19.0	0.750
5/8"	16.0	0.625
1/2"	12.5	0.500
7/16"	11.2	0.438
3/8"	9.5	0.375
5/16"	8.0	0.312
NO. 3(1/4")	6.3	0.250
NO. 3 1/2	5.6	0.223
NO. 4	4.75	0.187
NO. 5	4.00	0.157
NO. 6	3.35	0.132
NO. 7	2.80	0.111
NO. 8	2.36	0.0937
NO. 10	2.00	0.0787
NO. 12	1.70	0.0661
NO. 14	1.40	0.0555
NO. 16	1.18	0.0469
NO. 18	1.00	0.0394
NO. 20	.850	0.0331
NO. 25	.710	0.0280
NO. 30	.600	0.0232
NO. 35	.500	0.0197
NO. 40	.425	0.0165
NO. 45	.355	0.0138
NO. 50	.300	0.0117
NO. 60	.250	0.0098
NO. 70	.212	0.0083
NO. 80	.180	0.0070
NO. 100	.150	0.0059
NO. 120	.125	0.0049
NO. 140	.106	0.0041
NO. 170	.090	0.0035
NO. 200	.075	0.0029
NO. 230	.063	0.0024
NO. 270	.053	0.0021
NO. 325	.045	0.0017
NO. 400	.038	0.0015

NOTE: NUMBERED SIEVES REFER TO FINE AGGREGATE.  
SIEVES IN INCHES REFER TO COARSE AGGREGATE.

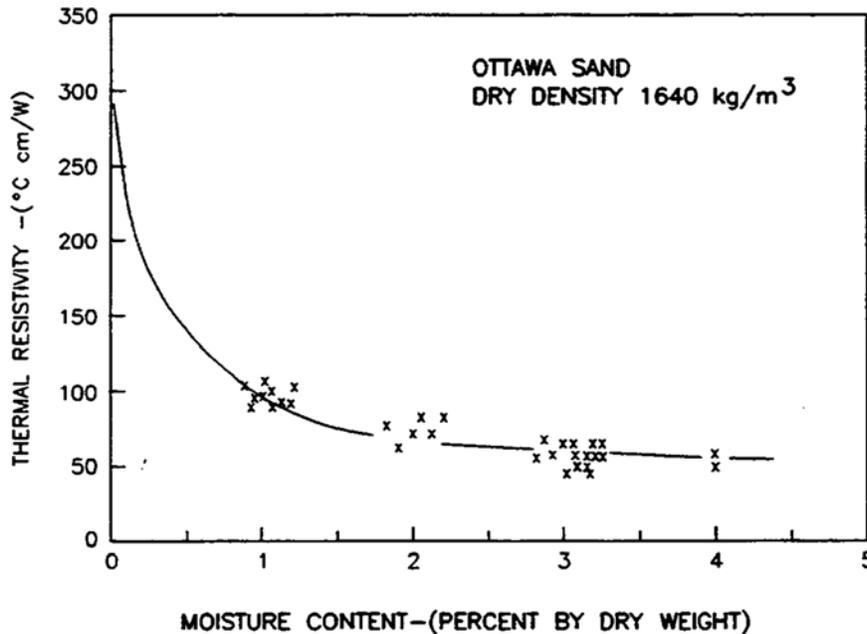
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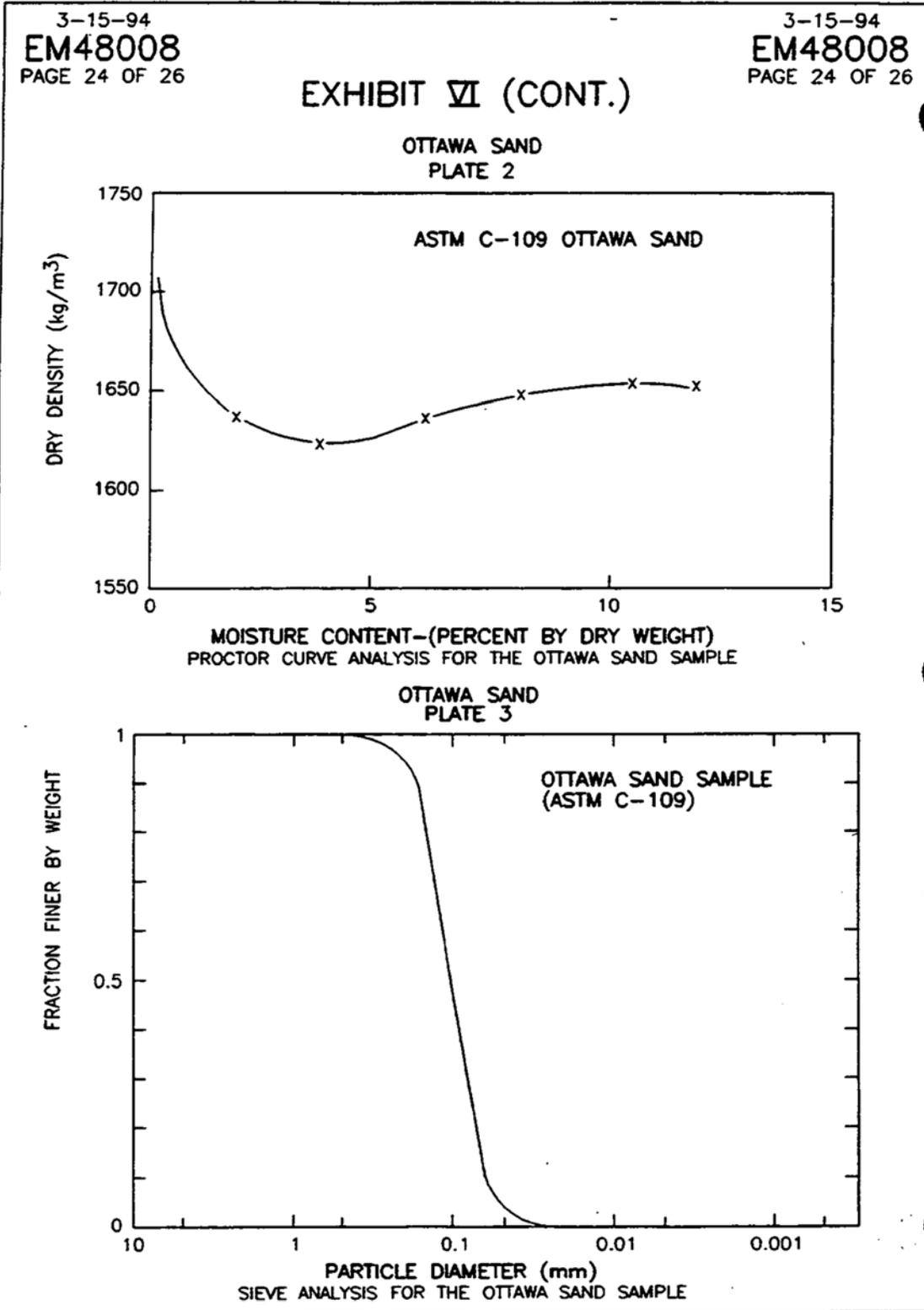
**EXHIBIT VI**  
**BENCH MARK SAMPLE**

THE OTTAWA SAND SAMPLE IS A WELL GRADED SAND SAMPLE WITH A HIGH POROSITY AND PRACTICALLY NO CLAY CONTENT. THIS SAMPLE IS EXTREMELY UNSTABLE BECAUSE THE SOIL MOISTURE EXPERIENCES VERY LITTLE RESISTANCE WITHIN THE INTERSTITIAL SPACES AND THE MOISTURE THEREFORE IS HIGHLY MOBILE WHEN THE SAMPLE IS HEATED BY AN ENERGY SOURCE. THE PRIMARY REASON FOR SELECTING OTTAWA SAND AS ONE OF THE SOIL SAMPLES WAS TO ENSURE THAT A SAMPLE WITH REPRODUCIBLE PROPERTIES COULD ALWAYS BE OBTAINED AND THEREFORE ANY FUTURE STABILITY MEASUREMENTS, REGARDLESS OF WHO MADE THE MEASUREMENTS, COULD ALWAYS BE REPRODUCED WITH REASONABLE ACCURACY. THE OTTAWA SAND SAMPLE WAS THEREFORE VIEWED AS A STANDARD SAMPLE AND SOMEONE WHO WAS PREVIOUSLY UNFAMILIAR WITH STABILITY HARDWARE AND STABILITY MEASUREMENTS SHOULD START HIS INVESTIGATION WITH AN OTTAWA SAND SAMPLE TO ENSURE HIS SAMPLE PREPARATION TECHNIQUES AND MEASUREMENT PROCEDURES WILL REPRODUCE DATA THAT HAS BEEN PREVIOUSLY COLLECTED. THE SAMPLE REFERRED TO THROUGHOUT THIS REPORT AS OTTAWA SAND HAS A ASTM DESIGNATION C-109 AND IT IS AVAILABLE FROM SOIL TEST, INC., 2205 LEE ST. EVANSTON, ILLINOIS 60602. SEE PLATE 1.

**OTTAWA SAND**  
**PLATE 1**



THERMAL RESISTIVITY OF THE OTTAWA SAND SAMPLE AT A DRY DENSITY OF 1640 kg/m<sup>3</sup> FOR VARIOUS MOISTURE CONTENTS



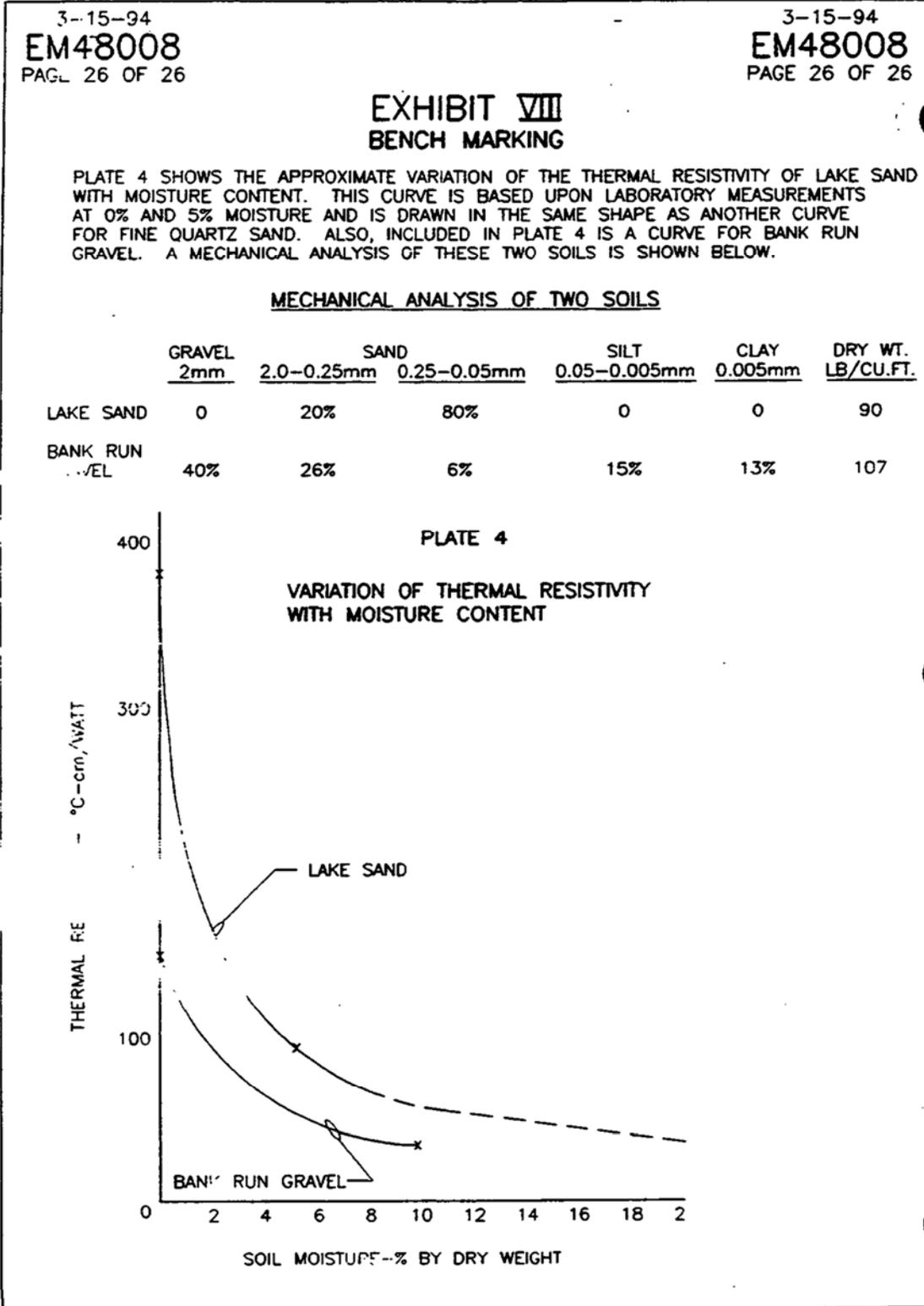
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**EXHIBIT VII**

MEASURED VALUES OF SOIL THERMAL RESISTIVITY  
(FOR REFERENCE)

<u>NATURE OF SOIL</u>	<u>% MOISTURE</u>	<u>(RHO) C-cm/W</u>
YELLOW SANDY CLAY SOIL	0	369
" " " "	2	354
" " " "	4	342
" " " "	6	296
" " " "	8	226
" " " "	10	165
" " " "	12	113
" " " "	14	73
YELLOW BUILDERS SAND	0	338
" " " "	2	280
" " " "	4	207
" " " "	6	146
" " " "	8	104
INDIANA BANK SAND	0	412
" " " "	9.9	71
LAKE SAND FROM BEACH	0	379
" " " "	5	85.6
#1 TORPEDO SAND	0	324
" " " "	10.2	86
SOIL FROM 119TH ST. SUB	0	260
" " " " "	14.9	72.9
SAND AND GRAVEL	9.3	51
BANK RUN GRAVEL (LIGHT)	0	143
" " " " (HEAVY)	10.2	54
" " " " (HEAVY)	8	45
CINDERS	18.9	214
SLAG (LIGHT)	0	905
" (HEAVY)	0	825
CONCRETE (STONE)	0	110
CONCRETE (CINDER)	0	293



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Method of Measurement. This work will be measured for payment in cubic yards (cubic meters) in place.

Basis of Payment. This work will be paid for at the contract unit price per cubic yards (cubic meter) which price shall include all materials provided by ComEd, labor, tools and equipment, for TRENCH BACKFILL, SPECIAL at locations shown in the plans, as specified herein, and as determined by the Engineer.

**TRENCH EXCAVATION:**

This work shall be done in accordance with applicable Sections of the Standard Specifications for proposed sewer or drainage structures except as modified herein.

Description The contractor shall furnish all labor, equipment and material necessary for dewatering trench excavations as well as shoring trench walls during utility operations.

Basis of Payment.

The cost shall be included in the cost of the utility being constructed.

**MAINTENANCE OF EXISTING DRAINAGE:**

This work shall be done in accordance with applicable Sections of the Standard Specifications for proposed sewer or drainage structures except as modified herein.

Description When existing drainage facilities are disturbed, the contractor shall provide and maintain temporary outlets and connections for all private or public drains, sewers or catch basins. The contractor shall provide facilities to take in all storm water which will be received by these drains and sewers and discharge the same. The contractor shall provide and maintain an efficient pumping plant, if necessary, and a temporary outlet. The contractor shall be prepared at all times to dispose of the water received from temporary connections until such time as the permanent connections with sewers are built and in service.

Basis of Payment.

The cost shall be included in the cost of the sewer or structure being constructed.

**STORM SEWERS:**

This work shall be done in accordance with Section 550 of the Standard Specifications except as modified herein.

Unless otherwise noted on the plans, existing drainage facilities shall remain in use during the period of construction. Locations of existing drainage structures and sewer as shown on the plans

are approximate. Prior to commencing work the contractor, at his own expense, shall determine the exact locations of existing structures which are within the proposed construction limits.

During construction, if the contractor encounters or otherwise becomes aware of any sewers, underdrains or field drains within the right-of-way other than those shown on the plans, they shall so inform the engineer, who will determine the work necessary to maintain or replace the facilities in service and to protect them from damage during construction if maintained. Existing facilities to be maintained that are damaged because of non-compliance with this provision shall be replaced at the contractor's own expense. Should the engineer have determined the replacement of a facility, the necessary work and payment shall be in accordance with sections 550 and 601, and article 104.02 of the Standard Specifications.

550.05 Plugging Existing Sewers and Drains. Add the following in this Article:

All temporary storm sewer plugs and temporary storm sewer connections required for construction staging will not be paid for separately, but shall be considered as included in the contract unit price bid for the storm sewer items.

**SEWER CONNECTIONS:**

This work shall be done in accordance with applicable Sections of the Standard Specifications for proposed sewer or drainage structures except as modified herein.

Description This work shall consist of making sewer and/ or underdrain connections to existing or proposed sewer or drainage structures at the locations shown on the plans or as determined by the Engineer.

Basis of Payment.

The cost of making sewer connections to existing or proposed sewer or drainage structures shall be included in the cost of the sewer or structure being constructed.

**FRAMES, GRATES AND LIDS:**

This work shall be done in accordance with Section 604 of the Standard Specifications except as modified herein.

604.03 Materials Permitted. Add the following in this Article:

All frames with self sealing closed lids to be furnished as part of the contract for construction, adjustment or reconstruction of any manholes, catch basins, inlets, valve vaults, or meter vaults shall have cast into the lid one of the following words:

- A. All lids to be used on storm sewer structures shall bear the words "STORM SEWER".
- B. All lids to be used on sanitary sewer structures shall bear the words "SANITARY SEWER".
- C. All lids to be used on water system structures shall bear the word "WATER".
- D. All open and grates shall bear the words "DRAINS TO RIVER, DUMP NO WASTE".
- E. All closed lids shall bear the words "VILLAGE OF SCHAUMBURG".

604.04 General. Add the following in this Article:

The contractor will be required to use a steel plate or plates to close any gaps occurring when a frame is offset from the structure. The steel plate shall be ½ inch thick and approximately 6 inch wide by 24 inch long. Some adjustment in size may be necessary to prevent the steel plate from overhanging the outside of the structure wall. The steel plate shall be bedded in and covered with mortar.

**INLETS, TYPE A, TYPE 3V FRAME AND GRATE:**

This work shall be done in accordance with Section 602 of the Standard Specifications

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

**MANHOLES, TYPE A, 6'-DIAMETER, TYPE 1 FRAME, CLOSED LID, RESTRICTOR PLATE:**

This work shall be done in accordance with Section 602 of the Standard Specifications and the Details provided in the Plans.

Basis of Payment. This work will be paid for at the contract unit price each for MANHOLES, TYPE A, 6'-DIAMETER, TYPE 1 FRAME, CLOSED LID, RESTRICTOR PLATE.

**ABANDON AND FILL EXISTING STORM SEWER:**

Description This work shall consist of filling existing sewers that are to be abandoned at the locations shown on the plans or as determined by the Engineer.

Construction Requirements. Based on a review of available information it is believed that there are no existing active connections draining into the pipe to be abandoned. However, before the pipe is abandoned, the Contractor must field verify there are no existing active connections draining into the pipe to be abandoned. In the event there are existing active connections, the Contractor must either re-route the existing active connection or maintain the existing pipe so as not to block flow from the existing active connections at no additional cost.

After field verification that there are no existing active connections draining into the pipe

to be abandoned, the Contractor must plug the pipe with Class SI Concrete or brick and suitable mortar to the satisfaction of the Engineer, and fill the remaining empty length of pipe with Controlled Low-Strength Material. The Controlled Low-Strength Material (CLSM) must meet material requirements of Article 593.02.

Method of Measurement. This work will be measured for payment in feet for the pipe to be abandoned in place.

Basis of Payment. This work will be paid for at the contract unit price per foot which price shall include all materials, labor, tools and equipment, backfilling of any excavation necessary for ABANDON AND FILL EXISTING STORM SEWER at locations shown in the plans, as specified herein, and as determined by the Engineer.

593.06 Basis of Payment. Revise this Article to read:

“This work shall be paid for at the contract unit price per foot (meter) for ABANDON AND FILL EXISTING STORM SEWER regardless of diameter of the storm sewer.”

**REMOVING SANITARY MANHOLES TO MAINTAIN FLOW:**

This work shall be done in accordance with Section 605 of the Standard Specifications except as modified herein.

605.03 Removing Existing Manholes, Catch Basins, and Inlets. Replace the following in this Article:

Replace all references to “storm sewer” or “storm sewer system” with “sanitary sewer” or “sanitary sewer system”.

605.06 Basis of Payment. Add the following to the end of this Article:

“The work of removing existing sanitary manholes at locations where flow is to be maintained in the sanitary sewer system will be paid for at the contract unit price per each for SANITARY MANHOLES TO BE REMOVED.”

**HOT-MIX ASPHALT SURFACE REMOVAL, VARIABLE DEPTH:**

This work shall be done in accordance with Section 440 of the Standard Specifications except as modified herein.

440.04 HMA Surface Removal for Subsequent Resurfacing. Modify the first sentence of this Article to read:

“The existing HMA surface shall be removed to the depth indicated by the engineer to transition between existing and proposed pavements for staged construction with a self-propelled milling machine.”

440.04 HMA Surface Removal for Subsequent Resurfacing. Remove the last sentence of this Article.

440.08 Basis of Payment. Add the following to the end of this Article:

“Variable depth removal of hot-mix asphalt pavement will be paid for at the contract unit price per SQUARE YARD (square meter) for HOT-MIX ASPHALT SURFACE REMOVAL, VARIABLE DEPTH.”

**GEOSYNTHETIC REINFORCEMENT:**

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

Submittals.

- (a) Submit product data, including Manufacturer’s Tech Data product sheet, for specified products and installation procedure in accordance with manufactures recommendation.
- (b) Submit manufacturer supplied product certification evidence of third party quality control.
- (c) Submit summary of test compliance with specified performance characteristics and physical properties.

Materials. Each layer of geogrid shall conform to the property requirements listed below. Multilayer geogrid and multiple layers of lesser strength geogrids will not be accepted.

Acceptable manufacturers: Tensar International TriAx TX160 geogrid

Material	Test Standard	Value
Polypropylene	ASTM D1401 Group1/Class1/Grade 2	98% (min)
Carbon Black	ASTM 4218	0.5% (min)

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Structural Properties	Test Standard	Value
Aperture shape		Triangular
Junction Efficiency	GRI-GG2-87 and GRI-GG1-87	93% (min)
Radial Stiffness at 0.5% strain	ASTM D6637-01	20,000 lb/ft (min)
Resistance to chemical degradation	EPA 9090	100%
Resistance to ultraviolet light and weathering	ASTM D4355-05	100%

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

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

Installation. Prior to the installation of the geogrid, the application surface shall be cleared of all debris and sharp objects and graded and compacted to provide a reasonably smooth surface.

The geogrid shall be placed with the "roll length" perpendicular to the roadway centerline and in accordance with the manufacturer's recommendations. The "roll length" of the geogrid shall extend the entire distance across the salvaged aggregate base and shall be one continuous length perpendicular to the roadway centerline. No butt joint overlaps will be allowed. Overlap the "roll length" edges of the geogrid in accordance with manufacturer's recommendations.

The geogrid shall be pulled taut and staked in place to minimize slack and distortion during placement of the sub-base granular material.

Sub-base granular material, paid for separately, shall be placed on the geogrid in such a manner as to prevent tearing or shoving of the geogrid. Dumping of material directly on the geogrid will only be permitted to establish an initial working platform. No construction equipment shall be allowed on the geogrid prior to placement of the sub-base granular material. Unless otherwise specified in the plans or Special Provisions, the granular material, shall be placed to the full required thickness and compacted.

Any geogrid which is damaged during installation or subsequent placement of granular material shall be repaired or replaced at the Contractor's expense, including costs of removal and replacement of the granular material.

Method of Measurement. This work will be measured for payment in place in square yards for the surface area placed.

Basis of Payment. This work will be paid for at the contract unit price per square yard for GEOSYNTHETIC REINFORCEMENT which shall include all items necessary to complete the geogrid installation.

**EROSION CONTROL BLANKET:**

This Special Provision revises Section 251 of the Standard Specifications for Road and Bridge Construction to eliminate the use of Excelsior Blanket for Erosion Control Blanket. This work shall consist of furnishing, transporting, and placing 100 % biodegradable erosion control blanket over seeded areas as detailed on the plans, according to Section 251 except as modified herein.

Delete Article 1081.10(a) Excelsior Blanket.

Delete the first paragraph of Article 1081.10 (b) Knitted Straw Mat and substitute the following:

Knitted Straw Mat. Knitted straw mat shall be a machine-produced mat of 100% clean, weed free agricultural straw. The blanket shall be of consistent thickness with the straw evenly distributed over the entire area of the blanket. The blanket shall be covered on top and bottom sides with a 100% biodegradable woven natural organic fiber netting such as North American Green S150BN or equal. No plastic netting will be allowed. The top netting shall consist of machine directional strands formed from two intertwined yarns with cross directional strands interwoven through the twisted machine stands to form an approximate 0.50 x 1.0 (1.27 x 2.54 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with degradable thread. The blanket shall be manufactured with a colored thread stitched along both outer edges (approximately 2-5 inches (5-12.5cm) from the edge) as an overlap guide for adjacent mats.

Delete Article 1081.10(c) (1) Excelsior Blanket.

Delete the first paragraph of Article 1081.10 (c) (2) Knitted Straw Mat and substitute the following:

Knitted Straw Mat. The blanket shall be machine-produced 100% biodegradable blanket of 70% agricultural straw and 30% coconut fiber with a functional longevity of up to 18 months. The blanket shall be of consistent thickness with the straw and coconut evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom sides with 100% biodegradable woven natural organic fiber netting such as North American Green SC150BN or equal. The top netting shall consist of machine directional strands formed from two intertwined yarns with cross directional strands interwoven through the twisted machine strands to form an approximate 0.50 x 1.0 (1.27 x 2.54 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with degradable

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thread. The blanket shall be manufactured with a colored thread stitched along both outer edges (approximately 2-5 inches (5-12.5cm) from the edge) as an overlap guide for adjacent mats.

Delete Article 1081.10(d) Wire Staples.

Add the following to Article 1081.10 (e) Wood Stakes:

Biodegradable plastic stakes will be allowed. The biodegradable plastic anchor shall be approximately 6 in (15.24 cm) in length. No metal wire stakes will be allowed.

**MULCH:**

This work shall be done in accordance with the applicable portion of Section 253.02 (c)(e), Section 1081.06 (b) and Section 1081.14 of the Standard Specifications for Road and Bridge Construction.

Description. This work shall consist of furnishing, transporting, and spreading an approved shredded hardwood bark mulch on top of weed barrier fabric to the depth of 4 inches as shown in the plans or as determined by the Engineer.

Material. Hardwood bark mulch shall be clean, finely shredded mixed-hardwood bark meeting the following requirements:

Material shall be free of sticks, leaves, stones, dirt clods, and other debris.  
Individual wood chips shall not exceed 2 inches (50 mm) in the largest dimension.  
Color shall match existing hardwood mulch

Method. The grade, depth, and condition of the area must be approved by the Engineer prior to placement.

The Contractor shall remove all weeds, litter and plant debris before mulching.

The Contractor shall prepare a neatly spaded edge between the landscaped bed and/or tree ring and the turf. The Contractor shall repair the grade by raking and adding topsoil as needed, before mulching. Weed barrier fabric shall be installed prior to mulching per Section 253.11 of Standard Specifications for Road and Bridge Construction.

The shredded mulch shall be placed according at the required depth as specified in the plans for planting trees, shrubs, vines and perennial plants. Care shall be taken not to bury leaves, stems, or vines under mulch material. Mulch shall not be in contact with the base of the trunk.

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All finished mulch areas shall be left smooth and level to maintain uniform surface and appearance.

After the mulch placement, any debris or piles of material shall be immediately removed from the right of way, including raking excess mulch out of turf areas.

Method of Measurement. MULCH placement will be measured in place and the area computed in square yards. WEED BARRIER FABRIC placement will be measured 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 MULCH and WEED BARRIER FABRIC.

**PAVEMENT MARKING, SPECIAL:**

DESCRIPTION: The work will be described as hot-applied stamped synthetic crosswalk pavement material. The stamped patterned treatment shall be applied according to the manufacturer's specifications, as amended in these specifications and as shown on the plans. For the purpose of this specification, patterns are defined as palpable surface markings. Joint openings shall not exceed three quarters of one inch in width.

MATERIALS: Hot-applied stamped synthetic crosswalk pavement material consists of stamping a hot resin-based compound to create the appearance of hand-laid decorative paving products. The hot applied polymer modified synthetic asphalt surface treatment incorporates polymers, binder resin, aggregates and fibers laid at approx 3/4 inch thick with integral color throughout. Traffic Patterns by Ennis-Flint shall be used.

Acceptable manufacturers include:

Ennis-Flint  
115 Todd Court  
Thomasville, NC 27360  
Office: 800-331-8118  
<http://www.ennisflintamericas.com>

Color shall be red brick with grey grout. Pattern to be used shall be Herringbone with a 6 inch width soldier course border.

Meet manufacturer's specifications for all pattern/texture templates, coating and coloring materials. Use only material that is delivered to the job site in sealed containers bearing the manufacturer's original labels. The manufacturer should certify that they have tested the material in place in accordance with ASTM E-274, Skid Resistance of Paved Surfaces Using a standard

ribbed full Scale Tire at a speed of 40 mph (FN40R) and has a minimum FN40R value of 35.

MATERIAL ACCEPTANCE: The Contractor must provide a Manufacturer's written certification that the material complies with these specifications.

CONSTRUCTION REQUIREMENTS: When installing onto asphalt, the surface shall be compacted by traffic and the asphalt oils dispersed to avoid transmission to the decorative crosswalk surface.

Saw cut area to be imprinted along border of entire application area. Remove a depth of 0.75" or as required per manufacturer's specifications, of HMA surface in application area.

Site conditions shall be dry before installing decorative crosswalk. The surface may be dried with propane to ensure dry conditions. After placing and while the material is still molten, a specially designed stamp is placed into the material to form a pattern. Pattern shall be consistent with design shown in the plans. Engineer shall approve custom stamp prior to installation. Finish grade of decorative crosswalk shall be flush with adjacent paving surfaces.

Protect treated surfaces from traffic and environmental effects until the area is completely coated/imprinted, and material has dried or cured according to the manufacturer's instructions.

Complete all utility, traffic loop detector, and other items requiring a cut and installation under the finished surface, prior to pattern installation.

At crosswalk locations with handicap access, application must be placed to ensure the transition between the textured pavement and curb and gutter meet current local, state and federal guidelines. Failure to comply, as determined by the Engineer, will result in removal and replacement of the entire textured area at no additional cost.

Upon completion of the installation, the Engineer will check the area at random locations for geometric accuracy, as specified in the plans. If any of the chosen areas have an imprint depth that is less than the manufacturer's specifications, correct the entire textured area, at no additional cost.

Supply the specified color chips for the Engineer's use to visually determine that the material matches the color specified in the plans or by the Village. For any continuous or touching area, i.e. all treated areas of an intersection, color materials must be from the same lot/batch.

WARRANTY: Manufacturer must provide warranty that material will maintain a depth of at least 50% of the original installed depth and width, and that the color will be maintained with normal use for period of two (2) years. The warranty period will begin on the date of Final Acceptance of the work. Contractor shall provide Owner with a hard copy of warrantee.

**MEASUREMENT:** The quantity to be paid will be the area in square feet of PAVEMENT MARKING, SPECIAL, measured in place, completed and accepted. No deduction will be made for the area(s) occupied by manholes, inlets, drainage structures, or by any public utility appurtenances within the asphalt area. Asphalt or concrete materials placed prior to treatment will be paid separately under the appropriate pay items. Milling required for the placement of patterned/textured pavement will be included in the cost of the patterned/textured pavement.

**BASIS OF PAYMENT:** This work will be paid for at the contract unit price per square foot for PAVEMENT MARKING, SPECIAL which price will be payment in full for completing the work as described herein including milling required for placement and surface materials including colors, sealers, and/or resins.

**FENCE REMOVAL:**

This work shall be done in accordance with Section 501 of the Standard Specifications except as modified herein.

501.04 Complete Removal of Structures. Add the following to the end of this Article:

“Removal of existing fence shall include any posts, foundations, paneling, wires, or other items that make up or are attached to the fence.”

501.06 Method of Measurement. Add the following to the end of this Article:

“Removal of existing fence will be measured for payment in place, in feet (meters) along the base of the fence.”

501.07 Basis of Payment. Add the following to the end of this Article:

“Removal of fence will be paid for at the contract unit price per FOOT (meter) for FENCE REMOVAL.”

**TEMPORARY DRAINAGE SYSTEM NO. 1:**

**Description.** This work shall consist of furnishing all formwork, material, pipe, structures, frames & grates/lids, equipment and labor to install and remove a temporary drainage system as specified on the plans and as needed based on the Contractor’s temporary drainage system design. The contractor is responsible for providing positive drainage and maintaining all existing drainage outlets. This design is to be performed by the Contractor.

The temporary drainage system shall remain in place and operate until the permanent drainage

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system is installed and functioning, which would include final grading in the parkway, and installation of permanent traffic signals, sidewalk and bike paths.

Design. The temporary drainage system shall be designed by the Contractor and approved by the Engineer. The design may include temporary swales, existing storm sewer and drainage structures, temporary plugs, temporary connections, temporary structures, temporary curb & gutter and pumps.

Construction Requirements: The Contractor shall submit, for approval by the Engineer, details of the temporary drainage system he/she proposes to use, prior to ordering of material and implementation. All dewatering, pumping, formwork, labor, equipment and materials required for this work is included in the price for TEMPORARY DRAINAGE SYSTEM NO.1.

Temporary inlets shall be in accordance with section 602 of the Standard Specifications and Highway Standard 602301.

Temporary frames and lids shall be in accordance with section 604 of the Standard Specifications. Temporary frames and lids shall be in accordance with Highways Standard 604001 except that the frame height shall be 3 inches.

Temporary curb and gutter shall be in accordance with the detail drawing for temporary curb and gutter.

Method of Measurement: This work shall be measured by the contract lump sum for TEMPORARY DRAINAGE SYSTEM NO. 1 as indicated on the Plans and specified herein.

Basis of Payment. This work will be paid for at the contract lump sum price for TEMPORARY DRAINAGE SYSTEM NO 1.

**REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES:**

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

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

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

All contaminated materials shall be managed as either “uncontaminated soil” or non-special waste. This work shall include monitoring and potential sampling, analytical testing, and management of a material contaminated by regulated substances. The Environmental Firm shall continuously monitor all soil excavation for worker protection and soil contamination. Soil samples or analysis without the approval of the Engineer will be at no additional cost. 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:

Intersection of Plum Grove Road and IL Route 72 (Higgins Road)

- All excavation planned at the northwest quadrant, southwest quadrant, and southeast quadrant at the intersection of Plum Grove Road and IL Route 72 (Higgins Road), Schaumburg. This material meets the criteria of Article 669.09(a)(5) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs and Metals.
- All excavation planned at the northeast quadrant at the intersection of Plum Grove Road and IL Route 72 (Higgins Road), Schaumburg. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs and Metals.

Plum Grove Road Right of Way

- Station 23+70 to Station 25+50 (CL Plum Grove Road) 0 to 50 feet LT (Plum Grove Road Right of Way). This material meets the criteria of Article 669.09(a)(5) and shall be managed in accordance to Article 669.09. Contaminants of concern sampling parameters: Arsenic.
- Station 23+70 to Station 25+50 (CL Plum Grove Road) 0 to 60 feet RT (Plum Grove Road Right of Way). This material meets the criteria of Article 669.09(a)(5) and shall be managed in accordance to Article 669.09. Contaminants of concern sampling parameters: Arsenic.
- Station 30+80 to Station 32+20 (CL Plum Grove Road) 0 to 50 feet LT (Plum Grove Road Right of Way). This material meets the criteria of Article 669.09(b)(1) and shall be managed in accordance to Article 669.09.
- Station 30+80 to Station 32+20 (CL Plum Grove Road) 0 to 50 feet RT (Plum Grove Road Right of Way). This material meets the criteria of Article 669.09(b)(1) and shall be managed in accordance to Article 669.09.

- Station 33+80 to Station 35+20 (CL Plum Grove Road) 0 to 40 feet LT (Plum Grove Road Right of Way). This material meets the criteria of Article 669.09(a)(5) and shall be managed in accordance to Article 669.09. Contaminants of concern sampling parameters: Arsenic
- Station 33+80 to Station 35+20 (CL Plum Grove Road) 0 to 50 feet RT (Plum Grove Road Right of Way). This material meets the criteria of Article 669.09(a)(5) and shall be managed in accordance to Article 669.09. Contaminants of concern sampling parameters: Arsenic

Intersection of Plum Grove Road and IL Route 58 (Golf Road)

- All excavation planned at the northwest quadrant, southwest quadrant, and southeast quadrant at the intersection of Plum Grove Road and IL Route 58 (Golf Road), Schaumburg. This material meets the criteria of Article 669.09(a)(5) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs and Metals.
- All excavation planned at the northeast quadrant at the intersection of Plum Grove Road and IL Route 58 (Golf Road), Schaumburg. This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Potential contaminants of concern sampling parameters: VOCs, SVOCs and Metals.

**FORM LINER TEXTURED SURFACE:**

Work shall be according to the applicable portions of Article 503.06 of the Standard Specifications and as shown in the Plans, except as modified herein:

The form liner pattern (below the 4" coping) shall be:

*Minnehaha Blend (#12010)*  
Custom Rock Formliner  
2020 West 7<sup>th</sup> Street  
St. Paul, MN 55116  
(651)699-1345 (Jim Rogers)  
[www.customrock.com](http://www.customrock.com)

The form liner pattern for the edges of the 4" coping shall be:

*Texture #T307 Fractured Granite ¼"*  
Also by Custom Rock.

The top surface of the 4" coping shall be finished with a roughened texture, to simulate natural

stone.

Installation.

Form liners shall be installed in accordance with the manufacturer's recommendations to achieve the highest quality concrete appearance possible. Form liners shall withstand concrete placement pressures without leakage causing physical or visual defects. After each use, liners shall be cleaned and made free of build-up prior to the next placement, and visually inspected for blemishes or tears. If necessary, the form liners shall be repaired in accordance with the manufacturer's recommendations. All form liner panels that will not perform as intended or are no longer repairable shall be replaced.

The liner shall be securely attached to the forms according to the manufacturer's recommendations. Liners shall be attached to each other with flush seams and seams filled as necessary to eliminate visible evidence in cast concrete. Liner butt joints shall be blended into the pattern so as to create no visible vertical or horizontal seams or conspicuous form butt joint marks. Liner joints must fall within pattern joints or reveals. Finished textures shall be continuous without visual disruption and properly aligned over adjacent and multiple liner panels. Continuous or single liner panels shall be used where liner joints may interrupt the intended pattern.

Wall ties shall be coordinated with the liner and form to achieve the least visible result. Curing methods shall be compatible with the desired aesthetic result. Use of curing compounds will not be allowed. Concrete slump requirements shall meet the form liner manufacturer's recommendations for optimizing the concrete finish.

It is the intention of this specification that no rubbing of flat areas or other repairs shall be required after form removal. The finished exposed formed concrete surfaces shall be free of visible vertical seams, horizontal seams, and butt joint marks. Grinding and chipping of finished formed surfaces shall be avoided.

Submittals.

A 3' wide x 2' tall test sample shall be supplied to the Engineer for Village approval 30 days prior to pouring cast-in-place concrete. This sample shall be representative of a three-foot section of the parapet as view from the roadway side, and shall include:

- Concrete coping with textures and coloration
- Form liner textured surface with coloration

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

Basis of Payment. This work will be paid for at the contract unit price per square foot for FORM LINER TEXTURED SURFACE, which price will be payment in full for all materials, equipment, and labor necessary to complete the Work as herein specified.

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**CONCRETE SURFACE COLOR TREATMENT:**

Description.

This work shall consist of concrete substrate surface preparation, furnishing material and staining concrete surfaces. That work shall be performed according to Manufacturer's requirements, as specified herein and on the Plans.

Materials.

Concrete stain system shall be according to the requirements of the Manufacturer:

Custom Rock, Inc.  
2020 West 7<sup>th</sup> Street  
St. Paul, MN 55116  
(651)699-1345 (Jim Rogers)  
[www.customrock.com](http://www.customrock.com)

Coloration.

Concrete surfaces shall be cleaned prior to applying color stain. The prepared surfaces shall be cleaned such that all curing compounds, laitance, dirt and other foreign material and substances are removed.

All areas receiving Form Liner Textured Surface shall receive concrete stain, except 4" coping on top of retaining wall and headwall. Final coloration shall be a uniform color scheme, to be determined at a later date by the Engineer as coordinated with the Village of Schaumburg.

Submittals.

- (a) Manufacturer's technical data sheets and installation instructions.
- (b) The test sample described in the special provision for FORM LINER TEXTURED SURFACE.

Method of Measurement.

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

Basis of Payment.

Staining concrete will be paid for at the contract unit price per square foot for CONCRETE SURFACE COLOR TREATMENT, which price will be payment in full for all materials, equipment, and labor necessary to complete the Work as herein specified.

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**REBUILD EXISTING HANDHOLE:**

Effective: January 1, 2002  
Revised: July 1, 2015  
895.04TS

This item shall consist of rebuilding and bringing to grade a handhole at a location shown on the plans or as directed by the Engineer. The work shall consist of removing the handhole frame and cover and the walls of the handhole to a depth of eight (8) inches below the finished grade.

Upon completion of the above work, four (4) holes, four (4) inches in depth and one half (1/2) inch in diameter, shall be drilled into the remaining concrete; one hole centered on each of the four handhole walls. Four (4) #3 steel dowels, eight (8) inches in length, shall be furnished and shall be installed in the drilled holes with a masonry epoxy.

All concrete debris shall be disposed of outside the right-of-way.

The area adjacent to each side of the handhole shall be excavated to allow forming. All steel hooks, handhole frame, cover, and concrete shall be provided to construct a rebuilt handhole according to applicable portions of Section 814 of the Standard Specification and as modified in 814.01TS HANDHOLES Special Provision. The existing frame and cover shall be replaced if it was damaged during removal or as determined by the Engineer.

**Basis of Payment.**

This work shall be paid for at the contract unit price each for REBUILD EXISTING HANDHOLE, 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.

**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:

<b>Type of Work (discipline)</b>	<b>Item</b>
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.

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

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

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

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

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

**Marking Proposed Locations for Highway Lighting System.** The Contractor shall 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

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- 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

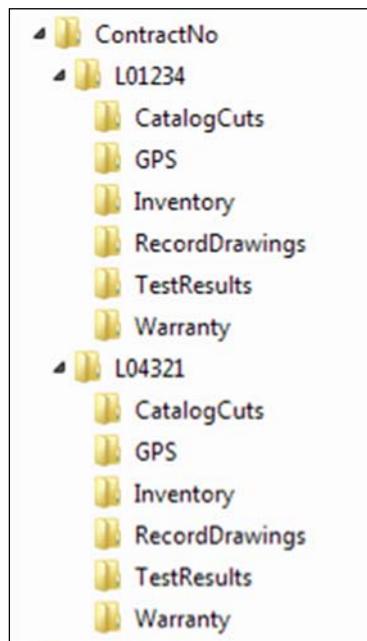
unacceptable the contractor shall make corrections to the data collection equipment and or process and submit the data for review and approval as specified. **Data collection prior to the submittal and review of the sample data of existing data points will be unacceptable and rejected.**

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.

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The inspection will not be made until after the delivery of acceptable record drawings, specified certifications, and the required guarantees.

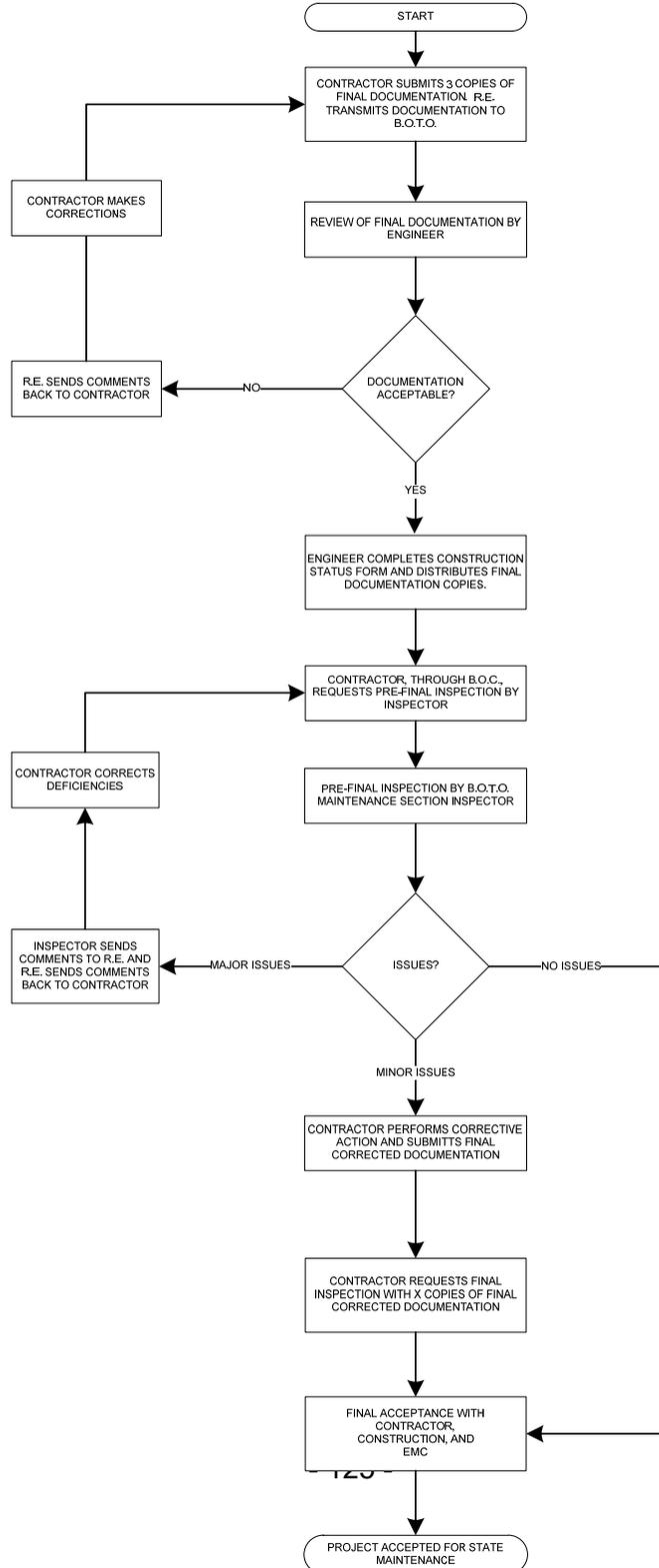
The Final Acceptance Documentation Checklist shall be completed and is contained elsewhere herein.

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 drawings, specified certifications, and the required guarantees.



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**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)
<b>Record Drawings</b> -Four hardcopies (11" x 17") -Scanned to two CD-ROMs	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
<b>Field Inspection Tests</b> -Voltage -Amperage -Cable Insulation Resistance -Continuity -Controller Ground Rod Resistance (Four Hardcopies & scanned to two CD's)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>GPS Coordinates</b> -Excel file (Check Special Provisions, Excel file scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
<b>Job Warranty Letter</b> (Four Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
<b>Catalog Cut Submittals</b> -Approved & Approved as Noted (Scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
<b>Lighting Inventory Form</b> (Four Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
<b>Lighting Controller Inventory Form</b> (Four Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>

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<b>Light Tower Inspection Form</b> (If applicable, Four Hardcopies & scanned to two CD's)	<input type="checkbox"/>	<input type="checkbox"/>
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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.

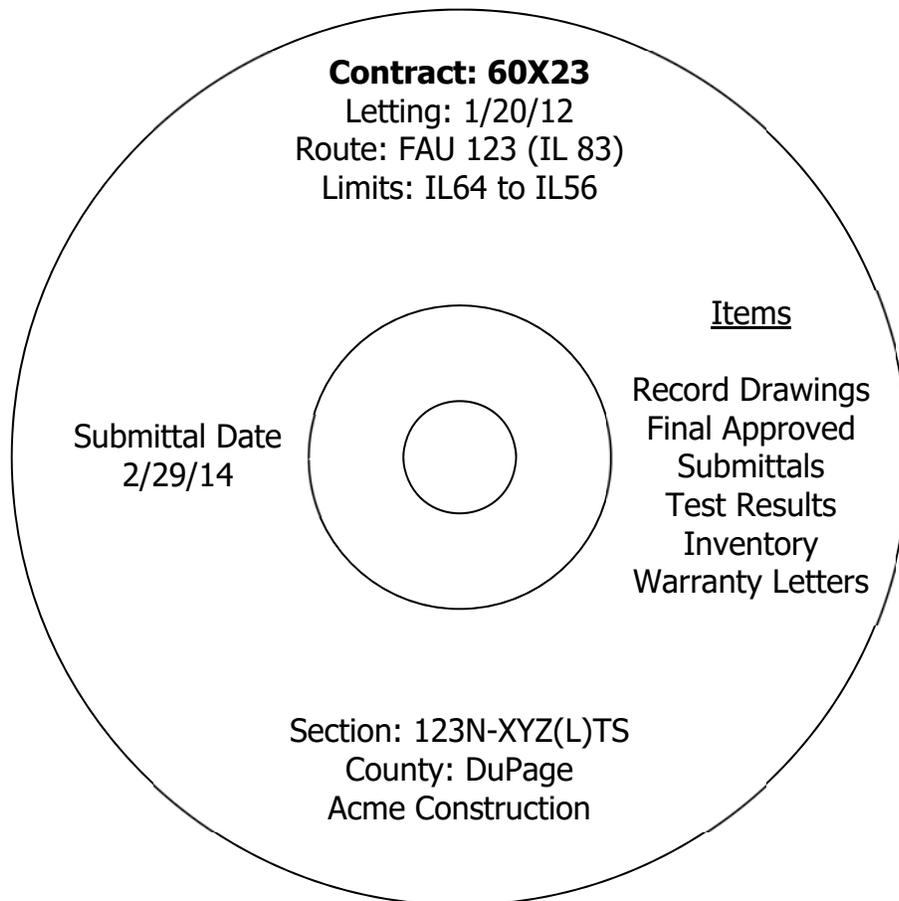
Light Tower Safety Inspection Form – Form should be filled out for each proposed light tower.

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CD LABEL FORMAT TEMPLATE.

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



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### **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 \$5,000.00

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

Add the following to Article 810.04 of the Standard Specifications:

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

Add the following to Article 810.04 of the Standard Specifications:

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

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

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

### **ELECTRIC CABLE ASSEMBLY IN CONDUIT**

This work shall be performed in accordance with Section 870 of the Standard Specifications insofar as applicable and as detailed on the Plans.

Contractor is responsible for coordinating installation of various cable assemblies in common conduits.

This work shall be paid for at the contract unit price per foot for ELECTRIC CABLE ASSEMBLY IN CONDUIT of the type, size and number of conductors shown on the Plans. Price shall be payment in full for all labor, materials, equipment and incidental expenses as necessary to complete this work as specified and as indicated on the Plans.

### **COMBINATION LIGHTING CONTROLLER**

Effective: February 1, 2015

#### **Description**

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

#### **Materials**

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

Fusing. Fuse holders shall be dead front, finger safe, and allowing for the removal and installation of fuses without tools or fuse pullers.

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

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

Enclosure. A molded fiberglass polyester NEMA 4X enclosure with matching cover shall be utilized.

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A molded hinge with stainless steel pin shall be used with a stainless steel draw type "snap latch" door fastener. Threaded brass inserts shall be provided for the non-conductive inner mounting panel.

## **CONSTRUCTION REQUIREMENTS**

### General

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

### Basis of Payment

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

### **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 Section 109.04.

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 initial notification to the Contractor until the time permanent repairs are made if the Contractor was required to make temporary repairs to meet the service restoration requirement.

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

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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.

#### **LIGHT POLE, ALUMINUM**

This work shall consist of providing and installing light poles. This work shall include equipment, hardware, assembly, wiring, mounting, testing, grounding, labor and other miscellaneous work necessary to for complete fully operational installation of the light poles. This work shall be done in accordance with Sections 830 of the Standard Specifications insofar as applicable.

Materials. The following materials comprise the light pole assembly.

Light Poles: Spun aluminum light pole with 6' or 12' arm (as shown on plans) to accommodate the LUMINAIRE, LED, HORIZONTAL MOUNT at 40' M.H. as detailed in the plans.

Finish: Factory natural finish.

Fuse holder: Bussmann HEX-A W-DRCLA.

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Method of Measurement. This work will be measured for payment per each fully-assembled and operational lighting pole installed.

Basis of Payment. This work will be paid for at the contract unit price per each for LIGHT POLE, ALUMINUM of the type and size shown in the plan set.

### **LUMINAIRE, LED**

Effective: January 1, 2017 Revised: April 1, 2018

#### 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  $\pm 5$  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 -40°C to 70°C.

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 25° 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.

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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/m<sup>2</sup>). 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		
<b>ROADWAY DATA</b>	Pavement Width	55 (ft)
	Number of Lanes	5
	Median Width	N/A
	I.E.S. Surface Classification	R3
	Q-Zero Value	.07
<b>LIGHT POLE DATA</b>	Mounting Height	40 (ft)
	Mast Arm Length	6 (ft)
	Pole Set-Back From Edge Of Pavement	5 (ft)
<b>LUMINAIRE DATA</b>	Lumens	Type B
	BUG Rating	B3 – U0 – G3 (Max)
	I.E.S. Vertical Distribution	Medium
	I.E.S. Lateral Distribution	Type III
	Total Light Loss Factor	0.70
<b>LAYOUT DATA</b>	Spacing	300 (ft)
	Configuration	Opposite
	Luminaire Overhang over EOP	1 (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		
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**NOTE:** These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

<b>ROADWAY LUMINANCE</b>	Average Luminance, $L_{AVE}$	0.6	Cd/m <sup>2</sup> (Max)
			Cd/m <sup>2</sup> (Min)
	Uniformity Ratio, $L_{AVE}/L_{MIN}$	3.5	(Max)
	Uniformity Ratio, $L_{MAX}/L_{MIN}$	6.0	(Max)
	Veiling Luminance Ratio, $L_V/L_{AVE}$	0.4	(Max)



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.

<b>Contract Quantity</b>	<b>Luminaires to be Tested</b>
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. The testing facility shall not be associated in any way, subsidiary or otherwise, with the luminaire manufacturer. 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 review and approval.

The testing performed shall include photometric and electrical testing.

Photometric testing shall be according to IES recommendations, performed with a goniophotometer and as a minimum, shall yield an isofootcandle chart, with max candela point

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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: District Engineer  
Attn: Bureau Chief of Traffic Operations  
Illinois Department of transportation  
201 West center Ct.  
Schaumburg, IL 60196

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 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**, of the **TYPE** indicated.

**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.

**LUMINAIRE, LED, HORIZONTAL MOUNT, MEDIUM WATTAGE**

This work shall consist of providing and installing horizontal mount LED luminaires. This work shall include equipment, hardware, assembly, wiring, mounting, testing, grounding, labor and other miscellaneous work necessary to for complete fully operational installation of the LED luminaires. This work shall be done in accordance with specification "LUMINAIRE, LED" and

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Sections 821 of the Standard Specifications insofar as applicable.

Materials. The following materials comprise the luminaire.

Luminaire: American Electric Lighting, Autobahn Series TB2 (Cat. ATB2-80BLEDE70-MVOLT-R2-P7SH, 180 watt, and multi-volt compatible, 4000K color temperature, 700 mA drive current, as detailed on Plans for roadway lighting.

Finish: Factory gray finish.

Method of Measurement. This work will be measured for payment per each fully-assembled and operational lighting unit installed.

Basis of Payment. This work will be paid for at the contract unit price per each for LUMINAIRE, LED, HORIZONTAL MOUNT, MEDIUM WATTAGE.

### **BREAKAWAY DEVICE, TRANSFORMER BASE**

This work shall be performed in accordance with Section 838 of the Standard Specifications insofar as applicable and as detailed on the Plans.

Contractor is responsible for installation of breakaway devices and coordinating with other trades and aspects of the project.

Upper and lower bolt circle diameters must be coordinated to accommodate the mounting configuration of the actual light pole and metal helix foundation being provided.

Method of Measurement. This work will be measured for payment per each fully-assembled and operational breakaway device installed.

Basis of Payment. This work shall be paid for at the contract unit price per each for BREAKAWAY DEVICE, TRANSFORMER BASE of the type and size shown in the plan set. Price shall be payment in full for all labor, materials, equipment and incidental expenses as necessary to complete this work as specified and as indicated on the Plans.

### **METAL HELIX FOUNDATION**

This work shall be performed in accordance with Section 836 of the Standard Specifications insofar as applicable and as detailed on the Plans.

Contractor is responsible for installation of foundations and coordinating with other trades and aspects of the project.

Foundation shall be as detailed in the plan set. Baseplate size and bolt circle diameter must be sufficient to accommodate the mounting configuration of the actual lighting unit being provided.

Method of Measurement. This work will be measured for payment per each fully-assembled and operational lighting unit installed.

Basis of Payment. This work shall be paid for at the contract unit price per each for LIGHT POLE FOUNDATION, METAL of the type and size shown in the plan set. Price shall be payment in full for all labor, materials, equipment and incidental expenses as necessary to complete this work as specified and as indicated on the Plans.

### **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

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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.”

### **REMOVE EXISTING CABLE**

Contractor is responsible for removal, salvage, and delivery of salvaged cable to the Village for recycling. Coordinate with other trades and aspects of the project. Contact Village ECS Foreman (Dave Hellmer 847-923-6632) to coordinate delivery of salvaged wire/cable to the Village Public Works Facility at 714 Plum Grove Road.

Method of Measurement. This work will be measured for payment per foot of cable removed and turned over to the Village.

Basis of Payment. This work shall be paid for at the contract unit price per foot for REMOVE EXISTING CABLE. Price shall be payment in full for all labor, materials, equipment and all other expenses as necessary to complete this work as specified and as indicated on the Plans

### **LIGHT POLE FOUNDATION, 24” DIAMETER OFFSET**

This work shall be performed in accordance with Section 836 of the Standard Specifications insofar as applicable and as detailed on the Plans.

Contractor is responsible for removal, salvage, and delivery of salvaged cable to the Village for recycling. Coordinate with other trades and aspects of the project. Contact Village ECS Foreman (Dave Hellmer 847-923-6632) to coordinate delivery of salvaged wire/cable to the Village Public Works Facility at 714 Plum Grove Road.

Method of Measurement. This work will be measured for payment in feet in place. The length measured will be limited to that shown on the plans or authorized by the Engineer. Offsets will be measured along the vertical and horizontal centerlines of the foundation without overlap.

Basis of Payment. Concrete offset foundations will be paid for at the contract unit price per foot for LIGHT POLE FOUNDATION, 24” DIAMETER, OFFSET. Price shall be payment in full for all labor, materials, equipment and all other expenses as necessary to complete this work as specified and as indicated on the Plans.

## **PAINT NEW PEDESTRIAN PUSH-BUTTON POST**

### Description.

This work shall include surface preparation, powder coated finish application, and packaging of new galvanized steel pedestrian push-button posts. All work associated with applying the painted finish shall be performed at the vendor's facility for the posts or at a painting facility approved by the Engineer. Pedestrian post bases shall also be painted the same color as the posts.

### Surface Preparation.

All weld flux and other contaminants shall be mechanically removed. The posts 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 °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 °F.

The finish paint color shall be one of the vendor'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.

Any damage to the finish after leaving the vendor's facility shall be repaired to the satisfaction of the Engineer using a method recommended by the vendor and approved by the Engineer. If while at the vendor's facility the finish is damaged, the finish shall be re-applied at no cost to the contract.

### Warranty.

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

### Packaging.

Prior to shipping, the 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 PEDESTRIAN PUSH-BUTTON POST, which shall be payment in full for painting and packaging the pedestrian push-button posts described above including all bases and appurtenances.

### **REMOVE EXISTING DOUBLE HANDHOLE**

#### Description.

This work shall be done in accordance to Section 895, except as modified herein:

#### 895.05 Removal.

(e) Double Handhole. The frame and cover of an existing double handhole shall be broken off the top section of the double handhole wall to a minimum depth of 3 feet below the surrounding grade, or as specified, backfilled with approved material, and the surface reconstructed to match the adjoining area. The concrete debris shall be disposed of outside the right-of-way and the frame and cover disposed of as determined by the Engineer. If the double handhole is located in the sidewalk area, the entire sidewalk square or squares where the double handhole is located shall be replaced with new sidewalk.

895.07 Method of Measurement. This work will be measured for payment in place for each double handhole removed.

895.08 Basis of Payment. This work will be paid for at the contract unit price each for REMOVE EXISTING DOUBLE HANDHOLE and shall include sidewalk replacement if necessary.

### **TRAFFIC SIGNAL MATERIALS APPROVAL (FOR NON-IDOT MAINTAINED INTERSECTIONS)**

Material approval requests for items to only be used on signals not maintained by IDOT shall be submitted as a separate submittal from the material approval requests for IDOT maintained signals. Items which will be used on both IDOT and non-IDOT traffic signals shall be submitted to the District One Bureau of Traffic Operations as directed in the Traffic Signal General Requirements special provision.

### **VIDEO DETECTION SYSTEM**

#### General

The following specification is for the VantageNext Video Detection System as manufactured by Iteris.

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

#### 1. System Hardware

The video detection system (VDS) shall consist of up to four video cameras, up to two video detection processors (VDP) capable of processing two video sources each, one

Central Control Unit (CCU), input/output extension modules, video surge suppressors and a pointing device, or any combination thereof.

The VDS will be deployed at locations where site conditions and roadway geometry vary. The VDS system may also be deployed at locations where existing cabinets or equipment exist. Existing site configurations will dictate the availability of cabinet space and VDS usage.

2. System Software

The system shall include software that discriminately detects the presence of individual vehicles and bicycles in a single or multiple lanes using only the video image. Detection zones shall be defined using only an embedded software application. A monitor, a keyboard and a pointing device are used to place the zones on a video image. A minimum of 32 detection zones per camera view shall be available. A separate computer shall not be required to program the detection zones. In addition to creating vehicle and bicycle zones, the system shall automatically define a pedestrian crossing area in front of the stop bar zones. The system shall provide a tracking mechanism that counts pedestrian volume moving within this crossing area, and also determine the average, maximum, and minimum speed of pedestrians moving within this crossing zone. The system shall also provide discrete outputs when pedestrians are in the crosswalk during normal crossing phases and when a red phase input has been detected. The system shall also provide a visual indication on the video image that a pedestrian is in the crosswalk.

3. The VDS shall be made in the U.S.A. in compliance with FTA "Buy America" regulations.

VDS Hardware

1. Video Detection Processor (VDP) System Interfaces

The VDP shall be a single-rack detector card width, and provide provision for up to two sensors per VDP. The following interfaces shall be provided on each video detection processor:

a. Video Input

Each VDP will be supplied with video from the VDS Camera Sensor via Ethernet cables plugged into the front of the Central Control Unit. The interface connectors shall be RJ-45 type.

b. Video Lock LED

A LED indicator shall be provided to indicate the presence of the video signal. The LED shall illuminate upon valid video synchronization and turn off when the presence of a valid video signal is removed.

c. Contact Closure Output

Open collector (contact closure) outputs shall be provided. Four (4) open collector outputs shall be provided for the Video Detection Processor rack-mount configuration. Additionally, the VDS shall allow the use of extension modules to provide up to 32 open collector contact closures per camera input. Each open collector output shall be capable of sinking 30mA at 24VDC. Open collector outputs will be used for vehicle detection indicators as well as discrete outputs for alarm conditions. The VDP outputs shall be compatible with industry standard detector racks assignments.

d. Logic Input

Logic inputs such as delay/extend or delay inhibit shall be supported through the appropriate detector rack connector pin or front panel connector in the case of the I/O module. For VDPs and extension modules, 4 inputs shall be supported via detector rack interface. The I/O module shall accommodate eight (8) inputs through a 15-pin "D" connector.

e. Detection LEDs

Detection status LEDs shall be provided on the front panel. The LEDs shall illuminate when a contact closure output occurs. Rack-mounted video processors shall have a minimum of four (4) LEDs. Rack-mounted extension modules shall have two (2), four (4) or eight (8) LEDs (depending upon extension module type) to indicate detection.

f. Test Switches

The front panel of the VDP shall have detector test switches to allow the user to manually place vehicle and bicycle calls on each VDP output channel. The test switch shall be able to place a momentary call.

2. Both the VDP and EM shall be specifically designed to mount in a standard detector rack, using the edge connector to obtain power, provide contact closure outputs and accept logic inputs (e.g. delay/extend). No adapters shall be required to mount the VDP or EM in a standard detector rack and no rack rewiring shall not be required.

3. VDP printed circuit boards (PCBs) shall be conformally coated in accordance with Caltrans and NEMA specifications.

4. On-Board Memory

The VDP shall utilize non-volatile memory technology to store on-board firmware and operational data.

5. Firmware Upgrade

The CCU shall enable the loading of modified or enhanced software through either the Ethernet or front-panel USB port (using a USB thumb drive) and without removing or modifying the CCU hardware. The upgrade will affect both the CCU and VDP hardware when connected into a single system.

6. VDP and EM Power

The VDP and EM shall be powered by 12 or 24 volts DC. VDP and EM modules shall automatically compensate for either 12 or 24 VDC operation. VDP power consumption shall not exceed 7.5 watts. The EM power consumption shall not exceed 3 watts.

7. Operating Temperature

The VDS shall operate satisfactorily in a temperature range from -30° F to +165° F (-34° C to +74° C) and a humidity range from 0%RH to 95%RH, non-condensing as set forth in NEMA specifications.

#### VDS CCU

The VDS Central Control Unit (CCU) shall be supplied by the VDS manufacturer.

1. Hardware

The CCU shall be supplied in a standard One (1) Rack Unit (1U) 19" rack format. There shall be brackets to allow the CCU to be mounted under shelves where a 19" frame is not available.

2. CCU Power

The CCU shall be powered from an 110V or 230V, 50Hz or 60Hz supply. CCU power consumption shall not exceed 20 Watts

3. Operating Temperature

The VDS shall operate satisfactorily in a temperature range from -30° F to +165° F (-34° C to +74° C) and a humidity range from 0%RH to 95%RH, non-condensing as set forth in NEMA specifications.

4. On-Board Memory

The CCU shall utilize non-volatile memory technology to store on-board firmware and operational data.

5. Video Surge Suppression

The CCU shall incorporate video surge suppression for each video input. The CCU shall be appropriately grounded to the cabinet ground rod using 14 AWG (2.5mm<sup>2</sup>) minimum.

6. Power Surge Suppression

The CCU shall incorporate power surge suppression both on the input power and on the power supplied to the cameras. The CCU shall be appropriately grounded to the cabinet ground rod using 14 AWG (2.5mm<sup>2</sup>) minimum.

7. Power Management

The CCU shall incorporate power management for the various parts of the VDS such that if fault conditions are detected the power supply will safely shut down the power to that peripheral.

8. Interfaces

a. Extension Modules

Extension modules (EM) shall be available to eliminate the need of rewiring the detector rack, by enabling the user to plug an extension module into the appropriate slot in the detector rack to provide additional open collector outputs. The EM shall be available in both 2- and 4-channel configurations. EM configurations shall be programmable from the CCU. A separate I/O module shall also be available having 32 outputs through a 37-pin "D" connector on the front panel and 8 inputs through a 15-pin "D" connector using an external wire harness for expanded flexibility.

b. The CCU shall provide four ports for connection to VDS camera sensors. The connector shall be an RJ-45 type.

- c. The CCU shall provide four ports for connection to VDPs. The connector shall be an RJ-45 type.
- d. The CCU shall provide 2 USB 'A' ports on the front panel of the rack mount CCU unit. These ports can be utilized for various functions. For example, keyboard and mouse functions during system configuration, USB storage devices can be utilized for bin data and video collection. The USB ports shall not require special mouse software drivers. The USB ports shall be used as part of system setup and configuration
- e. 1.1.5 The CCU shall provide an output to a monitor. The port shall be HDMI. The native resolution of the monitor port shall be 1024 x 768.
- f. Communications  

An Ethernet communications port shall be provided on the front panel. The Ethernet port shall be compliant with IEEE 802.3 and shall use a RJ-45 type connector mounted on the front panel of the CCU. The Ethernet communications interface shall allow the user to remotely configure the system and/or to extract calculated vehicle/roadway information. The interface protocol shall be documented or interface software shall be provided. Each VDS shall have the capability to be IP addressable. The VDP shall support data rates of up to 100Mbps.
- g. The CCU shall provide an SDLC connection to the Traffic Controller. The connector shall be a 'D-15' type, in compliance with NEMA TS-2 specifications.
- h. The CCU shall provide an indicator when the SDLC port is active.
- i. The CCU shall provide an indicator when the unit has power.
- j. The CCU shall provide an indicator when the unit is on line.
- k. The CCU shall provide a Wi-Fi connection. The connection shall be over a standard 2.4GHz connection. The Wi-Fi connection shall be enabled and disabled by a switch on the CCU. The CCU shall provide an indicator when the Wi-Fi connection is active.
- l. The CCU shall provide a connection for a removable antenna. The antenna connection shall be a SMA Male type.
- m. The CCU shall provide system status via an on-board Organic Light Emitting Diode

display. The display shall indicate various system parameters, such as camera health and VDP health, firmware version and camera air temperature. The display will be enabled with a switch on the CCU. The display will automatically disable 15 minutes after the button is pressed.

#### VDS Camera Sensor

The VDS camera sensor shall be supplied by the VDS manufacturer.

1. The VDS camera sensor shall utilize a single shielded CAT5E or CAT6 cable for power and video. Cable termination at the camera shall not require crimping or special tools. The cable termination shall only require a standard wire stripper and a screw driver. No connectors (e.g. BNC) shall be allowed.
2. The camera sensor shall allow the user to set the focus and field of view via the VDS software. Camera sensor control from the controller cabinet shall communicate over a single Cat-5e or CAT6 cable. No additional wires shall be required.
3. The camera shall produce a useable video image of the features of vehicles under all roadway lighting conditions, regardless of time of day. The minimum range of scene luminance over which the camera shall produce a useable video image shall be the minimum range from nighttime to daytime, but not less than the range 0.003 lux to 10,000 lux.
4. The camera electronics shall include automatic gain control (AGC) to produce a satisfactory image at night for the VDS algorithms.
5. The imager luminance signal to noise ratio (S/N) shall be more than 50 dB with the automatic gain control (AGC) disabled.
6. The imager shall employ three dimensional dynamic noise reduction (3D-DNR) to remove unwanted image noise.
7. The camera imager shall employ wide dynamic range (WDR) technology to compensate for wide dynamic outdoor lighting conditions. The dynamic range shall be greater than 100 dB.
8. The camera shall be digital signal processor (DSP) based and shall use a CCD sensing element and shall output color video with resolution of not less than 540 TV lines. The color CCD imager shall have a minimum effective area of 811(h) x 508(v) pixels.
9. The camera shall include an electronic shutter control based upon average scene luminance and shall be equipped with an auto-iris lens that operates in tandem with the

electronic shutter. The electronic shutter shall operate between the range of 1/60th to 1/90,000th second.

10. The camera shall utilize automatic white balance.
11. The camera shall include a variable focal length lens with variable focus that can be adjusted, without opening up the camera housing, to suit the site geometry by means of a portable interface device designed for that purpose and manufactured by the detection system supplier.
12. The horizontal field of view shall be adjustable from 4.5 to 48 degrees. This camera configuration may be used for the majority of detection approaches in order to minimize the setup time and spares required by the user. The lens shall be a 12x zoom lens with a focal length of 3.5mm to 35mm.
13. The lens shall also have an auto-focus feature with a manual override to facilitate ease of setup.
14. The camera shall incorporate the use of preset positioning that store zoom and focus positioning information. The camera shall have the capability to recall the previously stored preset upon application of power.
15. The camera shall be housed in a weather-tight sealed enclosure. The housing shall allow the camera to be rotated to allow proper alignment between the camera and the traveled road surface.
16. The camera enclosure shall be equipped with a sunshield. The sunshield shall include a provision for water diversion to prevent water from flowing in the camera's field of view. The camera enclosure with sunshield shall be less than 3.5" (89mm) diameter, less than 5.25" (133mm) long, and shall weigh less than 2.5 pounds (1.14kg) when the camera and lens are mounted inside the enclosure.
17. The enclosure shall be designed so that the pan, tilt and rotation of the camera assembly can be accomplished independently without affecting the other settings.
18. Camera Lens
  - a. The camera enclosure shall include a proportionally controlled Indium Tin Oxide (ITO) lens coating for the heating element of the front glass that maximizes heat transfer to the lens. The output power of the heater shall vary with temperature, to assure proper operation of the lens functions at low temperatures and prevent moisture condensation on the optical faceplate of the enclosure. The transparent

coating shall not impact the visual acuity and shall be optically clear.

- b. The glass face on the front of the enclosure shall have an anti-reflective coating to minimize light and image reflections.
  - c. The glass face on the front of the enclosure will include a Titanium Dioxide self cleaning coating
19. When mounted outdoors in the enclosure, the camera shall operate satisfactorily in a temperature range from -30° F to +140° F (-34 °C to +60 °C) and a humidity range from 0% RH to 100% RH. Measurement of satisfactory video shall be based upon VDP system operation.
  20. The camera shall be powered by 48VDC. Power consumption shall be 5 watts typical and 16 watts or less under worst conditions.
  21. Recommended camera placement height shall be 33 feet (or 10 meters) above the roadway, and over the traveled way on which vehicles are to be detected. For optimum detection the camera should be centered above the traveled roadway. The camera shall view approaching vehicles at a distance not to exceed 350 feet (107 meters) for reliable detection (height to distance ratio of 10:100). Camera placement and field of view (FOV) shall be unobstructed and as noted in the installation documentation provided by the supplier.
  22. The video signal shall be fully isolated from the camera enclosure.
  23. Cable terminations at the camera for video and power shall not require crimping tools.
  24. A weather-proof protective cover shall be provided shall be provided to protect all terminations at the camera. No special tooling shall be required to remove or install the protective cap.
  25. The camera assembly shall include a temperature sensor. The sensor will be polled by the VDS every minute and will supply the current air temperature. The VDS software will display this information on the On-Screen Display for each camera.

#### VDS Software

1. General System Functions
  - a. Detection zones shall be programmed via an embedded application displayed on a video monitor and a keyboard and a pointing device connected to the CCU. The

menu shall facilitate placement of detection zones and setting of zone parameters or to configure system parameters. A separate computer shall not be required for programming detection zones or to view system operation. All programming function shall occur on live video images, no snapshots or still images are allowed.

- b. The VDS software shall store up to five completely independent detection zone patterns in non-volatile memory. The VDS can switch to any one of the three different detection patterns within 1 second of user request via menu selection with the pointing device. Each configuration shall be uniquely labeled and able to be edited by the user for identification. The currently active configuration indicator shall be displayed on the monitor.
- c. The VDS shall detect vehicles and bicycles in real time as they travel across each detection zone.
- d. The VDP shall automatically define a pedestrian crossing area, and track pedestrians in real-time as they travel across this pedestrian crossing area in both directions. The VDP shall count pedestrians moving left-to-right, and right-to-left. The VDP shall measure the speed of pedestrians moving left-to-right, and right-to-left, and provide the minimum, maximum, and average speed of the pedestrians per the bin interval. These values shall be displayed on-screen for both directions, and an option shall be provided to the user to turn this on-screen display on or off. This data will be stored in local memory for later retrieval via a remote device. The data will be stored at the Bin Interval set in the system.
- e. The VDS shall accept new detection patterns from an external computer through the Ethernet port when the external computer uses the correct communications protocol for downloading detection patterns. A Windows™-based software designed for local or remote connection and providing video capture, real-time detection indication and detection zone modification capability shall be provided with the system.
- f. The VDS shall have the capability to automatically switch to any one of the stored configurations based on the time of day which shall be programmable by the user.
- g. The VDS shall send its detection patterns to an external computer through the Ethernet port when requested when the external computer uses the appropriate communications protocol for uploading detection patterns.

- h. The VDS shall default to a safe condition, such as a constant call on each active detection channel, in the event of unacceptable interference or loss of the video signal.
- i. The VDS shall be capable of automatically detecting a low-visibility condition such as fog and respond by placing all affected detection zones in a constant call mode. A user-selected alarm output shall be active during the low-visibility condition that can be used to modify the controller operation if connected to the appropriate controller input modifier(s). The system shall automatically revert to normal detection mode when the low-visibility condition no longer exists. An On-Screen Icon will be displayed while the system is in this mode.
- j. Up to 32 detection zones per camera input shall be supported and each detection zone must be user-sizeable to suit the site and the desired vehicle detection region.
- k. The VDS shall provide up to 32 open collector output channels per camera input using one or more extension modules.
- l. The VDS shall provide a discrete output when pedestrians are being tracked in the crosswalk.
- m. The VDS shall provide a discrete output when pedestrians are crossing against a red phase. The VDS shall allow up to 4 phase inputs to be assigned to each crosswalk.
- n. A single detection zone shall be able to replace multiple inductive loops and the detection zones shall be OR'ed as the default or may instead be AND'ed together to indicate vehicle presence on a single approach of traffic movement.
- o. When a vehicle is detected within a detection zone, a visual indication of the detection shall activate on the video overlay display to confirm the detection of the vehicle for the zone.
- p. Detection shall be at least 98% accurate in good weather conditions, with slight degradation possible under adverse weather conditions (e.g. rain, snow, or fog) which reduce visibility. Detection accuracy is dependent upon site geometry, camera placement, camera quality and detection zone location, and these accuracy levels do not include allowances for occlusion or poor video due to camera location or quality.

- q. The VDS shall provide dynamic zone reconfiguration (DZR). DZR sustains normal operation of existing detection zones when one zone is being added or modified during the setup process. The new zone configuration shall not go into effect until the configuration is saved by the operator.
- r. Detection zone setup shall not require site specific information such as latitude and longitude to be entered into the system.
- s. The VDS shall process the video input from each camera at 30 frames per second. Multiple camera processors shall process all video inputs simultaneously.
- t. The VDS shall output a constant call during the background learning period of no longer than 3 minutes.
- u. Detection zone outputs shall be individually configurable to allow the selection of presence, pulse, extend, and delay outputs. Timing parameters of pulse, extend, and delay outputs shall be user definable between 0.1 to 25.0 seconds.
- v. Up to six detection zones per camera view shall have the capability to count the number of vehicles detected. The count value shall be internally stored for later retrieval through the Ethernet port. The zone shall also have the capability to calculate and store average speed and lane occupancy at user-selectable bin intervals of 10 seconds, 20 seconds, 1 minute, 5 minutes, 15 minutes, 30 minutes and 60 minutes.
- w. In addition to the count type zone, the VDS shall be able to calculate average speed and lane occupancy for all of the zones independently. These values shall be stored in non-volatile memory for later retrieval.
- x. The VDS shall have an "advance" zone type where raw detection output duration to the traffic controller is compensated for angular occlusion and distance.
- y. The VDS shall employ color overlays on the video output.
- z. The VDS shall have the ability to show controller phase status (green, yellow, or red) for up to 8 phases. These indications shall also be color coded.
- aa. The user shall have the ability to enable or disable the display of the phase information on the video output.

- ab. The VDS shall have the capability to change the characteristics of a detection zone based on external inputs such as signal phase. Each detection zone shall be able to switch from one zone type (i.e. presence, extension, pulse, etc.) to another zone type based on the signal state. For example, a zone may be a “count” zone when the phase is green but change to a “presence” zone type when the phase is not green. Another application would be zone type of “extension” when the signal phase is green and then “delay” when red.
- ac. The VDS software shall aid the user in drawing additional detection zones by automatically drawing and placing zones at appropriate locations with only a single click of the mouse. The additional zone shall utilize geometric extrapolation of the parent zone when creating the child zone. The process shall also automatically accommodate lane marking angles and zone overlaps.
- ad. When the user wishes to modify the location of a zone, the VDS software shall allow the user move a single zone, multiple zones or all zones simultaneously.
- ae. When the user wishes to modify the geometric shape of the zone, the VDS software shall allow the user to change the shape by moving the zone corner or zone sides.
- af. On screen zone identifiers shall be modifiable by the user. The user shall be allowed to select channel output assignments, zone type, input status, zone labels or zone numbers to be the identifier.
- ag. The VDS shall have the capability to show pedestrian activity in the crosswalk through a visual indication on the video output.
- ah. The VDS software shall support bicycle type zones where the zone can differentiate between motorized vehicles and bicycles, producing a call for one but not the other.
- ai. Bicycle zone types shall only output when a bicycle is detected. Larger motorized vehicles such as cars and trucks that traverse a bicycle zone shall not provide an output.
- aj. The VDS software shall provide the ability to assign a separate output channel for bicycle zones to allow traffic controllers to implement special bicycle timing.
- ak. Placement of bicycle type zones in vehicle lanes shall be allowed.

- al. Upon detection of a bicycle, the video output overlay shall indicate active detection as well as providing a unique bicycle detection identifier to visually distinguish bicycle detection versus vehicle detection.
- am. Up to six bicycle detection zones per camera view shall have the capability to count the number of bicycles detected in addition to their normal detection function. The count value shall be internally stored for later retrieval through the Ethernet port.
- an. Automatic Traffic Volume Graph

The On-Screen Display shall include an Automatic Traffic Volume graph. This graph will display estimated Vehicles Per Hour (VPH) per movement for each camera view. The graph will display a rolling 24 hour period of VPH.

- ao. Occupancy Graph

The On-Screen Display shall include an Occupancy Graph. This graph will display estimated approach occupancy for each camera view. The graph will display a rolling 24 hour period of Occupancy.

## 2. User Interfaces

This section sets forth the minimum requirements for the VDS to provide a single point interface to remote and local users. The VDS shall also have the capability to stream up to four simultaneous video streams over an Ethernet interface.

- a. The user interface shall provide capabilities to enable multiple rack-mounted video detection processors to be locally and remotely accessed from a single point via an Ethernet connection.
- b. The device shall allow the operator to view four videos simultaneously or any one video by controls embedded in the VDS.
- c. Local user access to video detection programming shall be limited to the detection processor unit that is currently being displayed on the monitor.
- d. All local programming and setup parameters for the video detection processor shall be user accessible through the interface unit without requiring the user to swap user interface cables between video detection processors.

- e. Remote access to the device shall be through the built-in Ethernet port via access software running on a Microsoft Windows based personal computer.
- f. A Windows OS remote access firmware shall also be available for remote setup and diagnostics of the interface unit.
- g. The VDS shall support streaming video technology using H.264 standards to allow the user to monitor video detection imagery over the Ethernet interface. Motion JPEG streaming video shall not be allowed.
- h. The interface unit shall allow eight independent streams, one from each video processor, to be transported via Ethernet to four independent streaming video players simultaneously in D1 resolution.
- i. The interface shall allow the user to select the resolution of the displayed streamed video.
- j. The interface unit shall support the streaming and display of eight concurrent streams in D1 resolution.
- k. The VDS shall allow the user to manage the unit's Ethernet bandwidth usage by allowing the user to select high, medium or low resolution.
- l. The interface shall allow the user to change the unit's Ethernet network settings of IP address, subnet mask and default gateway.
- m. The VDS shall allow the user to upload new application firmware through the use of the interface, remotely or on-site.
- n. A Windows OS based application will be provided to remotely view video streams from the VDS.
- o. An iOS and Android based application shall be available to remotely access each configured VDS on the agency's network. This application shall allow the user to choose between any number of pre-configured intersection locations. Using the iOS or Android device, the application will allow the user to view live video from any camera at that intersection, including vehicle and bicycle detections in real-time. The application will also allow the user to view individual intersection data, including turning movement counts and occupancy. The application will show each data set in time periods of day, week, or month, and have the capability of turning on or off right, left, and thru movement data for turning movement count data. The application will also allow the user to view current system diagnostic

data, including the following, but not limited to; individual camera glare and low contrast information, system low contrast, constant call, alarm, reboots, logins, and menu access information.

### SDLV Functionality

This section sets forth the minimum requirements for a full-function BIU and integrated video detection communication. The VDS shall provide outputs to the controller of vehicle calls from video processors that reside within the detector rack.

#### 1. Functional Capabilities

The VDS shall have the capability of monitoring phase information and passing that information and other system data such as "time" from the controller to video detection processor modules. The VDP shall also accept data from video processor modules and relay the information to the controller. The unit shall provide a maximum of 64 detector outputs to the controller via the SDLC interface.

#### 2. Requirements

The module shall be in compliance with the following industry specifications:

- *Transportation Electrical Equipment Specifications (TEES)*, August 16, 2002 (or latest edition), California Department of Transportation
- *NEMA Standard Publication TS 1-1989* (or latest edition), *Traffic Control Systems*, National Electrical Manufacturers Association
- *NEMA Standard Publication TS 2-2003, Traffic Controller Assemblies With NTCIP Requirements, Version 02.06* (or latest edition), National Electrical Manufacturers Association

#### 3. Data Interfaces

The VDS shall have two data interfaces:

- The interface to the controller shall be accomplished by the use of the TS-2 SDLC port and protocol in accordance with the TS-2 specifications. The module shall be able to be configured to respond to BIU addresses 8, 9, 10 and 11 or a combination thereof.
- The interface to communicate with card rack video detection processors shall be manufacturer specific.

4. SDLC Communication Indicators

One LED indicator shall be provided for the TS-2 SDLC interface. The indicator shall be used to inform the user of any communication activity on the SDLC port.

Installation

1. The cable to be used between the camera and the CCU in the traffic cabinet shall be Cat-5e, shielded, direct burial. This cable shall be suitable for installation in conduit or overhead with appropriate span wire. Shielded RJ-45 connectors shall be used where applicable. The Cat-5e cable, RJ-45 connector, stripping and crimping tool shall be approved by the supplier of the video detection system, and the manufacturer's instructions must be followed to ensure proper connection.
2. The video detection camera shall be installed by factory-certified installers as recommended by the supplier and documented in installation materials provided by the supplier. Proof of factory certification shall be provided.

Warranty

1. The supplier shall provide a limited three-year warranty on the video detection system.
2. During the warranty period, technical support shall be available from the supplier via telephone within 4 hours of the time a call is made by a user, and this support shall be available from factory-certified personnel or factory-certified installers.
3. During the warranty period, updates to VDP software shall be available from the supplier without charge.

Maintenance and Support

1. The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the video detection system. These parts shall be available for delivery within 30 days of placement of an acceptable order at the supplier's then current pricing and terms of sale for said parts.
2. The supplier shall maintain an ongoing program of technical support for the video detection system. This technical support shall be available via telephone, or via personnel sent to the installation site upon placement of an acceptable order at the supplier's then current pricing and terms of sale for on site technical support services.

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3. Installation or training support shall be provided by a factory-authorized representative and shall be a minimum IMSA-Level II Traffic Signal Technician certified.
4. All product documentation shall be written in the English language.

Basis of Payment.

This work shall be paid for at the contract unit price each for VIDEO DETECTION SYSTEM, which price shall be payment in full for performing all work described herein per intersection. Each intersection will be paid for separately.

**MAST ARM SIGN PANELS**

Effective: May 22, 2002  
Revised: July 1, 2015  
720.01TS

Add the following to Article 720.02 of the Standard Specifications:

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**

Effective: May 22, 2002  
Revised: March 25, 2016  
800.01TS

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 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, Area Traffic Signal Maintenance and Operations Engineer, IDOT ComCenter 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 (847) 705-4424 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 signaling 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 of 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 (847) 705-4424 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 2<sup>nd</sup> 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 Contractor 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.

Special Provisions  
150615

Village of Schaumburg  
FAU 2582 (Plum Grove Rd)  
Section No.: 14-00115-00-PV  
County: Cook

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 3<sup>rd</sup> 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 IDOT 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 IDOT electrical facilities from the District One 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/unenergized 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.

**RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM**

Effective: May 22, 2002

Revised: July 1, 2015

800.03TS

**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 discs, copies of computer simulation files for the existing optimized system and a timing database

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 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(s) 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 and/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 intersection(s) 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(s)
    - (4) New or updated intersection(s) graphic display file for the subject intersection(s)
    - (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.

**SERVICE INSTALLATION (TRAFFIC SIGNALS)**

Effective: May 22, 2002

Revised: June 15, 2016

805.01TS

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**

Effective: May 22, 2002

Revised: July 1, 2015

806.01TS

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 where 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 conductors 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 .

#### **COILABLE NON-METALLIC CONDUIT**

Effective: May 22, 2002

Revised: July 1, 2015

810.01TS

#### **Description.**

This work shall consist of furnishing and installing empty coilable non-metallic conduit (CNC).

#### **General.**

The CNC installation shall be in accordance with Sections 810 and 811 of the Standard Specifications except for the following:

Add the following to Article 810.03 of the Standard Specifications:

CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways to the handholes.

Add the following to Article 811.03 of the Standard Specifications:

On temporary traffic signal installations with detector loops, CNC meeting the requirements of NEC Article 353 shall be used for detector loop raceways from the saw-cut to 10 feet (3m) up the wood pole, unless otherwise shown on the plans

#### **Basis of Payment.**

All installations of CNC for loop detection shall be included in the contract and not paid for separately.

**UNDERGROUND RACEWAYS**

Effective: May 22, 2002  
Revised: July 1, 2015  
810.02TS

Revise Article 810.04 of the Standard Specifications to read:

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

Add the following to Article 810.04 of the Standard Specifications:

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

Add the following to Article 810.04 of the Standard Specifications:

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

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

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

**ROD AND CLEAN EXISTING CONDUIT**

Effective: January 1, 2015  
Revised: July 1, 2015  
810.03TS

**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.

**HANDHOLES**

Effective: January 01, 2002  
Revised: July 1, 2015  
814.01TS

Description.

Add the following to Section 814 of the Standard Specifications:

All conduits shall enter the handhole at a depth of 30 inches (762 mm) except for the conduits for detector loops when the handhole is less than 5 feet (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 (13 mm) diameter with two 90 degree bends and extend into the handhole at least 6 inches (152 mm). Hooks shall be placed a minimum of 12 inches (305 mm) below the lid or lower if additional space is required.

Precast round handholes shall not be used unless called out on the plans.

The cover of the handhole frame shall be labeled "Traffic Signals" with legible raised letters.

Revise the third paragraph of Article 814.03 of the Standard Specifications to read:

"Handholes shall be constructed as shown on the plans and shall be cast-in-place, or precast concrete units. Heavy duty handholes shall be either cast-in-place or precast concrete units."

Add the following to Article 814.03 of the Standard Specifications:

"(c) Precast Concrete. Precast concrete handholes shall be fabricated according to Article 1042.17. Where a handhole is contiguous to a sidewalk, preformed joint filler of 1/2 inch (13 mm) thickness shall be placed between the handhole and the sidewalk."

Cast-In-Place Handholes.

All cast-in-place handholes shall be concrete, with inside dimensions of 21-1/2 inches (546 mm) minimum. Frames and lid openings shall match this dimension.

For grounding purposes the handhole frame shall have provisions for a 7/16 inch (11 mm) diameter stainless steel bolt cast into 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 cover.

The minimum wall thickness for heavy duty hand holes shall be 12 inches (305mm).

Precast Round Handholes.

All precast handholes shall be concrete, with inside dimensions of 30 inches (762mm) diameter. Frames and covers shall have a minimum opening of 26 inches (660mm) and no larger than the inside diameter of the handhole.

For grounding purposes the handhole frame shall have provisions for a 7/16 inch (11 mm) diameter stainless steel bolt cast into the frame. For the purpose of attaching the grounding conductor to the handhole cover, the covers shall either have a 7/16 inch (11 mm) diameter stainless steel bolt cast into the cover or a stainless steel threaded stint extended from an eye hook assembly. A hole may be drilled for the bolt if one cannot be cast into the frame or cover. The head of the bolt shall be flush or lower than the top surface of the cover.

The minimum wall thickness for precast heavy duty hand holes shall be 6 inches (152 mm).

Precast round handholes shall be only produced by an approved precast vendor.

Materials.

Add the following to Section 1042 of the Standard Specifications:

“1042.17 Precast Concrete Handholes. Precast concrete handholes shall be according to Articles 1042.03(a)(c)(d)(e).”

**GROUNDING CABLE**

Effective: May 22, 2002

Revised: July 1, 2015

817.01TS

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

Add the following to Article 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 green color coded XLP jacket.

The traffic signal grounding conductor shall be bonded, using a UL Listed grounding connector 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

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wiring system and noted herein and detailed on the plans. The grounding conductor shall be bonded to conduit terminations using rated grounding bushings. Bonding to existing handhole frames and covers shall be paid for separately.

Add the following to Article 817.05 of the Standard Specifications:

Basis of Payment.

Grounding cable shall be measured in place for payment in foot (meter). 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, grounding connectors, conduit grounding bushings, and other hardware.

**FIBER OPTIC TRACER CABLE**

Effective: May 22, 2002

Revised: July 1, 2015

817.02TS

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

Add the following to Article 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 in locations shown on the plans. The tracer cable shall be continuous, extended into the controller cabinet and terminated on a barrier type terminal strip mounted on the side wall of the controller cabinet. The barrier type terminal strip and tracer cable shall be clearly marked and identified. All tracer cable splices shall be kept to a minimum and shall incorporate maximum lengths of cable supplied by the manufacturer. The tracer cable will be allowed to be spliced at handholes only. The tracer cable splice shall use a Western Union Splice soldered with resin core flux and shall be soldered using a soldering iron. Blow torches or other devices which oxidize copper cable shall not be allowed for soldering operations. All exposed surfaces of the solder shall be smooth. The splice shall be covered with a black shrink tube meeting UL 224 guidelines, Type V and rated 600V, minimum length 4 inches (100 mm) and with a minimum 1 inch (25 mm) coverage over the XLP insulation, underwater grade.

Add the following to Article 817.05 of the Standard Specifications:

Basis of Payment.

The tracer cable shall be paid for separately as ELECTRIC CABLE IN CONDUIT, TRACER, NO. 14 1C per foot (meter), which price shall include all associated labor and material for installation.

**MAINTENANCE OF EXISTING TRAFFIC SIGNAL AND FLASHING BEACON  
INSTALLATION**

Effective: May 22, 2002

Revised: July 1, 2015

850.01TS

**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 EXISTING FLASHING BEACON INSTALLATION. Each flashing beacon will be paid for separately.

**TRAFFIC SIGNAL PAINTING**

Effective: May 22, 2002

Revised: July 1, 2015

851.01TS

Description.

This work shall include surface preparation, powder coated 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 vendor's 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 °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 °F.

The finish paint color shall be one of the vendor'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

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and a copy of the approval shall be included in the material catalog submittal.

Painting of traffic signal heads, pedestrian signal heads and controller cabinets is not included in this pay item.

Any damage to the finish after leaving the vendor's facility shall be repaired to the satisfaction of the Engineer using a method recommended by the vendor and approved by the Engineer. If while at the vendor's facility the finish is damaged, the finish shall be re-applied at no cost to the contract.

Warranty.

The Contractor shall furnish in writing to the Engineer, the paint vendor'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 AND POLE, UNDER 40 FEET (12.19 METER), PAINT NEW MAST ARM AND POLE, 40 FEET (12.19 METER) AND OVER, PAINT NEW COMBINATION MAST ARM AND POLE, UNDER 40 FEET (12.19 METER), PAINT NEW COMBINATION MAST ARM AND POLE, 40 FEET (12.19 METER) AND OVER, or PAINT NEW TRAFFIC SIGNAL POST of the length specified, 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.

**FULL-ACTUATED CONTROLLER AND CABINET**

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 or

Eagle/Siemens M52 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 Centrac, 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.
- (b) (6) Controller Harness – Provide a TS2 Type 2 "A" wired harness in addition to the TS2 Type 1 harness.
- (b) (7) Surge Protection – Shall be a 120VAC Single phase Modular filter Plug-in type, supplied from an approved vendor.
- (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 – One (1) 200 watt, thermostatically-controlled, electric heater.
- (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.

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).

**UNINTERRUPTABLE POWER SUPPLY, SPECIAL**

Effective: January 1, 2013

Revised: May 19, 2016

862.01TS

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.
- (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**

Effective: May 22, 2002  
Revised: July 1, 2015  
871.01TS

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.

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**ELECTRIC CABLE**

Effective: May 22, 2002  
Revised: July 1, 2015  
873.01TS

Delete "or stranded, and No. 12 or" from the last sentence of Article 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.

**EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C**

Effective: January 1, 2013  
Revised: July 1, 2015  
873.03TS

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 (3) stranded conductors, colored blue, orange, and yellow with a stranded tinned copper drain wire. The cable shall meet the requirements of the vendor 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 operations.

**TRAFFIC SIGNAL POST**

Effective: May 22, 2002  
Revised: July 01, 2015  
875.01TS

Add the following to Article 1077.01 (c) of the Standard Specifications:

Washers for post bases shall be the same size or larger than the nut.

Revise the first sentence of Article 1077.01 (d) of the Standard Specifications to read:

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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.

**PEDESTRIAN PUSH-BUTTON POST**

Effective: May 22, 2002

Revised: July 01, 2015

876.01TS

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.

**MAST ARM ASSEMBLY AND POLE**

Effective: May 22, 2002

Revised: July 01, 2015

877.01TS

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 851.01TS TRAFFIC SIGNAL PAINTING Special Provisions.

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### **CONCRETE FOUNDATIONS**

Effective: May 22, 2002  
Revised: July 01, 2015  
878.01TS

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.

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

Effective: May 22, 2002  
Revised: July 1, 2015  
880.01TS

#### **Materials.**

Add the following to Section 1078 of the Standard Specifications:

1. 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 vendors and new models from IDOT District One approved vendors.
2. 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 vendor'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 vendor'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 vendor and not be a cost to this contract.

3. All signal heads shall provide 12" (300 mm) displays with glossy yellow or black polycarbonate housings. All head housings shall be the same color (yellow or black) at the intersection. For new signalized intersections and existing signalized intersections where all signals heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow or black) 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.
4. 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 7 years from the date of traffic signal TURN-ON. 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 7 years of the date of traffic signal TURN-ON shall be replaced or repaired. The vendor's written warranty for the LED signal modules shall be dated, signed by a vendor's representative and included in the product submittal to the State.

(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
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.
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

4. The LEDs utilized in the modules shall be AlInGaP technology for red and InGaN for green and amber 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
  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.

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 removal of the existing module, 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.

**LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD**

Effective: May 22, 2002

Revised: July 1, 2015

881.01TS

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 glossy yellow or black polycarbonate housings. All pedestrian head housings shall be the same color (yellow or black) at the intersection. For new signalized intersections and existing signalized intersections where all pedestrian heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow or black) 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.
- (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).

Materials.

Add the following to Article 1078.02 of the Standard Specifications:

General.

1. The module shall operate in one mode: Clearance Cycle Countdown Mode Only. The countdown module shall display actual controller programmed clearance cycle and shall start counting when the flashing clearance signal turns on and shall countdown to "0" and turn off when the steady Upraised Hand (symbolizing Don't Walk) signal turns on. Module shall not have user accessible switches or controls for modification of cycle.
2. At power on, the module shall enter a single automatic learning cycle. During the automatic learning cycle, the countdown display shall remain dark.
3. The module shall re-program itself if it detects any increase or decrease of Pedestrian Timing. The counting unit will go blank once a change is detected and then take one complete pedestrian cycle (with no counter during this cycle) to adjust its buffer timer.
4. If the controller preempts during the Walking Person (symbolizing Walk), the countdown will follow the controller's directions and will adjust from Walking Person to flashing Upraised Hand. It will start to count down during the flashing Upraised Hand.
5. If the controller preempts during the flashing Upraised Hand, the countdown will continue to count down without interruption.
6. The next cycle, following the preemption event, shall use the correct, initially programmed values.
7. If the controller output displays Upraised Hand steady condition and the unit has not arrived to zero or if both the Upraised Hand and Walking Person are dark for some reason, the unit suspends any timing and the digits will go dark.
8. The digits will go dark for one pedestrian cycle after loss of power of more than 1.5 seconds.
9. The countdown numerals shall be two (2) "7 segment" digits forming the time display utilizing two rows of LEDs.

10. The LED module shall meet the requirements of the Institute of Transportation Engineers (ITE) LED purchase specification, "Pedestrian Traffic Control Signal Indications - Part 2: LED Pedestrian Traffic Signal Modules," or applicable successor ITE specifications, except as modified herein.
11. 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.
12. In the event of a power outage, light output from the LED modules shall cease instantaneously.
13. The LEDs utilized in the modules shall be AlInGaP technology for Portland Orange (Countdown Numerals and Upraised Hand) and GaN technology for Lunar White (Walking Person) indications.
14. The individual LEDs 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.

Basis of Payment.

Add the following to the first paragraph of Article 881.04 of the Standard Specifications:

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

Add the following to Article 881.04 of the Standard Specifications:

If the work consists of retrofitting an existing polycarbonate pedestrian signal head and pedestrian countdown signal head with light emitting diodes (LEDs), it will be paid for as a PEDESTRIAN 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.

**TRAFFIC SIGNAL BACKPLATE**

Effective: May 22, 2002

Revised: July 1, 2015

882.01TS

Delete 1<sup>st</sup> sentence of Article 1078.03 of the Standard Specifications and add "All backplates shall be louvered, formed ABS plastic".

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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.

#### **DETECTOR LOOP**

Effective: May 22, 2002

Revised: January 5, 2016

886.01TS

#### **Procedure.**

A minimum of seven (7) working days prior to the Contractor cutting loops, the Contractor shall mark the proposed loop locations and contact the Area Traffic Signal Maintenance and Operations Engineer (847) 705-4424 to inspect and approve the layout. When preformed detector loops are installed, the Contractor shall have them inspected and approved prior to the pouring of the Portland cement concrete surface, using the same notification process as above.

#### **Installation.**

Revise Article 886.04 of the Standard Specifications to read:

Loop detectors shall be installed according to the requirements of the "District One Standard Traffic Signal Design Details." Saw-cuts (homeruns on preformed detector loops) from the loop to the edge of pavement shall be made perpendicular to the edge of pavement when possible in order to minimize the length of the saw-cut (homerun on preformed detector loops) unless directed otherwise by the Engineer or as shown on the plan.

The detector loop cable insulation shall be labeled with the cable specifications.

Each loop detector lead-in wire shall be labeled in the handhole using a water proof tag, from an approved vendor, secured to each wire with nylon ties.

Resistance to ground shall be a minimum of 100 mega-ohms under any conditions of weather or moisture. Inductance shall be more than 50 and less than 700 microhenries. Quality readings shall be more than 5.

- (a) Type I. All loops installed in new asphalt pavement shall be installed in the binder course and not in the surface course. The edge of pavement, curb and handhole shall be cut with a 1/4 inch (6.3 mm) deep x 4 inches (100 mm) saw cut to mark location of each loop cable.
- (b) Loop sealant shall be two-component thixotropic chemically cured polyurethane from an approved vendor. The sealant shall be installed 1/8 inch (3 mm) below the pavement surface. If installed above the surface the excess shall be removed immediately.
- (c) Preformed. This work shall consist of furnishing and installing a rubberized or cross linked polyethylene heat resistant preformed traffic signal loop in accordance with the Standard Specifications, except for the following:
- (d) Preformed detector loops shall be installed in new pavement constructed of Portland cement concrete using mounting chairs or tied to re-bar or the preformed detector loops may be placed in the sub-base. Loop lead-ins shall be extended to a temporary protective enclosure near the proposed handhole location. The protective enclosure shall provide sufficient protection from other construction activities and may be buried for additional protection.
- (e) Handholes shall be placed next to the shoulder or back of curb when preformed detector loops enter the handhole. CNC, included in this pay item, shall be used to protect the preformed lead-ins from back of curb to the handhole.
- (f) Preformed detector loops shall be factory assembled with ends capped and sealed against moisture and other contaminants. The loop configurations and homerun lengths shall be assembled for the specific application. The loop and homerun shall be constructed using 11/16 inch (17.2 mm) outside diameter (minimum), 3/8 inch (9.5 mm) inside diameter (minimum) Class A oil resistant synthetic cord reinforced hydraulic hose with 250 psi (1,720 kPa) internal pressure rating or a similarly sized XLPE cable jacket. Hose for the loop and homerun assembly shall be one continuous piece. No joints or splices shall be allowed in the hose except where necessary to connect homeruns to the loops. This will provide maximum wire protection and loop system strength. Hose tee connections shall be heavy duty high temperature synthetic rubber. The tee shall be of proper size to attach directly to the hose, minimizing glue joints. The tee shall have the same flexible properties as the hose to insure that the whole assembly can conform to pavement movement and shifting without cracking or breaking. For XLPE jacketed preformed loops, all splice connections shall be soldered, sealed, and tested before being sealed in a high impact glass impregnated plastic splice enclosure. The wire used shall be #16 THWN stranded copper. The number of turns in the loop shall be application specific. Homerun wire pairs shall be twisted a minimum of four turns per foot. No wire splices will be allowed in the preformed loop assembly. The loop and homeruns shall be filled and sealed with a flexible sealant to insure complete moisture

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blockage and further protect the wire. The preformed loops shall be constructed to allow a minimum of 6.5 feet of extra cable in the handhole.

Method of Measurement.

Add the following to Article 886.05 of the Standard Specifications:

Preformed detector loops will be measured along the detector loop embedded in the pavement, rather than the actual length of the wire. Detector loop measurements shall include the saw cut and the length of the detector loop wire to the edge of pavement. The detector loop wire, including all necessary connections for proper operations, from the edge of pavement to the handhole, shall be included in the price of the detector loop. CNC, trench and backfill, and drilling of pavement or handholes shall be included in detector loop quantities.

Basis of Payment.

This work shall be paid for at the contract unit price per foot (meter) for DETECTOR LOOP, TYPE I or PREFORMED DETECTOR LOOP as specified in the plans, which price shall be payment in full for furnishing and installing the detector loop and all related connections for proper operation.

**EMERGENCY VEHICLE PRIORITY SYSTEM**

Effective: May 22, 2002

Revised: July 1, 2015

887.01TS

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 signaled 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 signaled by a continuous indication.

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All light operated systems shall include security and transit preemption software and operate at a uniform rate of 14.035 Hz  $\pm$ 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.

**ACCESSIBLE PEDESTRIAN SIGNALS**

Effective: April 1, 2003

Revised: July 1, 2015

888.02TS

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.

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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.

**TEMPORARY TRAFFIC SIGNAL INSTALLATION**

Effective: May 22, 2002

Revised: January 1, 2017

890.01TS

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, uninterruptable 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 controller equipment supplier will be allowed to assemble temporary traffic signal and railroad traffic signal cabinet. Traffic signal inspection and TURN-ON shall be according to 800.01TS TRAFFIC SIGNAL GENERAL REQUIREMENTS special provision.

Construction Requirements.

(a) Controllers.

1. Only controllers supplied by one of the District approved closed loop equipment supplier 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 NEMA 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 and as modified herein.

2. Only control equipment, including controller cabinet and peripheral equipment, supplied by one of the District approved closed loop equipment suppliers 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 the latest version software installed at the time of the signal TURN-ON.
  - (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 806 of the Standard Specifications and shall meet the requirements of the 806.01TS GROUNDING OF TRAFFIC SIGNAL SYSTEMS special provision.
  - (d) Traffic Signal Heads. All traffic signal sections shall be 12 inches (300 mm). Pedestrian signal sections shall be 16 inch (406mm) x 18 inch (457mm). 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. If no traffic staging is in place or will not be staged on the

day of the turn on, the temporary traffic signal shall have the signal head displays, signal head placements and controller phasing match the existing traffic signal or shall be 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, including any required fiber splices and terminations, 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 cost of 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. Any temporary signal within an existing closed loop traffic signal system shall be interconnected to that system using similar brand control equipment at no additional cost to the contract.
3. Temporary wireless interconnect. The radio interconnect system shall be compatible with Eagle or Econolite controller closed loop systems. This work shall include all temporary wireless interconnect components, at the adjacent existing traffic signal(s) to provide a completely operational closed loop system. This work 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 the cost of TEMPORARY TRAFFIC SIGNAL INSTALLATION.

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 or existing 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 vendors recommendations.

- (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  $\pm$ 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 at all approaches of the intersection and as directed by the Engineer. Pedestrian push buttons shall be provided for all pedestrian signal heads/phases as directed by the Engineer. Microwave vehicle sensors or video vehicle detection system shall be approved by IDOT prior to Contractor 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. An equipment supplier 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) Uninterruptable Power Supply. All temporary traffic signal installations shall have Uninterruptable Power Supply (UPS). The UPS cabinet shall be mounted to the temporary traffic signal cabinet and shall be according to the applicable portions of Section 862 of the Standard Specifications and as modified in 862.01TS UNINTERRUPTABLE POWER SUPPLY, SPECIAL Special Provision.
- (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. Any intersection regulatory signs that are required for the temporary traffic signal shall be provided as shown on the plans or as directed by the Engineer. Relocation, removing, bagging and installing the regulatory signs for the various construction stages shall be provided as shown on the plans or as directed by the Engineer. If Illuminated Street Name Signs exist they shall be taken down and stored by the contractor and reflecting street name signs shall be installed on the temporary traffic signal installation.
- (j) Energy Charges. The electrical utility energy charges for the operation of the temporary 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 850.01TS MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION Special Provisions. 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 Bureau of Traffic Operations (847) 705-4424 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, Special Provisions and any plans for Bridge Temporary Traffic Signals included in the plans. The installation shall meet the Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION specification. 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 as shown in the plans, or as directed by the Engineer. Microwave vehicle sensors or video vehicle detection system may be used in place of detector loops as approved by the Engineer.
- (m) Temporary Portable Traffic Signal for Bridge Projects.
1. The controller and cabinet shall be NEMA type designed for NEMA TS2 Type 1 operation. Controller and LED signal displays shall meet the applicable Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION special provision.
  2. Work shall be according to Article 701.18(b) of the Standard Specifications except as noted herein.
  3. 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 hardware 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 and other applicable portions of the currently adopted version of the Manual on Uniform Traffic Control Devices (MUTCD) and the Illinois MUTCD. The signal system shall be designed to continuously operate over an ambient temperature range between -30 °F (-34 °C) and 120 °F (48 °C). When not being utilized to inform and direct traffic, portable signals shall be treated as non-operating equipment according to Article 701.11.

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, the temporary wireless interconnect system, temporary fiber optic interconnect system, all material required, the

installation and complete removal of the temporary traffic signal, and any changes required by the Engineer. Each intersection will be paid for separately.

**TEMPORARY TRAFFIC SIGNAL TIMING**

Effective: May 22, 2002

Revised: July 1, 2015

890.02TS

**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 (847) 705-4424 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

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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.

**LED INTERNALLY ILLUMINATED STREET NAME SIGN**

Effective: May 22, 2002

Revised: July 1, 2015

891.02TS

**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. 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. White translucent Type ZZ reflective sheeting sign faces with the street name applied in transparent green shall be installed on the street sign acrylic panels which shall be affixed to the interior of the sign enclosure. Sheeting material shall be of one continuous piece. Paneling shall not be allowed. Hinged door(s) shall be provided 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°C (-40 to +122°F) for storage in the ambient temperature range of -40 to +75°C (-40 to +167°F).

(c) General Construction.

1. 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. 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.

(d) Mechanical Construction.

1. The 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 110 pounds. All housing corners are continuous TIG (Tungsten Inert Gas) welded to provide a weatherproof seal.
2. The sign doors shall be continuous TIG welded along the two corners 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 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 an appropriate number of 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 translucent Type ZZ white reflective sheeting and transparent green 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 powder coated black.
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 shall provide a weather tight seal.
8. A photoelectric switch shall be mounted inside control cabinet to control lighting functions for day and night display. 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 unless indicated otherwise in the plans.

(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°C (+77°F), shall not exceed 20%.
4. The LED Light Engine shall be cycled ON and OFF with a photocell as shown on the detail sheet and shall not exceed 120 Watts. The 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).

(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<sup>2</sup>.
2. The manufacturer shall make available independent laboratory test results to verify compliance to Voltage Range and Luminous Intensity Distribution Sections.
3. 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 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.

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.

**MODIFY EXISTING CONTROLLER CABINET**

Effective: May 22, 2002

Revised: July 1, 2015

895.01TS

The work shall consist of modifying an existing controller cabinet as follows:

- (a) Uninterruptable Power Supply (UPS). The addition of uninterruptable 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 uninterruptable power supply (UPS) components inside the existing controller cabinet as outlined under Sections 862 and 1074.04 of the Standard Specifications and the wiring of UPS alarms.
- (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(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(b)(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.

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(d) This item shall include the upgrade of all non-railroad controller software to the latest version available at the time of the signal TURN-ON.

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 Uninterruptable Power Supply (UPS) and labor to install it in the existing controller cabinet shall be included in the pay item Uninterruptable Power Supply, Special or Uninterruptable Power Supply, Ground Mounted.

**REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT**

Effective: May 22, 2002

Revised: July 1, 2015

895.02TS

Add the following to Article 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 outside the right-of-way at the Contractor's expense.

All equipment to be returned to the State shall be delivered by the Contractor to the State's Traffic Signal Maintenance Contractor's main facility. The Contractor shall contact the State'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 one hard copy and one electronic file of a list of equipment that is to remain the property of the State, including model and serial numbers, where applicable. The Contractor 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 according to these requirements, it will be rejected by the State's Electrical Maintenance Contractor. The Contractor shall be responsible for the condition of the traffic signal equipment from the time Contractor takes maintenance of the signal installation until the acceptance of a receipt drawn by the State's Electrical Maintenance Contractor indicating the items have been returned in good condition.

The Contractor shall safely store and arrange for pick up or delivery 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.

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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 at no cost to the contractor

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:

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The entities listed above and their officers, employees, and agents shall be indemnified and held harmless in accordance with Article 107.26.



Storm Water Pollution Prevention Plan



Route Plum Grove Road	Marked Route FAU 2582	Section 14-00115-00-PV
Project Number	County Cook	Contract Number 61E29

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 gathering

Print Name Kristin L. Mehl P.E.	Title Senior Civil Engineer	Agency Village of Schaumburg
Signature 		Date 10/10/17

I. Site Description

- A. Provide a description of the project location (include latitude and longitude):  
Plum Grove Road between IL 72 and IL 58, 40°02'45.75"N, 88°03'35.86"W
- B. Provide a description of the construction activity which is subject of this plan:  
Roadway Reconstruction and lane reconfiguration, traffic signal installation
- C. Provide the estimated duration of this project:  
10 months
- D. The total area of the construction site is estimated to be 10 acres.  
The total area of the site estimated to be disturbed by excavation, grading or other activities is 10 acres.
- E. The following is a weighted average of the runoff coefficient for this project after construction activities are completed:  
0.6
- F. List all soils found within project boundaries. Include map unit name, slope information and erosivity:  
Clay and Topsoil are present throughout, both are very erosive if left exposed and unstabilized.
- G. Provide an aerial extent of wetland acreage at the site:  
See attached.
- H. Provide a description of potentially erosive areas associated with this project:  
Excavations, trenches, parkways
- 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. Strip Topsoil
2. Install temporary erosion control measures
3. Excavate and extend culvert
4. Replace existing storm sewer system
5. Excavate for roadway, sidewalk and shared use path reconstruction.
6. Parkway restoration
7. Removal of temporary erosion 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:

The project directly discharges to municipal owned storm sewer system, which ultimately discharges to Woodfield Lake and the Salt Creek West Branch Tributary No. 1.

L. The following is a list of General NPDES ILR40 permittees within whose reporting jurisdiction this project is located.

Village of Schaumburg

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

Woodfield Lake and the Salt Creek West Branch Tributary No. 1

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 vegetation outside of the construction limits will be 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):

a. The name(s) of the listed water body, and identification of all pollutants causing impairment:

b. Provide a description of how erosion and sediment control practices will prevent a discharge of sediment resulting from a storm event equal to or greater than a twenty-five (25) year, twenty-four (24) hour rainfall event:

c. Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:

d. Provide a description of the location(s) of any dewatering discharges

2. TMDL (fill out this section if checked above)

a. The name(s) of the listed water body:

[Empty text box for water body name]

b. Provide a description of the erosion and sediment control strategy that will be incorporated into the site design that is consistent with the assumptions and requirements of the TMDL:

[Empty text box for erosion and sediment control strategy]

c. If a specific numeric waste load allocation has been established that would apply to the project's discharges, provide a description of the necessary steps to meet the allocation:

[Empty text box for waste load allocation steps]

P. The following pollutants of concern will be associated with this construction project:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Soil Sediment             | <input checked="" type="checkbox"/> Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids) |
| <input checked="" type="checkbox"/> Concrete                  | <input checked="" type="checkbox"/> Antifreeze / Coolants  |
| <input checked="" type="checkbox"/> Concrete Truck waste      | <input checked="" type="checkbox"/> Waste water from cleaning                                      |
| <input checked="" type="checkbox"/> Concrete Curing Compounds | <input type="checkbox"/> Other (specify) _____   |
| <input checked="" type="checkbox"/> Solid waste Debris        | <input type="checkbox"/> Other (specify) _____   |
| <input checked="" type="checkbox"/> Paints                    | <input type="checkbox"/> Other (specify) _____   |
| <input checked="" type="checkbox"/> Solvents                  | <input type="checkbox"/> Other (specify) _____   |
| <input checked="" type="checkbox"/> Fertilizers / Pesticides  | <input type="checkbox"/> Other (specify) _____   |

**II. Controls**

This section of the plan addresses the controls that will be implemented for each of the major construction activities described in I.C. above and for all use areas, borrow sites, and waste sites. For each measure discussed, the Contractor will be responsible for its implementation as indicated. The Contractor shall provide to the Resident Engineer a plan for the implementation of the measures indicated. The Contractor and subcontractors, will notify the Resident Engineer of any proposed changes, maintenance, or modifications to keep construction activities compliant with the Permit ILR10. Each such Contractor has signed the required certification on forms which are attached to, and are a part of, this plan:

**A. Erosion and Sediment Controls:**

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:**

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 one (1) day**

1. Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.
2. On areas where construction activity has temporarily ceased and will resume after fourteen (14) days, a temporary stabilization method can be used.

The following stabilization practices will be used for this project:

- Preservation of Mature Vegetation       Erosion Control Blanket / Mulching

- |   |   |
|---|---|
| <input type="checkbox"/> Vegetated Buffer Strips                      | <input checked="" type="checkbox"/> Sodding                                   |
| <input checked="" type="checkbox"/> Protection of Trees               | <input type="checkbox"/> Geotextiles  |
| <input checked="" type="checkbox"/> Temporary Erosion Control Seeding | <input checked="" type="checkbox"/> Other (specify) <u>Permanent Mulching</u> |
| <input type="checkbox"/> Temporary Turf (Seeding, Class 7)            | <input type="checkbox"/> Other (specify) _____                                |
| <input checked="" type="checkbox"/> Temporary Mulching                | <input type="checkbox"/> Other (specify) _____                                |
| <input checked="" type="checkbox"/> Permanent Seeding                 | <input type="checkbox"/> Other (specify) _____                                |

Describe how the stabilization practices listed above will be utilized during construction:

Temporary seeding and mulching will be used throughout construction.

Describe how the stabilization practices listed above will be utilized after construction activities have been completed:

Permanent seeding and erosion control blanket, sodding and mulching will be placed at the conclusion of the project to establish permanent vegetation.

- 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:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Perimeter Erosion Barrier     | <input type="checkbox"/> Rock Outlet Protection  |
| <input checked="" type="checkbox"/> Temporary Ditch Check         | <input checked="" type="checkbox"/> Riprap   |
| <input checked="" type="checkbox"/> Storm Drain Inlet Protection  | <input type="checkbox"/> Gabions   |
| <input type="checkbox"/> Sediment Trap                            | <input type="checkbox"/> Slope Mattress  |
| <input type="checkbox"/> Temporary Pipe Slope Drain               | <input checked="" type="checkbox"/> Retaining Walls  |
| <input type="checkbox"/> Temporary Sediment Basin                 | <input type="checkbox"/> Slope Walls   |
| <input type="checkbox"/> Temporary Stream Crossing                | <input type="checkbox"/> Concrete Revetment Mats   |
| <input checked="" type="checkbox"/> Stabilized Construction Exits | <input type="checkbox"/> Level Spreaders   |
| <input type="checkbox"/> Turf Reinforcement Mats                  | <input checked="" type="checkbox"/> Other (specify) <u>Temporary Soil Retention System</u> |
| <input type="checkbox"/> Permanent Check Dams                     | <input type="checkbox"/> Other (specify) _____   |
| <input type="checkbox"/> Permanent Sediment Basin                 | <input type="checkbox"/> Other (specify) _____   |
| <input type="checkbox"/> Aggregate Ditch                          | <input type="checkbox"/> Other (specify) _____   |
| <input type="checkbox"/> Paved Ditch                              | <input type="checkbox"/> Other (specify) _____   |

Describe how the structural practices listed above will be utilized during construction:

Perimeter Erosion Barrier will be installed at the beginning of the project to prevent sediment from running out of the project area. Temporary Ditch Checks and Storm Drain Inlet Protection will be installed to help control erosion in ditches and to prevent sediment from flowing into the existing and proposed storm sewer system and ultimately into the Salt Creek Tributary No. 1 during storm events.

Describe how the structural practices listed above will be utilized after construction activities have been completed:

Perimeter Erosion Barrier will be maintained throughout construction and shall only be removed after construction activities have ended. Riprap will be installed at the storm sewer outlet to prevent erosion.

- D. **Treatment Chemicals**

Will polymer flocculents or treatment chemicals be utilized on this project:  Yes  No

If yes above, identify where and how polymer flocculents or treatment chemicals will be utilized on this project.

**E. Permanent Storm Water Management Controls:**

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:

Riprap will be installed at storm sewer outlets.

**F. Approved State or Local Laws:**

in accordance with IDOT specifications, which are at least as protective as the requirements contained in the Illinois Environmental Protection Agency's Illinois Urban Manual. Procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials shall be described or incorporated by reference in the space provided below. Requirements specified in sediment and erosion site plans, site permits, storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI, to be authorized to discharge under the Permit ILR10 incorporated by reference and are enforceable under this permit even if they are not specifically included in the plan.

Description of procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials:

All management practices, controls and other provisions provided in this plan are in accordance with IDOT Standard Specifications for Road and Bridge Construction.

**G. Contractor Required Submittals:**

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
  - 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 used
  - 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.
  - Additional measures indicated in the plan.

### **III. Mainten**

When requested by the Contractor, the Resident Engineer will provide general maintenance guides to the Contractor for the practices associated

All erosion and sediment control measures should be checked weekly and after each significant rainfall, 0.5 inch or greater in a 24 hour period, or equivalent snowfall. Additionally, during winter months, all measures should be checked after each additional snow melt. All erosion and sediment control measures should be included in the list of items to be inspected. All maintenance or erosion control systems is the responsibility of the contractor, and is a requirement of the contract.

### **IV. Inspecti**

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](mailto:epa.swnoncomp@illinois.gov) five

The Incidence of Non-Compliance shall be mailed to the following address:

Illinois Environmental Protection Agency  
Division of Water Pollution Control  
Attn: Compliance Assurance Section  
1021 North Grand East  
Post Office Box 19276  
Springfield, Illinois 62794-9276

Additional Inspections Required:

--

**V. Failure to Comp**

Failure to comply with any provisions of this Storm



### 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

Route Plum Grove Road	Marked Route FAU 2582	Section 14-00115-00-PV
Project Number	County Cook	Contract Number 61E29

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.

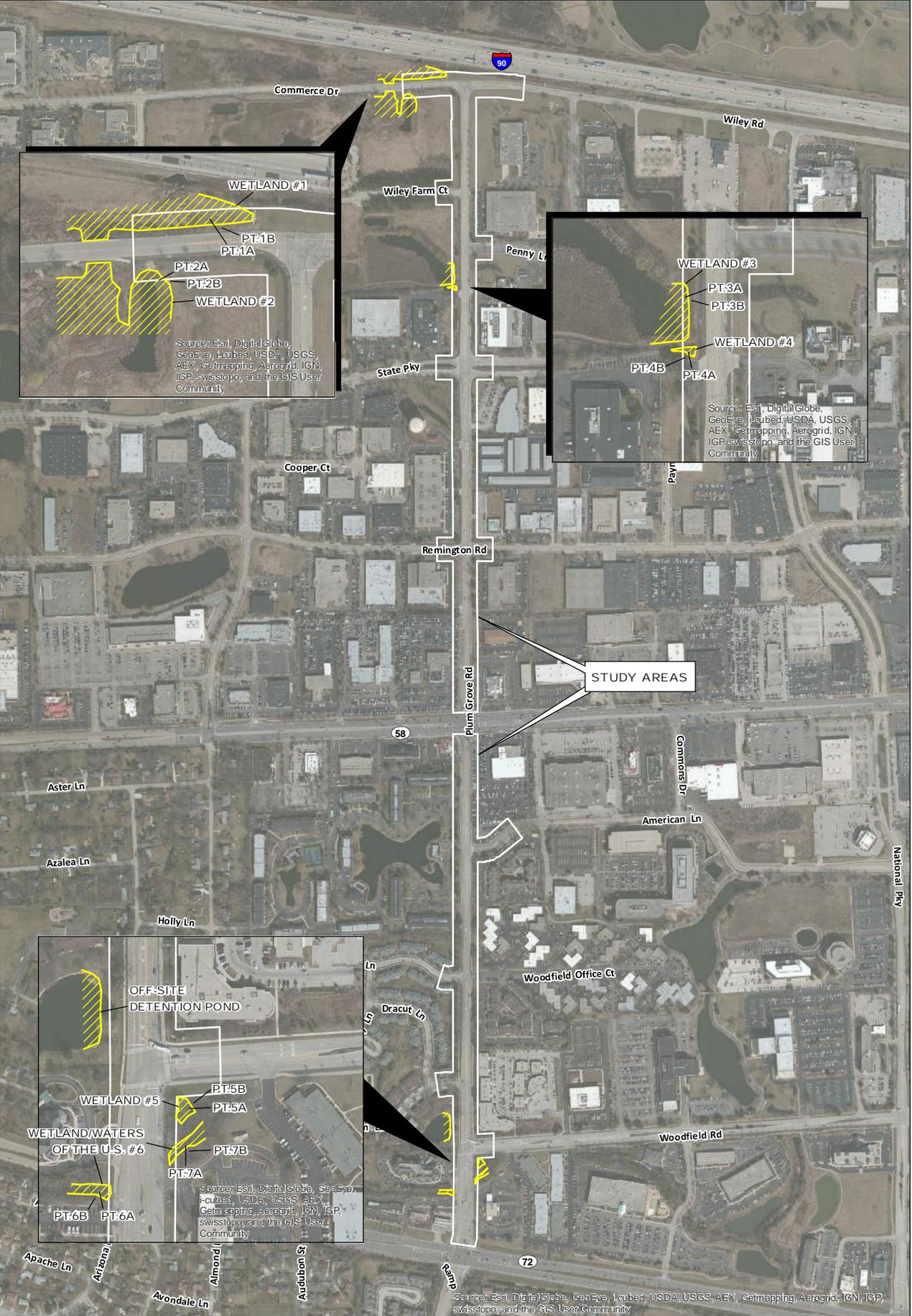
I certify under penalty of law that I understand the terms of the Permit No. ILR10 that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

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:



CLIENT: VILLAGE OF SCHAUMBURG

TITLE: APPROXIMATE WETLAND DELINEATION

CBREL # 14-0013  
DATE: 4-22-14

**CB** CHRISTOPHER B. BURKE ENGINEERING, LTD.  
9575 W. Higgins Road, Suite 600 · Rosemont, Illinois 60018 · (847) 823-0500

DSGN.	KEK	SCALE:	1" = 200'
DWN.	TGM	USER:	kkopija
CHKD.		PLOT DATE:	5/29/2014
DATE:	140013_AWD		

EXH 6

P:\VILLAGE OF SCHAUMBURG\140013\_AWD\140013\_AWD.dwg



# Illinois Environmental Protection Agency

Bureau of Water • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

## 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

### OWNER INFORMATION

Permit No. ILR10 \_\_\_\_\_

Company/Owner Name: Village of Schaumburg

Mailing Address: 714 South Plum Grove Road

Phone: 847-923-6618

City: Schaumburg State: IL Zip: 60193

Fax: 847-923-2386

Contact Person: Kristin L. Mehl P.E.

E-mail: kmehl@villageofschaumburg.com

Owner Type (select one) City

### CONTRACTOR INFORMATION

MS4 Community:  Yes  No

Contractor Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_ Phone: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Fax: \_\_\_\_\_

### CONSTRUCTION SITE INFORMATION

Select One:  New  Change of information for: ILR10 \_\_\_\_\_

Project Name: Plum Grove Road Roadway Improvement County: Cook

Street Address: Plum Grove Rd from IL 72 to IL 58 City: Schaumburg IL Zip: 60193

Latitude: 40 02 45.75 Longitude: 88 03 35.86 14 41N 10E  
(Deg) (Min) (Sec) (Deg) (Min) (Sec) Section Township Range

Approximate Construction Start Date March 2018 Approximate Construction End Date Novemebr 2018

Total size of construction site in acres: 10

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](mailto:epa.constilr10swppp@illinois.gov))

Location of SWPPP for viewing: Address: 714 South Plum Grove Road City: Schaumburg

SWPPP contact information: Inspector qualifications: \_\_\_\_\_

Contact Name: Kristin L. Mehl, P.E., Senior Civil Engineer P.E. \_\_\_\_\_

Phone: 847-923-6618 Fax: 847-923-2386 E-mail: kmehl@villageofschaumburg.com

Project inspector, if different from above Inspector qualifications: \_\_\_\_\_

Inspector's Name: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

**TYPE OF CONSTRUCTION (select one)**

Construction Type Transportation

SIC Code: \_\_\_\_\_

Type a detailed description of the project:

This project consists of roadway reconstruction, roadway resurfacing, storm sewer removal and replacement, earth excavation, culvert extension, sidewalk installation, traffic signal installation, lighting installation., water main relocation, and various landscaping items.

**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:    Village of Schaumburg

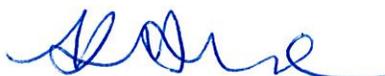
Name of closest receiving water body to which you discharge:    Woodfield Lake and Salt Creek West Branch Tributary

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](mailto: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))*

  
\_\_\_\_\_  
Owner Signature:

10/10/17  
\_\_\_\_\_  
Date:

Kristin Mendi  
\_\_\_\_\_  
Printed Name:

Engineering Division 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](mailto: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](mailto:epa.constilr10swppp@illinois.gov) When submitting electronically, use Project Name and City as indicated on NOI form.

STATE OF



ILLINOIS

Permit No.: DIL-17-008

## Department of Transportation

Division of Highways  
2300 South Dirksen Parkway  
Springfield, IL 62764

### REGULATED FLOODWAY CONSTRUCTION PERMIT RIVERS, LAKES AND STREAMS ACT "615 ILCS 5"

PERMISSION IS HEREBY GRANTED TO: Village of Schaumburg  
101 Schaumburg Court  
Schaumburg, IL 60193-4329

FOR CONSTRUCTION OF: Replacing existing culvert wingwalls with cast-in-place T-type retaining walls on culvert located on Plum Grove Road just south of Woodfield Road. The proposed Cast-in-Place T-type Retaining Walls will have a Span Length of 60'-0" end to end. The project is located Section 14, Township 41 North, Range 10 East of the 3<sup>rd</sup> Prime Meridian, Cook County, as part of Section Number 14-00115-00-PV.

IN ACCORDANCE WITH THE Application and Plan  
DATED June 19, 2017 AND MADE A PART HEREOF, AND SUBJECT TO THE  
TERMS SHOWN ON THE BACK HEREOF AND THE SPECIAL CONDITIONS ATTACHED  
HERETO AS EXHIBIT.

EXAMINED AND APPROVED

  
REGIONAL ENGINEER/CENTRAL BUREAU CHIEF

7/19/17  
DATE

# North Cook County Soil & Water Conservation District

640 Cosman Road, Elk Grove Village, Il. 60007

Phone: 847-885-8830, email: [r.mcandless@northcookswcd.org](mailto:r.mcandless@northcookswcd.org)

January 5, 2018

Mr. Adam Woods, P.E.  
Baxter & Woodman Consulting Engineers  
8430 West Bryn Mawr  
Suite 400  
Chicago, Il. 60631

Re: Soil Erosion & Sediment Control (SE/SC) Plan Review for the proposed Village of Schaumburg-Plum Grove Road, Il. Route 72 (Higgins Road) to Il. Route 58 (Golf Road), LRC-2017-234.

Dear Mr. Woods,

I have completed my review of the proposed Village of Schaumburg-Plum Grove Road, Il. Route 72 (Higgins Road) to Il. Route 58 (Golf Road), LRC-2017-234. It is my opinion that the SE/SC plan meets technical standards. I will notify your U.S. Army Corps Project Manager of your completion of this phase of the permitting process. If any changes are made to the SE/SC plan, I will need to be notified prior to the installation of the design change. One of the requirements for this office under our Inter-Agency Cooperative Agreement with the U.S. Army Corps, Chicago District is to make monthly inspections of the SE/SC practices during the period of time that they will be in place during the life of the project. If it is noted that a planned practice does not function as designed, if an additional practice is needed, or if job changes require plan modifications, I will need to work with your office and all contracted parties to amend the existing plan and/or correct any deficiencies. Please notify this office at least seven working days prior to the onset of construction.

Regards,



Rick McAndless, CPESC

Cc: Soren Hall, Project Manager, U.S. Army Corps of Engineers



REPLY TO  
ATTENTION OF:

**DEPARTMENT OF THE ARMY**  
CHICAGO DISTRICT, CORPS OF ENGINEERS  
231 SOUTH LA SALLE STREET  
CHICAGO, ILLINOIS 60604-1437

February 14, 2018

Technical Services Division  
Regulatory Branch  
LRC-2017-00234

**SUBJECT:** Authorization for the Installation of a Sidewalk and Headwall Replacement in the West Branch of Salt Creek along Plum Grove Road in Schaumburg, Cook Count, Illinois (Latitude 42.04236, Longitude -88.05987)

Kristin Mehl  
Village of Schaumburg  
714 South Plum Grove Road  
Schaumburg, Illinois 60139

Dear Ms. Mehl:

This office has verified that your proposed activity complies with the terms and conditions of Regional Permit 3 (Transportation Projects) and 7 (Temporary Construction Activities) and the General Conditions for all activities authorized under the Regional Permit Program.

This verification expires three (3) years from the date of this letter and covers only your activity as described in your notification and as shown on the plans entitled "FAU Route 2582 Plum Grove Road – IL Route 72 (Higgins Road) to IL Route 58 (Golf Road) – Section: 14-00115-00-PV – Project [Blank] – Road Improvement – Village of Schaumburg, Cook County" dated December 2, 2016, prepared by Baxter & Woodman. Caution must be taken to prevent construction materials and activities from impacting waters of the United States beyond the scope of this authorization. If you anticipate changing the design or location of the activity, you should contact this office to determine the need for further authorization.

The activity may be completed without further authorization from this office provided the activity is conducted in compliance with the terms and conditions of the RPP, including conditions of water quality certification issued under Section 401 of the Clean Water Act by the Illinois Environmental Protection Agency (IEPA). If the design, location, or purpose of the project is changed, you should contact this office to determine the need for further authorization.

The following special conditions are a requirement of your authorization:

1. 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 North Cook County 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 construction 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.
2. This site is within the aboriginal homelands of several American Indian Tribes. If any human remains, Native American cultural items or archaeological evidence are discovered during any phase of this project, interested Tribes request immediate consultation with the entity of jurisdiction for the location of discovery. In such case, please contact Mr. Soren Hall by telephone at (312) 846-5532, or email at [Soren.G.Hall@usace.army.mil](mailto:Soren.G.Hall@usace.army.mil).
  3. You are responsible for all work authorized herein and for ensuring that all contractors are aware of the terms and conditions of this authorization.
  4. A copy of this authorization must be present at the project site during all phases of construction.
  5. 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.
  6. You shall notify this office prior to the transfer of this authorization and liabilities associated with compliance with its terms and conditions.
  7. Work in the waterway should be timed to take place during low or no-flow conditions. Low flow conditions are flow at or below the normal water elevation.
  8. The plan will be designed to allow for the conveyance of the 2-year peak flow past the work area without overtopping the cofferdam. The Corps has the discretion to reduce this requirement if documented by the applicant to be infeasible or unnecessary.

9. Water shall be isolated from the in-stream work area using a cofferdam constructed of non-erodible materials (steel sheets, aqua barriers, rip rap and geotextile liner, etc.). Earthen cofferdams are not permissible.
10. The cofferdam must be constructed from the upland area and no equipment may enter flowing water at any time. If the installation of the cofferdam cannot be completed from shore and access is needed to reach the area to be coffered, other measures, such as the construction of a causeway, will be necessary to ensure that equipment does not enter the water. Once the cofferdam is in place and the isolated area is dewatered, equipment may enter the coffered area to perform the required work.
11. If bypass pumping is necessary, the intake hose shall be placed on a stable surface or floated to prevent sediment from entering the hose. The bypass discharge shall be placed on a non-erodible, energy dissipating surface prior to rejoining the stream flow and shall not cause erosion. Filtering of bypass water is not necessary unless the bypass water has become sediment-laden as a result of the current construction activities.
12. During dewatering of the coffered work area, all sediment-laden water must be filtered to remove sediment. Possible options for sediment removal include baffle systems, anionic polymers systems, dewatering bags, or other appropriate methods. Water shall have sediment removed prior to being re-introduced to the downstream waterway. A stabilized conveyance from the dewatering device to the waterway must be identified in the plan. Discharge water is considered clean if it does not result in a visually identifiable degradation of water clarity.
13. The portion of the side slope that is above the observed water elevation shall be stabilized as specified in the plans prior to accepting flows. The substrate and toe of slope that has been disturbed due to construction activities shall be restored to proposed or pre-construction conditions and fully stabilized prior to accepting flows.

This verification does not obviate the need to obtain all other required Federal, state, or local approvals before starting work. Please note that Section 401 Water Quality Certification has been issued by IEPA for this RP. If you have any questions regarding Section 401 certification, please contact Mr. Darin LeCrone at IEPA Division of Water Pollution Control, Permit Section #15, by telephone at (217) 782-0610.

Once you have completed the authorized activity, please sign and return the enclosed compliance certification. If you have any questions, please contact Mr. Soren Hall of my staff by telephone at (312) 846-5532, or email at [Soren.G.Hall@usace.army.mil](mailto:Soren.G.Hall@usace.army.mil).

Sincerely,

Kathleen G. Chernich  
Chief, East Section  
Regulatory Branch

Enclosures

Copy Furnished:

North Cook SWCD (Rick McAndless)



**PERMIT COMPLIANCE  
CERTIFICATION**

Permit Number: LRC-2017-00234  
Permittee: Kristin Mehl  
Village of Schaumburg  
Date: February 7, 2018

I hereby certify that the work authorized by the above-referenced permit has been completed in accordance with the terms and conditions of said permit and if applicable, compensatory wetland mitigation was completed in accordance with the approved mitigation plan.<sup>1</sup>

\_\_\_\_\_  
PERMITTEE

\_\_\_\_\_  
DATE

Upon completion of the activity authorized by this permit and any mitigation required by the permit, this certification must be signed and returned to the following address:

U.S. Army Corps of Engineers  
Chicago District, Regulatory Branch  
231 South LaSalle Street, Suite 1500  
Chicago, Illinois 60604-1437

Please note that your permitted activity is subject to compliance inspections by Corps of Engineers representatives. If you fail to comply with this permit, you may be subject to permit suspension, modification, or revocation.

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<sup>1</sup> If compensatory mitigation was required as part of your authorization, you are certifying that the mitigation area has been graded and planted in accordance with the approved plan. You are acknowledging that the maintenance and monitoring period will begin after a site inspection by a Corps of Engineers representative or after thirty days of the Corps' receipt of this certification. You agree to comply with all permit terms and conditions, including additional reporting requirements, for the duration of the maintenance and monitoring period.



**COOK COUNTY DEPARTMENT OF  
TRANSPORTATION AND HIGHWAYS  
PERMIT APPLICATION**

GEORGE W. DUNNE COOK COUNTY OFFICE BUILDING  
69 WEST WASHINGTON STREET, ROOM # 2354  
CHICAGO, ILLINOIS 60602

PHONE: (312) 603-1670; FAX: (312) 603-9943 [hwv.permits@cookcountyil.gov](mailto:hwv.permits@cookcountyil.gov)

**Print or Type all information requested. Incomplete applications will NOT be accepted.**

<i>Office Use ONLY:</i>
ID#:
Date:
By:
Fees:

Application Fee: \$100.00

**Owner:**

Payment Receipt No. \_\_\_\_\_

Name: Village of Schaumburg Kristen Mehl Senior Civil Engineer  
(Legal Name of Company/Owner) (Contact Name) (Title)

Mailing Address: 714 South Plum Grove Road, Schaumburg, IL 60193

Phone No. 847-923-6618 Fax No. 847-923-2386 Email kmehl@ci.schaumburg.il.us  
(Day Time)

**Engineer/Architect:** (Primary Firm Assigned to prepare Civil Engineering Plans)

Name: Baxter & Woodman Consulting Engineers Jay Coleman  
(Contact Name)

Mailing Address: 8678 Ridgefield Road, Crystal Lake, IL 60012

Phone No. 815-444-3277 Fax No. 815-455-0450 Email jcoleman@baxterwoodman.com  
(Day Time)

**General Contractor:** (Contractor assigned to oversee all the work requested in this permit)

Name: \_\_\_\_\_ [Pending project letting on August 3, 2018] \_\_\_\_\_  
(Contact Name)

Mailing Address: \_\_\_\_\_

Phone No. \_\_\_\_\_ Fax No. \_\_\_\_\_ Email \_\_\_\_\_  
(Day Time)

**Owner of Existing Water Main:** (Required if proposing water connection)

Name: Not applicable \_\_\_\_\_  
(Local Govt. Agency/Private (Public) Utility Company Name) (Contact Name)

Mailing Address: \_\_\_\_\_

Phone No. \_\_\_\_\_ Fax No. \_\_\_\_\_ Email \_\_\_\_\_  
(Day Time)

**Owner of Existing Sanitary Sewer:** (Required if proposing sanitary connection)

Name: Not applicable \_\_\_\_\_  
(Local Govt. Agency/Private (Public) Utility Company Name) (Contact Name)

Mailing Address: \_\_\_\_\_

Phone No. \_\_\_\_\_ Fax No. \_\_\_\_\_ Email \_\_\_\_\_  
(Day Time)

<b>Office Use ONLY:</b>
ID#:

**Project Location:** (Complete all information. Print or type clearly.)

Property address: Plum Grove Road at Higgins Road (Illinois Route 72)

Site City: Village of Schaumburg

County Route Name(s): Plum Grove Road

Hwy Section #(s): \_\_\_\_\_ (to be completed by County)

Locations to nearest cross street: At Higgins Road (Illinois Route 72)

Description of Work: The project consists of roadway resurfacing north of Higgins Road to Woodfield Road and reconstruction from Woodfield Road to Golf Road. The County right-of-way begins south of Higgins road, and no improvements are planned for that section. However, it will be necessary to set up work zone traffic control items within the County right-of-way.

**Proposed Work:** (Check all items that apply within Cook County ROW only)

<p><b>Entrance/Access</b></p> <input type="checkbox"/> Commercial entrance <input type="checkbox"/> Temporary const. entrance <input type="checkbox"/> Existing entrance removal <input type="checkbox"/> Existing entrance revisions <input type="checkbox"/> Street entrance <input type="checkbox"/> Private entrance(Residential Single family) <input type="checkbox"/> Utility Access <input type="checkbox"/> Planned Unit Development (PUD)	<p><b>Utilities</b></p> <input type="checkbox"/> Force main /appurtenances <input type="checkbox"/> Water main/appurtenances <input type="checkbox"/> Water service/b-box <input type="checkbox"/> Sanitary sewer/appurtenances <input type="checkbox"/> Storm sewer/appurtenances <input type="checkbox"/> Sump pump/downspout/ discharge/sewer connection <input type="checkbox"/> Water/sanitary sewer service disconnection removal	<p><b>Landscaping (Municipal Only)</b></p> <input type="checkbox"/> Parkway/median trees <input type="checkbox"/> Misc. plantings <input type="checkbox"/> Grading/restoration <p><b>Paths/Walks</b></p> <input type="checkbox"/> P.C.C. sidewalk <input type="checkbox"/> Bike Path	<p><b>Roadway Improvements</b></p> <input type="checkbox"/> Widening (Left turn lane ) <input type="checkbox"/> Widening (Right turn lane) <input type="checkbox"/> Dual Left/right turn lane(s)
<p><b>Traffic Control/Signage</b></p> <input type="checkbox"/> Temporary road closure/detour <input checked="" type="checkbox"/> Daily lane closures <input checked="" type="checkbox"/> Regulatory, informational and/or warning signage <input type="checkbox"/> Municipal/Homeowner <input type="checkbox"/> Association entry signs	<p><b>Utility Companies Only:</b></p> <input type="checkbox"/> Cable installation <input type="checkbox"/> Cable relocation <input type="checkbox"/> Lane closures <input type="checkbox"/> Tree trimming <input type="checkbox"/> Maintenance and repair* <input type="checkbox"/> Annual <input type="checkbox"/> One time <input type="checkbox"/> New Construction	<p><b>Signals/Lighting</b></p> <input type="checkbox"/> New traffic signals/loops <input type="checkbox"/> Signal interconnection <input type="checkbox"/> Signal modifications/loops <input type="checkbox"/> Temporary signals <input type="checkbox"/> Street lighting	<p><b>Miscellaneous</b></p> <input type="checkbox"/> Pavement open-cut <input type="checkbox"/> Soil borings/Monitor wells/Pavement <input type="checkbox"/> Cores <input type="checkbox"/> Parade/Festival/Race/Event <p>Other: _____</p> <p>Other: _____</p>

\* Parkway Excavation, Pavement Cut and/or Lane Closure are not permitted under Maintenance and Repair permit.

I declare that I have prepared or examined this Application and it is true and correct to the best of my knowledge and belief. I agree to perform all permitted work according to and with all provisions of the Ordinances of the COUNTY OF COOK and any/all local, state and federal statutes and/or codes. I realize that the Department of Transportation and Highways is relying on the information that I have provided in this application in the issuance of the Highway Construction Permit and approval of plans and specifications without variations. The permit issued pursuant to this application shall not be construed to permit any construction upon or within said right of way or use thereof in violation of any provision of any Ordinance of COOK COUNTY or to excuse the owner or the owner's successors and assigns from complying therewith.

**NOTICE: THIS APPLICATION FORM IS NOT A PERMIT AND IN NO WAY AUTHORIZES THE APPLICANT OR CONTRACTOR TO CONSTRUCT/PERFORM ANY WORK OR HOLD AN EVENT WITHIN THE COUNTY'S RIGHTS-OF-WAY WITHOUT THE ISSUANCE OF COUNTY HIGHWAY PERMIT.**

**Owner Name:** Kristen Mehl **Date:** \_\_\_\_\_  
 (PRINT) (SIGNATURE)

**Applicant Name:** Kristen Mehl **Date:** \_\_\_\_\_  
 (PRINT) (SIGNATURE)

COOK COUNTY DEPARTMENT OF  
TRANSPORTATION AND HIGHWAYS PERMIT  
DIVISION

BOND AND INSURANCE REQUIREMENTS

BEFORE BOND AND INSURANCE REQUIREMENTS ARE ISSUED, THE GENERAL CONTRACTOR MUST SUBMIT A SIGNED LETTER ON COMPANY STATIONARY STATING THE FOLLOWING:

"(Name of Contractor) is the contractor responsible for all work performed in Permit (#00-00-0000)." I understand that if there is an open cut in the pavement the bond shall remain with the Cook County Department of Transportation and Highways for one year after the construction work is completed.

Upon receipt of the "CONTRACTOR LETTER," bond forms and insurance requirements will be forwarded by the Permit Office.

GENERAL CONTRACTOR SHOULD SUBMIT INSURANCE SPECIFIED FOR PERMIT. IN

THE EVENT THE INSURANCE EXPIRES OR IS CANCELED PRIOR TO THE COMPLETION OF THE PERMIT, THE PROJECT WILL BE STOPPED UNTIL INSURANCE COVERAGE IS SUFFICIENT.

Insurance coverage shall be with insurance companies licensed to do business in the State of Illinois and are subject to approval by the County Insurance Coordinator.

Contractor and/or Insurance Companies must notify this office when there is a change of address, and/or change of Insurance Company. The Permit number must always be on all correspondence.

CURRENT CERTIFICATE OF INSURANCE MUST REMAIN ON FILE UNTIL RELEASE OF BOND.

BOND FORMS

Must be properly executed with signature of officers of company and have corporate seal. If contractor is sole beneficiary, it should be stated on the bond.

BONDS WILL NOT BE RELEASED UNTIL INSURANCE REQUIREMENTS ARE MET.

If you have any questions, please contact Mr. Michael Sterr, Permits Division Head, at 312-603-1670.

FORM20.

**COOK COUNTY DEPARTMENT OF**  
**TRANSPORTATION AND HIGHWAYS**  
**GENERAL CONDITIONS FOR PERMITS FOR WORK**

1. Capitalized terms used in this Permit and not otherwise defined herein shall have the meanings ascribed to them in the Public Way Regulatory Ordinance (the "Ordinance"), Chapter 66, Article III, Sections 50 et seq. of the Cook County Code. Requirements set forth in these General Conditions are in addition to and not in limitation of the requirements of the Ordinance.
2. No lane closures or traffic detours relating to permitted work will be allowed between the hours of 6 a.m. to 9 a.m. and 3 p.m. to 6:30 p.m., (other than as allowed for emergency maintenance per the Ordinance). All traffic control devices must conform to the latest edition of the State of Illinois "Manual on Uniform Traffic Control Devices for Streets and Highways."
3. Permittee shall furnish all material to do all work required, and pay all costs which may be incurred in connection with such work, and shall prosecute the same diligently and without delay to completion. See Ordinance for additional requirements as to work in the Public Way.
4. Permittee shall perform all Permitted Work in accordance with the current Standard Specifications for Road and Bridge Construction of the Illinois Department of Transportation including the Supplemental Specifications thereto of the County of Cook, and as detailed in the Permit and the Ordinance, and all submittals made pursuant to the application process, as modified at the request of the Department of Transportation and Highways and as finally approved by the Department of Transportation and Highways.
5. Upon completion of the Permitted Work, Permittee shall, at its own cost, and in a timely manner, (but in no event more than 30 days unless another time frame is directed by the Department of Transportation and Highways , restore the Public Way substantially to the same condition in which it was before the Permitted Work was commenced and shall remove all debris, rubbish, materials, apparatus, tools, and equipment, as well as all excess excavated materials, from the Public Way, all to the satisfaction of the Cook County Superintendent of the Department of Transportation and Highways.
6. Should future construction and operation of the highways by the County of Cook require alteration or relocation of the Permittee's Facilities, such change shall be made by the Permittee, its successor or assigns upon the written request of the Superintendent of the Department of Transportation and Highways without expense to said County or State. Requirements for any such requested alteration or relocation are further detailed in the Ordinance.
7. Permittee, its successor and assigns assume all risk and liability for accidents and damages that may accrue to persons and property, during the prosecution of the work or any time thereafter, by reason of the location, construction, installation, operation, maintenance, repair and work referred to herein, and Permittee, by acceptance of this Permit, agrees to indemnify and save harmless the County of Cook from any such claims for damages and from all costs and expenses incurred on account thereof and in connection therewith.
8. No changes, alterations, or revisions to the Permitted Work are allowed unless approved in writing by the Cook County Superintendent of the Department of Transportation and Highways or his designee. See Ordinance for detailed requirements and fees relating to permit modifications.
9. In accordance with ordinances of the County, and agreement by the Permittee, the Permittee acknowledges and agrees that this Permit is null and void if the Permittee is delinquent in the payment of any tax or fee administered by the County of Cook.

10. The pavement, parkway and all drainage systems shall be kept clean and free of debris at all times.
11. Unless particularly specified in the Permit, no equipment other than pneumatic-tired equipment used during the installation shall be permitted to stop or operate on the pavement nor shall any excavated materials be stored temporarily or otherwise on the County Highway pavement.
12. Access to driveways, houses, buildings or other property abutting the site of the Permitted Work shall not be blocked.
13. The Permittee shall conduct its operations in a manner so as to insure the minimum hindrance to traffic.
14. The use of flagmen and that the number, type, color, size and placement of all traffic control devices shall conform to the latest edition of the State of Illinois "Manual on Uniform Traffic Control Devices for Streets and Highways."
15. All aerial lines crossings or parallel must have a minimum clearance of 18'3".
16. This Permit covers only the Permitted Work and does not release the Permittee from fulfilling the requirements of any other Laws relating to the Permitted Work. Fulfillment by Permittee of all requirements set forth in the Permit for Work Application and its instructions, including without limitation, insurance and bonding requirements ("Application Requirements") are a condition of this Permit. Issuance of this Permit, without the fulfillment of all Application Requirements by Permittee shall not act as a waiver of Permittee's obligation to comply with such Application Requirements, unless approval in writing of such change is given by the Cook County Superintendent of the Department of Transportation and Highways.
17. At least two (2) days advance notice prior to the start of work shall be given to the County Permit Division, Mr. Michael Sterr (312)-603-1670.
18. This Permit can be revoked pursuant to the terms of the Ordinance or at the discretion of the Cook County Superintendent of the Department of Transportation and Highways,

#### **ADDITIONAL GENERAL CONDITIONS THAT PERTAIN TO CONSTRUCTION PERMITS**

19. All trenches and openings made in the Public Way shall be backfilled with sand or limestone screening adequately compacted in accordance with Method 1 specified in Article 550.07 of the State Standard Specifications.
20. All pavement openings and curb cuts shall be saw cut full depth.
21. All pavement openings shall be immediately surfaced with a temporary bituminous patch at least three inches in thickness. This patch then must be inspected daily and additional bituminous patch material must be placed, daily if necessary, to maintain the patched area at the same elevation as the adjacent undisturbed pavement for a period of not less than 30 days. After 30 days permanent replacement in kind shall be made to the base course and pavement surface.
22. All auger pits shall be a minimum of 10 feet from the edge of pavement or back of curb, and wood or steel sheeting shall be used, and auger pits left open overnight shall be protected with concrete barrier walls.
23. All casings shall be pressure grouted both inside and outside of the casing.

24. That a minimum depth of 42 inches will be maintained from the ground surface to the top of the conduit, cable or pipe and a minimum depth of 36 inches from the true flow line of the drainage ditch to the top of the conduit, cable or pipe.
25. That all excavation work within three (3) feet of the pavement edge will be done manually.
26. If Permittee discovers during the progress of the Permitted Work that subterranean conditions prohibit the construction of said improvement in and along the alignment as outlined in the plans, it is expressly understood that all Permitted Work shall cease until a proposed revised alignment has been approved by the Cook County Department of Transportation and Highways and the Permit has been modified.
27. Without further action, the Cook County Department of Transportation and Highways reserves the right to make connections to the proposed storm sewer for the purpose of draining the highway.
28. The Permittee shall be responsible for providing positive drainage.
29. In the removal of sidewalks, curb, gutter or pavement, the use of any type of concrete breaker that will damage the underground structures will not be permitted.
30. Permittee shall provide and maintain at its own expense, such temporary roads and approaches, as may be necessary to provide access to driveways, houses, buildings or other property abutting the site of the Permitted Work.
31. For driveway installations, the Permittee shall remove earth to its full depth, starting at the edge of the pavement, for the full dimensions of the proposed driveway, and replaced with materials to be used in the construction of the driveway.
32. When existing traffic control signs such as stop signs, stop ahead signs and crossroad signs are removed in the progress of the Permitted Work, said signs shall be immediately reset as close as possible to their original location. After the construction of the Facility or the completion of the Permitted Work has been approved, said traffic control signs shall be restored to their original position and condition or as directed by the County Permit Engineer.
33. The Permittee shall conduct its operations in a manner so as to insure the minimum hindrance to traffic, using the pavement and at no time shall its operations obstruct more than one half(1/2) of the available pavement width.
34. This Permit is issued with the express understanding that the Permittee has obtained the proper authority for the said installation from the Illinois Environmental Protection Agency Division of Public Water Supplies.



Department of Transportation and Highways

**John Yonan, P.E.**

Superintendent

69 West Washington Street, 24<sup>th</sup> Floor • Chicago, Illinois 60602-3007 • (312) 603-1601

**TONI PRECKWINKLE**

**PRESIDENT**

**Cook County Board  
of Commissioners**

RICHARD R. BOYKIN  
1st District

DENNIS DEER  
2nd District

JERRY BUTLER  
3rd District

STANLEY MOORE  
4th District

DEBORAH SIMS  
5th District

EDWARD M. MOODY  
6th District

JESUS G. GARCIA  
7th District

LUIS ARROYO JR.  
8th District

PETER N. SILVESTRI  
9th District

BRIDGET GAINER  
10th District

JOHN P. DALEY  
11th District

JOHN A. FRITCHEY  
12th District

LARRY SUFFREDIN  
13th District

GREGG GOSLIN  
14th District

TIMOTHY O. SCHNEIDER  
15th District

JEFFREY R. TOBOLSKI  
16th District

SEAN M. MORRISON  
17th District

January 25, 2018

Village of Schaumburg  
101 Schaumburg Court  
Schaumburg, IL 60193

Attn: Kristen Mehl

**RE: Permit Number: 17-09-7421-C**  
County Highway: Plum Grove Rd.  
Section Number: V63-4040  
Location: Higgins Rd.  
Customer Ref. #: 150615  
**PERMIT FOR WORK**

Please have the enclosed **“Permit for Work”** properly executed (Kindly Affix Corporate Seal, where necessary) by **PRINCIPAL/MUNICIPALITY**.

**IF APPLICABLE PERMIT MUST BE SIGNED BY THE MAYOR or VILLAGE PRESIDENT** and returned to this office within 30 days for further processing and issuance of the permit.

No construction permit shall be issued without receipt and approval of Bond & Insurance papers and permit for work fee if applicable.

Return permit applications to:

Cook County Department of Transportation & Highways  
69 West Washington - Permits (24<sup>TH</sup> Floor)  
Chicago, Illinois 60602  
Attention: Mr. Michael D. Sterr, P.E.

If you have any questions, please feel free to contact my office, 312-603-1670.

Very truly yours,

Michael D. Sterr, P.E.  
Permit Engineer  
For: John Yonan, P.E.  
Superintendent of Transportation and Highways  
Cook County, Illinois

<b>PERMIT NUMBER</b>	<b>17-09-7421-C</b>	<b>ISSUE DATE</b>	
<b>BOND NUMBER</b>		<b>EXPIRATION DATE</b>	



# HIGHWAY PERMIT

Cook County Department of Transportation and Highways Permits Office  
 George W. Dunne Cook County Office Building  
 69 W. Washington, 24th Floor, Chicago, Illinois 60602

312.603.1670  
 312.603.9943  
 hwy.permits@cookcountyil.gov

1. Owner(s): Village of Schaumburg

2. Project Description: Municipality

3. Permit Type:
- A. Construction
  - B. Individual Maintenance and Repair
  - C. Annual Maintenance and Repair
  - D. Tree Trimming

4. Emergency Permit:  (check only if emergency as described is in the PWO, e.g. hazards in the public way)

5. Pavement Breaks:  Yes  No

6. County Highway Impacted:

Road Name	Road No.	Section No.	Limits or Cross Street
Plum Grove Road	V63	4040	Higgins Road

7. Permission:

The Cook County Transportation and Highways Department hereby grants permission and authority to

- install, construct, and operate the following described facilities; or
- maintain and repair the following described facilities; or
- trim trees

in the following geographical area as stated in item 3 above in Cook County, Illinois; on County Highway(s) stated in item 6 above subject to the general conditions and any special conditions attached to this permit, and subject to the Public Way Ordinance, as well as all laws defined therein and in conformance with all submittals made pursuant to the application process, as modified at the request of the Cook County Department of Transportation and Highways, per plans prepared by:

Engineer/Architect Baxter & Woodman Consulting Engineers Job No.: 150615

FAU Route 2582 (Plum Grove Road), IL Route 72 (Higgins Road) to IL Route 58 (Golf Road)

Titled: Reconstruction / Traffic Signal

Dated: 6/30/17 and final revision date of: Rec'd 10/31/17 Is finally approved.

8. Approved Work:

Permitted Work	Level #	Fee
Lane Closures	3	\$ 0.00
Signage	2	\$ 0.00
	<b>Total Fee</b>	<b>\$ 0.00</b>

<b>PERMIT NUMBER</b>	<b>17-09-7421-C</b>	<b>ISSUE DATE</b>	
<b>BOND NUMBER</b>		<b>EXPIRATION DATE</b>	

**This Permit will not be issued until receipt of all applicable fees is confirmed by the Department of Revenue.**

**This permit includes and is subject to the “General Conditions for Permit for Work” and any applicable “C.C.D.O.T.H. Construction Notes” attached hereto and incorporated into this Permit.**

9. Note (Additional Rules and Special Conditions as Follows):

1. The Owner(s) assumes all responsibility and acknowledges the County of Cook is free from any liability as a result of the permit work.
2. There is an IDOT traffic signal located within the limits of this permit work. Additional accommodations may be required by IDOT to protect the traffic signal. Coordinate all traffic signal locates with IDOT.
3. Cook County Right-of-Way to be restored with 4” topsoil, fertilizer and sod.
4. The general contractor, before starting the job, will deposit with the Cook County Transportation and Highways Department, Permit Office, insurance as required on Form " A".
5. Upon awarding a contract for the above mentioned installations, the applicant must direct its contractor to appear in the Cook County Transportation and Highways Department Permit Office, Room 2354 County Building, 69 W. Washington Street, Chicago, to deposit a Performance and Right Of Way Restoration Bond in the amount of \$20,000.00, with said Permit Office prior to the start of work within the County Right Of Way.

The work authorized by this Permit shall be completed by the expiration date as shown on page 1 or above; otherwise this Permit becomes null and void.

Owner's Signature <b>(Village of Schaumburg)</b>	Date
Owner's Name (printed)	Owner's Title

Applicable Fee(s) Received. Application approved and Permit granted:

Superintendent of Cook County Department of Transportation and Highways	Approved Date
--	---------------

**A COPY OF THIS PERMIT MUST BE KEPT ON THE JOB SITE DURING CONSTRUCTION**

This Permit is not effective unless and until the Cook County Superintendent of Transportation and Highways has signed this Permit. If, per the Cook County Transportation and Highways Department, municipal acceptance is required, then this Permit is not effective unless and until the municipality has signed this Permit.

**COUNTY OF COOK**  
**TRANSPORTATION AND HIGHWAYS DEPARTMENT**  
**GENERAL CONDITIONS FOR PERMIT FOR WORK**

1. Capitalized terms used in this Permit and not otherwise defined herein shall have the meanings ascribed to them in the Public Way Regulatory Ordinance (the "Ordinance"), Chapter 66, Article III, and Sections 50 et seq. of the Cook County Code. Requirements set forth in these General Conditions are in addition to and not in limitation of the requirements of the Ordinance.
2. No lane closures or traffic detours relating to Permitted Work will be allowed between the hours of 6 a.m. to 9 a.m. and 3 p.m. to 6:30 p.m., (other than as allowed for emergency maintenance per the Ordinance). All traffic control devices must conform to the latest edition of the State of Illinois "Manual on Uniform Traffic Control Devices for Streets and Highways."
3. Owner shall furnish all material to do all work required, and pay all costs which may be incurred in connection with such work, and shall prosecute the same diligently and without delay to completion. See Ordinance for additional requirements as to work in the Public Way.
4. Owner shall perform all Permitted Work in accordance with the current Standard Specifications for Road and Bridge Construction of the Illinois Department of Transportation including the Supplemental Specifications thereto of the County of Cook, and as detailed in the Permit and the Ordinance, and all submittals made pursuant to the application process, as modified at the request of the Cook County Transportation and Highways Department and as finally approved by the Cook County Transportation and Highways Department.
5. Upon completion of the Permitted Work, Owner shall, at its own cost, and in a timely manner, (but in no event more than 30 days unless another time frame is directed by the Cook County Transportation and Highways Department) restore the Public Way substantially to the same condition in which it was before the Permitted Work was commenced and shall remove all debris, rubbish, materials, apparatus, tools, and equipment, as well as all excess excavated materials, from the Public Way, all to the satisfaction of the Cook County Superintendent of Transportation and Highways.
6. Should future construction and operation of the highways by the County of Cook require alteration or relocation of the Owner's Facilities, such change shall be made by the Owner, its successor or assigns upon the written request of the Cook County Superintendent of Transportation and Highways without expense to said County or State. Requirements for any such requested alteration or relocation are further detailed in the Ordinance.
7. Owner, its successor and assigns assume all risk and liability for accidents and damages that may accrue to persons and property, during the prosecution of the work or any time thereafter, by reason of the location, construction, installation, operation, maintenance, repair and work referred to herein, and Owner, by acceptance of this Permit, agrees to indemnify and save harmless the County of Cook from any such claims for damages and from all costs and expenses incurred on account thereof and in connection therewith.

8. No changes, alterations, or revisions to the Permitted Work are allowed unless approved in writing by the Cook County Superintendent of Transportation and Highways or his designee. See Ordinance for detailed requirements and fees relating to permit modifications.
9. In accordance with Ordinances of the County, and agreement by the Owner, the Owner acknowledges and agrees that this Permit is null and void if the Owner is delinquent in the payment of any tax or fee administered by the County of Cook.
10. The pavement, parkway, and all drainage systems shall be kept clean and free of debris at all times.
11. Unless particularly specified in the Permit, no equipment other than pneumatic-tired equipment used during the installation shall be permitted to stop or operate on the pavement nor shall any excavated materials be stored temporarily or otherwise on the County Highway pavement.
12. Access to driveways, houses, buildings or other property abutting the site of the Permitted Work shall not be blocked.
13. The Owner shall conduct its operations in a manner so as to insure the minimum hindrance to traffic.
14. The use of flagmen and the number, type, color, size and placement of all traffic control devices shall conform to the latest edition of the State of Illinois "Manual on Uniform Traffic Control Devices for Streets and Highways."
15. All aerial lines crossings or parallel must have a minimum clearance of 18'3".
16. This Permit covers only the Permitted Work and does not release the Owner from fulfilling the requirements of any other Laws relating to the Permitted Work. Fulfillment by Owner of all requirements set forth in the Permit For Work Application and its instructions, including without limitation, insurance and bonding requirements ("Application Requirements") are a condition of this Permit. Issuance of this Permit, without the fulfillment of all Application Requirements by Owner shall not act as a waiver of Owner's obligation to comply with such Application Requirements, unless approval in writing of such change is given by the Cook County Superintendent of Transportation and Highways.
17. At least two (2) days advance notice prior to the start of work shall be given to the Cook County Transportation and Highways Department Permit Office, (312) 603-1670.
18. This Permit can be revoked pursuant to the terms of the Ordinance or at the discretion of the Cook County Superintendent of Transportation and Highways.
19. All trenches and openings made in the Public Way shall be backfilled with sand or limestone screening adequately compacted in accordance with Method 1 specified in Article 550.07 of the State Standard Specifications.
20. All pavement openings and curb cuts shall be saw cut full depth.
21. All pavement openings shall be immediately surfaced with a temporary bituminous patch at least three inches in thickness. This patch then must be inspected daily and additional bituminous patch material must be placed, daily if necessary, to maintain the patched area at the same elevation as the adjacent undisturbed pavement for a period of not less than 30 days. After 30 days, permanent replacement in kind shall be made to the base course and pavement surface.

22. All auger pits shall be a minimum of 10 feet from the edge of pavement or back of curb, and wood or steel sheeting shall be used, and auger pits left open overnight shall be protected with concrete barrier walls.
23. All casings shall be pressure grouted both inside and outside of the casing.
24. That a minimum depth of 42 inches will be maintained from the ground surface to the top of the conduit, cable, or pipe and a minimum depth of 36 inches from the true flow line of the drainage ditch to the top of the conduit, cable or pipe.
25. That all excavation work within three (3) feet of the pavement edge will be done manually.
26. If Owner discovers during the progress of the Permitted Work that subterranean conditions prohibit the construction of said improvement in and along the alignment as outlined in the plans, it is expressly understood that all Permitted Work shall cease until a proposed revised alignment has been approved by the Cook County Transportation and Highways Department and the Permit has been modified.
27. Without further action, the Cook County Transportation and Highways Department reserves the right to make connections to the proposed storm sewer for the purpose of draining the highway.
28. The Owner shall be responsible for providing positive drainage.
29. In the removal of sidewalks, curb, gutter or pavement, the use of any type of concrete breaker that will damage the underground structures will not be permitted.
30. Owner shall provide and maintain at its own expense, such temporary roads and approaches, as may be necessary to provide access to driveways, houses, buildings or other property abutting the site of the Permitted Work.
31. For driveway installations, the Owner shall remove earth to its full depth, starting at the edge of the pavement, for the full dimensions of the proposed driveway, and replace with materials to be used in the construction of the driveway.
32. When existing traffic control signs such as stop signs, stop ahead signs, and crossroad signs are removed in the progress of the Permitted Work, said signs shall be immediately reset as close as possible to their original location. After the construction of the Facility or the completion of the Permitted Work has been approved, said traffic control signs shall be restored to their original position and condition or as directed by the Cook County Transportation and Highways Department Permit Engineer.
33. The Owner shall conduct its operations in a manner so as to insure the minimum hindrance to traffic, using the pavement and at no time shall its operations obstruct more than one half (1/2) of the available pavement width.
34. This Permit is issued with the express understanding that the Owner has obtained the proper authority for the said installation from the "Illinois Environmental Protection Agency Division of Public Water Supplies.

**C.C.D.O.T.H. CONSTRUCTION NOTES**  
**(For placement of P.C.C. pavement, median, and curb and gutter)**

1. All construction shall be done in accordance with the latest version of the I.D.O.T. standard specifications for road and bridge construction.
2. Saw cut the full depth of pavement, median, and curb and gutter at the limits of removal.
3. Pavement composition shall be 10 inch P.C. concrete pavement with pavement fabric on 6-inch subbase granular material, type B.
4. Construct pavement fabric in accordance with I.D.O.T. standard 420701 and provide 3 ½ inches of clearance between the pavement surface and the top of the fabric.
5. Where the proposed pavement or type C-4 median abuts the existing pavement longitudinally, provide a tied longitudinal construction joint in accordance with I.D.O.T. standard 420001, using ¾ inch diameter tie bars at 24 inch centers.
6. Where the proposed pavement or type C-4 median abuts the existing pavement or type C-4 median transversally, provide a transverse joint in accordance with I.D.O.T. standard 442101, using 1 ½ inch diameter dowel bars at 12 inch centers.
7. Provide transverse sawed contraction joints every 15 (fifteen) feet in accordance with I.D.O.T. standard 420001, using 1 ½ inch diameter dowel bars at 12-inch centers, and align proposed joints with existing joints. If a proposed joint is located less than 10 feet from an existing joint, then the existing pavement or type C-4 median shall be removed and replaced up to the existing joint.
8. Pavement patches shall be class B, constructed in accordance with I.D.O.T. standard 442101, and shall extend the full width of the existing lane(s). Where patching more than one lane width, provide a tied longitudinal joint (construction or sawed) between lanes. C.C.D.O.T.H. construction notes 1 through 7 shall apply to the construction of class B patches.
9. Construct curb and gutter in accordance with I.D.O.T. standard 606001. Provide a tied longitudinal construction joint in accordance with I.D.O.T. standard 420001, using ¾ inch diameter tie bars at 24 inch centers.
10. Construct type C-4 and type M-7 medians in accordance with the C.C.D.O.T.H. median standard.
11. Placement of catch basins along type M-7 median shall be in accordance with the C.C.D.O.T.H. policy for draining type M-7 median standard.
12. Where a median opening is provided, the pavement shall be crowned at the centerline using a one percent cross slope.
13. Include all applicable I.D.O.T. and C.C.D.O.T.H. standards in the plans.

**ASPHALT PATCH STANDARD**

1. Pavement opening shall be saw-cut to the full depth of the pavement at the limits of removal and must extend 1 foot beyond each side of the trench excavation. Patch width shall be either 6 feet (from edge to center of lane or, from center of lane to centerline) or 12 feet (full lane width).
2. Pavement patch composition shall be 1½ in. Hot-Mix Asphalt Surface Course, Mix “D”, IL-12.5 or 9.5, N70\*, 2¼ in. Hot Mix Asphalt Binder Course, IL-19.0, N70\*\* and 9 in. Hot-Mix Asphalt Binder Course, IL-19.0, N50\*\*\* over 6 in. Sub base Granular Material, Type B, per I.D.O.T. Specifications.
  - \* Allowable RAP is 10%, 4% Design Air Voids
  - \*\* Allowable RAP is 15%, 4% Design Air Voids
  - \*\*\* Allowable RAP is 25%, 4% Design Air Voids
3. All trenches within Cook County R.O.W. shall be trench backfilled with FA-6 sand in accordance with Article 550.07 of the State Standard Specifications.

Revised

# Contractor \$20,000 Bond and Insurance A Requirements for Cook County Permit

## Bond:

1. The contractor shall send a letter to Cook County per the directions in the "Bond and Insurance Requirement Form 20." See Form 20 below. To get a copy of Form 20 see page 5.

COOK COUNTY DEPARTMENT OF TRANSPORTATION AND  
HIGHWAYS PERMIT DIVISION

BOND AND INSURANCE REQUIREMENTS

BEFORE BOND AND INSURANCE REQUIREMENTS ARE ISSUED, THE GENERAL CONTRACTOR MUST SUBMIT A SIGNED LETTER ON COMPANY STATIONARY STATING THE FOLLOWING:

Contractor Address:

Contractor Phone Number:

"(Name of Contractor) is the contractor responsible for all work performed in Permit (#00-00-0000)." I understand that if there is an open cut in the pavement the bond shall remain with the Cook County Department of Transportation and Highways for one year after the construction work is completed.

Upon receipt of the "CONTRACTOR LETTER," bond forms and insurance requirements will be forwarded by the Permit Office.

GENERAL CONTRACTOR SHOULD SUBMIT INSURANCE SPECIFIED FOR PERMIT. IN

THE EVENT THE INSURANCE EXPIRES OR IS CANCELED PRIOR TO THE COMPLETION OF THE PERMIT, THE PROJECT WILL BE STOPPED UNTIL INSURANCE COVERAGE IS SUFFICIENT.

Insurance coverage shall be with insurance companies licensed to do business in the State of Illinois and are subject to approval by the County Insurance Coordinator.

Contractor and/or Insurance Companies must notify this office when there is a change of address, and/or change of Insurance Company. The Permit number must always be on all correspondence.

CURRENT CERTIFICATE OF INSURANCE MUST REMAIN ON FILE UNTIL RELEASE OF BOND.

### BOND FORMS

Must be properly executed with signature of officers of company and have corporate seal. If contractor is sole beneficiary, it should be stated on the bond.

BONDS WILL NOT BE RELEASED UNTIL INSURANCE REQUIREMENTS ARE MET.

If you have any questions, please contact Mr. Michael Sterr, Permits Division Head at 312-603-1670.

Form 20

2. Note, in addition to the required statement on the above form 20 the contractor letter must provide the contractor address for Cook County to mail the bond form and the contractor phone number for Cook County to call for questions

- Once the contractor letter is sent to Cook County, Cook County will generate an original "Highway Permit Bond Form 24" for the contractor, emboss the bond and mail it to the contractor. If time is of the essence the contractor can come and pick up the bond. See Highway Permit Bond example below.



**COUNTY OF COOK**  
**DEPARTMENT OF TRANSPORTATION & HIGHWAYS** Permit # \_\_\_\_\_  
**CHICAGO, ILLINOIS**  
**HIGHWAY PERMIT BOND** Bond # \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that we \_\_\_\_\_

as principal and \_\_\_\_\_  
(NAME AND ADDRESS OF SURETY CO.)

as surety, are held and firmly bound unto The County of Cook, a body politic and corporate of the State of Illinois, in the penal sum of **Twenty Thousand and no cents** dollars, (**\$20,000.00**) lawful money of the United State of America, for the payment of which sum of money, well and truly to be made, we bind ourselves, our heirs, executors and administrators or our successors and assigns, jointly or severally, firmly by these presents.

Signed, sealed and dated this \_\_\_\_ day of \_\_\_\_\_ A.D. 2015

WHEREAS, The County of Cook of the State of Illinois is about to grant to the principal permission and authority to construct, install, operate and maintain certain installations, work or improvements in, under, along or upon a certain highway in Cook County, Illinois, identified as:

COUNTY HIGHWAY \_\_\_\_\_ SECTION \_\_\_\_\_  
 and specified in application by the principal dated \_\_\_\_\_ day of \_\_\_\_\_ A.D. 2015 for a highway permit.

NOW, the condition of the above obligation is such that if the said principal shall do the work as described in said permit and upon completion of same shall, within 10 days, at ITS own cost, restore said highway substantially to the same condition in which it was before said work was commenced, and shall remove all debris, rubbish, materials, apparatus, tools and equipment as well as all excess excavated materials from the right of way of said highway, all to the satisfaction of the County Superintendent of Transportation and Highways for The County of Cook, and shall indemnify and save harmless The County of Cook against all claims for damages to persons or property on account of the prosecution of said work, and the construction, location, operation and maintenance of the proposed installations work or improvements; also, against all costs and expenses which may be incurred by The County of Cook on account of or in connection with such claims, then the above obligation to be void, otherwise to remain in full force and effect.

**NOTE: UPON COMPLETION OF SAID WORK THE CONTRACTOR MUST REQUEST, IN WRITING, FOR A FINAL INSPECTION AND RELEASE OF THIS BOND. THIS BOND WILL REMAIN IN FULL FORCE AND EFFECT UNTIL SAID BOND IS RELEASED, IN WRITING, BY THE SUPERINTENDENT OF TRANSPORTATION AND HIGHWAYS, COOK COUNTY, ILLINOIS. THIS BOND IS HELD FOR ONE YEAR AFTER JOB IS COMPLETED IF PERMIT REQUIRES AN OPEN CUT IN THE PAVEMENT.**

ATTEST **A F F I X S E A L** \_\_\_\_\_

BY \_\_\_\_\_  
PRESIDENT (CORPORATION)

\_\_\_\_\_  
SECRETARY (CORPORATION)

\_\_\_\_\_  
SURETY

**A F F I X S E A L**

BY \_\_\_\_\_  
ATTORNEY IN FACT

APPROVED AS TO FORM: May 1, 1989 COOK COUNTY STATE'S ATTORNEY

FORM 24

The contractor name on the bond should match exactly to the contractor name on the insurance cert or one of the many names the company does business as on

- The contractor shall have the bond properly executed with signature of the officers of the company and the company corporate seal and return it back to Cook County via mail or hand deliver. Note the bond has to be the original Highway Permit Bond that was sent out the contractor and the Contractor's original bond attachments.

## Insurance Cert.:

1. The contractor shall follow the insurance requirements in the "Bond and Insurance Requirement Form 20" See Form 20 below.

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COOK COUNTY DEPARTMENT OF TRANSPORTATION AND  
HIGHWAYS PERMIT DIVISION

BOND AND INSURANCE REQUIREMENTS

BEFORE BOND AND INSURANCE REQUIREMENTS ARE ISSUED, THE GENERAL CONTRACTOR MUST SUBMIT A SIGNED LETTER ON COMPANY STATIONARY STATING THE FOLLOWING:

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Upon receipt of the "CONTRACTOR LETTER," bond forms and insurance requirements will be forwarded by the Permit Office.

GENERAL CONTRACTOR SHOULD SUBMIT INSURANCE SPECIFIED FOR PERMIT. IN

THE EVENT THE INSURANCE EXPIRES OR IS CANCELED PRIOR TO THE COMPLETION OF THE PERMIT, THE PROJECT WILL BE STOPPED UNTIL INSURANCE COVERAGE IS SUFFICIENT.

Insurance coverage shall be with insurance companies licensed to do business in the State of Illinois and are subject to approval by the County Insurance Coordinator.

Contractor and/or Insurance Companies must notify this office when there is a change of address, and/or change of Insurance Company. The Permit number must always be on all correspondence.

CURRENT CERTIFICATE OF INSURANCE MUST REMAIN ON FILE UNTIL RELEASE OF BOND.

BOND FORMS

Must be properly executed with signature of officers of company and have corporate seal. If contractor is sole beneficiary, it should be stated on the bond.

BONDS WILL NOT BE RELEASED UNTIL INSURANCE REQUIREMENTS ARE MET.

If you have any questions, please contact Mr. Michael Sterr, Permits Division Head at 312-603-1670.

Form 20

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- a. The contractor name on the Insurance should match exactly to the contractor name on the bond.
- b. General Liability: Must meet the minimum limits on the right side of the page.
- c. Must state "XCU Underground Explosion and Collapse Hazard coverage is included in the General Liability." This statement can also be located in the "Description of Operations/Location/vehicles/Exclusions added by Endorsement/Special Provisions" section.
- d. Automobile Liability: Must have Any Auto checked or three other boxes checked. If a contractor can only check two boxes and the contractor does not own any vehicles they can submit a letter on company letterhead stating they do not own any vehicles to meet the third requirement.

In addition must meet the minimum limits on the right side of the page.

- e. Automobile Liability Bodily Injury and Property Damage can be covered in Automobile Liability Combined Single Limit (ea accident) \$1,000,000 or Bodily Injury (per incident) \$1,000,000 and Property Damage (per incident) \$500,000.
- f. Workers Compensation and Employer's Liability: Must meet the minimum limits on the right side of the page.
- g. Must state "Cook County Additional Insured for Permit 00-00-0000-C." or alternate option "Cook County Additional Insured under the General Liability and Automobile Liability for Permit 00-00-0000-C"
- h. Certificate Holder must be Cook County Department of Transportation and Highways, Permit Office (Room 2345), 69 West Washington Street, Chicago, IL 60602

All forms can be found on the Cook County Permit website <http://www.cookcountyil.gov/department-of-transportation-and-highways/permits/> . See screen shot below.



**Contact Permits Office**

Email: [hwy.permits@cookcountyil.gov](mailto:hwy.permits@cookcountyil.gov)  
 Mail: Permit Office – Cook County Department of Transportation and Highways  
 69 W. Washington Street, 23rd Floor  
 Chicago, Illinois 60602-3007  
 Phone: (312) 603.1670  
 Fax: (312) 603.9943

**Construction/Maintenance Permits**

**IMPORTANT NOTICE** All permit applicants will be required to submit an Affidavit of Child Support Obligations form with their permit application as of January 1, 2014. See Permit Application form.

Construction/maintenance permits are issued by the Permits Office of the Cook County Department of Transportation and Highways when any work is required within Cook County highway right of way. Type of work includes, but is not limited to, residential or commercial access, street entrances, roadway widening, regrading ditch or storm or sanitary sewers, water mains, sidewalk, bike paths, informational signage, traffic signals, plantings, soil borings, monitoring wells, road closures, road detour, and parades.

Utility companies, such as Commonwealth Edison, AT&T and Nicor, may apply for utility permits to work within the Cook County Department of Transportation and Highways Right of Way under the existing agreement. The designated personnel of these companies may submit applicable documents to the Permit Office.

**Construction Permit Packet**

[Construction Permit Information Packet](#)

Contains all required construction permit documents listed below.  
 All documents can be downloaded together in this file or downloaded individually below.

The Construction Permits Information Packet contains the following documents:

- [General Requirements](#)  
Information and documents required to submit an application for a construction permit.
- [Permit Application Form](#) - Application form to obtain construction permit.
- [Bond and Insurance Requirements](#)  
Details the bond and insurance requirements when applying for a construction permit.
- [Insurance Form Sample A](#)  
Sample for Certificate of Insurance for individual construction permit.
- [Insurance Form Sample C](#)  
Sample for Certificate of Insurance for multiple permits commonly used for pipeline/cable/fiber optic companies and private utilities.
- [General Conditions](#)

Bond and Insurance Requirements,  
Insurance Form Sample A



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: Village of Schaumburg Plum Grove Road Improvement Office Phone Number, if available: \_\_\_\_\_

Physical Site Location (address, including number and street):

Plum Grove Road from Stonewall Court to Golf Road

City: Schaumburg State: IL Zip Code: 60173

County: Cook Township: Schaumburg

Lat/Long of approximate center of site in decimal degrees (DD.ddddd) to five decimal places (e.g., 40.67890, -90.12345):

Latitude: 42.045717 Longitude: -88.060162

(Decimal Degrees) (-Decimal Degrees)

Identify how the lat/long data were determined:

GPS  Map Interpolation  Photo Interpolation  Survey  Other

Google Earth

IEPA Site Number(s), if assigned: \_\_\_\_\_ BOL: \_\_\_\_\_ BOW: \_\_\_\_\_ BOA: \_\_\_\_\_

### II. Owner/Operator Information for Source Site

Site Owner

Site Operator

Name: Village of Schaumburg

Name: Village of Schaumburg

Street Address: 714 S. Plum Grove Road

Street Address: 714 S. Plum Grove Road

PO Box: \_\_\_\_\_

PO Box: \_\_\_\_\_

City: Schaumburg State: IL

City: Schaumburg State: IL

Zip Code: 60193 Phone: 847-895-7100

Zip Code: 60193 Phone: 847-895-7100

Contact: Margo Killian

Contact: Margo Killian

Email, if available: mkillian@ci.schaumburg.il.us

Email, if available: mkillian@ci.schaumburg.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: Village of Schaumburg Plum Grove Road Improv

Latitude: 42.045717 Longitude: -88.060162

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):

Soil Borings, SB-01, SB-03 through SB-11, SB-13 through SB-15, SB-17, and SB-19 through SB-23 are covered under this Certification form. Soil Borings were installed at appropriate intervals within the Plum Grove Rd. right-of-way along the proposed construction alignment extending from Stonewall Ct. to Golf Rd., Schaumburg, IL. See Attached Soil Sample Location Exhibits.

- 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]:

See attached Soil Sample Location Exhibits, Laboratory Analytical Data Table, Laboratory Analytical Report and the Environmental Data Resources Radius Map Report

**IV. Certification Statement, Signature and Seal of Licensed Professional Engineer or Licensed Professional Geologist**

I, Donald H. Palmer Jr. (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: Baxter & Woodman, Inc.

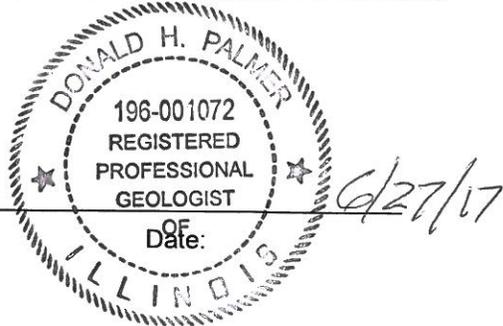
Street Address: 8678 Ridgefield Road

City: Crystal Lake State: IL Zip Code: 60014

Phone: 815-459-1260

Donald H. Palmer Jr.  
Printed Name:

*Donald H. Palmer Jr.*  
 Licensed Professional Engineer or  
 Licensed Professional Geologist Signature:



P.E. or L.P.G. Seal:

## 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	ASTM D 1621	50 - 70	70 - 90
at 5% deformation		45 - 60	60 - 80
at 2% deformation		15 - 20	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  $\pm 0.063$  in. ( $\pm 1.6$  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  $\pm 0.063$  in. ( $\pm 1.6$  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

## 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  $\pm$  1/4 in. ( $\pm$  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 <sup>1/</sup> , percent	ASTM D 638	7.3 min.
Durometer Hardness, Shore D	ASTM D 2240	65
Heat Deflection Temperature, 66 psi	ASTM D 648	176 °F (80 °C)
Low Temperature Brittleness, F <sub>50</sub>	ASTM D 746	<-105 °F (<-76 °C)

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:

$$\text{ETCP Adjustment (\$)} = \text{TE} \times (\% / 100 \times \text{CUP} / \text{OCT})$$

Extended Traffic Control occurs between December 1 and March 31:

$$\text{ETCP Adjustment (\$)} = \text{TE} \times 1.5 (\% / 100 \times \text{CUP} / \text{OCT})$$

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."

## 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 <sup>1/</sup>	600-749	2002
	750 and up	2006
June 1, 2011 <sup>2/</sup>	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006
June 1, 2012 <sup>2/</sup>	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

## **DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (DBE)**

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 21.00 % 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](mailto: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, then 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 may request administrative reconsideration of a decision to deduct the amount of the goal not achieved as liquidated damages. A request to reconsider shall be delivered to the Contract Compliance Section and shall be handled and considered in the same manner as set forth in paragraph (c) of "Good Faith Effort Procedures" of this Special Provision, except a final decision that a good faith effort was not made during contract performance to achieve the goal agreed to in the Utilization Plan shall be the final administrative decision of the Department. The result of the reconsideration process is not administratively appealable to the U.S. Department of Transportation.

## **EQUIPMENT PARKING AND STORAGE (BDE)**

Effective: November 1, 2017

Replace the first paragraph of Article 701.11 of the Standard Specifications with the following.

**“701.11 Equipment Parking and Storage.** During working hours, all vehicles and/or nonoperating equipment which are parked, two hours or less, shall be parked at least 8 ft (2.5 m) from the open traffic lane. For other periods of time during working and for all nonworking hours, all vehicles, materials, and equipment shall be parked or stored as follows.

- (a) When the project has adequate right-of-way, vehicles, materials, and equipment shall be located a minimum of 30 ft (9 m) from the pavement.
- (b) When adequate right-of-way does not exist, vehicles, materials, and equipment shall be located a minimum of 15 ft (4.5 m) from the edge of any pavement open to traffic.
- (c) Behind temporary concrete barrier, vehicles, materials, and equipment shall be located a minimum of 24 in. (600 mm) behind free standing barrier or a minimum of 6 in. (150 mm) behind barrier that is either pinned or restrained according to Article 704.04. The 24 in. or 6 in. measurement shall be from the base of the non-traffic side of the barrier.
- (d) Behind other man-made or natural barriers meeting the approval of the Engineer.”

80388

## HOT-MIX ASPHALT - DENSITY TESTING OF LONGITUDINAL JOINTS (BDE)

Effective: January 1, 2010

Revised: August 1, 2018

Description. This work shall consist of testing the density of longitudinal joints as part of the quality control/quality assurance (QC/QA) of hot-mix asphalt (HMA). Work shall be according to Section 1030 of the Standard Specifications except as follows.

Quality Control/Quality Assurance (QC/QA). Delete the second and third sentence of the third paragraph of Article 1030.05(d)(3) of the Standard Specifications.

Add the following paragraphs to the end of Article 1030.05(d)(3) of the Standard Specifications:

“Longitudinal joint density testing shall be performed at each random density test location. Longitudinal joint testing shall be located at a distance equal to the lift thickness or a minimum of 4 in. (100 mm), from each pavement edge. (i.e. for a 5 in. (125 mm) lift the near edge of the density gauge or core barrel shall be within 5 in. (125 mm) from the edge of pavement.) Longitudinal joint density testing shall be performed using either a correlated nuclear gauge or cores.

- a. Confined Edge. Each confined edge density shall be represented by a one-minute nuclear density reading or a core density and shall be included in the average of density readings or core densities taken across the mat which represents the Individual Test.
- b. Unconfined Edge. Each unconfined edge joint density shall be represented by an average of three one-minute density readings or a single core density at the given density test location and shall meet the density requirements specified herein. The three one-minute readings shall be spaced 10 ft (3 m) apart longitudinally along the unconfined pavement edge and centered at the random density test location.

When a longitudinal joint sealant (LJS) is applied, longitudinal joint density testing will not be required on the joint(s) sealed.”

Revise the Density Control Limits table in Article 1030.05(d)(4) of the Standard Specifications to read:

“Mixture Composition	Parameter	Individual Test (includes confined edges)	Unconfined Edge Joint Density Minimum
IL-4.75	Ndesign = 50	93.0 – 97.4% <sup>1/</sup>	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 <sup>2/</sup> – 97.4%	90.0%

SMA	Ndesign = 50 & 80	93.5 – 97.4%	91.0%”
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80246

**HOT-MIX ASPHALT – OSCILLATORY ROLLER (BDE)**

Effective: August 1, 2018

Add the following to Article 406.03 of the Standard Specifications:

“(j) Oscillatory Roller .....1101.01”

Revise Table 1 and Note 3/ of Table 1 in Article 406.07(a) of the Standard Specifications to read:

“TABLE 1 - MINIMUM ROLLER REQUIREMENTS FOR HMA				
	Breakdown Roller (one of the following)	Intermediate Roller	Final Roller (one or more of the following)	Density Requirement
Level Binder: (When the density requirements of Article 406.05(c) do not apply.)	P <sup>3/</sup>	--	V <sub>S</sub> , P <sup>3/</sup> , T <sub>B</sub> , T <sub>F</sub> , 3W, O <sub>T</sub>	To the satisfaction of the Engineer.
Binder and Surface <sup>1/</sup>  Level Binder <sup>1/</sup> : (When the density requirements of Article 406.05(c) apply.)	V <sub>D</sub> , P <sup>3/</sup> , T <sub>B</sub> , 3W, O <sub>T</sub> , O <sub>B</sub>	P <sup>3/</sup> , O <sub>T</sub> , O <sub>B</sub>	V <sub>S</sub> , T <sub>B</sub> , T <sub>F</sub> , O <sub>T</sub>	As specified in Articles: 1030.05(d)(3), (d)(4), and (d)(7).
IL-4.75 and SMA <sup>4/5/</sup>	T <sub>B</sub> , 3W, O <sub>T</sub>	--	T <sub>F</sub> , 3W, O <sub>T</sub>	
Bridge Decks <sup>2/</sup>	T <sub>B</sub>	--	T <sub>F</sub>	As specified in Articles 582.05 and 582.06.

3/ A vibratory roller (V<sub>D</sub>) or oscillatory roller (O<sub>T</sub> or O<sub>B</sub>) may be used in lieu of the pneumatic-tired roller on mixtures containing polymer modified asphalt binder.”

Add the following to EQUIPMENT DEFINITION in Article 406.07(a) contained in the Errata of the Supplemental Specifications:

“O<sub>T</sub> - Oscillatory roller, tangential impact mode. Maximum speed is 3.0 mph (4.8 km/h) or 264 ft/min (80 m/min).

O<sub>B</sub> - Oscillatory roller, tangential and vertical impact mode, operated at a speed to produce not less than 10 vertical impacts/ft (30 impacts/m).”

Add the following to Article 1101.01 of the Standard Specifications:

“(h) Oscillatory Roller. The oscillatory roller shall be self-propelled and provide a smooth operation when starting, stopping, or reversing directions. The oscillatory roller shall be able to operate in a mode that will provide tangential impact force with or without vertical impact force by using at least one drum. The oscillatory roller shall be equipped with water tanks and sprinkling devices, or other approved methods, which shall be used to wet the drums to prevent material pickup. The drum(s) amplitude and frequency of the tangential and vertical impact force shall be approximately the same in each direction and meet the following requirements:

- (1) The minimum diameter of the drum(s) shall be 48 in. (1200 mm);
- (2) The minimum length of the drum(s) shall be 66 in. (1650 mm);
- (3) The minimum unit static force on the drum(s) shall be 125 lb/in. (22 N/m);
- (4) The minimum force on the oscillatory drum shall be 18,000 lb (80 kN); and
- (5) Self-adjusting eccentrics, and reversible eccentrics on non-driven drum(s).”

80399

## **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:

<u>Product</u>	<u>Current Standard</u>	<u>Previous Standard</u>
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

## **MAST ARM ASSEMBLY AND POLE (BDE)**

Effective: August 1, 2018

Revise the first sentence of Article 1077.03(b) of the Standard Specifications to read:

“Anchor rods shall be according to Article 1006.09, Grade 105, and shall be threaded a minimum of 7 1/2 in. (185 mm) at one end and threaded a minimum of 2 in. (50 mm) with matching hex head nut at the other end.”

80400

## PAVEMENT MARKING BLACKOUT TAPE (BDE)

Effective: November 1, 2014

Revised: April 1, 2016

Revise the fourth paragraph of Article 701.04 of the Standard Specifications to read:

“The traffic control shall remain in place only as long as needed and shall be removed when directed by the Engineer. Signs that do not apply to current conditions shall be removed, covered, or turned from the view of motorists. All existing pavement markings which conflict with the revised traffic pattern shall be removed according to Section 783 or when specified, temporarily covered with pavement marking blackout tape. The width of blackout tape shall be at least 1 in. (25 mm) wider than the width of the pavement marking being covered. The removing or covering of existing markings shall be scheduled immediately to facilitate the revised traffic pattern. If darkness or inclement weather prohibits the removal or covering operations, such operations shall be resumed the next morning or when weather permits.”

Revise Article 701.19(f) of the Standard Specifications to read:

“(f) Removal of existing pavement markings and raised reflective pavement markers will be measured for payment according to Article 783.05. Temporary covering of existing pavement markings with blackout tape will be measured for payment in feet (meters) in place. Removal of blackout tape will be measured for payment in square feet (square meters).”

Revise Article 701.20(j) of the Standard Specifications to read:

“(j) Removal of existing pavement markings and raised reflective pavement markers will be paid for according to Article 783.06. Temporary covering of existing pavement markings with blackout tape will be paid for at the contract unit price per foot for PAVEMENT MARKING BLACKOUT TAPE, of the line width specified.” Removal of blackout tape will be paid for as short term pavement marking removal according to Article 703.07.”

Revise the first two paragraphs of Article 1095.06 of the Standard Specifications to read:

“**1095.06 Pavement Marking Tape.** White or yellow marking tape shall consist of glass spheres of high optical quality embedded into a binder on a suitable backing that is precoated with a pressure sensitive adhesive. The spheres shall be of uniform gradation and distributed evenly over the surface of the tape. Blackout marking tape shall be a Type III tape consisting of a matte black, non-reflective, patterned surface that is precoated with a pressure sensitive adhesive. The surface of the blackout pavement marking tape shall provide a minimum skid resistance value of 45 BPN when tested according to ASTM E 303-74.

The material shall be white, yellow, or matte black as specified. White and yellow colors shall conform closely to Federal color tolerances for pavement marking paint.”

Revise the second table of Article 1095.06 to read:

"Test	Type I		Type III		
	White	Yellow	White	Yellow	Blackout
Initial Thickness, mils (mm)	20 (0.51)	20 (0.51)	20 (0.51)	20 (0.51)	65 (1.65) <sup>1/</sup> 10 (0.25) <sup>2/</sup>
Durability (cycles)	5,000	5,000	1,500	1,500	1,500

Notes:

1/ Measured at the thickest point of the patterned surface.

2/ Measured at the thinnest point of the patterned surface."

80349

**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

## **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<sub>L</sub>**

Color	R <sub>L</sub> 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

## 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  $\pm 2$  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

**REQUIRED CONTRACT PROVISIONS  
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

**ATTACHMENTS**

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

**I. GENERAL**

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor

performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

**II. NONDISCRIMINATION**

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

**1. Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection

for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

**2. EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

**3. Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

**4. Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

**5. Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

## **6. Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

**7. Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

**8. Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

**9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

#### **10. Assurance Required by 49 CFR 26.13(b):**

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

**11. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#).

The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

### **III. NONSEGREGATED FACILITIES**

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

### **IV. DAVIS-BACON AND RELATED ACT PROVISIONS**

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

#### **1. Minimum wages**

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each

classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a

separate account assets for the meeting of obligations under the plan or program.

## 2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

## 3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee ( e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and trainees

##### a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice

performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

##### b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

##### d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

**5. Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

**6. Subcontracts.** The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

**7. Contract termination: debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8. Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

**9. Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

#### **10. Certification of eligibility.**

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

#### **V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT**

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

**1. Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one

and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

**2. Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

**3. Withholding for unpaid wages and liquidated damages.** The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

**4. Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

#### **VI. SUBLETTING OR ASSIGNING THE CONTRACT**

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

## **VII. SAFETY: ACCIDENT PREVENTION**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

## **VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

## **IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

## **X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

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

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

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

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

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

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contractor). "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 contractor). "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.

