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Letting August 3, 2018

Notice to Bidders, Specifications and Proposal



**Illinois Department
of Transportation**

Springfield, Illinois 62764

**Contract No. 61E16
COOK County
Section 14-00115-01-PV (Schaumburg)
Route FAU 2582 (Plum Grove Road)
Project X5CP-010 ()
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. 61E16
COOK County
Section 14-00115-01-PV (Schaumburg)
Project X5CP-010 ()
Route FAU 2582 (Plum Grove Road)
District 1 Construction Funds**

Reconstruction of Plum Grove Road from Wiley Road to Golf Road (IL 58) 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

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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	251	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	253	X 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	255	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	256	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	260	X Construction Air Quality – Diesel Retrofit	June 1, 2010	Nov. 1, 2014
80387		Contrast Preformed Plastic Pavement Marking	Nov. 1, 2017	
* 80029	263	X Disadvantaged Business Enterprise Participation	Sept. 1, 2000	April 2, 2018
80378		Dowel Bar Inserter	Jan. 1, 2017	Jan. 1, 2018
80388	274	X Equipment Parking and Storage	Nov. 1, 2017	
80229	275	X Fuel Cost Adjustment	April 1, 2009	Aug. 1, 2017
80304		Grooving for Recessed Pavement Markings	Nov. 1, 2012	Nov. 1, 2017
* 80246	278	X Hot-Mix Asphalt – Density Testing of Longitudinal Joints	Jan. 1, 2010	Aug. 1, 2018
* 80398	280	X Hot-Mix Asphalt – Longitudinal Joint Sealant	Aug. 1, 2018	
* 80399	284	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	286	X Hot-Mix Asphalt – Tack Coat	Nov. 1, 2016	
80392	287	X Lights on Barricades	Jan. 1, 2018	
80336		Longitudinal Joint and Crack Patching	April 1, 2014	April 1, 2016
* 80393	289	X Manholes, Valve Vaults, and Flat Slab Tops	Jan. 1, 2018	March 2, 2018
* 80400		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		Pavement Marking Blackout Tape	Nov. 1, 2014	April 1, 2016
80371	291	X Pavement Marking Removal	July 1, 2016	
80390	292	X Payments to Subcontractors	Nov. 2, 2017	
80377	293	X Portable Changeable Message Signs	Nov. 1, 2016	April 1, 2017
80389	294	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	295	X	Portland Cement Concrete Sidewalk	Aug. 1, 2017	
80300			Preformed Plastic Pavement Marking Type D - Inlaid	April 1, 2012	April 1, 2016
80328	296	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	297	X	Subcontractor and DBE Payment Reporting	April 2, 2018	
80391	298	X	Subcontractor Mobilization Payments	Nov. 2, 2017	
80317			Surface Testing of Hot-Mix Asphalt Overlays	Jan. 1, 2013	April 1, 2016
80298	299	X	Temporary Pavement Marking (NOTE: This special provision was previously named "Pavement Marking Tape Type IV".)	April 1, 2012	April 1, 2017
20338	302	X	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	305	X	Warm Mix Asphalt	Jan. 1, 2012	April 1, 2016
80302	307	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	

STATE OF ILLINOIS

SPECIAL PROVISIONS

The following Special Provisions supplement the specifications listed in the table below, which apply to and govern the proposed improvement designated as Section 14-00115-01-PV, Contract No 61E16 and in case of conflict with any part or parts of said specifications; the said Special Provisions shall take precedence and govern.

All construction shall be done in accordance with:

- A. "Standard Specifications for Road and Bridge Construction", Adopted April 1, 2016:
- B. "Supplemental Specifications and Recurring Special Provisions", Adopted January 1, 2018
- C. Latest Edition of the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways" (IMUTCD)
- D. "Standard Specifications for Water and Sewer Main Construction in Illinois" June 2014 Seventh Edition
- E. Latest Edition of the Manual of Test Procedure of Materials
- F. "Special Provisions" Included in the Contract Documents
- G. All Permits
- H. The "Natural Resources Conservation Service Technical Guide and Engineering Field Manual"
- I. The "Illinois Urban Manual", and the "Illinois Urban Manual Field Manual for Inspection of Erosion and Sediment Control Best Management Practices"
- J. Americans With Disabilities Act of 1990 Accessibility Guidelines.
- K. The "American Standards for Nursery Stock ANSI Z60.1-2014", Approved April 14, 2014
- L. The Illinois Department of Transportation Geotechnical Manual, December 15, 2015
- M. The "Draft" Rehabilitation Act of 1973 (Section 504)
- N. The Public Rights-of-Way Accessibility Guidelines

LOCATION OF PROJECT

General Project limits are Plum Grove Rd [PGR] from IL Rte 58-Golf Rd (north pavement edge) to Wiley Rd, Remington Rd - 650' crossing PGR, State Pkwy 1100' crossing PGR, Wiley Rd 300' crossing PGR, in the Village of Schaumburg, Cook County, Illinois. Geographically, the study area is located in Sections E10, S2, N14, and W12, Township 41 North, Range 10, East of the Third Principal Meridian Lat 42°03'17" Long 88°03'36". The net and gross length is 3,906 feet (0.74 miles).

DESCRIPTION OF PROJECT

The work consists of removal of roadway, sidewalk, path, lighting, driveways, and landscaping. Other elements include full depth HMA pavement, concrete medians, concrete truck aprons, roundabouts, road diet, storm sewer, retaining walls, lighting, landscaping, conflict resolution improvements to water main, conflict resolution improvements to sanitary sewer, sidewalks, shared use paths, driveways, pavement marking, segmental block walls, signage, tree removal/replacement, and lighting, and all incidental and collateral work necessary to complete the project as shown on the plans and special provisions. This project does not include in-stream work, or impacts to wetlands or Waters of the US.

STATUS OF UTILITIES (D-1)

Effective: June 1, 2016

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

UTILITIES TO BE ADJUSTED

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

Pre-Stage

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
STA 47+75	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 48+86	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 50+10	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 51+40	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 51+25 to STA 54+25	Modification to existing facilities	Expose existing transmission line pipe and install protective boilerplate	ComEd Transmission	10 days for ComEd contractor to expose pipe and install protective boilerplate
STA 54+46	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 55+75 to STA 56+25	Modification to existing facilities	Expose existing transmission line pipe and install protective boilerplate	ComEd Transmission	10 days for ComEd contractor to expose pipe and install protective boilerplate
STA 57+39	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 65+25	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 65+73	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 66+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 66+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
STA 71+92	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 83+40	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
Station 47+50 to 48+00 (east of PGR CL), Station 48+75 to Station 49+25 (east of PRG CL)	Level(3) facility relocation	Expose and shift ducts 2.0 feet to the east	Level(3)	2 days required at each location

Station 53+50 to 55+50 (west of PGR CL)	Level(3) facility relocation	Expose existing Level(3) and lower conduits in place	Level(3)	3 days required
Station 55+00 to Station 56+00 (west of PGR CL)	Level(3) Facility relocation	Install new handhole behind PR curb south of Remington Road, directional bore underneath Remington Road, install new handhole north of Remington Road	Level(3)	4 days required
Station 170+00 to Station 172+00 (north of Remington CL)	Level(3) Facility relocation	Directional bore on north side of Remington Road approximately 200 feet, install new handhole in parkway, tie into existing Level(3)	Level(3)	8 days required
Station 170+00 to Station 172+00 (north of Remington CL)	Windstream Facility relocation	Install new handhole south side of Remington Road, directional bore underneath Remington Road, bore 200 feet along north side of Remington Road, tie into existing Windstream	Windstream	10 days required
Station 56+00 to Station 57+50 (west of PGR CL)	Windstream Facility relocation	Directional bore 161 feet along west side of PGR, install new handhole at 57+50 west side of PGR, tie into existing Windstream	Windstream	8 days required

<p>Station 139+50 to Station 142+00 (north of State Parkway CL)</p>	<p>Windstream Facility relocation</p>	<p>Install handhole to tie into existing Windstream south side of State Parkway at Station 139+50, directional bore underneath State Parkway, directional bore 261 feet along north side of State Parkway, tie into existing</p>	<p>Windstream</p>	<p>10 days required</p>
<p>Station 171+50 to Station 173+50 (south of Remington Road CL)</p>	<p>XO/Verizon Facility relocation</p>	<p>Tie into existing XO/Verizon facility at Station 171+50, open cut and directional bore to Station 173+50, tie into existing facility at Station 173+50, remove existing XO/Verizon handholes after facility is moved, install proposed handholes at Station 171+50 and Station 173+50</p>	<p>XO/Verizon</p>	<p>10 days required</p>
<p>Sta 46+00</p>	<p>Relocation</p>	<p>Connect from pole to existing cabinets</p>	<p>WOW</p>	<p>2 days required</p>
<p>Sta 53+80 across Plum Grove Rd north on Remington Rd to Sta 172+54</p>	<p>Relocation</p>	<p>Relocate (2)-1.5" conduit</p>	<p>WOW</p>	<p>10 days required</p>

Sta 66+15 to Sta 67+97	Relocation	Relocate (2)-1.5" conduit	WOW	10 days required
Anticipated Relocation Across Golf Road	Relocation	Relocate (6)-4" across Golf Road pending system proofing. Anticipated open trench with lane closures	WOW	20 days required
System Wide	Splicing	Splicing and cutover work	WOW	15 days required
Plum Grove Rd/ State Pkwy Int.	Conduit/Cable/ Handhole	Relocation	VINAKOM	21 Days Total Installation
Plum Grove Rd Remington Rd State Parkway	Conduit/cable	Relocations (TBD)	AT&T Distribution	30 Days Total Installation.
Plum Grove Rd Remington Rd State Parkway	Conduit/cable	Relocations (TBD)	AT&T TCG- LNS	30 Days Total Installation.
Plum Grove Rd Remington Rd State Parkway	Conduit/cable	Relocations (TBD)	Comcast	30 Days Total Installation.
Plum Grove Rd Remington Rd State Parkway	Conduit/cable	Relocations (TBD)	MCI-Verizon	30 Days Total Installation.
Plum Grove Rd Remington Rd State Parkway	8" gas main, 6" gas main	Relocations (TBD)	Nicor Gas	60 Days Total Installation.

Total days installation for ComEd Transmission in Pre-Stage: 80 days
 Total days installation for Level(3) in Pre-Stage: 19 days
 Total days installation for Windstream in Pre-Stage: 28 days
 Total days installation for XO/Verizon in Pre-Stage: 10 days
 Total days installation for WOW in Pre-Stage: 57 days
 Total days installation for VINAKOM in Pre-Stage: 21 days
 Total days installation for AT&T Distribution in Pre-Stage: 30 days
 Total days installation for AT&T TCG-LNS in Pre-Stage: 30 days
 Total days installation for Comcast in Pre-Stage: 30 days
 Total days installation for MCI-Verizon in Pre-Stage: 30 days
 Total days installation for Nicor Gas in Pre-Stage: 60 days

Stages 1 & 2A

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
MH #s 434114003 434114004 434114002 434114001 434112003 434112006 434112008	ComEd Manhole	Lid Adjustment	ComEd Distribution	Contact Pete Kratzer for ComEd Manhole Lid Adjustments ~10 Days Installation
1 – 2A	Relocation	1,532 LF 12-5” PVC installed via open cut trench and associated cable cut overs	ComEd Distribution	~25 Days Total Installation
1 – 2A	Relocation	Approx 200 LF of 9-5” PVC shifted 4.5’ horizontally	ComEd Distribution	~10 Days Total Installation
1 – 2A	Relocation	13 new ComEd poles installed, 14 existing ComEd poles removed	ComEd Distribution	~20 Days Total Installation
Sta. 172+60	Handhole removal	Existing buried handhole at Sta. 172+60 to be removed	MCI-Verizon Business	1 to 2 days work.

1 – 2A	Relocation	243 LF of 1-5" PVC installed via directional bore and associated cable cut overs	ComEd Distribution	~10 Days Total Installation
MH # 434113001 STA 64+00	ComEd Manhole	Lid Adjustment	ComEd Transmission	1 day for ComEd contractor to complete frame and cover adjustments
1 – 2A	Relocation	134 LF of 1-5" PVC installed via directional bore and associated cable cut overs	ComEd Distribution	~15 Days Total Installation
1 – 2A	Relocation	Approx 200 LF of 6-5" PVC shifted 3' vertically	ComEd Distribution	~10 Days Total Installation
MH #s 434113006 434114005 434111005	ComEd Manhole	Lid Adjustment	ComEd Distribution	Contact Pete Kratzer for ComEd Manhole Lid Adjustments ~5 Days Installation

Total days installation for ComEd Distribution in Stage 1-2A: 106 days
 Total days installation for MCI-Verizon Business in Stage 1-2A: 1-2 days

Stage 2B

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
Station 62+50 to Station 63+00 (west of PGR CL)	Windstream Facility watch and protect	Watch and protect during water main construction	Windstream	5 days required
2B	Relocation	480 LF 10-5" PVC installed via open cut trench and associated cable cut overs	ComEd Distribution	~15 Days Total Installation

2B	Relocation	4 new ComEd poles installed, 4 existing ComEd poles removed	ComEd Distribution	~8 Days Total Installation
Sta. 169+95 to Sta. 175+54 along Remington Rd.	Proposed Directional Bore	Propose 756' of new directional bore 1-4" HDPE with 3-1.25" innerduct and 1-72 FOC from existing handhole at Sta. 169+95 to intersection point at Sta. 175+54 and placed proposed handhole.	MCI-Verizon Business	Estimated 2 week construction

Total days installation for Windstream in Stage 2B: 5 days

Total days installation for ComEd Distribution in Stage 2B: 23 days

Total days installation for MCI-Verizon Business in Stage 2B: 14 days

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.

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

Agency/Company Responsible to Resolve Conflict	Name of contact	Address	Phone	e-mail address
AT&T (Distribution)	Bruce Robbins	1000 Commerce Dr. Floor 1 Oak Brook, IL	Bus (630) 573-6471	BR1831@att.com
AT&T (TCG-LNS)	Bobby Akhter	4531 Western Ave. Lisle, IL 60532	Bus (630) 719-1483	ba3817@att.com
<i>"Facilities within AT&T ducts, to be reloc/adj by AT&T"</i> Teleport Communications America LLC	Mark Schwabe	CCSI Networks 2649 Gardner Road Broadview, IL 60155	Bus Mobile (630) 478-3147	mschwabe@cgroupmail.com

Comcast	Martha Gieras	688 Industrial Dr. Elmhurst, IL	Bus (630) 600-6352 Mobile (630) 600-6390	martha_gieras@ cable.comcast.com
ComEd Transmission	Joseph W. Lureau, P.E.	2 Lincoln Center Oakbrook Terrace, IL	Bus (630) 437-2803	joseph.lureau@ comed.com
ComEd Distribution	Pete Kratzer [Hugo Silva]	Facility Relocation Dept. 1 Lincoln Centre – Suite 600 Oakbrook Terrace, IL 60181	Bus (708) 518-6209 [(630) 437- 3182] Mobile [(630) 441- 4025]	Peter.Kratzer@ ComEd.com [hugo.silva@ comed.com]
MCI-Verizon Business	Thomas E. Buher	7719 W. Summit, IL 60501	Bus (708) 458-6410	Thomas.buher@ verizon.com
Telecom Eng. Representing - MCI	Sandra B. Cisneros	220 S. Hasted Ave. Chicago, IL 60661	Bus (312) 612-5216	Scisneros@telecom- eng.com
Level 3 Communications	Reece Conrad	1305 E. Algonquin Rd Arlington Heights, IL 60005	Bus (847) 954-8204 Mobile (312) 833-8164	reece.conrad@ level3.com
Nicor Gas	Bruce Koppang	1844 Ferry Rd. Naperville, IL 60563-9600	Bus (630) 388-046	bkoppan@ aglresources.com
“No Facilities within Project Limits” TDS Metrocom, LLC	Matthew Schulte	16924 West Victor Road New Berlin, WI 53151	Bus (262) 754-3063 Mobile (262) 409-1177	Matt.schulte@ tdstelecom.com
VinaKom Communications	Dicky Patel	860 Remington Road Schaumburg, IL 60173	Bus (847) 592-5785	dicky.patel@ vinakom.com

WOW Internet & Cable	Christopher Kasallis	1674 Frontenac Rd. Naperville, IL 60563	Bus (630) 486-9038	c_kasallis10@wideopenwest.com
XO	Mel Conn	810 Jorie Blvd. Oak Brook, IL 60523	Bus (630) 371-3108	mel.conn@xo.com
Windstream	Lakisha Johnson	929 Marthas Way Hiawatha, IA 52233	Bus (501) 748-4433	Lakisha.Johnson@Windstream.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

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER	ACTION
Stage 1	Watch and Protect	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 2A

STAGE / LOCATION	TYPE	DESCRIPTION	OWNER	ACTION
Stage 2A	Watch and Protect	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 2B

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
Stage 2B	Watch and Protect	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

STAGE / LOCATION	TYPE	DESCRIPTION	RESPONSIBLE AGENCY	ACTION
Stage 3	Watch and Protect	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

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.

ARTICLE 105.09 – PAVEMENT MARKING PAINT

In addition to the requirements of Article 105.09 of the Standard Specifications, the CONTRACTOR shall furnish (included in the cost of mobilization) white, pink or purple pavement marking paint in aerosol cans, for use by the ENGINEER. The CONTRACTOR and SUBCONTRACTORS shall only use these same colors for their own markings, therefore, not using J.U.L.I.E. utility colors.

ARTICLE 108.05 – COMPLETION DATE WITH INTERIM COMPLETION DATES

This is a completion date with interim completion dates contract. The first interim completion date is **December 14, 2018**; all work up to and including Stage 1 work shall be completed prior to December 14, 2018. During Winter Shut-Down (December 14, 2018 to March 1, 2019) Contractor shall provide and maintain lanes, all entrances, sidewalk, and bike paths as shown in the STAGE 1-WINTER plan sheets. During winter shut-down, weather dependent, Contractor may work on watermain and box culvert installation as noted in Maintenance of Traffic notes. It is anticipated that all asphalt/pavement marking work be completed, and all Winter Shut-Down traffic lanes open to traffic prior to November 16, 2018.

The second interim completion date is **July 26, 2019**; all work up to and including Stage 2A and all work up to and including Stage 2B work shall be completed prior to July 26, 2018.

Standard working hours shall be from 7am to 7pm Monday through Saturday. If Contractor wants to work outside of these hours, the Contractor shall have prior written approval in response to Contractor's written request for specific time periods with the associated additional traffic control/protection items (such as night time work zone lighting, flaggers, etc) to be used at no additional cost to the Contract.

After the completion date, an additional TEN working days will be allowed to complete punch list items.

All work shall be completed by **November 15, 2019**.

ARTICLE 108.09 – FAILURE TO COMPLETE THE WORK ON TIME

Append each occurrence of “completion date” with: “and interim completion dates”.

AVAILABLE REPORTS

No project specific reports were prepared.

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

- Record structural plans
- Preliminary Site Investigation (PSI)
- Preliminary Environmental Site Assessment (PESA)
- Soils/Geotechnical Report
- Boring Logs
- Pavement Cores
- Location Drainage Study (LDS)
- Hydraulic Report
- Noise Analysis
- Other: _____

Those seeking these reports should request access from:

Kristin L. Mehl, P.E. Senior Civil Engineer
Village of Schaumburg Engineering and Public Works Department
714 South Plum Grove Road, Schaumburg, Illinois 60193
847-923-6618 | 847-923-2386 (Fax)
(Hours: 10 AM to 2PM (Mon-Fri))

COOPERATION WITH ADJACENT CONSTRUCTION

The intent of this provision is to inform the Contractor that the Village is aware of adjacent roadway construction projects that are currently scheduled during the same time period as this contract.

Plum Grove Road: IL Route 72 (Higgins Rd) to IL Route 58 (Golf Road)
Section no 14-00115-00-PV
Plans by: Baxter & Woodman, Inc. Anticipated spring 2018 construction start

State and National Parkway: Plum Grove Road to IL Route 58 (Golf Road)
Section no 15-00119-00-PV
Plans by: Civiltech Engineering, Inc. Anticipated spring 2019 construction start

The Contractor is to cooperate with these adjacent federally funded roadway construction projects and their associated private utility relocations in accordance with Section 105.08 of the Standard Specifications and may be required to modify his/her staging operations in order to meet these requirements.

TRAFFIC CONTROL PLAN

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

Special attention is called to Articles 107.09 of the Standard Specifications and the following Highway Standards, Details, Quality Standard for Work Zone Traffic Control Devices, Recurring Special Provisions and Special Provisions contained herein, relating to traffic control. Any detour requests for side street construction shall conform to the MUTCD and be approved by the Engineer.

The Contractor shall contact the Village and District 1 Bureau of Traffic at least 72 hours in advance of beginning work.

Highway Standards:

701001-02	Off-road Operations, 2L, 2W, More Than 15' Away
701006-05	Off-road Operations, 2L, 2W, 15' to 24' From Pavement Edge
701011-04	Off-road Moving Operations, 2L, 2W, Day Only
701101-05	Off-road Operations, Multilane, 15' to 24' From Pavement Edge
701301-04	Lane Closure, 2L, 2W, Short Time Operations
701311-03	Lane Closure, 2L, 2W, Moving Operations - Day Only
701427-05	Lane Closure, Multilane, Intermittent or Moving Oper. For Speeds < 40mph
701501-06	Urban Lane Closure, 2L, 2W, Undivided
701502-08	Urban Lane Closure, 2L, 2W, with Bidirectional Left Turn Lane
701601-09	Urban Lane Closure, Multilane, 1W or 2W with Nontraversable Median
701602-09	Urban Lane Closure, Multilane, 2W with Bidirectional Left Turn Lane
701701-10	Urban Lane Closure, Multilane Intersection
701801-06	Sidewalk, Corner or Crosswalk Closure
701901-07	Traffic Control Devices
704001-08	Temporary Concrete Barrier
720001-01	Sign Panel Mounting Details
720006-04	Sign Panel Erection Details
720011-01	Metal Posts for Signs, Markers and Delineators
728001-01	Telescoping Steel Sign Support
729001-01	Applications of Types A and B Metal Posts (For Signs & Markers)
731001-01	Base for Telescoping Steel Sign Support
780001-05	Typical Pavement Markings

Details:

	Maintenance of Traffic Plan Sheets
	Construction Details Sheets
TC-10	Traffic Control and Protection for Side Roads, Intersections and Driveways
TC-13	District One Typical Pavement Markings
TC-16	Short-Term Pavement Marking Letters and Symbols

TC-21	Detour Signing for Closing State Highways
TC-22	Arterial Road Information Sign
TC-26	Driveway Entrance Signing
TS-07	Detector Loop Installation Details for Roadway Resurfacing

Special Provisions:

TRAFFIC CONTROL AND PROTECTION (ARTERIALS) (D-1)
TEMPORARY INFORMATION SIGNING
MAINTENANCE OF ROADWAYS (D-1)
PUBLIC CONVENIENCE AND SAFETY (D-1)
PORTABLE CHANGEABLE MESSAGE SIGNS (BDE)
TEMPORARY PAVEMENT MARKING (BDE)
PAVEMENT MARKING REMOVAL (BDE)
LIGHTS ON BARRICADES (BDE)
EQUIPMENT PARKING AND STORAGE (BDE)

AGGREGATE SUBGRADE IMPROVEMENT (D-1)

Effective: February 22, 2012

Revised: April 1, 2016

Add the following Section to the Standard Specifications:

“SECTION 303. AGGREGATE SUBGRADE IMPROVEMENT

303.01 Description. This work shall consist of constructing an aggregate subgrade improvement.

303.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a)Coarse Aggregate	1004.07
(b)Reclaimed Asphalt Pavement (RAP) (Notes 1, 2 and 3)	1031

Note 1. Crushed RAP, from either full depth or single lift removal, may be mechanically blended with aggregate gradation CS 01 but shall not exceed 40 percent by weight of the total product. The top size of the Coarse RAP shall be less than 4 in. (100 mm) and well graded.

Note 2. RAP having 100 percent passing the 1 1/2 in (37.5 mm) sieve and being well graded, may be used as capping aggregate in the top 3 in. (75 mm) when aggregate gradation CS 01 is used in lower lifts. When RAP is blended with any of the coarse aggregates, the blending shall be done with mechanically calibrated feeders. The final product shall not contain more than 40 percent by weight of RAP.

Note 3. The RAP used for aggregate subgrade improvement shall be according to the current Bureau of Materials and Physical Research Policy Memorandum, “Reclaimed Asphalt Pavement (RAP) for Aggregate Applications”.

303.03 Equipment. The vibratory machine shall be according to Article 1101.01, or as approved by the Engineer. The calibration for the mechanical feeders shall have an accuracy of ± 2.0 percent of the actual quantity of material delivered.

303.04 Soil Preparation. The stability of the soil shall be according to the Department’s Subgrade Stability Manual for the aggregate thickness specified.

303.05 Placing Aggregate. The maximum nominal lift thickness of aggregate gradation CS 01 shall be 24 in. (600 mm).

303.06 Capping Aggregate. The top surface of the aggregate subgrade shall consist of a minimum 3 in. (75 mm) of aggregate gradations CA 06 or CA 10. When Reclaimed

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

303.07 Compaction. All aggregate lifts shall be compacted to the satisfaction of the Engineer. If the moisture content of the material is such that compaction cannot be obtained, sufficient water shall be added so that satisfactory compaction can be obtained.

303.08 Finishing and Maintenance of Aggregate Subgrade Improvement. The aggregate subgrade improvement shall be finished to the lines, grades, and cross sections shown on the plans, or as directed by the Engineer. The aggregate subgrade improvement shall be maintained in a smooth and compacted condition.

303.09 Method of Measurement. This work will be measured for payment according to Article 311.08.

303.10 Basis of Payment. This work will be paid for at the contract unit price per cubic yard (cubic meter) for AGGREGATE SUBGRADE IMPROVEMENT or at the contract unit price per square yard (square meter) for AGGREGATE SUBGRADE IMPROVEMENT, of the thickness specified.

Add the following to Section 1004 of the Standard Specifications:

“1004.07 Coarse Aggregate for Aggregate Subgrade Improvement. The aggregate shall be according to Article 1004.01 and the following.

- (a) Description. The coarse aggregate shall be crushed gravel, crushed stone, or crushed concrete. The top 12 inches of the aggregate subgrade improvement shall be 3 inches of capping material and 9 inches of crushed gravel, crushed stone or crushed concrete. In applications where greater than 36 inches of subgrade material is required, rounded gravel, meeting the CS01 gradation, may be used beginning at a depth of 12 inches below the bottom of pavement.
- (b) Quality. The coarse aggregate shall consist of sound durable particles reasonably free of deleterious materials. Non-mechanically blended RAP may be allowed up to a maximum of 5.0 percent.
- (c) Gradation.
 - (1) The coarse aggregate gradation for total subgrade thicknesses of 12 in. (300 mm) or greater shall be CS 01.

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

COARSE AGGREGATE SUBGRADE GRADATIONS (Metric)					
Grad No.	Sieve Size and Percent Passing				
	200 mm	150 mm	100 mm	50 mm	4.75 mm
CS 01	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20

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

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 course for any operation that may disturb or remove the temporary access. The same type and gradation of material used to construct the temporary access shall be used to maintain it.

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

Add the following to Article 402.12 of the Standard Specifications:

“Aggregate surface course for temporary access will be measured for payment 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 (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.”

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 + 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.

GENERAL ELECTRICAL REQUIREMENTS (D-1)

Effective: April 1, 2016

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Type of Work (discipline)	Item
All Electrical Work	Electric Service Metering Emergency Standby System Transformers Cable Unit Duct Splices Conduit Surge Suppression System
Lighting	Tower Pole Luminaire Foundation Breakaway Device Controllers Control Cabinet and Peripherals
ITS	Controller Cabinet and Peripherals

	CCTV Cameras Camera Structures Ethernet Switches Detectors Detector Loop Fiber Optic Cable
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Within 30 calendar days after contract execution, the Contractor shall submit, for approval, one copy each of the manufacturer's product data (for standard products and components) and detailed shop drawings (for fabricated items). Submittals for the materials for each individual pay item shall be complete in every respect. Submittals which include multiple pay items shall have all submittal material for each item or group of items covered by a particular specification, grouped together and the applicable pay item identified. Various submittals shall, when taken together, form a complete coordinated package. A partial submittal will be returned without review unless prior written permission is obtained from the Engineer.

The submittal shall be properly identified by route, section, county, and contract number.

The Contractor shall have reviewed the submittal material and affixed his/her stamp of approval, with date and signature, for each individual item. In case of subcontractor submittal, both the subcontractor and the Contractor shall review, sign, and stamp their approval on the submittal.

Illegible print, incompleteness, inaccuracy, or lack of coordination will be grounds for rejection.

Items from multiple disciplines shall not be combined on a single submittal and transmittal. Items for lighting, signals, surveillance and CCTV must be in separate submittals since they may be reviewed by various personnel in various locations.

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

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

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

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

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

Authorized Project Delay. See Article 801.08

Maintenance transfer and Preconstruction Inspection:

General. 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
 - 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.
- 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.
- All fiber optic slack locations shall be identified with quantity of slack cable included. When sequential cable markings are available, those markings shall be documented as cable marking into enclosure and marking out of enclosure.

Datum to be used shall be North American 1983.

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

1. District
2. Description of item
3. Designation
4. Use
5. Approximate station
6. Contract Number
7. Date
8. Owner
9. Latitude
10. Longitude
11. Comments

A spreadsheet template will be available from the Engineer for use by the Contractor.

Prior to the collection of data, the contractor shall provide a sample data collection of at least six data points of known locations to be reviewed and verified by the Engineer to be accurate within 20 feet. Upon verification, data collection can begin.

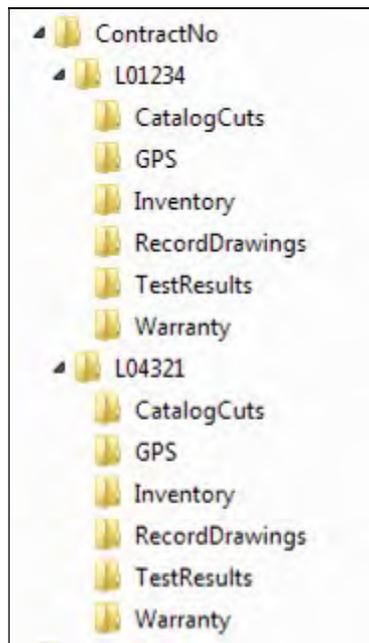
Data collection can be made as construction progresses, or can be collected after all items are installed. If the data is unacceptable the contractor shall make corrections to the data collection equipment and or process and submit the data for review and approval as specified. **Data collection prior to the submittal and review of the sample data of existing data points will be unacceptable and rejected.**

Accuracy. Data collected is to be mapping grade. A handheld mapping grade GPS device shall be used for the data collection. The receiver shall support differential correction and data shall have minimum 5 meter accuracy after post processing.

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

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

The documents on the CD shall be organized by the Electrical Maintenance Contract Management System (EMCMS) location designation. If multiple EMCMS locations are within the contract, separate folders shall be utilized for each location as follows:



Extraneous information not pertaining to the specific EMCMS location shall not be included in that particular folder and sub-folder.

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

The Final Acceptance Documentation Checklist shall be completed and is contained

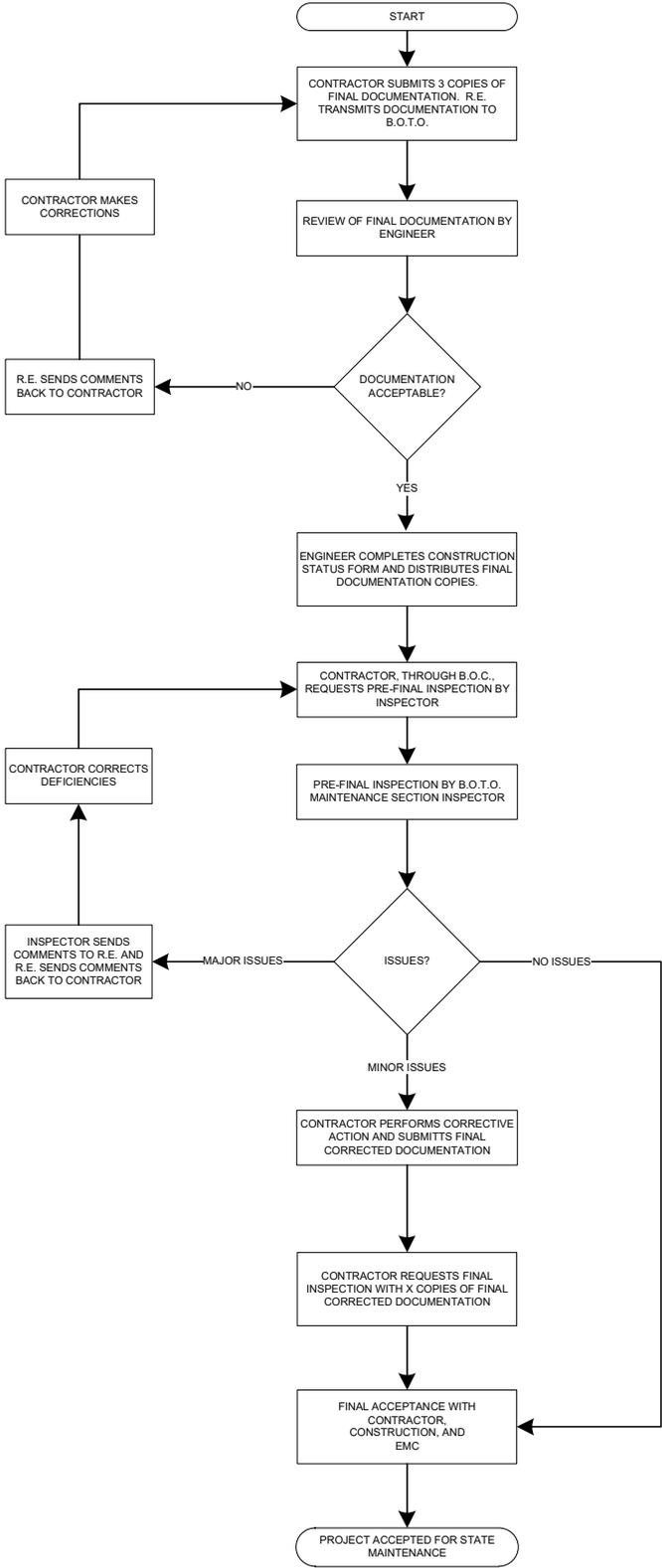
elsewhere herein.

All CD's shall be labeled as illustrated in the CD Label Template contained herein.

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

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

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



Final Acceptance Documentation Checklist

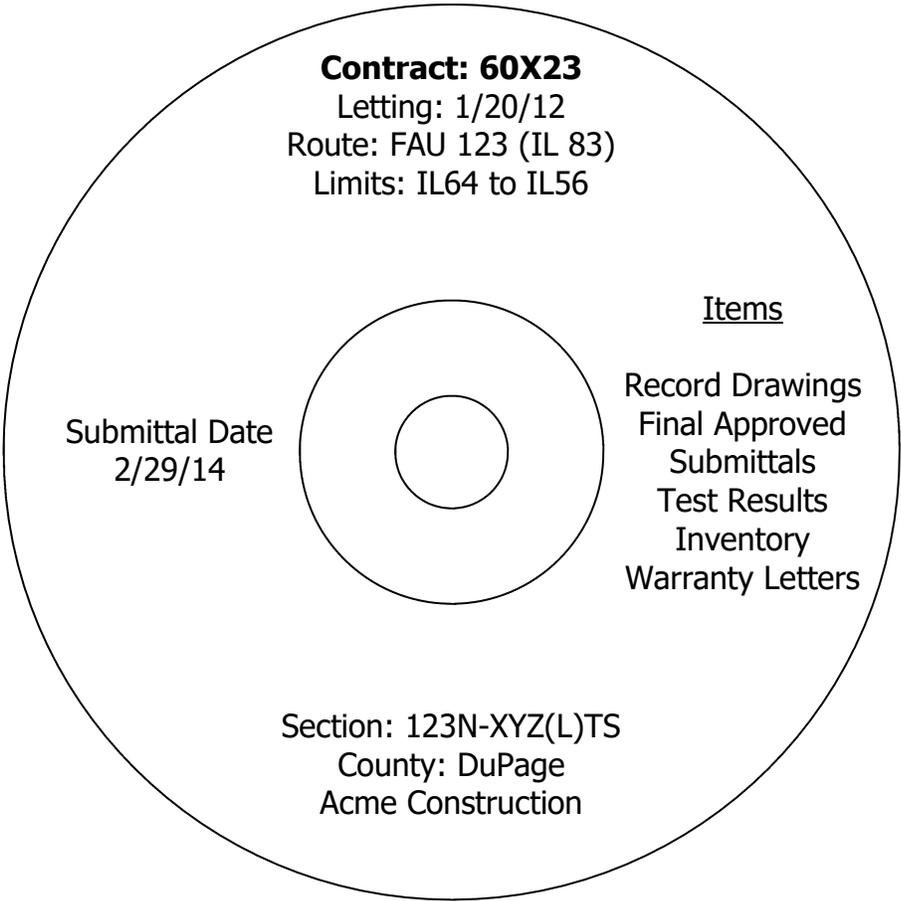
LOCATION	
Route	Common Name
Limits	Section
Contract #	County
Controller Designation(s)	EMC Database Location Number(s)

ITEM	Contractor (Verify)	Resident Engineer (Verify)
Record Drawings		
-Five hardcopies (11" x 17")	<input type="checkbox"/>	<input type="checkbox"/>
-Scanned to Five CD-ROMs	<input type="checkbox"/>	<input type="checkbox"/>
Field Inspection Tests		
-Voltage	<input type="checkbox"/>	<input type="checkbox"/>
-Amperage	<input type="checkbox"/>	<input type="checkbox"/>
-Cable Insulation Resistance	<input type="checkbox"/>	<input type="checkbox"/>
-Continuity	<input type="checkbox"/>	<input type="checkbox"/>
-Controller Ground Rod Resistance	<input type="checkbox"/>	<input type="checkbox"/>
GPS Coordinates		
-Excel file	<input type="checkbox"/>	<input type="checkbox"/>
Job Warranty Letter	<input type="checkbox"/>	<input type="checkbox"/>
Catalog Cut Submittals		
-Approved & Approved as Noted	<input type="checkbox"/>	<input type="checkbox"/>
Lighting Inventory Form	<input type="checkbox"/>	<input type="checkbox"/>
Lighting Controller Inventory Form	<input type="checkbox"/>	<input type="checkbox"/>
Light Tower Inspection Form (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>

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

CD LABEL FORMAT TEMPLATE.

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



ELECTRIC SERVICE INSTALLATION (D-1)

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.

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> ^{5/} : Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag Crushed Concrete
HMA Low ESAL	Stabilized Subbase or Shoulders	<u>Allowed Alone or in Combination</u> ^{5/} : Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag ^{1/} Crushed Concrete
HMA High ESAL Low ESAL	Binder IL-19.0 or IL-19.0L SMA Binder	<u>Allowed Alone or in Combination</u> ^{5/ 6/} : Crushed Gravel Carbonate Crushed Stone ^{2/} Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Concrete ^{3/}

Use	Mixture	Aggregates Allowed								
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> ^{5/} : Crushed Gravel Carbonate Crushed Stone ^{2/} Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag ^{4/} Crushed Concrete ^{3/}								
HMA High ESAL	D Surface and Leveling Binder IL-9.5 SMA Ndesign 50 Surface	<u>Allowed Alone or in Combination</u> ^{5/} : Crushed Gravel Carbonate Crushed Stone (other than Limestone) ^{2/} Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag ^{4/} Crushed Concrete ^{3/} <u>Other Combinations Allowed:</u> <table border="1"> <thead> <tr> <th><i>Up to...</i></th> <th><i>With...</i></th> </tr> </thead> <tbody> <tr> <td>25% Limestone</td> <td>Dolomite</td> </tr> <tr> <td>50% Limestone</td> <td>Any Mixture D aggregate other than Dolomite</td> </tr> <tr> <td>75% Limestone</td> <td>Crushed Slag (ACBF) or Crushed Sandstone</td> </tr> </tbody> </table>	<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
<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> ^{5/ 6/} : Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag No Limestone. <u>Other Combinations Allowed:</u>								

Use	Mixture	Aggregates Allowed	
		<i>Up to...</i>	<i>With...</i>
		50% Dolomite ^{2/}	Any Mixture E aggregate
		75% Dolomite ^{2/}	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone
		75% Crushed Gravel ^{2/} or Crushed Concrete ^{3/}	Crushed Sandstone, Crystalline Crushed Stone, Crushed Slag (ACBF), or Crushed Steel Slag
HMA High ESAL	F Surface IL-9.5 SMA Ndesign 80 Surface	<u>Allowed Alone or in Combination</u> ^{5/ 6/} :	
		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 ^{2/} , Crushed Concrete ^{3/} , or Dolomite ^{2/}	Crushed Sandstone, Crushed Slag (ACBF), Crushed Steel Slag, or Crystalline Crushed Stone

1/ Crushed steel slag allowed in shoulder surface only.

2/ Carbonate crushed stone (limestone) and/or crushed gravel shall not be used in SMA Ndesign 80. In SMA Ndesign 50, carbonate crushed stone shall not be blended with any of the other aggregates allowed alone in Ndesign 50 SMA binder or Ndesign 50 SMA surface.

- 3/ Crushed concrete will not be permitted in SMA mixes.
- 4/ Crushed steel slag shall not be used as leveling binder.
- 5/ When combinations of aggregates are used, the blend percent measurements shall be by volume.”
- 6/ Combining different types of aggregate will not be permitted in SMA Ndesign 80.”

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

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

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

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

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

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

“(c) RAP Materials (Note 5)1031”

Add the following note to 1030.02 of the Standard Specifications:

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

HMA MIXTURE DESIGN REQUIREMENTS (D-1)

Effective: January 1, 2013
 Revised: January 1, 2018

1) Design Composition and Volumetric Requirements

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

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

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

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

1/ CA 16 or CA 13 may be blended with the gradations listed.

2/ The coarse aggregates used shall be capable of being combined with stone sand, slag sand, or steel slag sand meeting the FA/FM 20 gradation and mineral filler to meet the approved mix design and the mix requirements noted herein.

3/ CA 13 shall be 100 percent passing the 1/2 in. (12.5mm) sieve.

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

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

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

“IL-4.75 and Stone Matrix Asphalt (SMA) mixtures which contain aggregate having absorptions greater than or equal to 2.0 percent, or which contain 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) ^{1/} ; HMA Shoulders ^{2/}

1/ Uses 19.0L binder mix.

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

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

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

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

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

Note 2. The asphalt binder shall be an SBS PG 76-28 when the SMA is used on a full-depth asphalt pavement and SBS PG 76-22 when used as an overlay, except

where modified herein. The asphalt binder shall be an Elvaloy or SBS PG 76-22 for IL-4.75, except where modified herein. The elastic recovery shall be a minimum of 80.

Note 3. A stabilizing additive such as cellulose or mineral fiber shall be added to the SMA mixture according to Illinois Modified AASHTO M 325. The stabilizing additive shall meet the Fiber Quality Requirements listed in Illinois Modified AASHTO M 325. Prior to approval and use of fibers, the Contractor shall submit a notarized certification by the producer of these materials stating they meet these requirements. Reclaimed Asphalt Shingles (RAS) may be used in Stone Matrix Asphalt (SMA) mixtures designed with an SBA polymer modifier as a fiber additive if the mix design with RAS included meets AASHTO T305 requirements. The RAS shall be from a certified source that produces either Type I or Type 2. Material shall meet requirements noted herein and the actual dosage rate will be determined by the Engineer.

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

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

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

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

- 1/ Based on percent of total aggregate weight.
- 2/ The mixture composition shall not exceed 44 percent passing the #8 (2.36 mm) sieve for surface courses with Ndesign = 90.
- 3/ Additional minus No. 200 (0.075 mm) material required by the mix design shall be mineral filler, unless otherwise approved by the Engineer.
- 4/ The maximum percent passing the #635 (20 μm) sieve shall be ≤ 3 percent.
- 5/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted above the percentage stated on the table.
- 6/ When establishing the Adjusted Job Mix Formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted below 34 percent.

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

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

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

- 1/ Maximum Draindown for IL-4.75 shall be 0.3 percent
 2/ VFA for IL-4.75 shall be 72-85 percent”

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

- “(3) SMA Mixtures.

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

- 1/ Maximum draindown shall be 0.3 percent. The draindown shall be determined at the JMF asphalt binder content at the mixing temperature plus 30 °F.
 2/ Applies when specific gravity of coarse aggregate is ≥ 2.760.
 3/ Applies when specific gravity of coarse aggregate is < 2.760.

- 4/ Blending of different types of aggregate will not be permitted. For surface course, the coarse aggregate can be crushed steel slag, crystalline crushed stone or crushed sandstone. For binder course, coarse aggregate shall be crushed stone (dolomite), crushed gravel, crystalline crushed stone, or crushed sandstone.

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

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

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

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

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

- (a.) Sufficient collected dust (baghouse) is available for production of the SMA mix for the entire project.
- (b.) A mix design was prepared based on collected dust (baghouse).

2) Design Verification and Production

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

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

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

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

Illinois Modified AASHTO T 324 Requirements ^{1/}

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

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

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

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

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

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

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

“The Hamburg Wheel test shall also be conducted on all HMA mixtures from a sample taken within the first 500 tons (450 metric tons) on the first day of production or during start up with a split reserved for the Department. The mix sample shall be tested according to the Illinois Modified AASHTO T 324 and shall meet the requirements specified herein. Mix production shall not exceed 1500 tons (1350 metric tons) or one day’s production, whichever comes first, until the testing is completed and the mixture is

found to be in conformance. The requirement to cease mix production may be waived if the plant produced mixture demonstrates conformance prior to start of mix production for a contract.

If the mixture fails to meet the Hamburg Wheel criteria, no further mixture will be accepted until the Contractor takes such action as is necessary to furnish a mixture meeting the criteria”

Method of Measurement:

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

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

Basis of Payment.

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

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

MAINTENANCE OF ROADWAYS (D-1)

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.

PUBLIC CONVENIENCE AND SAFETY (D-1)

Effective: May 1, 2012

Revised: July 15, 2012

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

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

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

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

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

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

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 ≤ 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)	± 5 %
No. 30 (600 μm)	± 5 %
No. 200 (75 μm)	± 2.0 %
Asphalt Binder	± 0.3 %
G _{mm}	± 0.03 ^{1/}

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

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

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

With the approval of the Engineer, the ignition oven may be substituted for extractions according to the ITP, “Calibration of the Ignition Oven for the Purpose of Characterizing Reclaimed Asphalt Pavement (RAP)” or Illinois Modified AASHTO T-164-11, Test Method A.

- (b) Evaluation of RAS Test Results. All of the test results, with the exception of percent unacceptable materials, shall be compiled and averaged for asphalt binder content and gradation. A five test average of results from the original pile will be used in the mix designs. Individual test results run thereafter, when compared to the average used for the mix design, will be accepted if within the tolerances listed below.

Parameter	RAS
No. 8 (2.36 mm)	± 5 %
No. 16 (1.18 mm)	± 5 %
No. 30 (600 μm)	± 4 %
No. 200 (75 μm)	± 2.5 %
Asphalt Binder Content	± 2.0 %

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

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

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

The Engineer will notify the Contractor of observed deficiencies.

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

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

1/ Based on washed extraction.

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

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

1031.05 Quality Designation of Aggregate in RAP and FRAP.

- (a) RAP. The aggregate quality of the RAP for homogeneous, conglomerate, and conglomerate "D" quality stockpiles shall be set by the lowest quality of coarse aggregate in the RAP stockpile and are designated as follows.

- (1) RAP from Class I, HMA (High ESAL), or (Low ESAL) IL-9.5L surface mixtures are designated as containing Class B quality coarse aggregate.
- (2) RAP from HMA (Low ESAL) IL-19.0L binder mixture is designated as Class D quality coarse aggregate.

- (3) RAP from Class I, HMA (High ESAL) binder mixtures, bituminous base course mixtures, and bituminous base course widening mixtures are designated as containing Class C quality coarse aggregate.
 - (4) RAP from bituminous stabilized subbase and BAM shoulders are designated as containing Class D quality coarse aggregate.
- (b) FRAP. If the Engineer has documentation of the quality of the FRAP aggregate, the Contractor shall use the assigned quality provided by the Engineer.

If the quality is not known, the quality shall be determined as follows. Fractionated RAP stockpiles containing plus #4 (4.75 mm) sieve coarse aggregate shall have a maximum tonnage of 5,000 tons (4,500 metric tons). The Contractor shall obtain a representative sample witnessed by the Engineer. The sample shall be a minimum of 50 lb (25 kg). The sample shall be extracted according to Illinois Modified AASHTO T 164 by a consultant laboratory prequalified by the Department for the specified testing. The consultant laboratory shall submit the test results along with the recovered aggregate to the District Office. The cost for this testing shall be paid by the Contractor. The District will forward the sample to the Central Bureau of Materials Aggregate Lab for MicroDeval Testing, according to ITP 327. A maximum loss of 15.0 percent will be applied for all HMA applications. The fine aggregate portion of the fractionated RAP shall not be used in any HMA mixtures that require a minimum of "B" quality aggregate or better, until the coarse aggregate fraction has been determined to be acceptable thru a MicroDeval Testing.

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

- (a) FRAP. The use of FRAP in HMA shall be as follows.
- (1) Coarse Aggregate Size (after extraction). The coarse aggregate in all FRAP shall be equal to or less than the nominal maximum size requirement for the HMA mixture to be produced.
 - (2) Steel Slag Stockpiles. FRAP stockpiles containing steel slag or other expansive material, as determined by the Department, shall be homogeneous and will be approved for use in HMA (High ESAL and Low ESAL) mixtures regardless of lift or mix type.
 - (3) Use in HMA Surface Mixtures (High and Low ESAL). FRAP stockpiles for use in HMA surface mixtures (High and Low ESAL) shall have coarse aggregate that is Class B quality or better. FRAP shall be considered equivalent to limestone for frictional considerations unless produced/screened to minus 3/8 inch.

- (4) Use in HMA Binder Mixtures (High and Low ESAL), HMA Base Course, and HMA Base Course Widening. FRAP stockpiles for use in HMA binder mixtures (High and Low ESAL), HMA base course, and HMA base course widening shall be FRAP in which the coarse aggregate is Class C quality or better.
 - (5) Use in Shoulders and Subbase. FRAP stockpiles for use in HMA shoulders and stabilized subbase (HMA) shall be FRAP, Restricted FRAP, conglomerate, or conglomerate DQ.
- (b) RAS. RAS meeting Type 1 or Type 2 requirements will be permitted in all HMA applications as specified herein.
- (c) FRAP and/or RAS Usage Limits. Type 1 or Type 2 RAS may be used alone or in conjunction with FRAP in HMA mixtures up to a maximum of 5.0 percent by weight of the total mix.

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

Max Asphalt Binder Replacement for FRAP with RAS Combination

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

- 1/ For Low ESAL HMA shoulder and stabilized subbase, the percent asphalt binder replacement shall not exceed 50 % of the total asphalt binder in the mixture.
- 2/ When the binder replacement exceeds 15 % for all mixes, except for SMA and IL-4.75, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 % binder replacement using a virgin asphalt binder grade of PG64-22 will be reduced to a PG58-28). When constructing full depth HMA and the ABR is less than 15 %, the required virgin asphalt binder grade shall be PG64-28.

- 3/ When the ABR for SMA or IL-4.75 is 15 % or less, the required virgin asphalt binder shall be SBS PG76-22 and the elastic recovery shall be a minimum of 80. When the ABR for SMA or IL-4.75 exceeds 15%, the virgin asphalt binder grade shall be SBS PG70-28 and the elastic recovery shall be a minimum of 80.
- 4/ When FRAP or RAS is used alone, the maximum percent asphalt binder replacement designated on the table shall be reduced by 10 %.

1031.07 HMA Mix Designs. At the Contractor's option, HMA mixtures may be constructed utilizing RAP/FRAP and/or RAS material meeting the detailed requirements specified herein.

- (a) FRAP and/or RAS. FRAP and /or RAS mix designs shall be submitted for verification. If additional FRAP or RAS stockpiles are tested and found to be within tolerance, as defined under "Evaluation of Tests" herein, and meet all requirements herein, the additional FRAP or RAS stockpiles may be used in the original design at the percent previously verified.
- (b) RAS. Type 1 and Type 2 RAS are not interchangeable in a mix design.

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

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

To remove or reduce agglomerated material, a scalping screen, gator, crushing unit, or comparable sizing device approved by the Engineer shall be used in the RAS and FRAP feed system to remove or reduce oversized material. .

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

- (a) RAS. RAS shall be incorporated into the HMA mixture either by a separate weight depletion system or by using the RAP weigh belt. Either feed system shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes. The portion of RAS shall be controlled accurately to within ± 0.5 percent of the amount of RAS utilized. When using the

weight depletion system, flow indicators or sensing devices shall be provided and interlocked with the plant controls such that the mixture production is halted when RAS flow is interrupted.

(b) HMA Plant Requirements. HMA plants utilizing FRAP and/or RAS shall be capable of automatically recording and printing the following information.

(1) Dryer Drum Plants.

- a. Date, month, year, and time to the nearest minute for each print.
- b. HMA mix number assigned by the Department.
- c. Accumulated weight of dry aggregate (combined or individual) in tons (metric tons) to the nearest 0.1 ton (0.1 metric ton).
- d. Accumulated dry weight of RAS and FRAP in tons (metric tons) to the nearest 0.1 ton (0.1 metric ton).
- e. Accumulated mineral filler in revolutions, tons (metric tons), etc. to the nearest 0.1 unit.
- f. Accumulated asphalt binder in gallons (liters), tons (metric tons), etc. to the nearest 0.1 unit.
- g. Residual asphalt binder in the RAS and FRAP material as a percent of the total mix to the nearest 0.1 percent.
- h. Aggregate RAS and FRAP moisture compensators in percent as set on the control panel. (Required when accumulated or individual aggregate and RAS and FRAP are printed in wet condition.)
- i. When producing mixtures with FRAP and/or RAS, a positive dust control system shall be utilized.
- j. Accumulated mixture tonnage.
- k. Dust Removed (accumulated to the nearest 0.1 ton (0.1 metric ton))

(2) Batch Plants.

- a. Date, month, year, and time to the nearest minute for each print.
- b. HMA mix number assigned by the Department.

- c. Individual virgin aggregate hot bin batch weights to the nearest pound (kilogram).
- d. Mineral filler weight to the nearest pound (kilogram).
- f. RAS and FRAP weight to the nearest pound (kilogram).
- g. Virgin asphalt binder weight to the nearest pound (kilogram).
- h. Residual asphalt binder in the RAS and FRAP material as a percent of the total mix to the nearest 0.1 percent.

The printouts shall be maintained in a file at the plant for a minimum of one year or as directed by the Engineer and shall be made available upon request. The printing system will be inspected by the Engineer prior to production and verified at the beginning of each construction season thereafter.

1031.09 RAP in Aggregate Surface Course and Aggregate Wedge Shoulders, Type

B. The use of RAP or FRAP in aggregate surface course and aggregate shoulders shall be as follows.

- (a) Stockpiles and Testing. RAP stockpiles may be any of those listed in Article 1031.02, except “Non-Quality” and “FRAP”. The testing requirements of Article 1031.03 shall not apply. RAP used shall be according to the current Central Bureau of Materials Policy Memorandum, “Reclaimed Asphalt Pavement (RAP) for Aggregate Applications”.
- (b) Gradation. The RAP material shall meet the gradation requirements for CA 6 according to Article 1004.01(c), except the requirements for the minus No. 200 (75 μ 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 INFORMATION SIGNING (D-1)

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:

	<u>Item</u>	<u>Article/Section</u>
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 REQUIRMENTS

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 (2.1m) 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.

TRAFFIC CONTROL AND PROTECTION (ARTERIALS) (D-1)

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 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.

UNDERGROUND RACEWAYS (D-1)

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.”

WIRE AND CABLE (D-1)

Effective: January 1, 2012

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

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

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

Aerial Electric Cable Properties

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

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

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

Revise Article 1066.04 to read:

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

Revise the second paragraph of Article 1066.05 to read:

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

LUMINAIRE, SODIUM VAPOR, HORIZONTAL MOUNT, 250 WATT (D-1)

Effective: January 1, 2012

Add the following to first paragraph of Article 1067(c) of the Standard Specifications:

“The reflector shall not be altered by paint or other opaque coatings which would cover or coat the reflecting surface. Control of the light distribution by any method other than the reflecting material and the aforementioned clear protective coating that will alter the reflective properties of the reflecting surface is unacceptable”

Add the following to Article 1067(f) of the Standard Specifications:

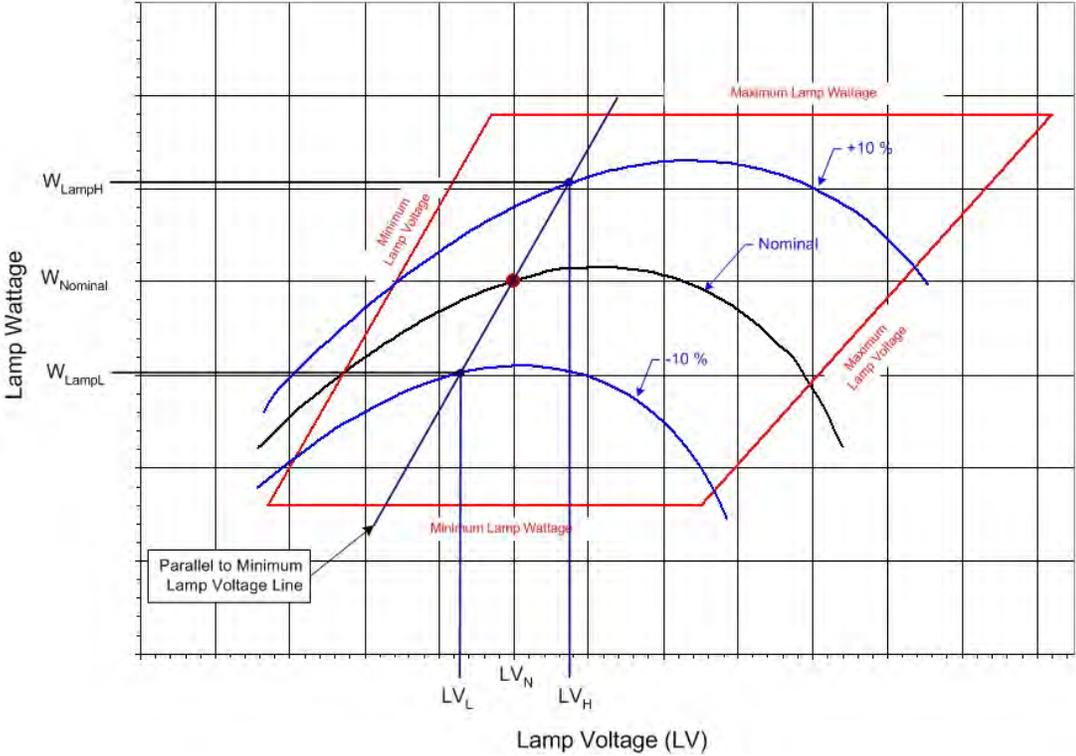
“The ballast shall be a High Pressure Sodium, high power factor, constant wattage auto-regulator, lead type (CWA) for operation on a nominal 240 volt system.”

Revise Article 1067(f)(1) of the Standard Specifications to read:

“The high pressure sodium, auto-regulator, lead type (CWA) ballast shall be designed to ANSI Standards and shall be designed and rated for operation on a nominal 240 volt system. The ballast shall provide positive lamp ignition at the input voltage of 216 volts. It shall operate the lamp over a range of input voltages from 216 to 264 volts without damage to the ballast. It shall provide lamp operation within lamp specifications for rated lamp life at input design voltage range. Operating characteristics shall produce output regulation not exceeding the following values:

Nominal Ballast Wattage	Maximum Ballast Regulation
750	25%
400	26%
310	26%
250	26%
150	24%
70	18%

For this measure, regulation shall be defined as the ratio of the lamp watt difference between the upper and lower operating curves to the nominal lamp watts; with the lamp watt difference taken within the ANSI trapezoid at the nominal lamp operating voltage point parallel to the minimum lamp volt line:



$$\text{Ballast Regulation} = \frac{W_{LampH} - W_{LampL}}{W_{LampN}} \times 100$$

where:

W_{LampH} = lamp watts at +10% line voltage when Lamp voltage = LV_H

W_{LampL} = lamp watts at - 10% line voltage when lamp voltage = LV_L

W_{LampN} = lamp watts at nominal lamp operating voltage = LV_N

Wattage	Nominal Lamp Voltage, LV_N	LV_L	LV_H
750	120v	115v	125v
400	100v	95v	105v
310	100v	95v	105v
250	100v	95v	105v
150	55v	50v	60v
70	52v	47v	57v

Ballast losses, based on cold bench tests, shall not exceed the following values:

Nominal Ballast Wattage	Maximum Ballast Losses
750	15%
400	20%
310	21%
250	24%
150	26%
70	34%

Ballast losses shall be calculated based on input watts and lamp watts at nominal system voltage as indicated in the following equation:

$$\text{Ballast Losses} = \frac{W_{Line} - W_{Lamp}}{W_{Lamp}} \times 100$$

where:

W_{line} = line watts at nominal system voltage

W_{lamp} = lamp watts at nominal system voltage

Ballast output to lamp. At nominal system voltage and nominal lamp voltage, the ballast shall deliver lamp wattage with the variation specified in the following table.

Nominal Ballast Wattage	Output to lamp variation
750	± 7.5%
400	± 7.5%
310	± 7.5%
250	± 7.5%
150	± 7.5%
70	± 7.5%

Example: For a 400w luminaire, the ballast shall deliver 400 watts ±7.5% at a lamp voltage of 100v for the nominal system voltage of 240v which is the range of 370w to 430w.

Ballast output over lamp life. Over the life of the lamp the ballast shall produce average output wattage of the nominal lamp rating as specified in the following table. Lamp wattage readings shall be taken at 5-volt increments throughout the ballast trapezoid. Reading shall begin at the lamp voltage (Lv) specified in the table and continue at 5 volt increments until the right side of the trapezoid is reached. The lamp wattage values shall then be averaged and shall be within the specified value of the nominal ballast rating. Submittal documents shall include a tabulation of the lamp wattage vs. lamp voltage readings.

Nominal Ballast Wattage	LV Readings begin at	Maximum Wattage Variation
750	110v	± 7.5%
400	90v	± 7.5%
310	90v	± 7.5%
250	90v	± 7.5%
150	50v	± 7.5%
70	45v	± 7.5%

Example: *For a 400w luminaire, the averaged lamp wattage reading shall not exceed the range of ±7.5% which is 370w to 430w*

Add the following to Article 1067(h) of the Standard Specifications:

“Independent Testing. Independent testing of luminaires shall be required whenever the pay item quantity of luminaires of a given pay item, as indicated on the plans, is 50 or more. For each luminaire type to be so tested, one luminaire plus one luminaire for each 50 luminaires shall be tested. Example: *A plan pay item quantity of 75 luminaires for a specific pay item would dictate that 2 be tested; 135 luminaires would dictate that three be tested.*” If the luminaire performance table is missing from the contract documents, the luminaire(s) shall be tested and the test results shall be evaluated against the manufacturer’s data as provided in the approved material submittal. The test luminaire(s) results shall be equal to or better than the published data. If the test results indicated performance not meeting the published data, the test luminaire will be designated as failed and corrective action as described herein shall be performed.

The Contractor shall be responsible for all costs associated with the specified testing, including but not limited to shipping, travel and lodging costs as well as the costs of the tests themselves, all as part of the bid unit price for this item. Travel, lodging and other associated costs for travel by the Engineer shall be direct-billed to or shall be pre-paid by the Contractor, requiring no direct

reimbursement to the Engineer or the independent witness, as applicable”

The Contractor shall select one of the following options for the required testing with the Engineer's approval:

- a. Engineer Factory Selection for Independent Lab: The Contractor may select this option if the luminaire manufacturing facility is within the state of Illinois. The Contractor shall propose an independent test laboratory for approval by the Engineer. The selected luminaires shall be marked by the Engineer and shipped to the independent laboratory for tests.
- b. Engineer Witness of Independent Lab Test: The Contractor may select this option if the independent testing laboratory is within the state of Illinois. The Engineer shall select, from the project luminaires at the manufacturer's facility or at the Contractor's storage facility, luminaires for testing by the independent laboratory.
- c. Independent Witness of Manufacturer Testing: The independent witness shall select from the project luminaires at the manufacturers facility or at the Contractor's storage facility, the luminaires for testing. The Contractor shall propose a qualified independent agent, familiar with the luminaire requirements and test procedures, for approval by the Engineer, to witness the required tests as performed by the luminaire manufacturer.

The independent witness shall as a minimum meet the following requirements:

- ▶ Have been involved with roadway lighting design for at least 15 years.
- ▶ Not have been the employee of a luminaire or ballast manufacturer within the last 5 years.
- ▶ Not associated in any way (plan preparation, construction or supply) with the particular project being tested.
- ▶ Be a member of IESNA in good standing.
- ▶ Provide a list of professional references.

This list is not an all inclusive list and the Engineer will make the final determination as to the acceptability of the proposed independent witness.

- d. Engineer Factory Selection and Witness of Manufacturer Testing: The Contractor may select this option if the luminaire manufacturing facility is within the state of Illinois. At the Manufacturer's facility, the Engineer

shall select the luminaires to be tested and shall be present during the testing process. The Contractor shall schedule travel by the Engineer to and from the Manufacturer's laboratory to witness the performance of the required tests.

Should any of the tested luminaires fail to satisfy the specifications and perform according to approved submittal information, the luminaire 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 corrections made 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. The number of luminaires to be tested shall be the same quantity as originally tested; i.e. if three luminaires were tested originally, one, two or three failed, another three must be tested after corrective action is taken.

Revise Article 1067.06(a)(1) of the Standard Specifications to read:

"The lamps shall be of the clear type and shall have a color of 1900° to 2200° Kelvin."

REMOVE EXISTING HANDHOLE

Description. This work shall consist of removing and disposing of a concrete handhole as shown on the plans or directed by the Engineer.

Construction Requirements. All work shall be performed in accordance with Section 895 of the Standard Specifications.

The entire concrete handhole structure and cover shall be completely removed and disposed of. The void area shall be backfilled with approved material, and the surface reconstructed to match the adjoining area. If the handhole is located in a sidewalk area, the entire sidewalk square or squares where the handhole is located shall be removed and replaced with new sidewalk. Sidewalk removal and replacement will be paid for separately.

The Contractor shall be responsible for constructing exploratory trenches for the purpose of locating existing utilities under, or adjacent, to the handhole to be removed. The depth of the exploratory trenches shall not exceed 66 in., as measured from the existing ground elevation.

If an existing utility is found to be in conflict with the handhole removal, the Contractor shall protect the existing utility, when removing the existing handhole.

Measurement and Payment. The work shall be paid for at the contract unit price each for REMOVE EXISTING HANDHOLE, which shall be payment in full for all work listed herein and as directed by the Owner's Representative.

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 \$2500.

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.

DETECTABLE WARNINGS (SPECIAL) (VOS)

Article 424.09. Append the article with the following;

“The vitrified polymer composite surface applied detectable/tactile warning surface tile shall be ‘Armor-Tile’, as manufactured by Engineered Plastics Inc. (800-682-2525).”

Article 424.09. Replace the second sentence with the following;

“Detectable warnings will be paid for at the contract unit price per square foot for DETECTABLE WARNINGS (SPECIAL).”

LANDSCAPING GENERAL PROVISION (VOS)

Approval at place of growth does not preclude inspection and right of rejection at the site. Rejected plants or materials shall be removed immediately from the site and promptly replaced with plants and materials meeting the specified requirements, as determined by the Engineer.

The Contractor shall deliver all standard products in the manufacturer's original containers with seals unbroken, labeled with manufacturer's names, product names, and analysis where applicable.

All work shall be performed by a firm specializing in landscaping. The Contractor shall use an adequate number of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.

Nomenclature: The botanical and common name of all plant materials shown on the drawings and required under this section are in conformance with the approved names given in "Standardized Plant Names" prepared by the American Committee on Horticultural Nomenclature. Names and varieties not included therein shall conform generally with names accepted in the nursery trade. In all cases, botanical names take precedence over common names.

Durable, legible labels stating in weather resistant ink or in an embossed process, the correct plant name, and plant size shall be securely attached to at least 1 plant from each bundle or lot.

All tags, seals, and other markers shall not be removed by the Contractor until after the final inspection and acceptance is made by the Engineer. Once the project is accepted, the Contractor shall remove all tags, seals, and other markers.

Submittals: The Contractor shall submit the following samples with copies of the manufacturer's specifications to the Engineer for approval prior to installation of any plants or materials.

- Specified Soil Mixes
- Soil Mixture Additives
- Hardwood Bark Mulch
- Topsoil

Inspection of Plant Material: Add the following to the end of Article 1081.01(c):

All plant materials shall be subject to inspection and approval at the place of growth, and upon delivery for conformity to specification requirements. Approval at the place of growth

shall not impair the right of the inspection and rejection upon delivery at the site or during the progress of the work for size and condition of ball, roots, canopy, diseases, insects, and latent defects or injuries. Rejected plants shall be removed immediately from the site.

Upon award of this Contract, the Contractor shall inform the Engineer of his intended sources of plant material. The Contractor shall provide the Engineer 30 calendar days advance notice of the plant material to be inspected. The Engineer will visit these sources with the Contractor to select and identify all woody plants for the project. All trees (deciduous, evergreen) and shrubs will be selected and tagged by the Engineer. The selection of materials by the Engineer shall in no way relieve the Contractor from his obligation to provide healthy plants as specified herein.

Materials for Planting: Add the following to the end of Article 1081:

Before commencing the work, all plant material shall be on order and the Contractor shall examine the site to determine that it is free of conditions which might be detrimental to proper and timely completion of the work. Start of work shall indicate acceptance of all the site conditions.

Protection During Work and Maintenance: The Contractor shall provide adequate protection during the construction period for planted areas against trespassing, erosion, and damage. Protect adjacent surfaces from damage and soiling during the work.

TREE PRESERVATION

Temporary Fencing: Add the following to the end of Article 201.05(a):

The Contractor shall install temporary barriers necessary for the preservation of existing plant materials (not to be removed) before any work takes place at the project site. The protective fencing shall be installed in accordance with Village Ordinance 154.135(C) (4). Wooden snow fencing or brightly colored plastic construction fencing shall be installed at the periphery of the drip line of the tree or beyond to prevent the storage of vehicles or materials, and the encroachment of grading and construction equipment. All protective fencing shall be maintained to the satisfaction of the Engineer.

In the event that a tree is damaged by the Contractor during construction, the Contractor shall replace such tree with a tree of a species listed in Section IX, Item C-2 of the Village of Schaumburg Subdivision Control Ordinance #1639 as specified by the Engineer, and having a diameter not less than the tree destroyed (not to exceed 6 inches, measured at 6 inches above the ground level). Any tree that is replaced out of the neglect of the Contractor shall be replaced at no cost to the Contract. In addition, all tree trimming, liming, root pruning, and tree preservation shall be approved by the Engineer.

GYP SUM PLACEMENT (VOS)

Effective: 6/1/2017

Scope: This work shall consist of furnishing, transporting, spreading, and incorporating Gypsum into the soil in areas shown on the plans and as directed by the Engineer.

Materials: The Gypsum shall be commercial grade as approved by the Engineer.

Gypsum soil conditioner shall not be placed until the area designated has been shaped, trimmed, and finished in accordance with Section 212 of the Standard Specifications and any required placement of Topsoil has been completed. Prior to Gypsum placement, the area shall be disked or raked to a minimum depth of 4" and all debris and loose stones removed. The grades and condition of the area must be approved by the Engineer prior to Gypsum Placement.

The Gypsum shall be used in accordance with the manufacturer's direction on the package. Apply the Gypsum using a rotary-type spreader designed to apply granular products. Calibrate application equipment prior to use according to manufacturer's directions. Check frequently to be sure equipment is working properly and distributing granules uniformly. Do not use spreaders that apply material in narrow concentrated bands. More uniform application may be achieved by spreading half of the required amount of product over the area and then applying the remaining half in swaths at right angles to the first. Apply the Gypsum at the rate of 30 lbs. per 100 square feet. After the Engineer verifies that the proper amount of Gypsum has been applied, the Contractor shall completely incorporate the Gypsum into the soil to a minimum depth of 6" by raking, disking, or rototilling to amend the existing topsoil.

After the Gypsum has been incorporated into the soil, any debris or piles of unincorporated material shall be immediately removed from the right-of-way and the area finished to the lines and grades shown of the plan and approved by the Engineer. Disposal of material shall be done in accordance with Article 202.03.

Method of Measurement: Gypsum Placement will be measured in pounds by weight of actual product used at the locations shown in the plans, and as directed by the Engineer prior to incorporation into the soil.

Basis of Payment: This work will be paid for at the Contract Unit Price per pound for GYP SUM PLACEMENT. Payment shall include all costs for materials, equipment, and labor required to complete the work specified herein, including the cost of removing and disposing of any debris.

PAVEMENT MARKING (SPECIAL) (VOS)

Effective: 06012017

Description. This work shall include furnishing and installing interconnected preformed thermoplastic pavement markings per Section 780 and as described herein.

Materials. The material must be a resilient preformed thermoplastic product which contains a minimum of thirty percent (30%) intermixed anti-skid/anti-slip elements and where the top surface contains anti-skid/anti-slip elements. These anti-skid/anti-slip elements must have a minimum hardness of 8 (Mohs scale) and meet the following gradation:

Size Gradation		Intermix		Drop - On	
US Mesh	µm	Retained, %	Passing, %	Retained, %	Passing, %
10	2000	0 - 10%	90 - 100%		
12	1700	5 - 25%	75 - 95%		
14	1400	15 - 50%	50 - 85%		
16	1180	15 - 50%	50 - 85%	0 - 5%	95 - 100%
18	1000	10 - 30%	70 - 90%	0 - 10%	90 - 100%
20	850	0 - 5%	95 - 100%	5 - 25%	75 - 95%
25	710	0 - 2%	98 - 100%	15 - 50%	50 - 85%
30	600			15 - 50%	50 - 85%
35	500			5 - 25%	75 - 95%
40	425			0 - 10%	90 - 100%

The material must be resistant to the detrimental effects of motor fuels, antifreeze, lubricants, hydraulic fluids, and other motor vehicle fluids.

The material shall be capable of being applied on bituminous and/or portland cement concrete pavements primarily by the use of an infrared heater supplied by the material manufacturer. A handheld propane heat torch supplied by the material manufacturer may be used in isolated areas. The use of a compactor or similar equipment shall not be necessary. The material must be able to be applied to asphalt and concrete surfaces without preheating the application surface to a specific temperature. The material must be capable of being affixed to green concrete (concrete that has set but not appreciably hardened). The material shall not require the portland cement concrete application areas to be cured or dried out.

The material must be capable of conforming to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures. It shall not be necessary to use a grid template or to make pattern grooves or other indentations in the asphalt or concrete surface prior to applying the material. It shall not be necessary to inlay the material in grooves or indentations. It shall not be necessary to heat the pavement or application surface to a specific temperature.

The material is typically supplied in segments measuring 24 in. by 24 in. The material must be factory assembled and interconnected with a compatible material, so that it is unnecessary to assemble the individual “brick” pieces at the jobsite. Certain 24 in. by 24 in. material segments may be rotated to create additional pattern options using standard parts.

Interchangeable, patterned borders shall be available in either 8 in. or 12 in. wide by 24 in. long sizes, to allow flexibility in design options using standard parts.

The material must be able to be applied in temperatures down to 45°F (7.2°C) without any special storage, preheating or treatment of the material before application.

The material must be able to be applied to asphalt and concrete surfaces without using a grid template and without forming a pattern in the pavement substrate. Heating indicators must be evenly distributed on the surface of the material in order to ensure correct application.

The material must cover the entire application area and be flush across the surface. Once applied, no part of the pavement surface should be visible in the application area.

Material must be composed of an ester modified rosin impervious to degradation by motor fuels, lubricants, etc. in conjunction with aggregates, pigments, binders, and anti-skid/anti-slip elements. Pigments and anti-skid/anti-slip elements must be uniformly distributed throughout the material. The thermoplastic material conforms to AASHTO designation M249, with the exception of the relevant differences due to the material being supplied in a preformed state, being non-reflective, and potentially being of a color different from white or yellow.

○ Pigments:

- White: The material shall be manufactured with sufficient titanium dioxide pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6 as revised and corrected.
- Red, Blue, and Yellow: The material shall be manufactured with sufficient pigment to meet FHWA Docket No. FHWA-99-6190 Table 5 and Table 6 as revised and corrected. The pigment system must not contain heavy metals nor any carcinogen, as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.

- Other Colors: The pigment system must not contain heavy metals nor any carcinogen, as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.
- Heating indicators: The top surface of the material shall have regularly spaced indents. These indents shall act as a visual cue during application that the material has reached a molten state allowing for satisfactory adhesion and proper embedment of anti-skid/anti-slip elements, and a post-application visual cue that the application procedures have been followed.
- Skid Resistance: The surface of the preformed thermoplastic material shall contain factory applied anti-skid material with a minimum hardness of 8 (Mohs scale). Upon application the material shall provide a minimum skid resistance value of 60 BPN when tested according to ASTM E 303.
- Slip Resistance: The surface of the preformed thermoplastic material shall contain factory applied anti-skid material with a minimum hardness of 8 (Mohs scale). Upon application the material shall provide a minimum static friction of coefficient of 0.6 when tested according to ASTM C 1028 (wet and dry), and a minimum static coefficient of friction of 0.6 when tested according to ASTM D 2047.
- Thickness: The material must be supplied at a minimum thickness of 125 mil (3.18mm).
- Environmental Resistance: The material must be resistant to deterioration due to exposure to sunlight, water, salt or adverse weather conditions and impervious to oil and gasoline.
- Interconnected: The material must consist of interconnected individual pieces of preformed thermoplastic pavement marking material, which through a variety of colors and patterns, make up the desired design. The individual pieces in each material segment, typically 24 in. (61cm) by 24 in. (61cm), must be factory assembled and interconnected with a compatible material so that in the field it is not necessary to assemble the individual pieces within a material segment. Multiple patterned border segment options shall be available in the material in either 8 in. (20cm) or 12 in. (30cm) wide by 24 in. (61cm) long sizes.

Manufacturing control and ISO certification. The manufacturer must be ISO 9001:2008 certified for design, development and manufacturing of preformed thermoplastic, and provide proof of current certification.

Application. Manufacturer Certified Applicator Requirement: The material shall be supplied and applied only by an applicator certified by the material manufacturer. The applicator shall provide proof of current certification before commencing work. The Certified Applicator shall follow the material manufacturer's current published application procedures.

Asphalt: The material shall be applied primarily by using an infrared heater supplied by the material manufacturer. A handheld propane heat torch supplied by the material manufacturer may be used in isolated areas. The material must be able to be applied at ambient and road temperatures down to 45°F (7.2°C) without any preheating of the pavement to a specific temperature. A sealer specified and supplied by the material manufacturer must be applied to the substrate prior to material application to ensure proper adhesion, and to provide bond reinforcement for larger volumes of material. The sealer must be supplied by the material manufacturer in 300/600ml cartridges along with sealer application supplies. A thermometer shall not be required during the application process. The pavement shall be clean, dry and free of debris. The supplier must provide current application instructions to the Certified Applicator.

Portland Cement Concrete: The same application procedure shall be used as described under Section 4.2.

The specified pattern for installation shall be Ennis-Flint Traffic Patterns, Herringbone pattern, Brick Red color, with Grey grout. Outside edge consists of Soldier course brick pattern of the same color, also with Grey grout. A 6" White color preformed thermoplastic stripe of the same specified material shall be placed outside of the patterned installation, separated by a 6" gap as shown on the plans.

Method of Measurement. This work shall be measured in square feet installed.

Basis of Payment. This work shall be paid for at the contract unit price per SQUARE FOOT for PAVEMENT MARKING (SPECIAL) of the type specified, which shall include all labor, equipment and materials as described within and as necessary to complete this work.

PERENNIAL PLANTS (VOS)

Effective: 6/1/2017

Layout of Planting: Add the following to Article 254.05:

The configuration of all plant beds shall be staked or layed out by the Contractor and verified by the Engineer prior to commencing with plant bed preparation.

Planting Procedures: Add the following to Article 254.06:

When planting perennials in bed areas shown on the plans or as directed by the Engineer, the following work shall be performed prior to planting:

All existing turf shall be cut out 2” below the existing soil line, and disposed of as specified in Article 202.03, or killed using glyphosate based broad spectrum herbicide at the manufacturer’s suggested rate 14 days prior to planting.

Compost shall be placed on the planting beds to a depth of 2” then tilled into the soil to a depth of 6” to amend the existing topsoil.

Fertilizer nutrients shall be added and applied to the perennial beds at a 5:3:2 ratio as follows:

- Nitrogen Fertilizer Nutrients 90 lbs./acre
- Phosphorus Fertilizer Nutrients 54 lbs./acre
- Potassium Fertilizer Nutrients 36 lbs./acre

This fertilizer shall be tilled and cultivated into the soil to a depth of 6”.

Gypsum shall be placed on the planting beds at the rate specified then tilled into the soil to a depth of 6” to amend the existing soil.

Mulching: Add the following to Article 254.07:

Within 24 hours, the entire perennial plant bed shall be mulched with 2” of fine grade shredded hardwood bark mulch. A mulch sample shall be submitted to the Engineer for approval 72 hours prior to placing. Care shall be taken to place the mulch so as not to smother the plants.

Pre-emergent Herbicide shall be used in the perennial beds after the mulch has been properly installed. See specification for Weed Control, Pre-emergent Granular Herbicide.

Method of Measurement: Delete Article 254.09 and add the following:

Disposal of sod, vegetative ground cover, and debris (rock, stones, concrete, etc.) shall be removed from the perennial planting bed as specified in Article 202.03.

Fertilizer nutrients will be measured for payment as specified in Article 250.09.

Compost will be measured in cubic yards placed and incorporated into the soil.

Gypsum will be measured in pounds placed and incorporated into the soil.

Basis of Payment: Add the following to Article 254.10:

Fertilizer will be paid as specified in Article 250.10.

Compost will be paid for as specified in Compost Placement at the Contract Unit Price per cubic yard for **COMPOST FURNISH AND PLACE, SPECIAL**.

Pre-emergent herbicide will be paid for as specified in Weed control, Pre-Emergent Granular Herbicide at the Contract Unit Price per pound for **WEED CONTROL, PRE-EMERGENT GRANULAR HERBICIDE**.

Gypsum will be paid for at the Contract Unit Price per pound for **GYPNUM PLACEMENT**, of the rate specified.

Payment for shredded hardwood bark mulch shall be included in the Contract Unit Price of the perennial plant pay item.

Disposal of sod, vegetative ground cover, and debris (rock, stones, concrete, etc.) removed from the planting bed as specified in Article 202.03 shall be included in the Contract Unit Price of the perennial plant pay item.

Payment for shredded hardwood bark mulch shall be included in the Contract Unit Price of the plant pay item.

Payment for the perennials, ground covers, and bulbs shall be made at the Contract Unit Price in place of the perennial plant pay item.

PLANTING WOODY PLANTS (VOS)

Effective: 6/1/2017

Layout of Planting: Add the following to Article 253.07:

The configuration of all plant beds shall be staked or layed out by the Contractor and verified by the Engineer prior to commencing with plant bed preparation.

Planting Procedures: Add the following to Article 253.10:

When planting shrubs and trees in bed areas as shown on the plans or as directed by the Engineer, the following work shall be performed prior to planting:

All existing ground cover vegetation shall be cut out 2" below the existing soil line and disposed of as specified in Article 202.03, or killed using glyphosate based broad spectrum herbicide at the Manufacturer's suggested rate 14 days prior to planting.

Compost shall be placed on the planting beds to a depth of 2" then tilled into the soil to a depth of 6" to amend the existing topsoil.

Fertilizer nutrients shall be added and applied to the planting beds at a 5:3:2 ratio as follows:

- Nitrogen Fertilizer Nutrients 90 lbs./acre
- Phosphorus Fertilizer Nutrients 54 lbs./acre
- Potassium Fertilizer Nutrients 36 lbs./acre

This fertilizer shall be tilled and cultivated into the soil to a depth of 6".

All plant beds and individual tree saucers with a minimum diameter of 5' shall receive a hand tooled edge. Using a garden spade, the edge shall be cleanly trenched to a minimum depth of 3" with one vertical side toward the lawn areas.

Mulch Cover: Omit Article 253.11 and substitute with the following:

Within 48 hours after planting, shredded hardwood bark mulch shall be placed around all plants in the entire mulched bed or saucer area specified to a depth of 3". The shredded hardwood bark shall be: free of leaf material, standard size with a minimum particle size of 1/4" and a maximum size of 1 1/4". In all areas within the project limits where there is existing plant material, all trees, shrubs, and planting beds shall be mulched according to the specifications for new plant material, included in the cost of the Contract. No weed barrier fabric will be required for tree and shrub planting. Pre-emergent herbicide will be used instead of weed barrier fabric. The pre-emergent herbicide shall be applied according to the Special Provision for Weed Control, Pre-emergent Granular Herbicide.

Wrapping of Tree Trunks: Delete Article 253.12 and substitute the following:

Wrapping of all deciduous trees (shade trees and ornamentals) shall be done immediately after planting. Trees shall be inspected for injury to trunks, disease insect infestation, and improper pruning before wrapping. The Contractor shall be responsible for the condition of this wrapping throughout the life of this Contract. Any damage resulting from the improper installation or maintenance of this wrapping shall be the responsibility of the Contractor and such damaged trees shall be replaced by the Contractor at his expense.

Period of Establishment: Delete the second and third paragraphs of Article 253.14.

Method of Measurement: Add the following to Article 253.16:

Fertilizer nutrients will be measured for payment in place as specified in Article 250.08.

Compost will be measured in cubic yards placed and incorporated into the soil as specified in Article 211.08.

Gypsum will be measured in pounds placed and incorporated into the soil.

Basis of Payment: Add the following to Article 253.17:

Fertilizer will be paid as specified in Article 250.09.

Compost will be paid for as specified in Compost Placement at the Contract Unit Price per cubic yard for **COMPOST FURNISH AND PLACE, SPECIAL**.

Pre-emergent herbicide will be paid for as specified in Weed control, Pre-Emergent Granular Herbicide at the Contract Unit Price per pound for **WEED CONTROL, PRE-EMERGENT GRANULAR HERBICIDE**.

Gypsum will be paid for at the Contract Unit Price per pound for **GYPNUM PLACEMENT**, of the rate specified.

Payment for shredded hardwood bark mulch shall be included in the Contract Unit Price of the woody plant pay item.

Disposal of sod, vegetative ground cover, and debris (rock, stones, concrete, etc.) removed from the planting bed as specified in Article 202.03 shall be included in the Contract Unit Price of the woody plant pay item.

TOPSOIL AND COMPOST (VOS)

Effective: 6/1/2017

Topsoil and Compost: Add the following to Article 211:

The Contractor shall inform the Engineer of his intended source for topsoil. The Engineer will inspect the topsoil to ensure that it meets with the requirements of the specifications.

Furnishing and Excavating Topsoil: Add the following to Article 211.03:

Median Soil Mix: Work under this item shall be performed in accordance with Section 200 of the Standard Specifications for Road and Bridge Construction except as modified herein.

Description: This work shall consist of testing, preparing, furnishing, and placing median soil including finish grading.

General Requirements: In general, the Median Soil Mix shall be 2 parts pulverized top soil and 1 part coarse sand. The sand shall be added and mixed during the pulverization process only. The sand shall be of an F2 gradation.

Submittals: Soil Testing: No median soil mix shall be delivered to the site until the Engineer has reviewed test results and has accepted the median soil mix. The Contractor shall employ a soil testing agency, acceptable to the Engineer, which uses methods approved by the Association of Agricultural Chemists. A minimum of 3 samples shall be taken from different locations of the proposed median soil source.

The median soil test report shall include the following, and the appropriate ranges are as follows:

Chemical Analysis:

	<u>HIGH</u>	<u>LOW</u>
• pH	7.0	6.5

Mechanical Analysis:

• % clay	25%	0%
• % silt	77%	45%
• % sand	33%	25%

Additionally, the following variables are required:

- cation exchange capacity (CEC)
- soluble salts
- organic matter
- phosphorous

- available potassium
- nutrients
- residual chemicals
- recommendations to mitigate any issues from the results.

The mechanical analysis should show that the % sand, % silt, and the % clay must yield a silt loam soil. See the attached Textural Classes diagram. To determine the class, plot a line parallel to the % clay axis starting the line at the value of the % silt. Plot another line parallel to the % sand axis starting the line at the value of the % clay. The intersection of these lines should be in the silt loam region.

Inspections: The Engineer retains the right to visually inspect the Median Soil Mix on site before placement. The Engineer may ask that the material suspected of not meeting specification be removed from the site.

The Engineer will take samples of the Median Soil Mix after it has been placed. A sample will be taken every 300' or every median. The same chemical and mechanical test will be performed. If the Median Soil Mix in place does not meet specification, then that area or median will not be paid for. The Contractor shall remedy any discrepancies per the soil test recommendations, so that full payment can be made.

Preparation and Placement: Structure Adjustments: perform or coordinate final adjustments of any utility structure.

Clean medians of all trash and debris before placement of the Median Soil Mix. Remove and legally dispose of debris off site. Repair to the satisfaction of the Engineer any portion of the sand pre-filter under drainage fabric or layers prior to installation of the Median Soil Mix.

Place, spread, and rough grade specified Median Soil Mix to depths specified in all areas to be planted. Place the Median Soil Mix in 2 level lifts. The first lift shall contain 2/3 of the median soil depth. After placing each lift, moisten the surface at a rate of 1 gallon of water per square foot. Allow the water to thoroughly percolate through the soil before placing the next lift. Allow for settling, and place additional planting soil as necessary. Allow for placement and mixing of compost in perennial planting areas, but place enough soil mix to meet finish grades within specified tolerances.

Rake smooth and finish grade all planted areas. The removal of excess material or the addition of median soil may be required prior to landscaping. This shall be included in the unit price for Median Soil Mix. Grading will be to a tolerance of +/- .10 foot of design grades. Grade disturbed by irrigation installation shall be restored to finish grade and raked smooth.

All debris, litter, tire tracks, dirt, and unintended materials shall be removed, raked, swept or washed off all landscape, hard median surfaces, and pavement on a daily basis.

Method of Measurement: Median Soil Mix Furnish and Place will be measured for payment in cubic yards at the locations shown in the plans and as directed by the Engineer.

Basis of Payment: Median Soil Mix Furnished will be paid for at the Contract Unit Price per cubic yard for **MEDIAN SOIL MIX FURNISH AND PLACE**.

Compost Placement: Omit the first paragraph of Article 211.01, and replace with the following:

Description: This work shall consist of furnishing, transporting, spreading, and incorporating landscape compost into soil in areas shown on the plans and as directed by the Engineer. The Contractor shall submit a sample of the compost for approval prior to installation.

Materials: Add the following to Article 1081.05(b) Topsoil and Compost:

The Contractor shall inform the Engineer of his intended source for the landscape compost. The Engineer will inspect the landscape compost to ensure that it meets with the requirements of the specifications.

Compost shall be a mixture of decomposed grass clippings, small branches, and leaves. Said mixture shall be screened and free of refuse, stone, clumps, roots, large branches, clay, and other foreign material. The compost shall be of such consistency that it can be readily incorporated with the topsoil.

Compost shall not be placed until the area designated has been shaped, trimmed, and finished in accordance with Section 212 of the Standard Specifications, and any required placement of topsoil has been completed. Prior to compost placement, the area shall be disked or raked to a minimum depth of 2" and all debris and loose stones removed. The grades and condition of the area must be approved by the Engineer prior to Compost Placement.

The compost shall be placed in the planting beds to a 2" depth and shall meet finish grades within specified tolerances. After the Engineer verifies that the proper compost depth has been applied, the Contractor shall completely incorporate the sand into the soil to a minimum depth of 6" by raking, disking or rototilling to amend the existing topsoil.

After the compost has been incorporated into the soil, any debris or piles of unincorporated material shall be immediately removed from the finished area to the lines and grades shown on the plan and approved by the Engineer. Disposal of material shall be done in accordance with Article 202.03.

Method of Measurement: Compost Placement will be measured in cubic yards at the locations shown in the plans and as directed by the Engineer prior to incorporation into the soil.

Basis of Payment: This work will be paid for at the Contract Unit Price per cubic yard for **COMPOST FURNISH AND PLACE, SPECIAL**. Payment shall include all costs for materials, equipment, and labor required to complete the work specified herein, including the cost of removing and disposing of any debris.

SODDING (VOS)

Effective: 6/1/2017

Sod: Add the following to Article 1081.03:

Sod shall be cleanly cut, either by hand or machine, to a minimum uniform thickness of 1" but of not more than 2", to a uniform width of 18", and in strips of not less than 3'-0" nor more than 6'-0" in length. Edges of sod shall be straight.

Sodding Time: Add the following to Article 252.04:

Sod shall be delivered to the site within 24 hours of harvest at the sod nursery. All sod installation shall be complete within 36 hours of harvest from the sod nursery. The Contractor shall submit a ticket from the sod nursery clearly stating the date and time of day that harvest took place.

Transportation: Add the following to Article 252.05:

Care shall be taken to retain the native soil on the roots during the process of stripping, transporting, and placing sod. Sod shall be cut and transported only when moisture conditions are favorable for correct handling, and shall be protected by a suitable canvas or other wind-resistant material while in transit. Dumping of sod from vehicles on the areas of delivery will not be permitted. Sod shall be delivered within 24 hours from time of cutting. Sod which has been damaged in transit or in handling, including drying out, shall be rejected and removed from the site immediately.

Placing Sod: Delete paragraph 1 of Article 252.06 and substitute the following:

Sod shall be of type specified, laid smoothly, edge to edge in close contact on the prepared surface, with joints staggered. Sod shall be pressed into setting bed immediately by tamping or rolling with approved equipment to eliminate air pockets and to produce an even surface. Where grades are such that the flow of water will be over sodded areas and onto paved areas, after compaction, the sod shall be placed flush with the pavement or drainage structures.

Inspection: Add the following to article 252.11:

Sod shall have been grown on a well-drained, fertile, sandy loam (not peat) soil. Sod shall be cut or stripped from living thickly matted turns of firmly rooted specified turf type. The consistency of adherent soil shall be such that it will not break, crumble, or tear during handling and placing of the sod.

Maintenance of Sodded Areas: Add the following to Article 252:

Maintenance of sodded areas by the Contractor shall consist of watering, weeding, 3 mowings, repair of erosion, spraying the sodded areas to keep them free of insects and diseases, and re-sodding as necessary to establish a uniform stand of turf. The Contractor shall provide general care for sodded areas until the time of knitting, or a period of not less than 6 weeks. Prior to acceptance, sodded areas shall be mowed at least 3 times by the Contractor to maintain healthy vigorous growth. At no time shall the turf be mowed shorter than 2" nor the average height allowed to become more than 4". Debris encountered during the mowing and/or overseeding operation shall be removed and disposed in accordance with Article 250.05. Damage to the seeded areas, such as ruts or wheel tracks more than 2" in depth, shall be repaired by the Contractor to the satisfaction of the Engineer. If noxious weeds start growth which threatens to smother the species grass, they shall be removed or sprayed as directed by the Engineer, and the vacant spots filled with new sod, if necessary. All necessary weed control applications and re-sodding are included in the cost for sodding.

Method of Measurement: Add the following to Article 252.12:

Payment for maintenance of sodded areas shall be included in the Contract Unit Price of **SOD** or **SOD, SALT TOLERANT**.

Basis of Payment: Sodding will be paid for at the contract unit price per square yard for **SODDING, SALT TOLERANT**. According to the following schedule:

- (a) Initial Payment. Upon placement of sod, 25 percent of the pay item will be paid.
- (b) Final Payment. Upon acceptance of sod, the remaining 75 percent of the pay item will be paid.

WEED CONTROL, PRE-EMERGENT GRANULAR HERBICIDE (VOS)

Effective: 6/1/2017

Scope: This work shall consist of spreading a pre-emergent granular herbicide in areas as shown on the plans or as directed by the Engineer. This item will be used in mulched plant beds and individual tree saucers.

Materials: The pre-emergent granular herbicide shall contain the chemicals Trifluralin 2% active ingredient and Isoxaben with 0.5% active ingredient. The herbicide label shall be submitted to the Engineer for approval at least 72 hours prior to application.

Method: The pre-emergent granular herbicide shall be used in accordance with the manufacturer's directions on the package. The granules will be applied within 4 days after planting or mulching. If the herbicide is applied 5 days after planting or mulching, it is considered ineffective and shall not be measured and/or paid for.

Apply the granular herbicide using a rotary-type spreader designed to apply granular herbicides or insecticides. Calibrate application equipment prior to use according to manufacturer's directions. Check frequently to be sure equipment is working properly and distributing granules uniformly. Do not use spreaders that apply material in narrow concentrated bands. Avoid skips or overlaps as poor weed control or crop injury may occur. More uniform application may be achieved by spreading half of the required amount of product over the area and then applying the remaining half in swaths at right angles to the first. Apply the granular herbicide at the rate of 2.3 lbs. /1000 square feet.

Method of Measurement: Pre-emergent granular herbicide will be measured in place in pounds of WEED CONTROL, PRE-EMERGENT GRANULAR HERBICIDE applied. Areas treated 5 days or more after planting or placing mulch shall not be measured for payment.

Basis of Payment: This work will be paid for at the Contract **Unit Price per pound of WEED CONTROL, PRE-EMERGENT GRANULAR HERBICIDE** which price shall include all materials, equipment, and labor necessary to complete the work as specified.

TRENCH BACKFILL (SPECIAL) (COMED)

Effective: 8/31/96

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.

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GRANULAR THERMAL BACKFILL (3/8" MATERIAL SI# 391082) (#4 MATERIAL SI# 391083)		
1. SCOPE		
<p><u>1.1</u> 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.</p>		
2. IDEAL BACKFILL		
<p><u>2.1</u> 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.</p>		
<p><u>2.2</u> 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.</p>		
<p><u>2.3</u> FOR BENCH MARKING, OTTAWA SAND IS USED. SEE EXHIBIT VI.</p>		
<p><u>2.4</u> SEE EXHIBIT VIII FOR SAMPLE MECHANICAL ANALYSIS AND GRAPH FOR TWO MATERIALS FOUND IN THE CHICAGO AREA AND SHOULD BE USED FOR BENCH MARKING.</p>		
<p><u>2.5</u> THE VENDOR SHALL SUPPLY ALL BACKFILL TO COMPLY WITH THE PERFORMANCE REQUIREMENTS OF THIS SPECIFICATION AND WITH THE REQUIREMENTS OF EACH SPECIFIC PURCHASE REQUISITION.</p>		
<p><u>2.6</u> THE VENDOR SHALL PROVIDE THE PERFORMANCE TESTS TO THE OWNER PRIOR TO SHIPPING MATERIALS.</p>		
<p><u>2.7</u> THE PERFORMANCE MEASUREMENTS ARE:</p>		
<p>A) SIEVE ANALYSIS OF BACKFILL, ITEM 1, OR ITEM 2 WITH GRAPHS AND WEIGHTS.</p>		
<p>B) PROCTER TEST WITH MAXIMUM MOISTURE CONTENT AND WEIGHT FOR BOTH ITEM 1, OR ITEM 2.</p>		
<p>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.</p>		

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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, PORUS 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.)

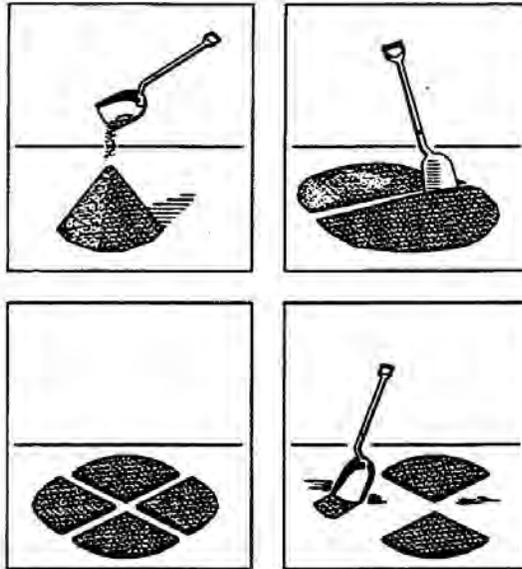


FIG. 1 - CONING AND QUARTERING OF SAMPLE

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 THROUGH 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 EFFECTS 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 (ρ) OF VARIOUS SOIL MATERIALS AND EDISON BACKFILL ARE LISTED BELOW:

SOIL MATERIAL	(ρ)(°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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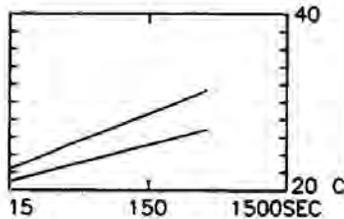
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15. TEST EQUIPMENT

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

T₁ = TEMPERATURE MEASURED AT SOME ARBITRARY ELAPSED TIME, CELSIUS

T₂ = TEMPERATURE MEASURED AT ANOTHER ARBITRARY ELAPSED TIME, CELSIUS

q = HEAT DISSIPATED PER UNIT LENGTH W/CM

t₁ = ELAPSED TIME AT WHICH A TEMPERATURE MEASUREMENT WAS RECORDED. MIN

t₂ = 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:

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

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.

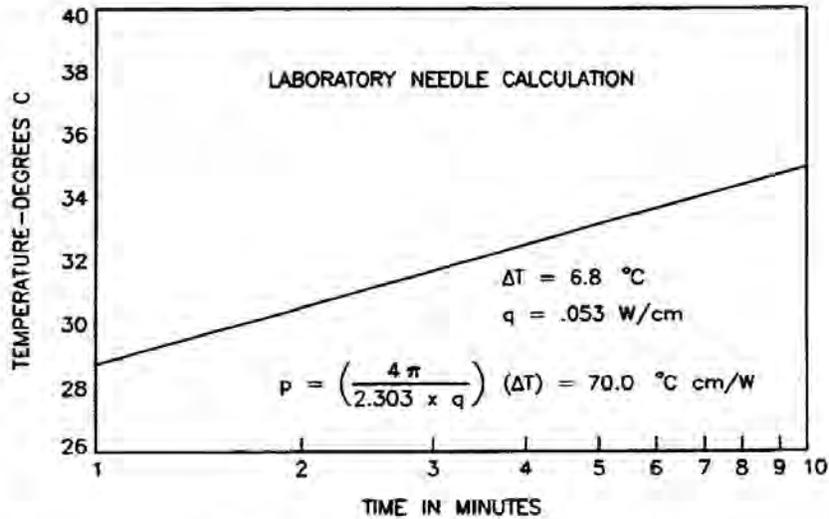


FIG. 2.
 TEMPERATURE VERSUS LOG OF TIME

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.

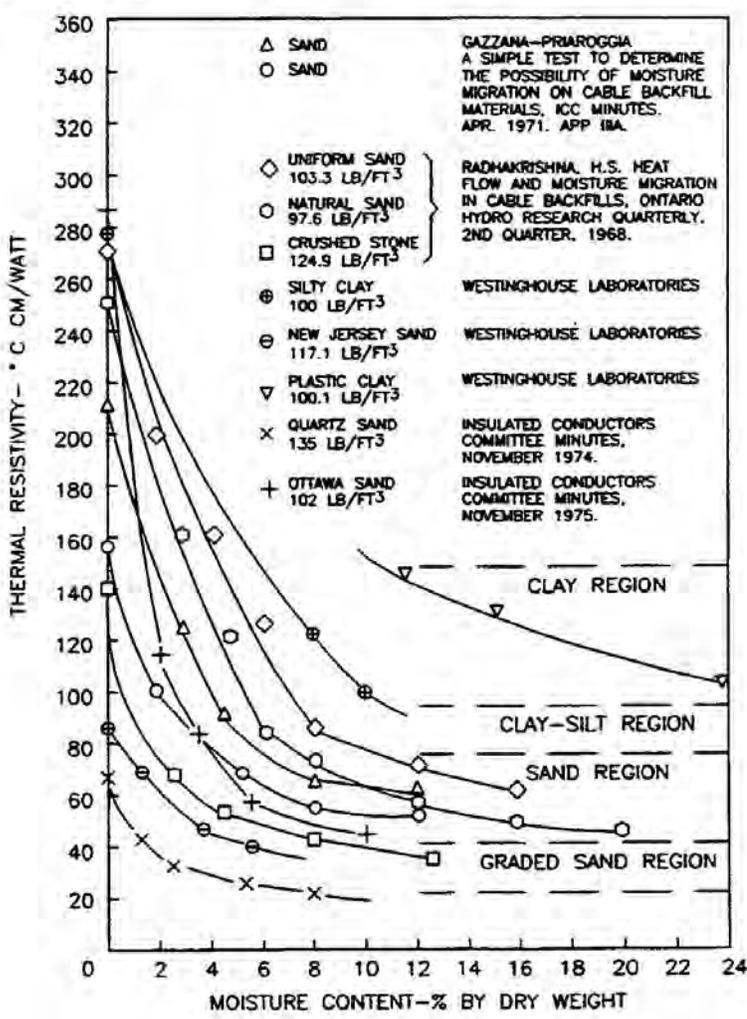


FIG. 3
THERMAL PROPERTY CHARACTERISTICS OF SOILS

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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 FT³

TIME	MILLVOLTS	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	MILLVOLTS	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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EXHIBIT II SAMPLE PREPARATION AND GRADATION ANALYSIS

LABORATORY SAMPLE NO. _____
 FEATURE EXAMPLE AREA A EXC. NO. 203 DEPTH 0.0 TO 5.0'

SAMPLE PREPARATION							
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%

SIEVE AND HYDROMETER ANALYSIS

DISH NO. 18 DRY WT. OF SAMPLE (W) = 50.0 GMS FACTOR (F) = $\frac{W\%}{W} = \frac{94.3}{50.0} = 1.886$

DRY WT. OF SAMPLE (SIEVED) 21.4 GMS.
 SIEVING TIME 15 MIN. DATE _____

SIEVE NO.	WEIGHT RETAINED	WEIGHT PASSING	# OF TOTAL PASSING	% OF TOTAL PASSING	PARTICLE DIA. (MM)	REMARKS
8	0.2	49.8	# OF TOTAL PASSING	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					
TOTAL	21.4					

TESTED AND COMPUTED BY _____ CHECKED BY _____ DATE _____

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EXHIBIT II (CONTINUED)

(SAMPLE PREPARATION AND GRADATION ANALYSIS CONT.)

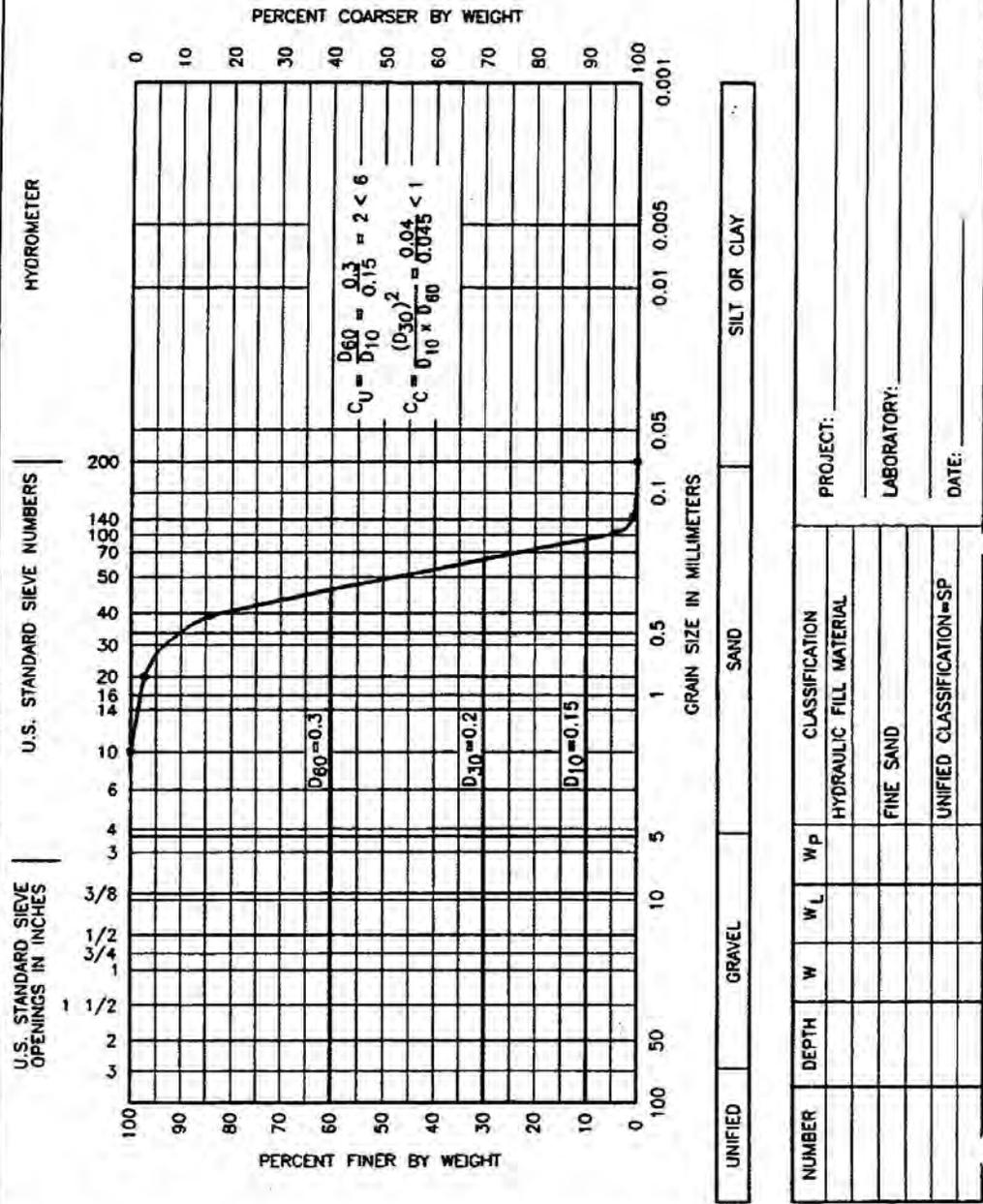
HYDROMETER ANALYSIS									
HYDROMETER NO. <u>320584</u>			DISPERSING AGENT <u>SODIUM METAPHOSPHATE</u>			STARTING TIME <u>8:00</u>			DATE _____
						AMOUNT <u>125</u> ml			
TIME	TEMP C	HYD READ	HYD CORR	CORR READ	F X CORRECT READ = % OF TOTAL PASSING	% OF TOTAL PASSING	PARTICLE DIA. (MM)	REMARKS	
.5 MIN ²								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 ²								0.002	
25 HR. 45 MIN ²								0.001	
TESTED AND COMPUTED BY _____ CHECKED BY _____ DATE _____									

SAMPLE PREPARATION AND GRADATION ANALYSIS DATA FORM.

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EXHIBIT III SAMPLE GRAIN SIZE ANALYSIS



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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)

8" DIAMETER BRASS SIEVES (WIRE CLOTH SIEVES)		
U.S.S.-ASTM SIEVE SIZE OR NUMBER	SIEVE OPENING MILLIMETERS	SIEVE OPENING INCHES
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.

TRANSMISSION RELIABILITY AND STANDARDS

COMMONWEALTH EDISON COMPANY
 SYSTEM STANDARD

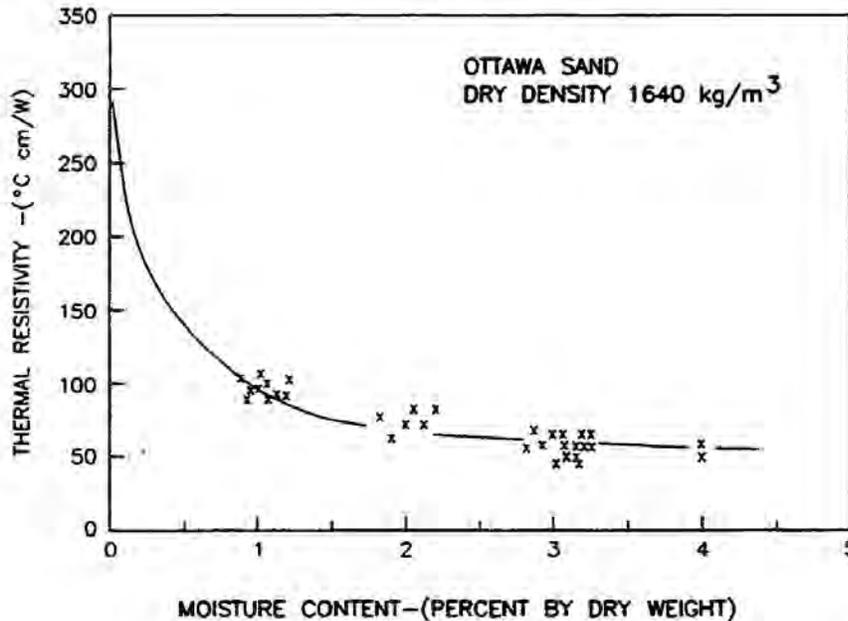
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EXHIBIT VI
BENCH MARK SAMPLE

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



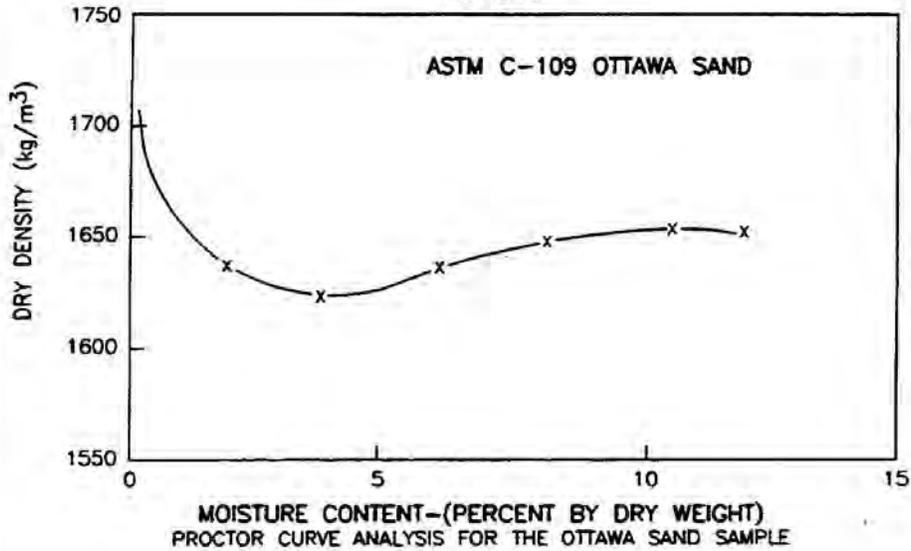
THE THERMAL RESISTIVITY OF THE OTTAWA SAND SAMPLE AT A DRY DENSITY OF 1640 kg/m³ FOR VARIOUS MOISTURE CONTENTS

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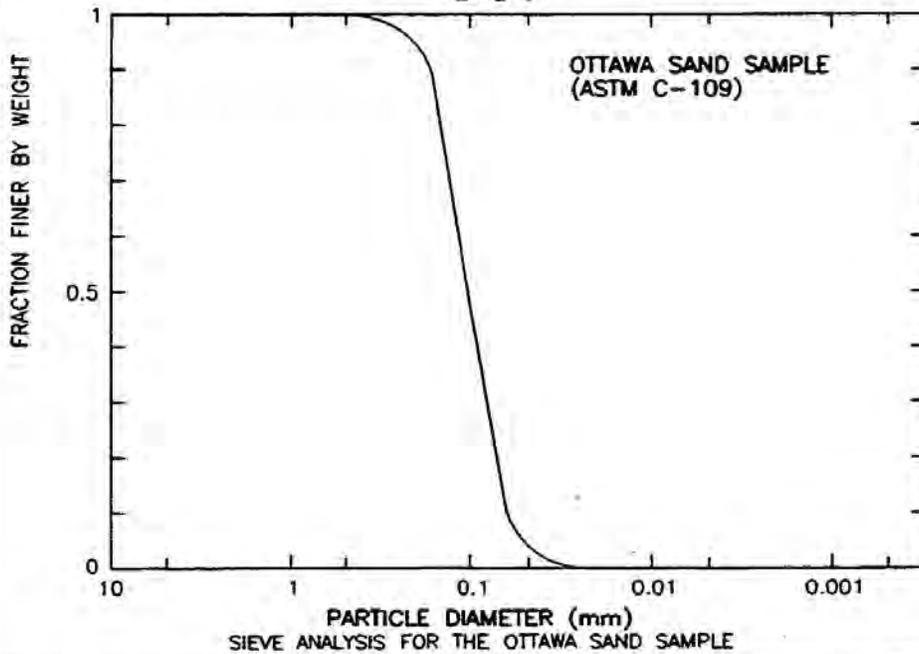
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EXHIBIT VI (CONT.)

OTTAWA SAND
PLATE 2



OTTAWA SAND
PLATE 3



TRANSMISSION RELIABILITY AND STANDARDS

COMMONWEALTH EDISON COMPANY
SYSTEM STANDARD

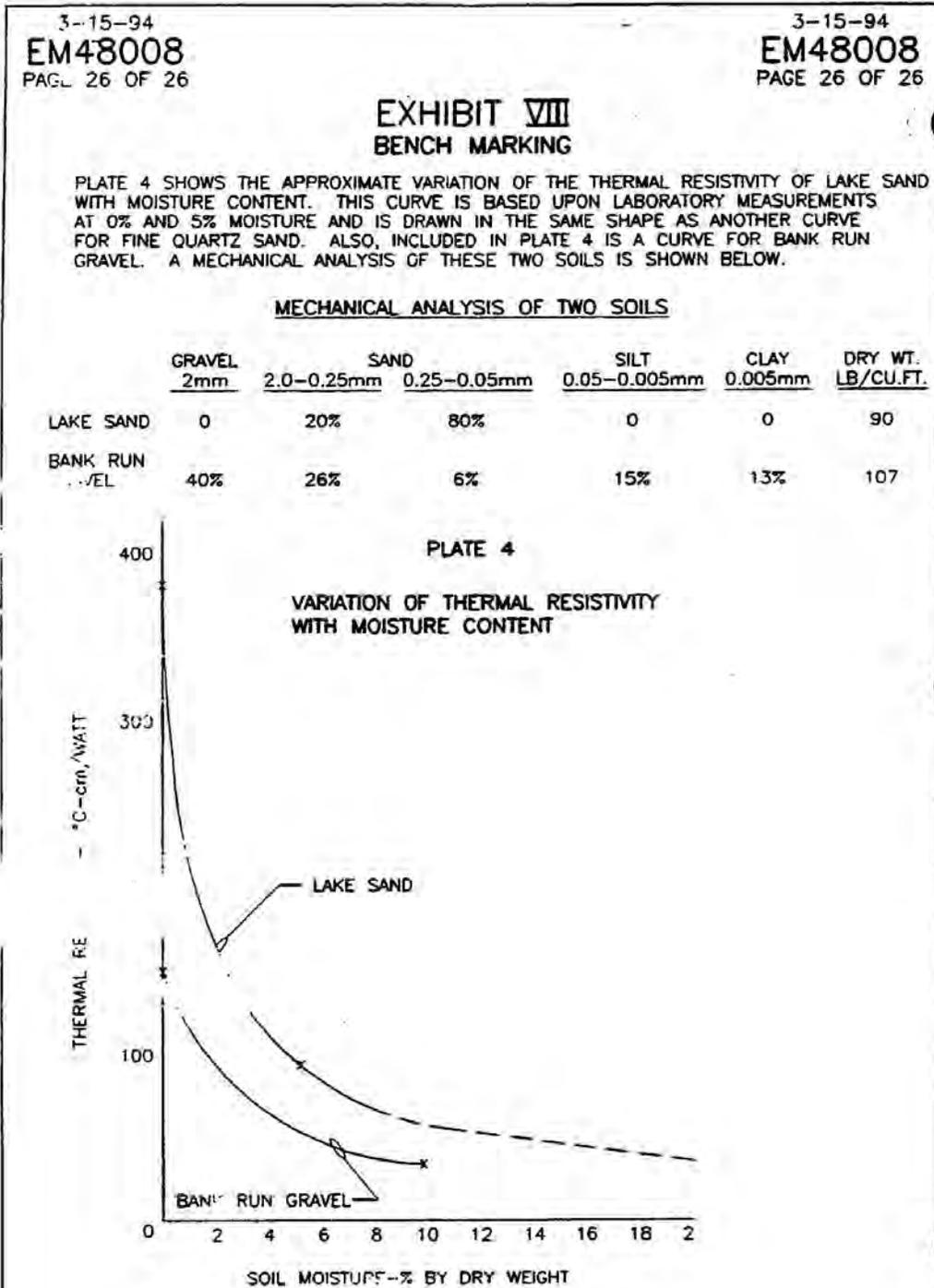
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EXHIBIT VII

**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



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

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

PORTLAND CEMENT CONCRETE PAVEMENT 10" (SPECIAL)

Description. This work shall consist of constructing tinted and stamped portland cement concrete pavement on a prepared subgrade as indicated in the plans. This work shall be done in accordance with Section 420, except as modified herein, and with the details shown in the plans.

Qualifications.

The Contractor shall provide written evidence that his firm or other entity proposed for the tinted portland cement paving work has at a minimum two years' experience with projects of similar scope and quality.

Materials.

- (a) Tinted portland cement concrete shall be integrally-colored "Utah Clay" by Butterfield Color. Color and proportions shall be mixed with portland cement concrete per manufacturer's instructions.
- (b) The class of concrete shall be in accordance with Section 1020 of the Standard Specifications, with the exception that the minimum cement factor shall be 6.05 cwt. The coarse aggregate to be used shall contain no more than two percent by weight (mass) of deleterious materials. Deleterious materials shall include substances whose disintegration is accompanied by an increase in volume which may cause spalling of the concrete.

Finishing. Pattern shall be a Herringbone Pattern (Typical 4x8 Holland Brick Paver) @45 degree angle.

Samples. Contractor shall submit product data and mix design from manufacturer to be approved by Village before fabrication.

Field Mock Up. Contractor shall provide a 4 foot by 4 foot field mock up to demonstrate finish, color, and texture of integrally-colored cement concrete median surface (and a minimum of 6" of the broom finished edging) to be approved by Engineer before fabrication.

Method of Measurement. The work will be measured in place in square yards for PORTLAND CEMENT CONCRETE PAVEMENT 10" (SPECIAL).

Basis of Payment. This work will be paid for at the contract unit price per square yard for PORTLAND CEMENT CONCRETE PAVEMENT 10" (SPECIAL).

REMOVE EXISTING STREET LIGHTING EQUIPMENT

Description. This work shall consist of disconnecting and removing an existing luminaire and luminaire arm at locations shown on the plans, or directed by the Engineer.

Construction Requirements. All work shall be performed in accordance with Section 842 of the Standard Specifications.

The existing luminaire and luminaire arm shall be inspected by the Engineer. If they are found to be non-operating or damaged, then the Contractor shall dispose of them in accordance with Article 202.03 of the Standard Specifications.

If the existing luminaire and luminaire arm are operational and not damaged, then the Contractor shall remove them from the existing pole, box them in new containers approved by the Engineer, and deliver them to the Village Public Works Department.

Measurement and Payment. The work shall be paid for at the contract unit price each for REMOVE EXISTING STREET LIGHTING EQUIPMENT, which shall be payment in full for all work listed herein and as directed by the Engineer.

TEMPORARY END SECTION

Description. This work shall be performed in accordance with Section 542 of the Standard Specifications. Material used for the end section shall be at the contractor's discretion and shall be approved by the engineer. Any damage to the temporary end section incurred as a result of unrelated construction processes, traffic, weather, or other reasons shall be replaced at the contractor's expense. Removal of the temporary end section and backfilling shall be included in this item.

Method of Measurement and Basis of Payment. The work shall be measured and paid for at the contract unit price per each for TEMPORARY END SECTION, which price shall be payment in full for all material, labor and any other items required to complete the work.

STORM SEWER TO BE FILLED

Description. This work shall consist of plugging and filling existing storm sewers that are to be abandoned.

Construction Requirements. All storm sewers to be filled shall be plugged at both ends with at least 2 feet long Class SI Concrete or mortar plug. After the concrete or mortar has set, the abandoned storm sewers can be filled. The controlled low-strength material used to fill the storm sewers and the filling operation shall be in accordance with Section 593 of the Standard Specifications.

Method of Measurement and Basis of Payment. This work will be measured and paid for at the contract unit price per cubic yard for STORM SEWER TO BE FILLED.

REMOVE EXISTING VALVE AND VAULT

Description. This work shall be performed in accordance with Section 604 of the Standard Specifications.

Method of Measurement and Basis of Payment. The work shall be measured and paid for at the contract unit price per each for REMOVE EXISTING VALVE AND VAULT, which price shall be payment in full for all material, labor and any other items required to complete the work.

REMOVE EXISTING CABLE

Description. This work shall consist of disconnecting and removing existing cable in conduit at locations shown on the plans, or directed by the Engineer.

Construction Requirements. All work shall be performed in accordance with Section 895 of the Standard Specifications.

The existing cable shall be disconnected from power source and/or light poles, prior to being removed from existing conduit to be abandoned.

The Contractor shall neatly coil removed cable and deliver to the Village Public Works Department at 714 S Plum Grove Road, Schaumburg, IL.

Method of Measurement. Removal of all cables installed in an existing conduit will be measured for payment in feet. Multiple cables in conduit shall not be paid to be removed separately. The length of measurement shall be the horizontal distance measured between points of connection, and shall not include vertical lengths and slack.

Measurement and Payment. The work shall be paid for at the contract unit price per foot for REMOVE EXISTING CABLE, which shall be payment in full for all work listed herein and as directed by the Engineer.

SEGMENTAL CONCRETE BLOCK WALL, SPECIAL

PART 1 GENERAL

1.1. Description

A. The work covered by this section includes the furnishing of all labor, materials, equipment and incidentals for the design, inspection and construction of a modular concrete retaining wall including drainage system and reinforcement as shown on the Construction Drawings and as described by the Contract Specifications. The work included in this section consists of, but is not limited, to the following:

1. Design, inspection and certification by a registered professional engineer.
2. Excavation and foundation soil preparation.
3. Furnishing and placement of the leveling base.
4. Furnishing and placement of the drainage system.
5. Furnishing and placement of geotextiles.
6. Furnishing and placement of segmental retaining wall facing units.
7. Furnishing and placement of geosynthetic reinforcement.
8. Furnishing and compaction of infill, drainage and retained soils.

1.2. Reference Standards

- A. Engineering Design
1. NCMA Design Manual for Segmental Retaining Walls, Second Edition.
 2. NCMA TEK 2-4 - Specifications for Segmental Retaining Wall Units.
 3. NCMA SRWU-1 - Determination of Connection Strength between Geosynthetics and Segmental Concrete Units.
 4. NCMA SRWU-2 - Determination of Shear Strength between Segmental Concrete Units.
- B. Segmental Retaining Wall Units
1. ASTM C 140 - Sampling and Testing Concrete Masonry Units
 2. ASTM C 1262 - Evaluating the Freeze - Thaw Durability of Manufactured Concrete Masonry Units and Related Concrete Units.
 3. ASTM C 33 - Specification for Concrete Aggregates
 4. ASTM C 90 - Standard Specification for Load-Bearing Concrete Masonry Units
 5. ASTM C 150- Specification for Portland Cement.
 6. ASTM C 595 - Specification for Blended Hydraulic Cements
- C. Geotextile Filter
1. ASTM D 4751 - Standard Test Method for Apparent Opening Size
- D. Geosynthetic Reinforcement
1. ASTM D 4595 - Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 2. ASTM D 5262 - Test Method for Evaluating the Unconfined Creep Behavior of Geosynthetics.

3. GRI GG-1: Single Rib Geogrid Tensile Strength
 4. GRI GG-5: Geogrid Pullout
 5. GRI GT-6: Geotextile Pullout
- E. Soils
1. ASTM D 698 - Moisture Density Relationship for Soils, Standard Method
 2. ASTM D 422 - Gradation of Soils
 3. ASTM D 424 - Atterberg Limits of Soils
 4. ASTM D G51 - Soil pH
- F. Drainage Pipe
6. ASTM D 3034 - Specification for Polyvinyl Chloride (PVC) Plastic Pipe
 7. ASTM D 1248 - Specification for Corrugated Plastic Pipe
- G. Where specifications and reference documents conflict, the Owner or Owner's Representative shall make the final determination of applicable document.

1.3. Approved Products

- A. Pisa2[®] Segmental Retaining Wall System as supplied by Unilock[®].
Unilock[®] Chicago
301 E Sullivan Rd, Aurora IL 60505.
Tel 630-892-9191 Fax 630-892-9215
- B. Color to be "Nevada".

1.4. The Contractor

- A. The term Contractor shall refer to the individual or firm who will be installing the segmental concrete block wall.
- B. The Contractor must have the necessary experience for the project and have successfully completed projects of similar scope and size.

1.5. Delivery, Material Handling and Storage

- A. The installing contractor shall check all materials delivered to the site to ensure that the correct materials have been received and are in good condition.
- B. The Contractor shall store and handle all materials in accordance with Unilock's recommendations and in a manner to prevent deterioration or damage due to moisture, temperature changes, contaminants, breaking, chipping or other causes.

1.6. Engineering Design and Certification

- A. The term Engineer shall refer to the individuals or firms who have been retained by the Contractor to provide design and inspection services for the retaining wall. The Design Engineer may be a different individual or firm from the Inspecting Engineer as Unilock[®] may provide this service. The Engineer(s) must be qualified in the area of segmental retaining wall design and construction and must be licensed to practice engineering in the Province or State that the wall is to be constructed.
- B. The Engineer(s) will perform the following tasks:
1. Produce sealed construction drawings and detailed design calculations, completed in accordance with the design requirements outlined in Part 3 of these specifications.
 2. Review the site soil and geometric conditions to ensure the designed wall is

compatible with the site prior to construction.

3. Inspect the site conditions, materials incorporated into the retaining wall, and the construction practices used during the construction.

4. Provide the Contractor with a letter after completion, certifying the design meets the requirements of this specification, the design was compatible with the site and the wall was constructed according to design.

1.7. Submittals

A. The Contractor shall submit the following information for approval thirty (30) days prior to the construction of the segmental retaining wall.

1. Design Submittal – Provide three (3) sets of stamped construction drawings and detailed design calculations, completed and sealed by the Engineer in accordance with the design requirements outlined in Part 3 of this specification. A detailed explanation of the design properties for the geosynthetic reinforcements shall be submitted with the design.

2. Materials Submittal – Manufacturer's certifications, stating that the SRW units, the geosynthetic reinforcement, and imported aggregates and soils meet the requirements of this specification and the Engineer's design.

3. Installer Qualifications - The Contractor must be able to demonstrate that their field construction supervisor has the necessary experience for the project by providing documentation showing that they have successfully completed projects of similar scope and size.

PART 2 MATERIALS

2.1. Definitions

A. Modular concrete block wall units are dry-cast solid concrete units that form the external fascia of a modular unit retaining wall system.

B. Coping units are the last course of concrete units used to finish the top of the wall.

C. Infill soil is specified material that is placed directly behind the drainage soil and within the reinforced zone, if applicable.

D. Retained soil is an in-situ soil or a specified soil that is placed behind the wall infill soil.

E. Foundation soil is the in-situ soil beneath the wall structure.

F. Drainage aggregate is a free draining soil with natural soil filtering capabilities, or a free draining soil encapsulated in a suitable geotextile, or a combination of free draining soil and perforated pipe all wrapped in a geotextile, placed directly behind the modular concrete units.

G. Drainage pipe is a perforated polyethylene pipe used to carry water, collected at the base of a soil retaining wall, to outlets in order to prevent pore water pressures from building up behind the wall facing modules.

H. Non-woven geotextiles are permeable synthetic fabrics formed from a random arrangement of fibers in a planar structure. They allow the passage of water from one soil

medium to another while preventing the migration of fine particles that might clog a drainage medium.

I. Geogrid reinforcement is a polymer grid structure having tensile strength and durability properties that are suitable for soil reinforcement applications.

J. All values stated in metric units shall be considered as accurate. Values in parenthesis stated in imperial units are the nominal equivalents.

2.2. Products

A. Concrete Segmental Retaining Wall Units

1. The concrete wall modules shall be 150 x 200 x 300 mm (6 x 8 x 12 inches) with a maximum tolerance of plus or minus 3 mm (1/8 in.) for each dimension.
2. The concrete block wall modules shall be solid units and have a minimum weight of 20.4kg (45 lbs.) per unit.
3. The concrete block wall modules shall have an integral shear key connection that shall be offset to permit a minimum wall batter of 1H : 8V.
4. The concrete wall modules shall have a minimum 28-day compressive strength of 35 MPa (5000 psi) as tested in accordance with ASTM C 140. The concrete shall have a maximum moisture absorption rate of 5 percent to ensure adequate freeze-thaw protection.

B. Infill Soil

1. The infill soil shall consist of free draining sands or gravels with less than 5% passing the #200 sieve size or as specified in the Construction Drawings.
2. The Engineer shall review and determine the suitability of the wall infill soil at the time of construction.

C. Retained Soil

1. The retained soil shall be on site soils unless specified otherwise in the Construction Specifications or as directed by the Engineer. If imported fill is required, it shall be examined and approved by the Engineer.

D. Foundation Soil

1. The foundation soil shall be the native undisturbed on site soils. The foundation soil shall be examined and approval by the Engineer prior to the placement of the base material.

E. Leveling Base Material

1. The footing material shall be non-frost susceptible, well graded compacted crushed stone (GW-Unified Soil Classification System), or a concrete leveling base, or as shown on the Construction Drawings.

F. Drainage Soil

1. The drainage soil shall be a free draining angular granular material of uniform particle size smaller than 25 mm (1 inch) separated from the infill soil or retained soil by a geotextile filter. The drainage soil shall be installed directly behind the SRW units if the infill soil is unable to provide adequate drainage capacity.

G. Drainage Pipe

1. The drainage pipe shall be perforated corrugated HDPE or PVC pipe, with a minimum diameter of 100 mm (4 inches), protected by a geotextile filter to

prevent the migration of soil particles into the pipe, or as specified on the construction drawings.

H. Geotextile Filter

1. The non-woven geotextile shall be installed as specified on the construction drawings. Although selection of the appropriate geotextile specifications is site soil specific, a commonly used geotextile for filtration will have an Apparent Opening Size ranging between 0.149 and 0.210 mm (U.S. Sieve Sizes 100 to 70) and a minimum unit weight of 135 grams per square meter (4.0 oz /square yard.) The coefficient of permeability will typically range between 0.1 and 0.3 cm/second.

I. Geogrid Reinforcement

1. The Engineer shall determine the type, strength and placement location of the reinforcing geosynthetic. The design properties of the reinforcement shall be determined according to the procedures outlined in this specification.

Detailed test data shall be submitted with the design calculations and shall include tensile strength (ASTM D 4595 or GGI GG-1), creep potential (ASTM D 5262), site damage and durability (GRI GG-4) and pullout resistance (GRI GG-5 or GRI-GT-6) and connection strength (NCMA SRWU-1).

J. Concrete Adhesive

1. The adhesive is used to permanently secure the coping stone to the top course of the wall. The adhesive must provide sufficient strength and remain flexible.

PART 3 WALL DESIGN

3.1. Design Standard

A. The Design Engineer is responsible for providing a design that shall consider the external stability, internal stability, and local stability of the SRW System. It is the responsibility of the Certifying Engineer or Site Geotechnical Engineer to determine if further design considerations must be implemented to ensure adequate global/overall slope stability, and/or, if the foundation soils will require special treatment to control total and differential settlement. The design life of the structure shall be 75 years unless otherwise specified in the construction drawings.

B. The segmental concrete block wall shall be designed in accordance with recommendations of the NCMA Design Manual for Segmental Retaining Walls, Second Edition. The following is a summary of the minimum factors of safety for the various modes of failure evaluated in the proposed design.

External Stability

Base Sliding	1.5
Overturning	2.0
Bearing Capacity	2.0
Global Stability	1.3

Internal Stability

Tensile Overstress	1.0
Pullout	1.5
Internal Sliding	1.5

Local Stability

Facing Shear	1.5
Connection	1.5

3.2. Soil

A. Soil design parameters shall be determined as specified by the Engineer.

3.3. Design Geometry

A. The length, height, and overall elevations of the retaining wall must comply with the requirements of the proposed elevation detail, station information and site grading plan.

B. The structures' design height, H, shall be measured from the top of the leveling pad to the top of the wall where ground surface intercepts the wall facing.

C. Slopes above and below all sections of the segmental retaining wall are detailed in the site grading plan.

D. The minimum wall embedment shall be the greater of:

1. The height of a SRW unit,
2. 150 mm (0.5 ft) or,
3. The minimum embedment required because of the slope below the wall:

Slope Below Wall	Minimum embedment
Level	H/10
3 : 1 (18.4 deg)	H/10
2 : 1 (26.5 deg)	H/7

E. The following surcharges shall be applied to the top of each design cross section based on the following proposed uses above the wall.

Use Above Wall	Minimum Surcharge
No Traffic	0 kPa (0 lb/sq. ft)
Light Traffic	4.8 kPa (100 lb/sq. ft)
Heavy Traffic	12.0 kPa (250 lb/sq. ft)

3.4. State of Stress

A. The lateral earth pressure to be resisted by the reinforcements at each reinforcement layer shall be calculated using the Coulomb coefficient of earth pressure, K_a , times the vertical stress at each reinforcement layer.

B. The vertical soil stress at each reinforcement layer shall be taken equal to the unit weight of the soil times the depth to the reinforcement layer below the finished grade behind the facing units. A coefficient of active earth pressure, K_a , shall be used from the top to the bottom of the wall. The coefficient of active earth pressure, K_a , shall be assumed independent of all external loads except sloping fills. For sloping fills, the coefficient of active earth pressure, K_a , appropriate for the sloping condition, using Coulomb earth pressure shall be used in the analysis.

3.5. Inclination of Failure Surface

A. A Coulomb failure surface passing through the base of the wall at the back of the reinforced zone up to the ground surface at or above the top of wall shall be assumed in design of walls.

3.6. Geosynthetic Reinforcement

A. The allowable reinforcement tension, T_a , shall be determined in accordance with the method outlined in the NCMA Design Manual for Segmental Retaining Walls, Second Edition. This method calculates the Long Term Design Strength (LTDS) of the geosynthetic reinforcement by considering the time-temperature creep characteristics of the reinforcement, environmental degradation, construction induced damage and an overall factor of safety.

3.7. Geogrid Length

A. The minimum soil reinforcement length shall be as required to achieve a minimum width of structure, B, measured from the front face of the wall to the end of the soil reinforcements. B must be greater than or equal to 60 percent of the total height, H. The length of the reinforcements at the top of the wall may be increased beyond the minimum length required to increase pullout resistance.

3.8. Settlement Control

A. It is the responsibility of the Certifying Engineer or Site Geotechnical Engineer to determine if the foundation soils will require special treatment to control total and differential settlement.

3.9. Global Stability

A. It is the responsibility of the Certifying Engineer or Site Geotechnical Engineer to determine if further design considerations must be implemented to ensure adequate global/overall slope stability.

PART 4 CONSTRUCTION

4.1. Inspection

A. The Engineer is responsible for verifying that the contractor meets all the requirements of the specification. This includes the use of approved materials and their proper installation.

B. The Contractor's field construction supervisor shall have demonstrated experience and be qualified to direct all work related to the retaining wall construction.

4.2. Construction Tolerances

A. The following tolerances are the maximum allowable deviation from the planned construction

Vertical Control: +/- 1.25 inches over a 10 ft distance, +/- 3 inches total
Horizontal Control: +/- 1.25 inches over a 10 ft distance, +/- 3 inches total
Rotation: +/- 2 degrees from planned wall batter

Bulging: 1.0 inch over a 10 ft distance

4.3. Site Preparation

- A. The foundation soil shall be excavated or filled as required to the grades and dimensions shown on the Construction Drawings or as directed by the Owner or Owner's Representative.
- B. The foundation soil shall be proof rolled and examined by the Engineer to ensure that it meets the minimum strength requirements according to the design assumptions. If unacceptable foundation soil is encountered, the contractor shall excavate the affected areas and replace with suitable quality material under the direction of the Engineer.
- C. In cut situations, the native soil shall be excavated to the lines and grades shown on the Construction Drawings and removed from the site or stockpiled for reuse as retained soil.

4.4. Installing Drainage System

- A. The approved non-woven geotextile shall be set against the back of the first retaining wall unit, over the prepared foundation, and extend towards the back of the excavation, up the excavation face and back over the top of the infill soil to the retaining wall, or as shown in the Construction Drawings.
- B. The drainage pipe shall be placed behind the leveling base, or lower course of facing units as shown in the Construction Drawings or as directed by the Engineer. The pipe shall be laid at a minimum gradient of 2% to ensure adequate drainage to free outlets.
- C. T - Sections and outlet pipes shall be installed on the drainage pipe at 15 m (50 ft.) centers or as shown on the Construction Drawings.
- D. The remaining length of geotextile shall be pulled taut and pinned over the face of the retained soil. Geotextile overlaps shall be a minimum of 300 mm (1 ft.) and shall be shingled down the face of the excavation in order to prevent the infiltration of retained soil into the wall infill.

4.5. Leveling Base or Spread Footing Placement

- A. The leveling base material shall be crushed stone compacted to 98% Standard Proctor Density, or vibrated concrete along the grades and dimensions shown on the Construction Drawings or as directed by the Engineer. The minimum thickness of the leveling base shall be 150 mm (6 inches)

4.6. Installation of Modular Concrete Block Wall Units

- A. The bottom row of retaining wall modules shall be placed on the prepared leveling base as shown on the Construction Drawings. Care shall be taken to ensure that the wall modules are aligned properly, leveled from side to side and front to back and are in complete contact with the base material.
- B. The wall modules above the bottom course shall be placed such that the tongue and groove arrangement provides the design batter (i.e. setback) of the wall face.
Successive courses shall be placed to create a running bond pattern with the edge of all units being approximately aligned with the middle of the unit in the course below it.
- C. The wall modules shall be swept clean before placing additional levels to ensure that no dirt, concrete or other foreign materials become lodged between successive lifts of

the wall modules.

- D. A maximum of 4 courses of wall units can be placed above the level of the infill soil at any time.
- E. The contractor shall check the level of wall modules with each lift to ensure that no gaps are formed between successive lifts that may affect the pullout resistance of geogrid reinforcement, if applicable.
- F. Care shall be taken to ensure that the wall modules and geosynthetic reinforcement are not broken or damaged during handling and placement.

4.7. Drainage Soil

- A. The drainage soil will be placed behind the retaining wall modules with a minimum width of 300 mm (1 ft.) and separated from other soils using the approved nonwoven geotextile.
- B. Drainage soil shall be placed behind the wall facing in maximum lifts of 6 inches and compacted to a minimum density of 95% Standard Proctor.
- C. No heavy compaction equipment shall be allowed within 1 meter (3 ft.) of the back of the wall fascia.

4.8. Infill Soil

- A. Wall infill soil shall be placed behind the first course of the wall facing units in maximum lifts of 150 mm (6 inches) and compacted to a minimum density of 95% Standard Proctor. At the specified elevations, geogrid reinforcement shall be placed, as described in section 4.09. The fill shall be placed and compacted level with the top of the wall modules at the specified geogrid elevations prior to placing the geogrid reinforcement.
- B. Wall infill soil shall be placed on top of the geogrid reinforcement layers in maximum lifts of 150 mm (6 inches) and compacted to a minimum of 95% Standard Proctor Density. Care shall be taken to ensure that the geogrid lays flat and taut during placement of the infill soil. This is best achieved by placing fill on top of the geogrid near the wall fascia and spreading toward the back of the infill soil zone.
- C. No tracked construction equipment shall be allowed to operate directly on top of the geogrid until a minimum thickness of 150 mm (6 inches) of fill has been placed. Rubber tired equipment may drive on top of the geogrid at slow speeds but should exercise care not to stop suddenly or make sharp turns. No heavy equipment shall be allowed within 1 meter (3 ft.) of the back of the wall.

4.9. Geogrid Soil Reinforcement

- A. Pre-cut sections of geogrid reinforcement shall be placed horizontally at the specified elevations and with longitudinal axis perpendicular to the wall face (i.e. machine direction), at the elevations shown on the Construction Drawings, or as directed by the Engineer.
- B. The geogrid shall be placed over the compacted infill soil and the wall facing units with the outside edge extending over the tongue of the bottom unit and to within 25 mm (1 in.) of the front facing unit. Care shall be taken to ensure that the wall modules are swept clean and that the geogrid is in complete contact with the top and bottom faces of the adjacent wall modules. The next course of wall modules shall be carefully placed on top of

the lower modules to ensure that no pieces of concrete are chipped off and become lodged between unit layers.

C. The geogrid shall be pulled taut away from the back the wall modules during placement of infill soil. Alternatively, suitable anchoring pins or staples can be used to ensure that there are no wrinkles or slackness prior to placement of the infill soil.

The geogrid shall lay perfectly flat when pulled back perpendicular to the back of the wall fascia.

4.10. Retained Soil

A. Retained soils shall be placed and compacted behind the infill soil or drainage soil if applicable, in maximum lift thickness of 150 mm (6 inches.) The retained soils shall be undisturbed native material or engineered fill compacted to a minimum density of 95% Standard Proctor.

B. No heavy compaction equipment shall be allowed within 1 m (3 ft.) of the back of the wall modules.

4.11. Finishing Wall

A. Items 4.5 to 4.10 shall be repeated until the grades indicated on the Construction Drawings are achieved.

B. Coping units shall be secured to the top of the wall with two 10 mm (3/8 inch) beads of the approved flexible concrete adhesive positioned 50mm (2 inches) in front and behind the tongue of the last course of retaining wall units.

C. Finish grading above the wall to direct surface run off water away from the segmental retaining wall. Use a soil with a low permeability to restrict the rate of water infiltration into the retaining wall structure.

Method of Measurement and Basis of Payment. This work will be measured and paid for at the contract unit price per SQUARE FOOT of vertical wall face area as shown on the construction drawings for SEGMENTAL CONCRETE BLOCK WALL, SPECIAL. The vertical wall face area shall be measured from the top of the base or footing to the top of the coping course multiplied by the length of the wall. The contract unit price shall include the cost of all engineering, labor, excavation, materials, and equipment used to complete the work as specified.

BIKE PATH REMOVAL

Description. This work shall consist of the removal of HMA bike path of all thicknesses per Section 440.

Method of Measurement and Basis of Payment. This work will be measured and paid for at the contract unit price per square yard for BIKE PATH REMOVAL, which price for all work as specified herein.

TEMPORARY WOOD POLE, 50 FT., CLASS 4

Description. This work shall consist of furnishing and installing a temporary wood pole complete, including the luminaire mast arm, and all hardware and accessories required, at locations shown on the plans or directed by the Engineer.

Construction Requirements. All work shall be performed in accordance with Section 830 and Article 1069.04 of the Standard Specifications, and as shown on the plans. Wood poles shall be stored and handled in accordance with ANSI 05.1.

Installation of the wood pole shall be raked 1ft and provided guy wiring as shown on the plans.

Temporary wood poles shall be provided with clevis for connecting proposed aerial cables, bare copper ground wire, ground rod and thimbleye.

Contractor shall furnish and install luminaire mast arms as part of this work, of the size and mounting height as shown on the plans. At location(s) shown on the plans, existing luminaire and luminaire mast arm shall be relocated to temporary wood pole. Relocation and reinstallation of the luminaire and luminaire mast arm shall be included in this pay item.

Temporary luminaires shall be paid for separately.

Measurement and Payment. The work shall be paid for at the contract unit price each for TEMPORARY WOOD POLE, 50FT., CLASS 4, which shall be payment in full for all work listed herein and as directed by the Owner's Representative.

PRECAST CONCRETE JUNCTION CHAMBER

Description. This work shall consist of all work and materials required for the construction of PRECAST CONCRETE JUNCTION CHAMBERS in accordance with the plans and as specified herein.

Materials.

Concrete:	IDOT Section 1020 Class PC (f' c min = 4,500 PSI)
Reinforcing Steel:	ASTM A 706, Grade 60 (IL Modified)
Frame and Grate:	Type 1 Frame, Closed Lid IDOT Standard 604001
Precast Riser/Slab:	IDOT Standard 602401 and 602601
Steps:	IDOT Standard 602701
Mastic Joint Sealer:	IDOT Section 1056
Loading:	Soil Loads and AASHTO HS-20

Construction Requirements. The precast junction chambers shall be constructed in accordance with IDOT Section 504. All precast concrete items shall be fabricated by a producer on the Bureau of Materials and Physical Research "Qualified Producer List of Certified Precast Concrete Producers". All excavation and granular backfill material shall be in accordance with IDOT Section 502. The CONTRACTOR shall be responsible for verifying the size, inverts and locations of the sewers to be connected to the proposed Junction Chamber. A precast concrete bench slab shall be poured up to the inverts of the pipes to prevent standing water on the bottom slab. The CONTRACTOR shall be take necessary precautions to prevent the chamber from becoming buoyant during construction.

The CONTRACTOR has the option of constructing the junction chamber using cast in place concrete in accordance with IDOT Section 503, with prior permission from the ENGINEER. Cast in place concrete shall be IDOT class SI (f'c min = 3500 PSI).

The CONTRACTOR shall submit calculations and detailed shop drawings that are signed and sealed by a Structural Engineer licensed in the State of Illinois to the ENGINEER for review prior to ordering material or starting construction. The required thickness of the chambers bottom slab, sidewalls and top slab, and reinforcement details shall be shown on the shop drawings.

A temporary shoring plan, signed and sealed by a Structural Engineer licensed in the State

of Illinois, shall be submitted to the ENGINEER with corresponding calculations and other necessary information, for all temporary shoring required to accommodate safety and other requirements during construction. Temporary shoring plan shall be approved by the ENGINEER as coordinated with the VILLAGE prior to installation of temporary shoring.

Basis of Payment. This work shall be paid for at the contract price per each for PRECAST CONCRETE JUNCTION CHAMBER, as shown on the plans. All labor and materials associated with excavation, granular backfill, granular subbase, concrete, reinforcement bars, frame and grate, cast iron steps, precast concrete riser and slab, temporary shoring and any miscellaneous items required for the junction chamber shall not be paid for separately, but shall be included in the price for PRECAST CONCRETE JUNCTION CHAMBER

TEMPORARY STORM SEWER

Description. This work shall be performed in accordance with Section 550 of the Standard Specifications. Material used for the storm sewer shall be at the contractor's discretion and shall be approved by the engineer. Any damage to the temporary storm sewer incurred as a result of unrelated construction processes, traffic, weather, or other reasons shall be replaced at the contractor's expense. Removal of the temporary storm sewer and backfilling shall be included in this item.

Method of Measurement and Basis of Payment. This work shall be measured and paid for in accordance with Article 550.096 of the Standard Specifications for TEMPORARY STORM SEWER of the diameter specified, and shall include all materials, labor, and equipment to perform the work.

STAMPED COLORED PORTLAND CEMENT CONCRETE MEDIAN SURFACE 4 INCH

Description. This work shall consist of constructing tinted and stamped portland cement concrete median surface on a prepared subgrade as indicated in the plans. This work shall be done in accordance with Section 424, except as modified herein, and with the details shown in the plans.

Qualifications.

The Contractor shall provide written evidence that his firm or other entity proposed for the tinted portland cement paving work has at a minimum two years' experience with projects of similar scope and quality.

Materials.

- (a) Tinted portland cement concrete shall be integrally-colored "Utah Clay" by Butterfield Color. Color and proportions shall be mixed with portland cement concrete per manufacturer's instructions.
- (b) The class of concrete shall be in accordance with Section 1020 of the Standard Specifications, with the exception that the minimum cement factor shall be 6.05 cwt. The coarse aggregate to be used shall contain no more than two percent by weight (mass) of deleterious materials. Deleterious materials shall include substances whose disintegration is accompanied by an increase in volume which may cause spalling of the concrete.

Finishing. Pattern shall be a Herringbone Pattern (Typical 4x8 Holland Brick Paver) @45 degree angle.

Samples. Contractor shall submit product data and mix design from manufacturer to be approved by Village before fabrication.

Field Mock Up. Contractor shall provide a 4 foot by 4 foot field mock up to demonstrate finish, color, and texture of integrally-colored cement concrete median surface (and a minimum of 6" of the broom finished edging) to be approved by Engineer before fabrication.

Method of Measurement. The work will be measured in place in square feet for STAMPED COLORED PORTLAND CEMENT CONCRETE MEDIAN SURFACE 4 INCH.

Basis of Payment. This work will be paid for at the contract unit price per square foot for STAMPED COLORED PORTLAND CEMENT CONCRETE MEDIAN SURFACE 4 INCH.

PAVEMENT REMOVAL (SPECIAL)

Description. This work shall consist of the removal of all types of pavements, of all thicknesses, per Section 440. Pavement types include the following. HMA, Concrete, Composite (HMA/Concrete), Composite (HMA/geofabric/Concrete), Class D Patch removal, and incidental bituminous surfaces.

Paragraph 440.07 (c) shall not apply.

Method of Measurement and Basis of Payment. This work will be measured and paid for at the contract unit price square yard for PAVEMENT REMOVAL (SPECIAL), which price for all work as specified herein.

FOUNDATION REMOVAL

Description. This work shall consist of removal and disposal of existing concrete foundations as shown on the plans or directed by the Engineer.

Construction Requirements. All work shall be performed in accordance with Section 842 of the Standard Specifications.

The entire concrete foundation shall be completely removed, transported offsite and disposed of in accordance with Article 202.03 of the Standard Specifications.

The Contractor shall be responsible for constructing exploratory trenches for the purpose of locating existing utilities under, or adjacent, to the foundation to be removed. The depth of the exploratory trenches shall not exceed 66 in., as measured from the existing ground elevation.

If an existing utility is found to be in conflict with the foundation removal, the Contractor shall protect the existing utility, separate it from the foundation, prior to breaking down/removing the existing concrete foundation.

Existing underground conduits shall be separated from the foundation prior to removal and abandoned.

The void area shall be backfilled with approved material, and the surface reconstructed to match the adjoining area.

Measurement and Payment. The work shall be paid for at the contract unit price each for FOUNDATION REMOVAL, which shall be payment in full for all work listed herein and as directed by the Engineer.

WATER MAIN LINE STOP

Description. This work shall consist of the placement of a self-contained unit of the size indicated on the plans for the purpose of abandoning a section of water main without interruption of service to that section of main that is to remain active.

Materials. The line stop unit shall be a self-contained hydraulic (hand pump operated) ram. The line stopping device shall be of such a design that when hydraulic pressure is applied, the rubber will expand and conform to the inside diameter of the pipe and tuberculation inside the main (if any) will be moved outside of the sealing area. The line stop shall be of the "Short Stop" variety which will require removing only the top of the pipe during operation. All fittings shall employ an inside diameter thread, screw-type connection. After insertion of the plug, a screw-on cap shall be used and bolted down. The system shall be capable of containing a water pressure of 150 psi. Shop drawings for line stop sleeves shall be submitted for approval by the Engineer prior to delivery to the job site.

Method of Measurement. This work will be measured for payment per each location where a water main line stop is installed.

Basis of Payment. This work will be paid for at the contract unit price each for WATER MAIN LINE STOP, of the diameter specified, which price shall be payment in full for all excavation, legal disposal of excavated material and trench backfill.

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

Description. This work shall consist of furnishing and installing catch basins with a new frame and grate as specified in the plans and in accordance with Section 602 of the Standard Specifications and as specified herein. The catch basin structure shall be in accordance with standard drawing 602001-02 of the Highway Standards.

The grate shall be IDOT Standard 604091 Type 24, however the frame shall also incorporate an adjustable curb box component in addition to the grate. The curb box shall be the full length of the grate and shall conform to being flush with dimensions of a Type B.6 curb, such as shown in IDOT Standard 604011.

Method of Measurement and Basis of Payment. This work will be measured and paid for at the contract unit price per EACH for CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE 24 FRAME AND GRATE, SPECIAL which shall include all equipment, materials and labor to perform the described work.

COMBINATION CONCRETE CURB AND GUTTER, TYPE B-9.12 (SPECIAL)

Description. In addition to Section 606 this work shall include providing and installing the brackets, at 6' centers, as shown in the plan details.

Method of Measurement and Basis of Payment. This work will be measured and paid for at the contract unit price foot for COMBINATION CONCRETE CURB AND GUTTER, TYPE B-9.12 (SPECIAL), which price for all work as specified herein.

CONCRETE MEDIAN, TYPE SB-6.12 (SPECIAL)

Description. This work shall consist of constructing concrete medians per Section 606 and as detailed in the plans.

Method of Measurement and Basis of Payment. This work will be measured and paid for at the contract unit price per square foot for CONCRETE MEDIAN, TYPE SB-6.12 (SPECIAL), which price for all work as specified herein.

CONDUIT SPLICE

Description. This item shall consist of splicing two high density polyethylene (HDPE) conduits together at the location shown on the plans.

Materials. Coupler shall be clamp on type, fabricated from HDPE, and have corrosion resistant stainless steel band clamps and locking rings. O-ring joints shall be air pressure tested to hold over 130 psi, and the water sealing capability to withstand head pressures greater than 20 feet.

The coupler shall be UL listed for underground HDPE conduit connections in wet locations.

Construction Requirements. Prior to splicing, the ends of the conduits shall be beveled, and the coupler shall be installed per the manufacturer's installation requirements.

The Contractor shall record location of the conduit splice, and include on the Record Drawings.

Measurement and Payment. This work shall be paid for at the contract unit price per each for CONDUIT SPLICE, which shall be payment in full for all work listed herein and as directed by the Engineer.

REMOVE EXISTING JUNCTION BOX

Description. This work shall consist of removing and disposing of an existing composite concrete handhole as shown on the plans.

Construction Requirements. All work shall be performed in accordance with Section 895 of the Standard Specifications.

The entire composite concrete handhole box and cover shall be completely removed and disposed of in accordance with Article 202.03 of the Standard Specifications. The void area shall be backfilled with approved material, and the surface reconstructed to match the adjoining area. If the handhole is located in a sidewalk area, the entire sidewalk square or squares where the handhole is located shall be removed and replaced with new sidewalk. Sidewalk removal and replacement will be paid for separately.

Measurement and Payment. The work shall be paid for at the contract unit price each for REMOVE EXISTING JUNCTION BOX, which shall be payment in full for all work listed herein and as directed by the Engineer.

LUMINAIRE, LED, HORIZONTAL MOUNT, SPECIAL

Description. This item shall consist of furnishing and installing a proposed LED type luminaire, including all mounting hardware and accessories, to a spun aluminum light pole as shown on the plans.

Construction Requirements. All work shall be installed in accordance with Sections 821 of the Standard Specifications, plan drawings, NEC, and local ordinances. Luminaire testing is not required.

The proposed luminaire is a 177W LED cobra head type luminaire, with type II optic, as manufactured by American Electric Lighting, model number ATB2-40BLEDE13-MVOLT-R2-IL-BL-NL-HK-P7-SH. The luminaire shall be mounted to a light pole and luminaire arm as shown on the plans. The light pole and luminaire arm shall be paid for separately.

Measurement and Payment. The work shall be paid for at the contract unit price each for LUMINAIRE, LED, HORIZONTAL MOUNT, SPECIAL, which shall be payment in full for all work listed herein and as directed by the Engineer.

RELOCATE EXISTING LUMINAIRE

Description. This work shall consist removing and relocating an existing luminaire and luminaire arm as shown on the plans, or as directed by the Engineer.

Construction Requirements. All work shall be performed in accordance with Section 844 of the Standard Specifications, Municipal requirements and NEC.

The existing luminaire and luminaire arm shall be disconnected and removed from existing light pole. The equipment shall be inspected by the Engineer, so that any damage sustained during removal and relocation operations shall be repaired, or replaced in kind. If the luminaire is found to be non-operating, then the Contractor shall contact the Engineer for written direction and/or replacement procedures.

The luminaire and luminaire arm shall be installed immediately on a temporary wood pole, at the same mounting height, as shown on the plans. The luminaire shall be connected to temporary aerial cables, which shall be paid for separately, so that the reinstalled luminaire is operational the same evening without interruption.

Measurement and Payment. The work shall be paid for at the contract unit price each for RELOCATE EXISTING LUMINAIRE, which shall be payment in full for all work listed herein and as directed by the Engineer.

REMOVE AERIAL CABLE

Description: This work shall consist of removing and disposing of existing temporary aerial electric cable at the locations shown on the plans.

Construction Requirements: The electric cables shall be disconnected from source and removed from the conduits prior to its removal from the existing structure.

All work shall be in accordance with Section 842.02 in the Standard Specifications.

Method of Measurement: This work will be measured for payment in feet along the aerial cable assembly. Measurements will be made in a straight line between wood poles. Sag of the aerial cables or vertical cable will not be measured for payment.

Basis of payment: This work shall be paid for at the contract unit price per foot for REMOVE AERIAL CABLE, which shall be payment in full for all work listed herein and as directed by the Owner's Representative.

PEDESTRIAN RAIL (SPECIAL)

Description. This work shall consist of furnishing and installing pedestrian railing and appurtenances as detailed in the plans.

Method of Measurement and Basis of Payment. This work will be measured and paid for at the contract unit price per foot for PEDESTRIAN RAIL (SPECIAL), which shall include any thickened slab sidewalk or base plates required to perform the work as specified herein.

STRUCTURES TO BE ADJUSTED

Description. This work shall consist of adjusting catch basins, manholes, inlets, water valve vaults, fire hydrants, fire hydrant valve boxes, or water service boxes to grade with their existing frame and grate or with a new frame and grate as specified in the plans and in accordance with Section 602 of the Standard Specifications and as specified herein.

For a vertical distance of 12", no more than two concrete adjustment rings are permitted. Concrete adjustment rings must be 2" thick or greater. Less than 2" adjustments shall be made of composite materials.

All catch basins, inlets and open-lid manholes in the pavement as well as all sanitary manholes require a chimney seal. Chimney seals are to be Canusa Rapid Seal Type ANS to capture 4" of frame, all rings, and 4" of barrel section. All manholes in the roadway and parkway shall be set in place with one of the following Butyle Rubber Joint Sealants: Concrete Products Supply Co. – EZ Stik 8 or Hamilton-Kent Gasket Co. – Kent Seal; all flat top structures shall have a 4" cast ring (to be included in the cost of this item if structure is existing or in the cost of the specified proposed structure for new structures).

Method of Measurement and Basis of Payment. This work will be measured and paid for at the contract unit price per EACH for STRUCTURES TO BE ADJUSTED. The word STRUCTURES shall be understood to mean catch basins, manholes, inlets, water valve vaults, fire hydrant auxiliary valve boxes, or water service boxes inclusive as shown in the plans.

IRRIGATION SYSTEM COMPLETE

PART 1 - GENERAL

1.1 SUMMARY

- A. This work shall consist of furnishing and installing landscape irrigation as shown on the plans or as directed by the Owner. This work shall include all material and labor required to install a complete functioning, automatically controlled irrigation system, including but not limited to water service connection, piping, valves, control wiring and conduits, PVC sleeves, valve boxes, spray heads and drip tubing, etc.

1.2 RELATED DOCUMENTS

- A. Drawings
- B. IDOT Standard Specifications for Road and Bridge Construction, Latest Edition.

1.3 DEFINITIONS

- A. Lateral Piping: Downstream from control valves to sprinklers and specialties. Piping is under pressure during flow.
- B. Irrigation Main Piping: Downstream from point of connection to service line piping including control valves. Piping is under system pump pressure.
- C. Supply Header: PVC pipe downstream of remote control valve with multiple connections to driplines.
- D. Flush Header: PVC pipe with multiple connections to driplines that forms the end of a drip zone.
- E. Drip Irrigation: Low-volume water delivery system utilizing in-line drip tubing, pressure-compensating emitters, low-volume sprays and bubblers or any combination of these products.
- F. The following are industry abbreviations for plastic materials:
 - 1. ABS: Acrylonitrile-butadiene-styrene plastic.
 - 2. HDPE: High density polyethylene.
 - 3. FRP: Fiberglass-reinforced plastic.
 - 4. PA: Polyamide (nylon) plastic.
 - 5. PE: Polyethylene plastic.
 - 6. PP: Polypropylene plastic.
 - 7. PTFE: Polytetrafluoroethylene plastic.

8. PVC: Polyvinyl chloride plastic.
9. SDR: Standard dimension ratio.
10. TFE: Tetrafluoroethylene plastic.

1.4 SYSTEM REQUIREMENTS

- A. Location of Sprinklers and Specialties: Design location is approximate. Minor adjustments shall be made as necessary to avoid plantings and obstructions such as signs, light poles, utilities, planters and tree grates.
- B. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties, unless otherwise indicated:
 1. Irrigation Main Piping: 50 psig
 2. Lateral Piping: 30 psig

Minor adjustments shall be made as necessary due to existing watermain pressures and losses through proposed irrigation equipment.

1.5 SUBMITTALS

- A. Product Data: Include pressure ratings, rated capacities, and settings of selected models for the following:
 1. Shut-off valves.
 2. Remote Control valves.
 3. Quick-couple valves.
 4. Valve boxes.
 5. Composite concrete handholes.
 6. Spray head equipment and accessories.
 7. Dripline equipment and accessories.
 8. Controllers. Include wiring diagrams.
 9. Control wiring and conduit. Include splice kits.
 10. Irrigation pipe and fittings.
- B. Coordination Drawings: Show piping and major system components. Indicate interface and spatial relationship between piping, system components, adjacent utilities, and proximate structures.
- C. Field quality-control test reports.
 1. Pressure and flow test performed at point(s) of connection.
- D. Operation and Maintenance Data: For irrigation systems, to include in operation and maintenance manuals. Include the following:
 1. Contractor information sheet (including Contractor's name, address,

numbers and point of contact).

2. Duration of warranty period.
3. Pressure line tests.
4. Controller settings and charts.
5. Equipment list, including manufacturer and model information for
 - a. Service connection equipment.
 - b. Controller enclosures and equipment.
 - c. Automatic-control valves.
 - d. Manual isolation valves.
 - e. Spray heads and drip equipment.
 - f. Controllers, RPZ and enclosure.
 - g. Valve boxes.
6. Spare parts list.
7. Startup procedures.
8. Winterization procedures.
9. Record drawings.

1.6 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Water service connection components and fittings: All materials shall meet ASTM International, American Water Works Association (AWWA), "Standard Specifications for Water and Sewer Main Construction in Illinois," the Illinois Plumbing Code, IDOT Standard Specifications for Road and Bridge Construction, and local municipal code.
- C. Installer shall have five (5) years minimum experience on comparable irrigation system projects.
- D. Installation of equipment shall be done in accordance with the National Electric Code, Municipal/Plumbing Code, and manufacturer recommendations.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver semi-rigid piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- B. Deliver flexible piping in factory-assembled rolls. Maintain protective wrap or

packaging through shipping, storage and handling.

- C. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.8 PROJECT CONDITIONS

- A. Locations and elevations of existing utilities shall be field verified prior to beginning construction. The Contractor shall notify the Owner's Representative of any conflicts with the proposed irrigation design.
- B. The Contractor shall be responsible for repair any damages to existing identified/marked utilities.
- C. Irrigation Contractor shall coordinate with other trades to ensure pre-construction protective measures have been taken to maintain existing system operation and integrity.
- D. The irrigation system was designed utilizing the working pressure(s) shown on the Drawings. In the event the minimum pressures required on the Drawings cannot be provided, Irrigation Contractor shall notify Landscape Architect immediately upon discovery of the discrepancy.

1.9 COORDINATION

- A. General: Coordination is required between several trades to execute the design as shown on the Drawings.
 - 1. The irrigation system shall be installed at two locations within the project limits:
 - a. Roundabout at Plum Grove Road and State Parkway, including landscape medians to the east and west of the roundabout, as shown on the plans.
 - b. Roundabout at Plum Grove Road and Remington Road.Irrigation Contractor shall coordinate all points of connection and scheduling with the relevant trades.
 - 2. Proposed irrigation enclosure and controller shall be at locations as shown on the Drawings. Irrigation Contractor shall ensure that all requirements for controller wire connections (both power and control) have been coordinated with the relevant trades.
 - 3. The Contractor shall be responsible for contacting the Village and scheduling the work to be performed. The Contractor shall contact the Village a minimum of one week prior to beginning construction of proposed water service connections.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.
- B. Hard Copper Tube: Type K (ASTM B 88M and B-251) water piping.
 - 1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
 - 2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end.
 - 3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.
- C. PVC, Pressure-Rated Pipe:
 - 1. Circuit Piping (all sizes): ASTM D 2241, PVC 1120 compound, SDR 21.
 - 2. Mainline Piping, 3" and smaller: ASTM D 2241, PVC 1120 compound, SDR 21.
 - 3. Sleeves (all sizes): ASTM D 1785, PVC 1120 compound, Schedule 40
- D. PVC Socket fittings, Schedule 40, ASTM D 2467.

2.2 JOINING MATERIALS

- A. Solvent Cement (PVC Piping):
 - 1. Primer and Solvent conforming to ASTM D2564-02

2.3 WATER SERVICE PIPE

- A. Water service lines 2 inches or less in internal diameter shall be Type K copper tubing, soft temper, for underground service, conforming to ASTM B-88 and B-251. Service line shall be continuous from corporation to curb stop. Service pipes shall be directional bored and pulled below undisturbed grade and/or pavement, that will not be removed, replaced or improved.
- B. Water service lines larger than 2 inches in diameter shall be ductile iron pipe conforming to AWWA C150 and AWWA C151. Service lines shall be continuous from corporation to curb stop, and the number of couplings between the curb stop and the building shall be kept to a minimum. All couplings shall be checked for leaks prior to backfilling.
- C. All connections to the Village water main distribution piping shall be made under full water service pressure, and size as shown on the Contract Drawings, unless otherwise directed by the Village.

2.4 PIPE SLEEVES

- A. Water service pipes located under pavement shall be installed through PVC or rigid galvanized steel (RGS) conduit sleeves. PVC and RGS conduits shall be in accordance with Standard Specification Section 810.

2.5 CORPORATION STOP

- A. Corporation stops shall be as manufactured by Mueller, Ford, or A.Y. McDonald. Service saddles shall be as manufactured by Smith Blair, Mueller, or Cascade.
- B. The corporation stop shall be of the same diameter as the service line and shall be inserted in the main at approximately a 45-degree angle with an 18 inch (18") horizontal loop. Corporation stops shall be as shown on the Contract Drawings and in accordance with the Village Standards.
- C. Service taps up to 2 inches in diameter installed on existing ductile iron water main pipes shall be tapped directly into water main. Service taps on all other water main pipes shall be made using a full circle, clamp, service saddle. Service saddles shall be single bolt, stainless steel construction, and neoprene rubber seal for tapped outlet.

2.6 CURB STOP

- A. Curb stops shall be as manufactured by Mueller, Ford, or A.Y. McDonald.
- B. Curb stops shall consist of a quarter turn, ball type valve, of the same diameter as the service line, and an adjustable, screw type, cast iron buffalo box (B-box).
- C. Curb stop shall be installed a minimum of 1 ft from the back of curb, or as shown on the Contract Drawings. A cast iron service box shall be used to set the valves plumb until sufficient backfill has been placed to insure permanent vertical alignment of the box. The buffalo box shall be provided with "water" cast iron lids, set flush with finish grade.

2.7 WATER METER

- A. Water meters shall be provided by the Village, and installed by the Contractor. Water meter shall be installed in accordance with manufacturer requirements and as shown on the Contract Drawings.

2.8 REDUCED PRESSURE DETECTOR ASSEMBLY

- A. Reduced pressure detector assemblies shall be as manufactured by Wilkins, Febco, or Watts.
- B. Reduced pressure detector assembly shall meet requirements of AWWA C511-92, ASSE 1047 and be UL listed. The assembly body shall be epoxy coated cast iron with rubber discs and bronze test cocks and relief valve seats.

2.9 BACKFLOW PREVENTION ENCLOSURES

- A. Backflow prevention enclosures shall be as manufactured by Hubbell, Watts, or Strong Box.
- B. Backflow prevention assemblies located above grade (subject to potential freezing conditions) shall be protected with manufactured enclosures as detailed on the Contract Drawings. Enclosures shall be two-piece, insulated, reinforced fiberglass construction with a smooth, UV inhibited polyester gel finish. The enclosure shall be pad mounted, and provided with pad lockable hasps and wall mounted heater. The enclosure shall be able to be sized to accommodate backflow prevention assembly, water meter and all above grade piping; and, be totally removable for maintenance purposes.

2.10 BALL VALVES

- A. General: Cast brass quarter turn ball valve with handle and threaded ends conforming to ANSI Standard B 2.1. Size shall match pipeline.

2.11 QUICK-COUPLE VALVES

- A. General: Factory-fabricated, brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, locking rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.
 - 1. Locking-Top Option: Vandal-resistant, locking feature. Include two matching keys.

2.12 ROUND VALVE BOXES

- A. Application: Flush valves, Quick couple valves, air/vacuum valves
- B. Box and cover, with open bottom and openings for piping; designed for installing flush with grade. Include size as required for valves and service.
 - 1. Shape: Round
 - 2. Sidewall Material: Polymer concrete
 - 3. Cover Material: Polymer concrete, green in color in landscape; grey/concrete color in concrete; or standard color to match brick. Cover shall be bolt down or have locking mechanism.
- C. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4-inch minimum to 1-inch maximum.

2.13 COMPOSITE CONCRETE HANDHOLES

- A. Application: Manual isolation valve, automatic control valve and drip zone control valve.
- B. Box and cover, with open bottom and openings for piping; designed for installing flush with grade. Include size as required for valves and service.

1. Shape: Rectangular
 2. Sidewall Material: Polymer concrete
 3. Cover Material: Polymer concrete, green in color in landscape; grey/concrete color in concrete; or standard color to match brick. Cover shall be bolted, gasketed and provided with an irrigation logo.
 4. Ratings: Minimum Tier 8
- C. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4-inch minimum to 1-inch maximum.

2.14 SWING JOINT ASSEMBLIES

- A. Swing joint assemblies shall be manufactured of rigid PVC, Type 1, Cell classification 12454-B per ASTM D1784 with NPT threads and pipe sockets per ASTM D2464 and D2466, respectively. Each rotating joint shall be sealed with Buna rubber O-ring, installed pre-compressed in a sealing groove free of parting lines to prevent leakage. Modified stub ACME threads shall have specially engineered diameters and clearances to allow full circle movement in 360 degrees.

2.15 SPRAY HEAD EQUIPMENT AND ACCESSORIES

- A. Automatic Control Valve:
1. Electric remote control valve shall consist of dc solenoid type, commercial rated, globe type diaphragm valve (normally closed).
- B. Pop-up Spray Heads
1. Spray heads shall have the pop-up heights and radiuses as shown on the plans. Sprinkler body shall be UV-resistant, heavy-duty, polyethylene body with inline check valve. The riser sprinkler shall have an adjustable pattern alignment, and positive return spring.

2.16 DRIPLINE EQUIPMENT AND ACCESSORIES

- A. Drip Control Zone Kit:
1. Factory assembled kit for controlling low-flow irrigation zones comprised of the following components:
 - a. Low-flow, dc solenoid, remote control valve with external bleed and internal bleed for manual operation.
 - b. Pressure regulator with plastic body capable of maintaining outlet pressure between 20-120 psi.
 - c. Filtration provided by inline Y filter of heavy-duty glass-filled nylon material with minimum 150-mesh filter screen (factory-installed).
- B. Landscape Dripline Tubing

1. Flexible PE tubing with pre-installed pressure-compensating emitters with dual outlet ports, spaced 12" on-center. Flow rate shall be 0.9 to 1.0 gallons-per-hour.
- C. Dripline Extension Tubing
 1. Flexible PE tubing, ½-inch minimum (ID controlled). Fittings shall be lock-type, UV-resistant with external locking ring.
- D. Air/Vacuum Relief Valve
 1. Air/vacuum relief valve designed to be installed on dripline tubing, and as shown on plans.
- E. Flush Valve
 1. Flush valve shall consist of PVC ball valve, with adapters, and dripline extension tubing located in a round valve box.
- F. Operation Indicator
 1. Pop-up indicator, with yellow stem, that attaches to PVC or dripline tubing, identifying low water pressure in pipe/dripline tubing. The nozzle shall be removeable for winterization.

2.17 IRRIGATION CONTROLLER

- A. Irrigation controller shall operate the number of stations as indicated on the plans.
- B. Irrigation controller shall be fully automatic, incorporating a 24-hour clock and 14-day minimum calendar. Controller shall be capable of repeating watering cycles as required with a maximum 2-hour delay between cycles.
- C. Irrigation controller shall be battery operated, and shall not require electric power.
- D. The controller shall be located in plastic enclosure (as provided by the manufacturer), and mounted inside a fiberglass, lockable, flip top enclosure, as shown on the plans.

2.18 CONTROL WIRE

- A. Two conductor, or multi-conductor, solid-copper twisted pair cable with overall jacket of polyvinyl chloride insulation, UL listed and rated for exterior, underground installations. Control wire shall be installed in 1" Schedule 40 PVC conduit.
- B. Control wire shall be a minimum of a no. 14 AWG, color coded as follows:
 - a. Control Cable – Red or black
 - b. Common Cable - White
 - c. Ground Cable – Green

2.19 WIRE SPLICES

- A. Wire splices shall be waterproof, compression type, as shown on the plans.
 - 1. Or Equal

2.20 MISCELLANEOUS SPRINKLER EQUIPMENT

- A. Valve Identification Tags: Pre-printed plastic tags with minimum text height of 1", capable of being attached to valve stem or valve wire within valve box.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install piping and electric wiring in sleeves under roadways and driveways as shown on the plans.
 - 1. Coordinate sleeve installation to occur prior to pavement construction
 - 2. Install piping sleeves by directional bore method under existing paving if possible. Where this is not feasible, cutting and patching operations will conform to relevant Division One requirements.
 - 3. Sleeves shall extend a minimum of 24" beyond the pavement.
- B. Provide minimum cover over top of underground piping according to the following:
 - 1. Irrigation Main Piping: Minimum depth of 24 inches below finished grade
 - 2. Lateral Piping (including drip headers): 18 inches
 - 3. Sleeves: 24 inches

3.2 PREPARATION

- A. Stake layout of system in the field, utilizing appropriate materials and notify Village Engineer and Landscape Architect to obtain approval prior to beginning installation activities.
 - 1. Notify the Village Engineer and Landscape Architect 48 hours prior to desired on-site review. Landscape Architect will provide review within the 48-hour time period.

3.3 POINT OF CONNECTION

- A. Construct connection to stubbed supply lines (provided by others) using appropriate fittings for metallic to plastic piping.

3.4 PIPING APPLICATIONS

- A. Install components having pressure rating equal to or greater than system operating pressure.

- B. Underground Irrigation Main Piping: Use the following piping materials for each size range:
 - 1. NPS 3" and Smaller: SDR 21, PVC, pressure-rated pipe.
- C. Lateral Piping: Use the following piping materials for each size range:
 - 1. NPS 2" and Smaller: SDR 21, PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and solvent-cemented joints.
- D. Swing Assemblies: Install appropriate swing assemblies as required by the Drawings and Part 2 above.
- E. Sleeves: Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.
- F. Transition Fittings: Use transition fittings for plastic-to-metal pipe connections according to the following:
 - 1. Couplings:
 - a. Underground Piping NPS 1-1/2" and Smaller: Manufactured fitting or coupling.
 - b. Underground Piping NPS 2" and Larger: AWWA transition coupling.
 - 2. Fittings:
 - a. Aboveground Piping: Plastic-to-metal transition fittings.
 - b. Underground Piping: Union with plastic end of same material as plastic piping.

3.5 VALVE APPLICATIONS

- A. Remote Control Valves:
 - 1. NPS 2" and Smaller: Plastic or bronze automatic control valve.
- B. Shut-off Valves:
 - 1. NPS 2" and Smaller: Brass NRS Ball Valve

3.6 PIPING INSTALLATION

- A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination Drawings.
- B. Install piping free of sags and bends.
- C. Install groups of pipes parallel to each other and spaced to permit valve servicing.
- D. Install fittings for changes in direction and branch connections.
- E. Install underground thermoplastic piping according to ASTM D 2774

- F. Install PVC piping in dry weather when temperature is above 40 deg F 5 deg C. Allow joints to cure at least 24 hours at temperatures above 40 deg F 5 deg C before testing unless otherwise recommended by manufacturer.

3.7 JOINT CONSTRUCTION

- A. Construct solvent-weld joints per ASTM D2855.

3.8 VALVE INSTALLATION

- A. Control Valves: Install in rectangular composite concrete handhole per the Plans.
- B. Quick Couple Valves: Install in round valve box per the Plans.
- C. Shut-off Valves: Install in rectangular composite concrete handhole per the Plans.

3.9 SPRAY HEAD INSTALLATION

- A. Install spray heads as indicated on plans and a minimum of 6" behind the back of curb.

3.10 DRIPLINE INSTALLATION

- A. Following final grading or fill operations, install dripline as indicated on the drawings. Parallel lines shall be spaced per the plans with the emitters 'staggered' to provide even coverage of the irrigated area.
- B. Install stainless steel stakes at 36-inch intervals to secure the dripline to the finished grade.
- C. Construct supply and flush headers of PVC pipe as shown on the plans and make connection to dripline tubing with appropriate compression fittings.
- D. Install Air/Vacuum relief kit at the highest point of the dripline zone as indicated on the plans.
- E. Install flush valves at the lowest point of the dripline zone as indicated on the plans.
- F. Install operation indicators after the drip zone kits.

3.11 IRRIGATION CONTROLLER INSTALLATION

- A. Install controllers as indicated on plans.
- B. Install control wire conduits in same trench as irrigation piping as indicated on plans. Provide conductors of size not smaller than recommended by controller manufacturer and as indicated on plans. Voltage drop shall be taken into consideration based valve requirements and distance from the controller. Install cable in separate conduit sleeve under paved areas if irrigation piping is installed in sleeve.
- C. Pull control cables through provided conduit to controller location and make final connections per the manufacturer's recommendations.

3.12 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Make all electrical connections in conformance with local code requirements. Provide waterproof connectors for all underground electrical connections.
- C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.13 LABELING AND IDENTIFYING

- A. Provide valve tags at each remote control valve as indicated on the plans.

3.14 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 - 1. Hydrostatic Test: After installation, charge system with pressurized air to 100 psi. System will be able to maintain pressure with no more than 5 psi loss in one hour. Each valve shall be opened and closed during test. Landscape Architect must be in attendance during test. Provide a minimum of 48 hours notice prior to scheduled test.
 - 2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
 - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Remove and replace faulty/malfunctioning system components and retest as specified above until the requirements are met.

3.15 STARTUP SERVICE

- A. Verify that controllers are installed and connected according to the Contract Documents.
- B. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements.
- C. Complete startup checks according to manufacturer's written instructions.

3.16 ADJUSTING

- A. Adjust settings of controllers and provide initial watering schedule per Owner's requirements.
- B. Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.
- C. Adjust valve boxes so they will be flush with finished grade.

3.17 CLEANING

- A. Flush dirt and debris from piping before installing sprinklers and other devices.

3.18 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain controller and automatic control valves.
- B. Schedule a complete demonstration and system walk-through with the Owner and Landscape Architect. Final Payment will not be made until all items noted during demonstration and walk-through have been made by Contractor and verified by Owner's staff.

3.19 DOCUMENTATION

- A. Provide a complete operations and maintenance manual to the Owner in a three-ring binder with the following items, separated by tabbed dividers for clear organization.
 - 1. Provide a label on the spine of the binder clearly stating "IRRIGATION SYSTEM OPERATION AND MAINTENANCE".
 - 2. Table of Contents
 - 3. Cut-sheets or manufacturer's data for all installed equipment including:
 - a. Remote Control Valves
 - b. Manual Isolation Valves
 - c. Spay Heads
 - d. Dripline Tubing
 - e. Dripline accessories (filters, valves, pressure regulators, etc.)
 - f. Controller
 - 4. Operations Data from manufacturers documenting diagnostic, repair and replacement procedures for all items "a" through "f" identified above.
 - 5. Complete description of spring start-up operations including:
 - a. Valve inspection
 - b. Controller programming guidelines for spring, summer and fall watering schedules. Guidelines shall be based on historical EVT rates for the Chicago area.
 - c. Controller battery replacement
 - d. Spray head inspection and replacement
 - e. Drip zone filter inspection and replacement

- f. Drip zone back-flushing operations
- 6. Complete description of fall shut-down/winterization operations including:
 - a. Blow-out procedures for irrigation system
 - b. Drain-down procedures for irrigation system
 - c. Controller shut-down procedures
- B. Provide an record drawing at the same size and scale as the design drawings on reproducible vellum or Mylar, and pdf files located on a zip drive, with the following information clearly shown:
 - 1. Location of all sleeves with dimensions to site elements
 - 2. Location of mainline and lateral pipe runs with sizes clearly indicated
 - 3. Location of all valves
 - 4. Location of controllers and rain/freeze sensor
 - 5. Utilize standard industry symbols and notations for all equipment.
- C. Provide a copy of the Maintenance/Operations Manual and Record Drawing to the Village Engineer and Landscape Architect for review and approval prior to transmittal to the Owner.
 - 1. Contractor shall make all revisions noted and required by the Landscape Architect prior to transmittal to the Owner.
 - 2. Contractor is required to demonstrate completion of all revisions, which may include providing a revised copy for additional review at the discretion of the Landscape Architect.

PART 4 - MEASUREMENT AND PAYMENT

The work shall be paid for at the contract lump sum price each for IRRIGATION SYSTEM, which shall be payment in full for all work listed herein and as directed by the Owner's Representative

EXPLORATION EXCAVATION (UTILITY)

Description. This work shall be performed in accordance with Section 213 of the Standard Specifications, except that the objects to be located are any type of existing utility within the project limits, and hand excavation will be required. Any damage incurred to the existing utility as a result of the exploration trench excavation shall be repaired immediately at no additional cost to the Owner.

Backfill used for the storm sewer shall be paid for separately per cubic yard of TRENCH BACKFILL or TRENCH BACKFILL, SPECIAL as shown in the plans.

Method of Measurement and Basis of Payment. The work shall be measured and paid for at the contract unit price per lineal FOOT for EXPLORATION EXCAVATION (UTILITY), which price shall be payment in full for all material, labor, equipment, and any other items required to complete the work.

TEMPORARY SIDEWALK

Description. This work shall include the installation, maintenance, and removal of ADA compliant temporary sidewalk (including sidewalk, ramps, and detectable warnings), at locations as directed by the ENGINEER and per Section 424 and 440 of the Standard Specifications.

Materials. Concrete or HMA, as approved by the Engineer.

Construction. All temporary sidewalk shall be a minimum of 2" thick, 5' wide, and ADA compliant. Contractor shall determine all grades, slopes and components to achieve ADA compliance.

Method of Measurement and Basis of Payment. The work shall be measured and paid for at the contract unit price per square foot for TEMPORARY SIDEWALK which price shall be payment in full for all material, labor, equipment, and any other items required to complete the work.

STABILIZED CONSTRUCTION ENTRANCE

Description. This work shall consist of furnishing, installation, maintenance and removal of stabilized pad of aggregate underlain with filter fabric as shown on the plans or directed by the Engineer.

Materials. Materials shall conform to the following:

Aggregate size. IDOT Coarse Aggregate Graduation: CA-1, CA-2 CA-3, or CA-4.

Filter Fabric shall consist of synthetic polymers composed of at least 85 percent by weight polypropylene, polyesters, polyamides, polyethylene, polyolefins, or polyvinylidene-chlorides. The geotextile shall be free of any chemical treatment or coating that significantly reduces its porosity. Fibers shall contain stabilizers and/or inhibitors to enhance resistance to ultraviolet lights.

Construction Requirements. The coarse aggregate shall be a thickness of 6 inches or more. The stone entrance should not be filled until the area has been inspected and approved by the Engineer.

The rock shall be dumped and spread into place in approximately horizontal layers not more than 3 feet in thickness. It shall be placed in a manner to produce a reasonable homogeneous stable fill that contains no segregated pockets or larger or small fragments or large unfilled space caused by bridging of larger fragments. No compaction will be required beyond that resulting from the placing and spreading operations.

The minimum width and length shall be 14 and 40 feet, respectively.

All surface water flowing or diverted toward the construction entrance shall be piped across the entrance. Any pipe used for this will be considered included in STABILIZED CONSTRUCTION ENTRANCE. The stabilized construction entrance will have positive drainage away from the roadway.

The entrance shall remain in place and be maintained until the disturbed area is stabilized. Any sediment spilled onto public right-of-ways must be removed immediately.

Method of Measurement and Basis of Payment. The work shall be measured and paid for at the contract unit price per square yard for STABILIZED CONSTRUCTION ENTRANCE, which price shall be payment in full for all material, labor and any other items required to complete the work.

MAINTAIN EXISTING LIGHTING SYSTEM

Description: 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.

At least one week prior to the beginning of construction of the proposed street lighting system, the contractor shall conduct an inspection of the existing lighting units with a representative of the agency responsible for maintenance. The inspection shall reveal defective lighting items such as cable, luminaire arms, luminaries, poles, and all other appurtenances that combine for a complete operating unit. The Contractor shall not be responsible for these defective items. The Contractor shall be held responsible for all additional items found defective at the completion of the contract that were not noted in the initial inspection report. Failure to coordinate or perform the initial inspection does not relieve the Contractor from this responsibility.

The Contractor shall become responsible for the maintenance of the existing lighting units on a date mutually agreed upon between the Contractor and the maintaining agency representative but no later than the beginning of any construction within the limits of this project. If any mobilization or any type of work begins on this project, the Contractor shall assume complete maintenance at that point and assume all deficiencies at their own expense. This maintenance shall remain in effect until written notice of final acceptance of the proposed lighting system is issued by the Engineer. Only after this requirement has been satisfied may the contractor begin work on any existing lighting systems.

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.

Existing Lighting Systems Requiring Maintenance.

Village of Schaumburg – Plum Grove Road – Full Maintenance:

- A Com Ed service drop and disconnect switch are mounted to the wood pole located on the east side of Plum Grove Road at Sta. 62+70
- Nine 30' light poles along Plum Grove Road

Village of Schaumburg – Plum Grove Road and Wiley Farm Court – Full Maintenance:

- Lighting Controller on northwest corner of Plum Grove Road at Wiley Farm Court

- Eight 30' light poles along Plum Grove Road
- Six 30' light poles along Wiley Farm Court
- Six 30' light poles along Penny Lane

Village of Schaumburg – State Parkway and Tower Road – Full Maintenance:

- Lighting Controller on northeast corner of State Parkway and Tower Road
- Four 35' light poles along Plum Grove Road
- Thirty-four 35' light poles along State Parkway/National Parkway
- Seven 35' light poles along Remington Road
- Four 35' light poles along Payne Road
- Five 35' light poles along Tower Road

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. The affected circuits shall be isolated by means of in-line waterproof fuse holders as specified elsewhere and as approved by the Engineer.

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.

Maintenance of Proposed Lighting Systems

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

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

Lighting System Maintenance Operations

The Contractor's responsibility shall include the maintenance of all lighting units (including sign lighting), cable runs, lighting controls and service. In the case of a pole knockdown or sign light damage caused by normal vehicular traffic, 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 equipment damaged by normal vehicular traffic, not contractor operations, is beyond repair and cannot be re-set, the contractor shall replace the equipment in kind with payment made for such equipment under Article 109.04. If the equipment damaged by any construction operations, not normal vehicular traffic, is beyond repair and cannot be re-set, the contractor shall replace the equipment in kind and the cost of the equipment shall be included in the cost of this pay item and shall not be paid for separately.

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	N/A	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	N/A
Circuit out – Cable trouble	1 hour	24 hours	21 Calendar days
Outage of 3 or more successive lights	1 hour	4 hours	N/A
Outage of 75% of lights on one tower	1 hour	4 hours	N/A
Outage of light nearest RR crossing approach, Islands and gores	1 hour	4 hours	N/A
Outage (single or multiple) found on night outage survey or reported to EMC	N/A	N/A	7 Calendar days
Navigation light outage	N/A	N/A	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 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 for. Payment shall not be made retroactively for months in which lighting systems were not operational.

Measurement and Basis of Payment: This work shall be paid for at the contract Lump Sum price for MAINTAIN EXISTING LIGHTING SYSTEM which shall be payment in full for all work listed herein.

PORTLAND CEMENT CONCRETE SURFACE REMOVAL

Description. This work shall be performed in accordance with Section 440 of the Standard Specifications for removal of hot-mix asphalt surfaces in preparation for subsequent resurfacing, except as modified herein; Each occurrence of "HOT-MIX ASPHALT" or "HMA" shall be replaced with "PORTLAND CEMENT CONCRETE".

Basis of Payment: This work shall be paid for in accordance with Article 440.08 of the Standard Specifications, except the pay item shall be PORTLAND CEMENT CONCRETE SURFACE REMOVAL, of the thickness specified, and shall include all materials, labor, and equipment to perform the work.

TIMBER RETAINING WALL REMOVAL

Description: This work shall consist of removing the existing timber retaining wall as shown on the plans.

All timber retaining wall material that has been removed shall be disposed of off-site by the Contractor in accordance with Article 202.03 of the Standard Specifications.

Basis of Payment: This work will be paid for at the contract unit price per FOOT for TIMBER RETAINING WALL REMOVAL, measured horizontally along the front face of the wall, which price shall include all equipment, material, and labor to complete this work.

STORM SEWERS, TYPE 1, WATER MAIN QUALITY PIPE

Description. This work shall be performed in accordance with Section 550 of the Standard Specifications, except that the material used for the storm sewer shall be ductile iron pipe. Pipe materials shall meet the material and installation requirements of Section 40 and 41-2.01 of the “Standard Specifications for Water and Sewer Main Construction in Illinois”.

Backfill used for the storm sewer shall be paid for separately per cubic yard of TRENCH BACKFILL or TRENCH BACKFILL, SPECIAL as shown in the plans.

Basis of Payment: This work shall be paid for in accordance with Article 550.096 of the Standard Specifications, except the pay item shall be STORM SEWERS, TYPE 1, WATER MAIN QUALITY PIPE of the diameter specified, and shall include all materials, labor, equipment, and non-shear couplings.

WATER MAIN AND APPURTENANCES (VOS)

Effective: August 21, 2017

Description. All water main and related work and material shall be completed in accordance with Village of Schaumburg specifications, the "Standard Specifications for Water and Sewer Main Construction in Illinois", latest edition, the American Water Works Association (AWWA). In case of conflict, the more stringent of the requirements shall apply.

Sequence of Water Main Construction

The Contractor is required to coordinate with the Engineer and with the Village of Schaumburg to establish an acceptable Sequence of Construction for the installation of the proposed water main. The Contractor is required to submit a construction schedule and sequence plan at the time of the pre-construction meeting.

Materials

Water main pipe and fittings must conform to the applicable paragraphs of the "Standard Specifications For Water And Sewer Main Construction In Illinois", current edition.

- A. Ductile Iron Water Main Pipe:
 - a. Ductile iron pipe shall be CL-52 Ductile Iron Pipe and conform to AWWA specifications C151-65. Normal working pressure shall not exceed one hundred fifty (150) psi. Pipe shall be furnished in nominal eighteen foot (18') laying lengths.
 - b. Ductile iron pipe shall be bituminous coated cement mortar lined as specified in section 51-8.2 of AWWA specification C151-65. The ductile iron pipe shall be coated on the outside as specified in section 15.8.1 with the exceptions that the thickness of the coating shall be an average of two (2) to four (4) mils and a minimum of two (2) mils. Each pipe shall have the weight and class designation conspicuously painted on it. In addition, the manufacturer's mark and year in which the pipe was made shall be distinctly cast or stamped on the bell.
 - c. All fittings shall be ductile iron, mechanical joint in accordance with AWSI/AWWA C153/A21.53 and ANSI/AWWA C111/A 21.11 installed using Stainless Steel Type 304 T-bolts and nuts. Fittings shall be cement-lined and seal coated in accordance with ANSI/AWWA C104/A21.4. The working pressure rating shall be 350 psi. All joints between the water main pipe and fitting shall be restrained using Mega Lugs by EBAA Iron, no screw type application shall be allowed. Testing and disinfecting of fittings shall be as

specified elsewhere herein.

- d. Polyethylene encasement (wrap) shall be installed for all buried water main piping, fittings, and valves as shown on the plans. Encasement or wrapping of piping shall be polyethylene film in tube or sheet and shall be in accordance with AWWA C105/A21.5-82 suitable for the appropriate diameter water main. The contractor shall follow the installation guideline as set forth with AWWA specification C-105 and as detailed on the plans.

B. Ductile Iron Water Main Pipe Joints:

- a. Slip Joints: Sections of water main pipe shall be connected by means of slip joints, consisting of bells cast integrally with pipe which have interior angular recesses conforming with the shape and dimensions of a rubber sealing gasket, the interior dimension of which is such that it will admit the insertion of the spigot end of the joining pipe in such manner as to compress the gasket tightly between the bell of the pipe and the inserted spigot, thus securing the gasket and sealing the joint. Such a slip joint shall be any one of the following make or type:
 - i. Super Belltite - as supplied by Griffin.
 - ii. Fastite - as supplied by the American Cast Iron Pipe Company.
 - iii. Tyton - as supplied by the U.S. Pipe and Foundry Company, or the Clow Valve Co.
- b. The lubricant used in conjunction with the slip joints shall be that recommended by the supplier specified.

C. Mechanical Joint Pipe:

- a. Bolting Material: Mechanical joint pipe shall meet the requirement of ASA specification A-U 11. Bolting materials shall meet the requirements of the manufacturer.
- b. All water main fasteners shall be 304 stainless steel

Construction Requirements:

- 1. Excavation: The trench shall be excavated so that the water main will have a minimum cover of five and one-half feet (5½'). The trench for the pipe shall be excavated at least twelve inches (12") wider than the external diameter of the pipe and not more than eighteen inches (18") wider than the diameter of the pipe at the top of the pipe.

- a. Bell holes of sufficient depth shall be provided across the bottom of the trench to accommodate the bell of the pipe to provide sufficient room for joint making and to ensure uniform bearing for the pipe.
 - b. Where a firm foundation is not found to exist for the bottom of the trench at the required depth, due to soft, spongy or other unsuitable soil, such unsuitable soil shall be removed for the full width of the trench or tunnel and replaced with well compacted unwashed gravel or an equal substitute therefor, or crushed stone if such compacted material proved unsatisfactory. Where rock in either ledge or boulder formation is encountered, it shall be removed below grade and replaced with a well-compacted cushion of unwashed gravel having a thickness under the pipe of not less than eight inches (8").
 - c. If the excavation has been made deeper than necessary, the water main shall be laid at the proper depth by installing CA-6 to the lower bedding depth, and no additional cost shall be charged for the additional stone or for subsequent adjustments to fire hydrants, valves, valve vaults or house services. All excavation materials not needed for backfilling the trenches shall be disposed of by the Contractor.
2. Sheeting and Bracing: Sheeting and bracing shall be per OSHA requirements. While sheeting is being withdrawn, all vacancies shall be carefully filled with sand free from silt, rammed into place, puddled or otherwise firmly compacted.
 3. Dewatering Trench: The contractor shall provide and use effective and satisfactory methods to lower the groundwater table to a safe plane below the bottom of the work. No pipe shall be laid or jointed unless the trench is completely dewatered.
 - a. Water pumped or drained from the work shall be disposed of in a manner that will not damage adjacent private property, other work construction, street pavements, or other municipal property. No water shall be discharged into sanitary sewers. No water containing settleable solids shall be discharged into storm sewers.
 4. Laying Water Main: The contractor shall keep the trench free from water while the water main is being placed and until the pipe joint has been sealed to the satisfaction of the Engineer.
 - a. Adequate provision shall be made for safety, storing and protecting all water pipe prior to actual installation in the trench. Care shall be taken to prevent damage to the pipe castings, both inside and out. Provisions shall be made to keep the inside of the pipe clean throughout its storage period and to keep mud and/or other debris from being deposited therein. All pipe shall be thoroughly cleaned on the inside before laying of the pipe. Proper equipment

shall be used for the safe handling, conveying and laying of the pipe. All pipe shall be carefully lowered into the trench, piece by piece, by means of a derrick, ropes, or other suitable tools or equipment, in such manner as to prevent damage to water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

- b. In making joints, all portions of the joining materials and the socket and spigot ends of the joining pipe shall be wiped clean of all foreign materials. The actual assembly of the jointing shall be in accordance with the manufacturer's installation instructions and/or directed in writing by the Engineer. During construction, until jointing operations are complete, the open ends of all pipes shall be at all times protected and sealed with temporary watertight plugs.
5. Pipe Cutting: The cutting of pipe for inserting valves, fittings or closure pieces shall be done in a neat and workmanlike manner without damage to cement lining and so as to leave a smooth end at right angles to the axis of the pipe.
 - a. When machine cutting is not available for cutting pipe twenty inches (20") in diameter or larger, the electric arc cutting method will be permitted, using a carbon or steel rod. Only qualified and experienced workmen shall be used on this work.
 - b. The flame cutting of pipe by means of an oxyacetylene torch shall not be allowed.
 6. Backfilling: The contractor shall not backfill above the top of the pipe, until grade, alignment and the pipe joints have been made available for checking by the Village engineer.
 - a. Unless otherwise directed, all trenches and excavations shall be backfilled as soon as possible and the work shall be prosecuted expeditiously after it has been commenced.
 - b. As soon as it is laid, all pipe shall have the space between the pipe and the bottom and sides of the trench packed full of sand, grade 9 gravel, or clean, dry materials by hand and thoroughly tamped with a shovel, hoe or light tamper, as fast as placed up to the level of the middle of the pipe.
 - c. The filling shall be carried up evenly on both sides. Care shall be taken that no rock, frozen material, or other hard substances are placed in contact with the pipe. The pipe shall then be covered at least twelve inches (12") with clean, dry material.

- d. The remainder of the trench shall be backfilled by using the material originally excavated from the ditch (except for conditions hereinafter defined) to a height slightly above the original elevation of the ground.
- e. Pipe constructed in open cut across or within two feet (2') of any existing or proposed pavements, existing driveways and sidewalks, shall be backfilled to subgrade with grade CA-6 gravel tamped in twelve inch (12") lifts into place. Alternately, Controlled Low Strength Material may be selected by the Village for use as Trench Backfill based on Alternate Bid Results.

7. Pipe Restraint

- a. All tees, bends, fittings, fire hydrants, and water valves shall be adequately blocked with poured-in-place thrust blocking. All thrust blocks shall be precast or poured with class X SI concrete in accordance with the applicable provisions of section 500 of the standard specifications for road and bridge construction. When poured, care shall be taken so that the cement does not interfere with access to joints or with hydrant drainage and shall be against undisturbed earth.
- b. In addition to the above blocking, all fittings, valves and hydrants shall be restrained with retainer glands, Megalug Retainer Gland Series 1100 as manufactured by EBBA Iron Inc. (set screw retainer glands will not be accepted) In addition to the Megalug retaining glands at mechanical joint fittings, the bell and spigot joints shall have to be restrained with Megalug Restraint Harness Series 1700 at each joint one pipe length beyond the fitting.

Locking gaskets will not be an acceptable alternative to restraining the bell and spigot joint.

All water main within casings shall be restrained joints. All nuts and bolts used for the mechanical fitting and restraint systems shall be 304 stainless steel.

Basis of Payment: The installation of the proposed water main shall be paid for at the contract unit price per Foot for WATER MAIN, of the size and material specified providing and installing the pipe, all equipment, labor, excavation, backfill, and furnishing materials as specified herein, including polyethylene encasement. Measurement shall be the actual installed length measured horizontally along the centerline of the pipe. The installation of fittings called out on the plans shall be considered incidental to the WATER MAIN which shall include all materials, labor and equipment to connect the fittings to the water main pipe and shall include all work and materials associated with construction of the thrust

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block (if applicable). All fasteners and Retainer glands used at these bends, tees and at water valves are incidental to this item and will not be paid separately.

Payment for concrete thrust blocking or retainer glands will not be measured separately for payment but shall be INCLUDED in the cost of the WATER MAIN.

FIRE HYDRANTS WITH AUXILIARY VALVE AND VALVE BOX (VOS)

Effective: August 21, 2017

Description. This item shall consist of furnishing fire hydrants with auxiliary valves and valve boxes and installing them at the locations shown on the plans and in accordance with the Standard Specifications for Water and Sewer Main Construction in Illinois.

Materials:

1. Fire Hydrants

Fire hydrants shall conform to AWWA Standard C-502 with breakaway traffic flange. They shall have a valve opening of five and one-fourth inches (5 1/4") and shall be equipped with two (2) 2 1/2-inch hose connections and one 4 1/2-inch male pumper connection. The outside diameter of the male thread on the two and one-half inch (2 1/2") hose connections shall be "national standard" threads. Hose caps shall not be fastened to barrel, the steel chain shall be removed.

A suitable tee of the quality and kind herein specified shall be placed in the watermain opposite each of the fire hydrants and shall be connected with the hydrant by means of the valve and connecting pipe.

All hydrant bolts installed underground shall be 304 stainless steel t-bolts and nuts. Each hydrant shall have a stainless steel lower operating stem.

Each hydrant shall be provided with a drain that will leave no water standing in the barrel of the hydrant when the hydrant is closed. This drain shall close tightly before the hydrant begins to open. The hose and steamer connections shall be securely threaded and locked into the hydrant and each shall be provided with a suitable cast iron threaded cover fastened securely.

All fire hydrants shall be equipped with an auxiliary valve and cast iron valve box, including a valve box stabilizer. The auxiliary valve shall be a six inch (6") valve and the pipe connecting the hydrant to the main shall be six inch (6") ductile iron water pipe (class 52) meeting the requirements contained in the special provision for WATER MAIN.

Fire hydrants shall be the break flange type Clow Medallion F-2545 or Mueller Super Centurion A-423.

All hydrants and any required fittings shall receive one (1) coat of factory applied red paint as recommended by the manufacturer prior to final acceptance.

All cap chains shall be removed prior to hydrant installation.

2. Auxiliary Valves and Valve Box

Auxiliary valves shall be "resilient seat wedge valves" in accordance with the following: The valves shall come complete with a cast iron valve box and cover produced by the same manufacturer producing the valve. The auxiliary valves shall be six (6) inches in diameter. The word "Water" shall be imprinted on the valve box cover (Mueller 1H-10360 or Clow 1F-2454). All valves shall be rated for 300 psi test pressure and 150 working pressure.

The auxiliary valve shall be attached directly to the hydrant with push joints or mechanical joints.

All valves shall be right hand turning.

Wedges shall be constructed of ductile iron, fully encapsulated in nitrite rubber except for guide and wedge nut areas.

Wedge rubber shall be molded in place and bonded to the ductile iron portion, and shall not be mechanically attached with screws, rivets, or similar fasteners.

Wedge shall seat against seating surfaces arranged symmetrically about the centerline of the operating stem, so that seating is equally effective regardless of direction of pressure unbalance across the wedge.

All seating surfaces in body shall be inclined to the vertical at a minimum angle of 32 degrees (when stem is in a vertical position) to eliminate abrasive wear of rubber sealing surfaces. The stem shall be sealed by at least two O-rings; all stem seals shall be replaceable with valve fully open and while subjected to full pressure. Waterway shall be smooth and shall have no depressions or cavities in seat area where foreign material can lodge and prevent closure or sealing.

Construction Methods:

Each hydrant shall be set on a concrete thrust block not less than 24 inches by 24

inches by 4 inches in thickness. Within the disturbed area, CA-7 gravel shall be placed 3 foot above the weep hole with a geofabric placed on top of the gravel to prevent fines from the soil backfill from clogging the drain field.

All hydrants shall be set plumb and shall have their nozzles parallel with edge of pavement, the steamer connection shall be facing the edge of pavement. The height of the nut on a four and one-half inch (4 ½") steamer connection shall be no less than twenty four inches (24") or more than thirty six inches (36") above finished grade at the hydrant. All hydrant leads between the tee and the hydrant shall be a positively restrained connection.

The bowl of each hydrant shall be well braced against undisturbed earth at the end of trench with stone slabs or concrete backing.

Fire hydrant extensions shall only be used with the approval of the Engineer. Should fire hydrant extensions be required due to improper construction methods by the Contractor, the extensions will be installed but will not be measured for payment.

Auxiliary valves shall be installed in the vertical position, supported on a concrete pedestal. It shall be the Contractor's responsibility to assure that the finished elevation of the box is flush with the adjacent proposed ground line. Valve box installation shall meet the requirements of Section 44 of the Standard Specifications for Water and Sewer Main Construction in Illinois.

All excavation around the fire hydrant and auxiliary valve shall be backfilled to the natural line or finished grade as rapidly as possible. The backfill material shall consist of CA-7 or trench backfill as herein specified. All backfill material shall be deposited in the excavation in a manner that will not cause damage to the fire hydrant or auxiliary valve. Any depressions which may develop within the area involved in a construction operation due to settlement of backfill material shall be filled in a manner consistent with standard practice.

If the new fire hydrant is added to an existing water main, the hydrant shall be installed within five to seven feet of the auxiliary valve.

Hydrant signs and sign posts shall be included with each fire hydrant as shown in the plans, and shall be located as directed by the Engineer.

Method of Measurement:

The fire hydrant with auxiliary valve and box complete and including all appurtenances, including the hydrant sign and signpost, shall be measured on a per each basis at each location.

Six (6) inch watermain connection pipe as specified shall not be measured for payment and shall be included in the cost of the fire hydrant with auxiliary valve and valve box.

Basis of Payment: This work shall be paid for at the contract unit price per each for FIRE HYDRANT WITH AUXILIARY VALVE AND VALVE BOX which price shall include furnishing and installing the fire hydrant with auxiliary valve and box, all labor, equipment, drainage stone, thrust block, ductile iron pipe, fittings, all appurtenances and backfilling necessary to complete the work.

VALVES (VOS)

Effective: August 21, 2017

Description. This work shall consist of furnishing and installing a water main valve connected to new water main inside a 5-foot diameter precast concrete valve vault at locations shown on the Plans and as directed by the Engineer.

Materials:

Gate valves shall conform to the provisions of section 42 of the standard specifications. For valves fourteen inches (14") and larger, rubber seated butterfly valves conforming to the provisions of AWWA standard C504 shall be used. If used, such valves shall be equipped with manual operators designed for submersible service in vaults and provided with two-inch (2") standard AWWA nut. All butterfly valves shall be flange end style.

The bodies of the valves shall be of the best quality of cast iron, bronze mounted and the stems of the valves shall be of the best quality of bronze. Each valve shall be constructed of the best material and shall withstand, without leaking, a three hundred (300) pound per square inch hydraulic pressure and a one hundred fifty (150) pound per square inch working pressure.

All valve box extensions must be cast iron and shall be equipped with a two inch (2") operating nut. All valves shall open by turning counterclockwise.

All valves produced by the following manufacturers:

Mueller Company, Decatur, Illinois
Clow Valve Company, Oskaloosa, Iowa

All require a minimum sixty inch (60") diameter vault. A valve box can be used for valves smaller than eight inches (8"). All nuts and bolts shall be stainless steel Type 304.

Gate valves shall be installed in each fire hydrant lead with "O" ring stuffing box.

CA-6 crushed compacted limestone shall be utilized to backfill all around the outside of the valve boxes and below the valve to prevent mud from penetrating valve box.

Measurement and Payment: Payment for gate valves shall be included in the contract unit price per Each for GATE VALVE WITH VAULT, of the size specified. 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.

VALVE VAULTS (VOS)

Effective: August 21, 2017

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 directed 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 — 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 Payment: Payment for valve vaults shall be made at the contract unit price per Each for GATE VALVE WITH VAULT, of the size specified. 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.

WATERMAIN TO BE ABANDONED (VOS)

Description. This work shall consist of the capping, filling, and abandonment of the existing watermain. When directed by the Engineer and the new watermain has been placed into service, this work is to be accomplished.

Construction Methods:

When the new watermain has been installed, tested and placed into service, the contractor shall excavate down to the existing watermain, work with the Village of Schaumburg Water Division (847.923.6612) to temporarily shut down the water system, cut into the existing watermain and cap both ends of the existing watermain. The caps shall be a fitting that is connected to sections of water main pipe by means of a positive restrained joint consisting of mechanical joints with retainer gland or MEGALUG joints. Fittings shall be ductile iron meeting requirements of ANSI/AWWA C153/A21.10 and ANSI/AWWA C111/A21.11. Concrete thrust blocks shall be placed against the cap on the existing watermain to remain in service.

The abandoned pipe shall be completely filled with controlled low strength materials per Section 1019.

The Contractor shall backfill the excavation with CA-6 or appropriate backfill, as approved by the Engineer, to the existing grade elevation. The backfill shall be compacted in accordance with Section 550 of the "Standard Specifications" except that only Method 1 shall be used.

Measurement and Basis of Payment: This work shall be paid for at the contract unit price per foot for ABANDON EXISTING WATER MAIN, FILL WITH CLSM, which price shall include all labor, equipment and material necessary to complete the work as specified herein.

WATERMAIN TO BE REMOVED (VOS)

Effective: August 21, 2017

Description. This work shall consist of cutting and removing the existing watermain where in conflict with new watermain construction where noted in the plans.

Construction Methods:

When the new watermain is ready for installation the existing main shall be isolated, water flow stopped and the main cut and removed. The new main and all required fittings and valves shall be installed tested and chlorinated to the satisfaction of the Village of Schaumburg Water Division Manager.

Prior to existing water main removal, the contractor shall provide 48 hour advance notice to excavate down to the existing watermain, work with the Village of Schaumburg Water Division (847.923.6612) to review removal and reconnection procedures and coordinate temporarily shut down the water system, cut into the existing watermain and cap the ends of the existing watermain as directed by the Engineer and noted in the plans. The caps shall be a fitting that is connected to sections of water main pipe by means of a positive restrained joint consisting of mechanical joints with retainer gland or MEGALUG joints. Fittings shall be ductile iron meeting requirements of ANSI/AWWA C153/A21.10 and ANSI/AWWA C111/A21.11. Concrete thrust blocks shall be placed against the cap on the existing watermain to remain in service.

The Contractor shall backfill the excavation with CA-6 or appropriate backfill, as approved by the Engineer, to the existing grade elevation. The backfill shall be compacted in accordance with Section 550 of the "Standard Specifications" except that only Method 1 shall be used.

Measurement and Basis of Payment: This work shall be paid for at the contract unit price per foot for REMOVE EXISTING WATERMAIN, which price shall include all labor, equipment and material necessary to complete the work as specified herein.

FIRE HYDRANTS TO BE REMOVED (VOS)

Effective: August 21, 2017

Description. This work shall consist of the removal of existing fire hydrants, auxiliary valve, capping the downstream end of the auxiliary valve, backfilling the excavated site and removal of the existing hydrant sign at location shown on the Plans.

Method of Construction:

This work shall conform to the applicable sections of the Standard Specifications for Water and Sewer Main Construction in Illinois. When a proposed fire hydrant is shown to be installed to replace the existing fire hydrant using the existing tee on the watermain, the Contractor shall remove the fire hydrant, auxiliary valve and valve box, and the watermain from the auxiliary valve to the existing tee.

When a proposed fire hydrant is shown to be installed at an adjacent location and not using the existing tee on a live watermain, the Contractor shall follow the following procedure. The fire hydrant and auxiliary valve along with any piping should be removed back to the existing tee and the tee should be plugged.

The Contractor shall remove the connector pipe, fire hydrant, and auxiliary valve and valve box (when described above) and coordinate delivery to the location specified by the Village of Schaumburg Public Works Department or dispose of them at the direction of the Engineer.

The Contractor shall backfill the excavation with CA-6 or appropriate backfill, as approved by the Engineer, to the existing grade elevation, unless a new fire hydrant is shown to be installed at this location. The backfill shall be compacted in accordance with Section 550 of the "Standard Specifications" except that only Method 1 shall be used.

Method of Measurement:

The removal of a fire hydrant with auxiliary valve and box and including all appurtenances shall be measured on a per each basis at each location.

Basis of Payment: This work shall be paid for at the contract unit price per each for FIRE HYDRANTS TO BE REMOVED, which price shall include all labor, equipment and material necessary to complete the work as specified herein.

FLUSHING, PRESSURE TESTING & CHLORINATION (VOS)

Effective: August 21, 2017

Water Main Pressure Testing:

1. Pressure Test:

Each section of water main and appurtenances shall be tested by the Contractor and Village jointly. Any defects or leaks shall be corrected by the Contractor.

It is the responsibility of the Contractor to re-excavate the pipe at his expense if the system fails to meet the requirements of the test.

A hydrostatic pressure of one hundred fifty (150) pounds per square inch shall be applied for the testing of the water main, valves, fittings and fire hydrants. The duration of the test shall be for a period of not less than two hours. Procedure for Test: Each section of pipe shall be tested and shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. The pump pipe connection and all necessary apparatus including gauges and meters shall be furnished by the Contractor. Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made, if necessary, at points of highest elevation and afterwards tightly plugged. Any cracked or defective pipes, fittings, valves, or hydrants discovered in consequence of this pressure test shall be removed and replaced by the Contractor with sound material and the test shall be repeated until satisfactory to the Engineer.

Provisions of AWWA C-600 and C-603, where applicable, shall apply.

The Contractor shall notify the Department of Engineering and Public Works a minimum of forty-eight (48) hours in advance to schedule this test. In no instance shall the Contractor draw water from an existing water main or operate any valves on an existing water main without the express permission of the Department of Engineering and Public Works.

Water Main Leakage Test:

1. After completion of the pressure test, a leakage test shall be conducted to determine the quantity of water lost by leakage under the specified test pressure. "Test pressure" is defined as the maximum operating pressure of the section under test and is based on the elevation of the lowest point in the line or section under test corrected to the elevation of the test gauge. Applicable provisions of AWWA C-600 and C-603 shall apply. Duration of each leakage test shall be a minimum of one hour in addition to the pressure test period.

2. Allowable leakage in gallons per hour for ductile iron water main shall not be greater than that determined by the formula:

L =	$\frac{ND[P]^{0.5}}{3700}$
-----	----------------------------

for mechanical joints and push on joints, or

L =	$\frac{ND[P]^{0.5}}{1850}$
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for caulked bell and spigot joints.

Note:	L =	Allowable leakage in gallons per hour.
	N =	Number of joints in length of pipeline tested.
	D =	Nominal diameter of the pipe in inches.
	P =	Average test pressure during leakage test in pounds per square inch gauge.

Tables of allowable leakage and basis of allowable leakage can be found on standard drawing 18 table 2 for cast iron water main.

TABLE 2
 ALLOWABLE LEAKAGE FOR MECHANICAL JOINT OR PUSH ON JOINT
 PIPE IN EIGHTEEN FOOT NOMINAL LENGTHS

	Test Pipe Size In Inches															
	2	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
Average Test Pressure PSI	Allowable Leakage Per 1,000 Feet In GPH															
200	0.42	0.64	0.85	1.27	1.70	2.12	2.55	2.97	3.40	3.82	4.25	5.10	6.37	7.64	8.92	10.19
175	0.40	0.60	0.79	1.19	1.59	1.99	2.38	2.78	3.18	3.58	3.97	4.77	5.96	7.15	8.34	9.54
150	0.37	0.55	0.74	1.10	1.47	1.84	2.20	2.58	2.94	3.31	3.68	4.41	5.52	6.62	7.72	8.83
140	0.36	0.53	0.71	1.07	1.42	1.78	2.13	2.49	2.84	3.20	3.55	4.26	5.33	6.40	7.46	8.53
120	0.33	0.49	0.66	0.99	1.32	1.64	1.98	2.30	2.63	2.96	3.29	3.95	4.93	5.92	6.91	7.89
100	0.30	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50	5.40	6.31	7.21
80	0.27	0.40	0.54	0.80	1.08	1.34	1.61	1.88	2.15	2.42	2.69	3.22	4.03	4.84	5.64	6.45
60	0.23	0.35	0.46	0.70	0.93	1.16	1.39	1.63	1.86	2.09	2.32	2.79	3.49	4.19	4.89	5.58

Standard Table No. 18
 Allowable Leakage For Cast Iron Pipe

3. "Leakage" is defined as the quantity of water to be supplied in the newly laid pipe or any valved section under test, which is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.
4. Flanged pipe shall be "bottle tight".
5. In no case shall the leakage exceed the greater of either three thousand (3,000) gallons per day per mile of water main or three percent (3%) of total supplied water.

Preliminary Flushing:

Prior to chlorination, the main shall be flushed as thoroughly as possible with the water pressure and outlets available. Flushing shall be done after the pressure test is made. It must be understood that such flushing removes only the lighter solids and cannot be relied upon to remove heavy material allowed to get into the main during laying. If no hydrant is installed at the end of the main, a tap should be provided large enough to effect a velocity in the main of at least 2.5 feet per second.

Sterilization:

The preferred point of application of the chlorinating agent shall be at the beginning of the pipeline extension or any valved section of it and through a corporation stop in the top of the newly laid pipe. The water injector for delivering the chlorine bearing water into the pipe should be supplied from a tap on the pressure side of the gate valve controlling the flow into the pipeline extension. In a new system application of chlorine may be made at the pumping station, the elevated tank, the standpipe or the reservoir. When properly cleaned first, these units are thus chlorinated adequately.

Water from the existing distribution system or other source of supply shall be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine. The rate of chlorine mixture flow shall be in such proportion to the rate of water entering the pipe that the chlorine dose applied to the water entering the newly laid pipe shall be at least fifty (50) ppm, or enough to meet the requirements during the retention period. A convenient method of determining the rate of flow of water into the line to be treated is to start with the line full of water and measure the rate of discharge at a hydrant with a Pitot tube. Great flexibility is made possible by providing a series of orifices to give good gauge readings at high and low flows.

Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water.

Treated water shall be retained in the pipe long enough to destroy all spore forming bacteria. This retention period should be at least twenty-four (24) hours. After the chlorine treated water has been retained for the required time, the chlorine residual at the pipe extremities and at other representative points should be at least ten (10) ppm.

In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipeline is filled with the chlorinating agent.

Final Flushing And Testing:

Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipeline at its extremities until the replacement water, throughout its length shall, upon test, be approved as safe water by the Department of Engineering and Public Works. This quality of water delivered by the new main should continue for a period of at least two (2) consecutive full days as demonstrated by laboratory examination of samples taken from a tap located and installed in such a way as to prevent outside contamination. Samples should never be taken from an unsterilized hose or from a fire hydrant, because such samples seldom meet current bacteriological standards.

1. Repetition of Procedures: Should the initial treatment fail to result in the conditions specified, the chlorination procedure shall be repeated until such results are obtained.
2. Sampling Tap: Three-quarter inch ($\frac{3}{4}$ ") bronze corporation cocks shall be

installed in all water mains at intervals not exceeding one thousand feet (1,000').

The Contractor must notify the Department of Engineering and Public Works at least forty-eight (48) hours in advance to arrange for appropriate pressure testing and water samplings. The Contractor is to provide the Department of Engineering and Public Works with sampling bottles at the time of sampling. All samples will be sent to the Cook County Department of Health or to a State of Illinois approved testing lab for analysis.

Environmental Protection Agency:

Water main design, construction, and testing shall in all respects be in accord with the regulations of the Bureau of Public Water Supplies, Environmental Protection Agency, State of Illinois. No construction shall commence until a copy of a permit from this agency is filed with the Village or the Village receives verification from this agency that a permit has been issued.

All water mains must be constructed according to the rules and regulations of the Illinois Department of Public Health regarding the protection of water mains, water service lines and appurtenances from contamination.

Measurement and Payment: Payment for flushing, testing, chlorination shall be paid on a Lump Sum basis for PRESSURE TESTING AND DISINFECTION. Payment shall be full compensation for all materials, labor, equipment, and other appurtenant items to complete this item as specified regardless of iterations required to complete this task.

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 IMSA 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 2nd paragraph of Article 801.16 of the Standard Specifications to read:

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

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

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

Add the following to Article 801.16 of the Standard Specifications:

“In addition to the specified record drawings, the 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.

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

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

Locating Underground Facilities.

Revise Section 803 to the Standard Specifications to read:

IDOT traffic signal facilities are not part of any of the one-call locating service such as J.U.L.I.E or Digger. If this Contract requires the services of an Electrical Contractor, the Contractor shall be responsible at his/her own expense for locating existing 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/un-energized signal sections and visors. Covers shall be made of outdoor fabric with urethane coating for repelling water, have elastic fully sewn around the cover ends for a tight fit over the visor, and have a minimum of two straps with buckles to secure the cover to the backplate. A center mesh strip allows viewing without removal for signal status testing purposes. Covers shall include a message indicating the signal is not in service.

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.

**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 deactivated 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.

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 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.

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 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.

IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL PROVISION (TPG) (D-1)

Effective: August 1, 2012

Revised: February 1, 2014

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

It is the policy of IDOT to fund IDOT pre-apprenticeship training programs throughout Illinois to provide training and skill-improvement opportunities to assure the increased participation of minority groups, disadvantaged persons and women in all phases of the highway construction industry. The intent of this IDOT Training Program Graduate (TPG) Special Provision is to place certified graduates of these IDOT funded pre-apprentice training programs on IDOT project sites when feasible, and provide the graduates with meaningful on-the-job training intended to lead to journey-level employment. IDOT and its sub-recipients, in carrying out the responsibilities of a state contract, shall determine which construction contracts shall include "Training Program Graduate Special Provisions." To benefit from the incentives to encourage the participation in the additional on-the-job training under this Training Program Graduate Special Provision, the Contractor shall make every reasonable effort to employ certified graduates of IDOT funded Pre-apprenticeship Training Programs to the extent such persons are available within a reasonable recruitment area.

Participation pursuant to IDOT's requirements by the Contractor or subcontractor in this Training Program Graduate (TPG) Special Provision entitles the Contractor or subcontractor to be reimbursed at \$15.00 per hour for training given a certified TPG on this contract. As approved by the Department, reimbursement will be made for training persons as specified herein. This reimbursement will be made even though the Contractor or subcontractor may receive additional training program funds from other sources for other trainees, provided such other source does not specifically prohibit the Contractor or subcontractor from receiving other reimbursement. For purposes of this Special Provision the Contractor is not relieved of requirements under applicable federal law, the Illinois Prevailing Wage Act, and is not eligible for other training fund reimbursements in addition to the Training Program Graduate (TPG) Special Provision reimbursement.

No payment shall be made to the Contractor if the Contractor or subcontractor fails to provide the required training. It is normally expected that a TPG will begin training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project through completion of the contract, so long as training opportunities exist in his work classification or until he has completed his training program. Should the TPG's employment end in advance of the completion of the contract, the Contractor shall

promptly notify the designated IDOT staff member under this Special Provision that the TPG's involvement in the contract has ended and supply a written report of the reason for the end of the involvement, the hours completed by the TPG under the Contract and the number of hours for which the incentive payment provided under this Special Provision will be or has been claimed for the TPG.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting its performance under this Special Provision.

METHOD OF MEASUREMENT: The unit of measurement is in hours.

BASIS OF PAYMENT: This work will be paid for at the contract unit price of \$15.00 per hour for certified TRAINEES TRAINING PROGRAM GRADUATE. The estimated total number of hours, unit price and total price have been included in the schedule of prices.

The Contractor shall provide training opportunities aimed at developing full journeyworker in the type of trade or job classification involved. The initial number of TPGs for which the incentive is available under this contract is 3 (three). During the course of performance of the Contract the Contractor may seek approval from the Department for additional incentive eligible TPGs. In the event the Contractor subcontracts a portion of the contract work, it shall determine how many, if any, of the TPGs are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this Special Provision. The Contractor shall also insure that this Training Program Graduate Special Provision is made applicable to such subcontract if the TPGs are to be trained by a subcontractor and that the incentive payment is passed on to each subcontractor.

For the Contractor to meet the obligations for participation in this TPG incentive program under this Special Provision, the Department has contracted with several entities to provide screening, tutoring and pre-training to individuals interested in working in the applicable construction classification and has certified those students who have successfully completed the program and are eligible to be TPGs. A designated IDOT staff member, the Director of the Office of Business and Workforce Diversity (OBWD), will be responsible for providing assistance and referrals to the Contractor for the applicable TPGs. For this contract, the Director of OBWD is designated as the responsible IDOT staff member to provide the assistance and referral services related to the placement for this Special Provision. For purposes of this Contract, contacting the Director of OBWD and interviewing each candidate he/she recommends constitutes reasonable recruitment.

Prior to commencing construction, the Contractor shall submit to the Department for approval the TPGs to be trained in each selected classification. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. No employee shall be employed as a TPG in any classification in which he/she has successfully completed a training course leading to journeyman status or in which he/she has been employed as a journeyman. Notwithstanding the on-the-job training purpose of this TPG Special Provision, some offsite training is permissible as long as the offsite

training is an integral part of the work of the contract and does not comprise a significant part of the overall training.

Training and upgrading of TPGs of IDOT pre-apprentice training programs is intended to move said TPGs toward journeyman status and is the primary objective of this Training Program Graduate Special Provision. Accordingly, the Contractor shall make every effort to enroll TPGs by recruitment through the IDOT funded TPG programs to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that it has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance and entitled to the Training Program Graduate Special Provision \$15.00 an hour incentive.

The Contractor or subcontractor shall provide each TPG with a certificate showing the type and length of training satisfactorily completed.

State of Illinois
Department of Transportation
Bureau of Local Roads and Streets

SPECIAL PROVISION
FOR
INSURANCE

Effective: February 1, 2007
Revised: August 1, 2007

All references to Sections or Articles in this specification shall be construed to mean specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

The Contractor shall name the following entities as additional insured under the Contractor's general liability insurance policy in accordance with Article 107.27:

Village of Schaumburg

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

State of Illinois
DEPARTMENT OF TRANSPORTATION
Bureau of Local Roads & Streets

SPECIAL PROVISION
FOR
FILLING HMA CORE HOLES WITH NON-SHRINK GROUT

Effective: January 1, 2008

All references to Sections and Articles in this Special Provision shall be construed to mean specific Sections and Articles in the Standard Specifications for Road and Bridge Construction adopted by the Department of Transportation.

Add the following after the first paragraph of Article 406.07(c) of the Standard Specifications:

“Upon completion of coring for density testing, all free water shall be removed from the core holes prior to filling. All core holes shall be filled with a non-shrink grout from the Department’s approved list, which shall be mixed in a separate container prior to placement in the hole. Only enough water to permit placement and consolidation by rodding shall be used, and the material shall be struck-off flush with the adjacent pavement.”



Storm Water Pollution Prevention Plan



Route FAU 2582	Marked Route Plum Grove Rd	Section 14-00115-01-PV
Project Number M4003(781)	County Cook	Contract Number 61E16

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issues by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name Kristin Mehl	Title Senior Civil Engineer	Agency Village of Schaumburg
Signature 	Date 9/25/17	

I. Site Description

A. Provide a description of the project location (include latitude and longitude):

General Project limits are Plum Grove Rd [PGR] from IL Rte 58-Golf Rd (north pavement edge) to Wiley Rd, Remington Rd - 650' crossing PGR, State Pkwy 1100' crossing PGR, Wiley Rd 300' crossing PGR, in the Villages of Schaumburg, Cook County, Illinois. Geographically, the study area is located in Sections E10, S2, N14, and W12, Township 41 North, Range 10, East of the Third Principal Meridian Lat 42°03'17" Long 88°03'36". Net/gross length is 3,869 feet (0.73 miles).

B. Provide a description of the construction activity which is subject of this plan:

This project includes the construction of the roadway, paths and sidewalks. Elements include roundabouts, road diet, storm sewer, retaining walls, lighting, landscaping, conflict resolution improvements to water main, conflict resolution improvements to sanitary sewer, sidewalks, shared use paths, driveways, pavement marking, signage, tree removal/replacement, and all incidental and collateral work necessary to complete the project as shown on the plans and special provisions. This project does not include in-stream work, or impacts to wetlands and Water of the US.

C. Provide the estimated duration of this project:

550 calendar days

D. The total area of the construction site is estimated to be 16 acres.

The total area of the site estimated to be disturbed by excavation, grading or other activities is 12.5 acres.

E. The following is a weighted average of the runoff coefficient for this project after construction activities are completed:

95.

F. List all soils found within project boundaries. Include map unit name, slope information and erosivity:

Form does not allow image to be inserted.
See Exhibit 3 "Soil Survey", appended to this form.

G. Provide an aerial extent of wetland acreage at the site:

There are no wetlands within or abutting the site.

H. Provide a description of potentially erosive areas associated with this project:

Areas where disturbance results in exposed soil. At a minimum, these areas along with the rest of the site will be monitored at a frequency that meets state and local permit requirements.

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.):

First Stage. Build PGR at Remington. Soil disturbance activities: excavate for walls, excavate for water main remove/replace, excavate for storm sewer, pavement/earth removal.

Second Stage, Substage A. Build PGR at State. Soil disturbance activities: excavate for water main remove/replace, excavate for storm sewer, pavement/earth removal.

Second Stage, Substage B. Build south portion of PGR. Soil disturbance activities: excavate for walls, excavate for storm sewer, pavement/earth removal.

Third Stage. Build north portion of PGR. Soil disturbance activities: excavate for storm sewer, pavement/earth removal.

The site has slopes generally at 7:1 or flatter and no slope steeper than 3:1 (with length less than 20').

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:

Village of Schaumburg, IDOT-D1.

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

MWRDGC

M. The following is a list of receiving water(s) and the ultimate receiving water(s) for this site. The location of the receiving waters can be found on the erosion and sediment control plans:

Salt Creek West Branch, Salt Creek West Branch.

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.

None.

O. The following sensitive environmental resources are associated with this project, and may have the potential to be impacted by the proposed development:

- Floodplain
- Wetland Riparian
- Threatened and Endangered Species
- Historic Preservation
- 303(d) Listed receiving waters for suspended solids, turbidity, or siltation
- Receiving waters with Total Maximum Daily Load (TMDL) for sediment, total suspended solids, turbidity, or siltation
- Applicable Federal, Tribal, State or Local Programs
- Other

1. 303(d) Listed receiving waters (fill out this section if checked above):

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

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

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

d. Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

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

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

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

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

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 type="checkbox"/> Antifreeze / Coolants |
| <input checked="" type="checkbox"/> Concrete Truck waste | <input type="checkbox"/> Waste water from cleaning construction equipment |
| <input checked="" type="checkbox"/> Concrete Curing Compounds | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Solid waste Debris | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Paints | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Solvents | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Fertilizers / Pesticides | <input type="checkbox"/> Other (specify) _____ |

II. Controls

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

A. Erosion and Sediment Controls: At a minimum, controls must be coordinated, installed, and maintained to:

1. Minimize the amount of soil exposed during construction activity;
2. Minimize the disturbance of steep slopes;
3. Maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible;
4. Minimize soil compaction and, unless infeasible, preserve topsoil.

B. Stabilization Practices: Provided below is a description of interim and permanent stabilization practices, including site- specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Stabilization practices may include but are not limited to: temporary seeding, permanent seeding, mulching, geotextiles, sodding, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Except as provided below in II(B)(1) and II(B)(2), stabilization measures shall be initiated **immediately** where construction activities have temporarily or permanently ceased, but in no case more than **one (1) day** after the construction activity in that portion of the site has temporarily or permanently ceases on all disturbed portions of the site where construction will not occur for a period of fourteen (14) or more calendar days.

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

The following stabilization practices will be used for this project:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Preservation of Mature Vegetation | <input checked="" type="checkbox"/> 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 type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Temporary Turf (Seeding, Class 7) | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Temporary Mulching | <input type="checkbox"/> Other (specify) _____ |
| <input type="checkbox"/> Permanent Seeding | <input type="checkbox"/> Other (specify) _____ |

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

Vegetation disturbance shall be limited to the area necessary to complete the work. Temporary or permanent erosion controls will be installed at the frequency described above. Disturbed soil shall be inspected until permanent stabilization is achieved.

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

Once construction activity in an area has permanently ceased, that area will be permanently stabilized. Temporary perimeter controls should be removed after final stabilization of those portions of the site upward of the perimeter control.

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 checked="" type="checkbox"/> Rock Outlet Protection |
| <input type="checkbox"/> Temporary Ditch Check | <input 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 storm sewer</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:

Storm drain inlet protection will be installed prior to ground disturbance, maintained during construction, and removed at Engineer's direction after all soils have been permanently stabilized. Perimeter controls of the site will be installed prior to soil disturbance (excluding soil disturbance necessary to install the controls). Stabilized construction entrance will be installed and maintained as described in the intended sequence of construction activities. Existing storm pipes will be adequately protected as necessary during construction operations. Additional Best Management Practices will be implemented on an as-needed basis to protect water quality.

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

Once construction activity in an area has permanently ceased, temporary structural practices will be removed after final stabilization of those portions of the site upward of the temporary structural practices. Permanent control measures shall be field verified for proper function and installation during active construction.

D. Treatment Chemicals

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

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

E. Permanent Storm Water Management Controls: Provided below is a description of measures that will be installed during the construction process to control volume and pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water act.

- 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 Outlet Protection.

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

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

Village of Schaumburg and IDOT D-1.

- G. **Contractor Required Submittals:** Prior to conducting any professional services at the site covered by this plan, the Contractor and each subcontractor responsible for compliance with the permit shall submit to the Resident Engineer a Contractor Certification Statement, BDE 2342a.

1. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:
 - Approximate duration of the project, including each stage of the project
 - Rainy season, dry season, and winter shutdown dates
 - Temporary stabilization measures to be employed by contract phases
 - Mobilization time frame
 - Mass clearing and grubbing/roadside clearing dates
 - Deployment of Erosion Control Practices
 - Deployment of Sediment Control Practices (including stabilized construction entrances/exits)
 - Deployment of Construction Site Management Practices (including concrete washout facilities, chemical storage, refueling locations, etc.)
 - Paving, saw-cutting, and any other pavement related operations
 - Major planned stockpiling operations
 - Time frame for other significant long-term operations or activities that may plan non-storm water discharges such as dewatering, grinding, etc.
 - Permanent stabilization activities for each area of the project
2. The Contractor and each subcontractor shall provide, as an attachment to their signed Contractor Certification Statement, a discussion of how they will comply with the requirements of the permit in regard to the following items and provide a graphical representation showing location and type of BMPs to be used when applicable:
 - Vehicle Entrances and Exits - Identify type and location of stabilized construction entrances and exits to be used and how they will be maintained.
 - Material delivery, Storage, and Use - Discuss where and how materials including chemicals, concrete curing compounds, petroleum products, etc. will be stored for this project.
 - Stockpile Management - Identify the location of both on-site and off-site stockpiles. Discuss what BMPs will be used to prevent pollution of storm water from stockpiles.
 - Waste Disposal - Discuss methods of waste disposal that will be used for this project.
 - Spill Prevention and Control - Discuss steps that will be taken in the event of a material spill (chemicals, concrete curing compounds, petroleum, etc.).
 - Concrete Residuals and Washout Wastes - Discuss the location and type of concrete washout facilities to be used on this project and how they will be signed and maintained.
 - Litter Management - Discuss how litter will be maintained for this project (education of employees, number of dumpsters, frequency of dumpster pick-up, etc.).
 - Vehicle and Equipment Cleaning and Maintenance - Identify where equipment cleaning and maintenance locations for this project and what BMPs will be used to ensure containment and spill prevention.

- Dewatering Activities - Identify the controls which will be used during dewatering operations to ensure sediments will not leave the construction site.
- Polymer Flocculants and Treatment Chemicals - Identify the use and dosage of treatment chemicals and provide the Resident Engineer with Material Safety Data Sheets. Describe procedures on how the chemicals will be used and identify who will be responsible for the use and application of these chemicals. The selected individual must be trained on the established procedures.
- Additional measures indicated in the plan.

III. Maintenance

When requested by the Contractor, the Resident Engineer will provide general maintenance guides to the Contractor for the practices associated with this project. The following additional procedures will be used to maintain, in good and effective operating conditions, the vegetation, erosion and sediment control measures and other protective measures identified in this plan. It will be Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

Stabilized Construction Entrance: The entrances should be maintained to prevent tracking of sediment onto public streets. Maintenance includes top dressing with additional stone and removing top layers of stone and sediment. The sediment tracked onto the public right-of-way should be removed immediately.

Sediment Filter Bags and Treatment Swales: Sediment filter bags should be installed on pump outlet hoses that discharge off-site, and should be placed in an area that allows for the bag to be removed without producing a sediment discharge. If required, jute and flocculent placed in treatment swales should be monitored for effectiveness, and replaced as needed to maintain a sediment-free storm water discharge.

Concrete Washout Area: Existing facilities should be cleaned out, or new facilities should be constructed and operational once the existing washout is 75% full. Washouts should be inspected frequently to ensure that plastic linings (as applicable) are intact and sidewalls have not been damaged by construction activities. When the washout area is adjacent to a paved road, the paved road should be inspected for accumulated concrete waste. Any accumulated concrete waste on the road, curb, or gutter should be removed and disposed of properly.

Erosion Control Blanket: The blanket and staples should be inspected frequently and shall be installed to Illinois Urban Manual Drawing Number IL-530, unless otherwise instructed by the manufacturer. Erosion occurring underneath the blanket should be backfilled and seeded with the appropriate seed mix. Additional BMPs may need to be installed to reduce erosion under the blanket.

Vegetative Soil Erosion Measures: The vegetative growth of temporary and permanent seeding, vegetative filters, etc., shall be maintained periodically and supplied adequate watering and fertilizer. Reseed as necessary where vegetation establishment is poor.

Silt Fence: Silt fences should be inspected regularly for undercutting where the fence meets the ground, overtopping, and tears along the length of the fence. Deficiencies should be repaired immediately. Remove accumulated sediments from the fence base when the sediment reaches one-half the fence height. During final stabilization, properly dispose of any sediment that has accumulated on the silt fence. Alternative BMPs (e.g. staked wattles, run off control, etc.) should be considered for areas where silt fence continually fails.

Catch Basin and Inlet Filters: Inlet filters should be inspected for proper filtering. If filter bags are used, remove sediment from the filter bags when 50% percent of the storage volume has been filled, unless otherwise instructed by the manufacturer. Remove trash and debris during inspections. Accumulated material in the filters should be disposed of properly. Do not puncture holes in filters if ponding occurs.

IV. Inspections

Qualified personnel shall inspect disturbed areas of the construction site which have not yet been finally stabilized, structural control measures, and locations where vehicles and equipment enter and exit the site using IDOT Storm Water Pollution Prevention Plan Erosion Control Inspection Report (BC 2259). Such inspections shall be conducted at least once every seven (7) calendar days and within twenty-four (24) hours of the end of a storm or by the end of the following business or work day that is 0.5 inch or greater or equivalent snowfall.

Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities are conducted, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.

If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer shall notify the appropriate IEPA Field Operations Section office by e-mail at: epa.swnoncomp@illinois.gov, telephone or fax within twenty-four (24) hours of the incident. The Resident Engineer shall then complete and submit an "Incidence of Non-Compliance" (ION) report for the identified violation within five (5) days of the incident. The Resident Engineer shall use forms provided by IEPA and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of non-compliance shall be signed by a responsible authority in accordance with Part VI. G of the Permit ILR10.

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

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

Additional Inspections Required:

--

V. Failure to Comply

Failure to comply with any provisions of this Storm Water Pollution Prevention Plan will result in the implementation of a National Pollutant Discharge Elimination System/Erosion and Sediment Control Deficiency Deduction against the Contractor and/or penalties under the Permit ILR10 which could be passed on to the Contractor.



Contractor Certification Statement



Prior to conducting any professional services at the site covered by this contract, the Contractor and every subcontractor must complete and return to the Resident Engineer the following certification. A separate certification must be submitted by each firm. Attach to this certification all items required by Section II.G of the Storm Water Pollution Prevention Plan (SWPPP) which will be handled by the Contractors/subcontractor completing this form.

Route FAU 2582	Marked Route Plum Grove Road	Section 14-001155-01-PV
Project Number M4003(781)	County Cook	Contract Number 61E16

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:



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 [Engineering and Public Works Dept]

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@ci.schaumburg.il.us

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 Rd [IL Rte 58 (Golf Rd) to Wiley Rd] Rdwy Improve County: Cook

Street Address: 23435 Black Road City: Schaumburg IL Zip: 60193

Latitude: 42 03 17 Longitude: 88 03 136 10,2... 41N 10E
(Deg) (Min) (Sec) (Deg) (Min) (Sec) Section Township Range

Approximate Construction Start Date Apr 1, 2018 Approximate Construction End Date Dec 1, 2019

Total size of construction site in acres: 12.5

If less than 1 acre, is the site part of a larger common plan of development?
 Yes No

Fee Schedule for Construction Sites:
Less than 5 acres - \$250
5 or more acres - \$750

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Has the SWPPP been submitted to the Agency? Yes No

(Submit SWPPP electronically to: epa.constilr10swppp@illinois.gov)

Location of SWPPP for viewing: Address: 1406 N Plum Grove Rd City: Schaumburg

SWPPP contact information: Inspector qualifications: _____

Contact Name: Kristin L. Mehl, P.E.

Phone: 847-923-6618 Fax: 847-923-2386 E-mail: kmehl@ci.schaumburg.il.us

Project inspector, if different from above Inspector qualifications: _____

Inspector's Name: _____

Phone: _____ Fax: _____ E-mail: _____

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed \$50,000 for the violation and an additional civil penalty of not to exceed \$10,000 for each day during which the violation continues (415 ILCS 5/42) and may also prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

TYPE OF CONSTRUCTION (select one)

Construction Type Transportation

SIC Code: _____

Type a detailed description of the project:

Construction of the HMA roadway, HMA paths and concrete sidewalks. Elements include roundabouts, road diet, storm sewer, retaining walls, lighting, landscaping, conflict resolution improvements to water main, conflict resolution improvements to sanitary sewer, sidewalks, shared use paths, driveways, pavement marking, signage, tree removal/ replacement. Net/gross length is 3,869 feet (0.73 miles).

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, IDOT-D1

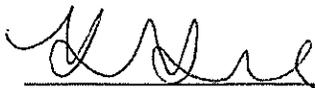
Name of closest receiving water body to which you discharge: _____

Mail completed form to: Illinois Environmental Protection Agency
Division of Water Pollution Control
Attn: Permit Section
Post Office Box 19276
Springfield, Illinois 62794-9276
or call (217) 782-0610
FAX: (217) 782-9891

Or submit electronically to: epa.constilr10swppp@illinois.gov

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a storm water pollution prevention plan and a monitoring program plan, will be complied with.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))



Owner Signature:

10/10/17

Date:

Kristin L Mehl

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

Reports must be typed or printed legibly and signed.

Any facility that is not presently covered by the General NPDES Permit for Storm Water Discharges From Construction Site Activities is considered a new facility.

If this is a change in your facility information, renewal, etc., please fill in your permit number on the appropriate line, changes of information or permit renewal notifications do not require a fee.

NOTE: FACILITY LOCATION IS NOT NECESSARILY THE FACILITY MAILING ADDRESS, BUT SHOULD DESCRIBE WHERE THE FACILITY IS LOCATED.

Use the formats given in the following examples for correct form completion.

	Example	Format
Section	12	1 or 2 numerical digits
Township	12N	1 or 2 numerical digits followed by "N" or "S"
Range	12W	1 or 2 numerical digits followed by "E" or "W"

For the Name of Closest Receiving Waters, do not use terms such as ditch or channel. For unnamed tributaries, use terms which include at least a named main tributary such as "Unnamed Tributary to Sugar Creek to Sangamon River."

Submission of initial fee and an electronic submission of Storm Water Pollution Prevention Plan (SWPPP) for Initial Permit prior to the Notice of Intent being considered complete for coverage by the ILR10 General Permits. Please make checks payable to: Illinois EPA at the above address.

Construction sites with less than 5 acres of land disturbance - fee is \$250.

Construction sites with 5 or more acres of land disturbance - fee is \$750.

SWPPP should be submitted electronically to: epa.constilr10swppp@illinois.gov When submitting electronically, use Project Name and City as indicated on NOI form.



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: Plum Grove Road Improvements Project Office Phone Number, if available: 847-923-6600

Physical Site Location (address, including number and street):

Plum Grove Road from Golf Road to Wiley 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: 42.0559605 Longitude: -88.0598954
(Decimal Degrees) (-Decimal Degrees)

Identify how the lat/long data were determined:

GPS Map Interpolation Photo Interpolation Survey Other

ISGS Public Land Survey System. Lat/long above refer to the approximate center of the Project Area

IEPA Site Number(s), if assigned: BOL: BOW: BOA:

II. Owner/Operator Information for Source Site

Site Owner

Site Operator

Name: 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) 823-0500

Zip Code: 60193 Phone: (847) 823-0500

Contact: David L. Lawry, P.E. Dir. Eng/Public Works

Contact: David L. Lawry, P.E. Dir. Eng/Public Works

Email, if available: dlawry@ci.schaumburg.il.us

Email, if available: dlawry@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

Project Name: Plum Grove Road Improvements Project

Latitude: 42.0559605 Longitude: -88.0598954

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):

Database review was completed for the entire Village of Schaumburg, including the Project Area, consisting of commercial land use. Five potentially impacted properties (PIPs) were identified through the database review and site visit. See attachments for maps, and a narrative. Rev. 5/10/17, refer to discussion on road base materials encountered during geotechnical borings.

- 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]:

Ten (10) borings were advanced within the Project Area on April 15, 2016 with samples analyzed for one or more of the following: VOCs, BTEX, PNAs, 8 RCRA Metals or total lead, PCBs, and pH. All results achieve the CCDD requirements. Geotechnical borings were conducted identifying pozzolanic material in upper 1-foot at 5 locations, currently excluded.

IV. Certification Statement, Signature and Seal of Licensed Professional Engineer or Licensed Professional Geologist

I, Jeremy J. Reynolds, P.G. (name of licensed professional engineer or geologist) certify under penalty of law that the information submitted, including but not limited to, all attachments and other information, is to the best of my knowledge and belief, true, accurate and complete. In accordance with the Environmental Protection Act [415 ILCS 5/22.51 or 22.51a] and 35 Ill. Adm. Code 1100.205(a), I certify that the soil from this site is uncontaminated soil. I also certify that the soil pH is within the range of 6.25 to 9.0. In addition, I certify that the soil has not been removed from the site as part of a cleanup or removal of contaminants. All necessary documentation is attached.

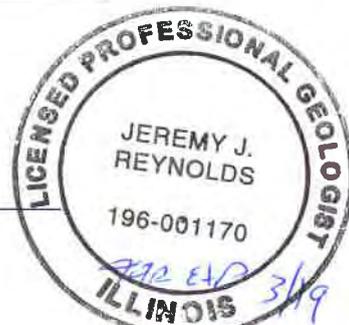
Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Company Name: Huff & Huff, Inc.
 Street Address: 915 Harger Rd Suite 330
 City: Oak Brook State: IL Zip Code: 60523
 Phone: (630) 684-9100

Jeremy J. Reynolds, P.G.
 Printed Name:


 Licensed Professional Engineer or
 Licensed Professional Geologist Signature:

5/31/17
 Date:



P.E. or L.P.G. Seal:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 North Grand Avenue, East; Post Office Box 19276; Springfield, IL 62794-9276

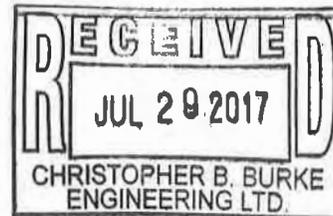
Division of Public Water Supplies

Telephone 217/782-1724

PUBLIC WATER SUPPLY CONSTRUCTION PERMIT

SUBJECT: SCHAUMBURG (Cook County – 0314890)

Permit Issued to:
Village of Schaumburg
101 Schaumburg Ct.
Schaumburg, IL 60193



PERMIT NUMBER: 1140-FY2017

DATE ISSUED: July 27, 2017

PERMIT TYPE: Water Main

The issuance of this permit is based on plans and specifications prepared by the engineers/architects indicated, and are identified as follows. This permit is issued for the construction and/or installation of the public water supply improvements described in this document, in accordance with the provisions of the "Environmental Protection Act", Title IV, Sections 14 through 17, and Title X, Sections 39 and 40, and is subject to the conditions printed on the last page of this permit and the ADDITIONAL CONDITIONS listed below.

FIRM: Christopher B. Burke Engineering, Ltd.

NUMBER OF PLAN SHEETS: 23

TITLE OF PLANS: "Plum Grove Road Roadway Improvements (Golf Rd. to Wiley Rd.)"

PROPOSED IMPROVEMENTS:

*** Install approximately 2,090 feet of 12-inch, 200 feet of 10-inch, 300 feet of 8-inch, and 160 feet of 6-inch water main. ***

ADDITIONAL CONDITIONS:

1. All water mains shall be satisfactorily disinfected prior to use. In accordance with the requirements of AWWA C651-05, at least one set of samples shall be collected from every 1,200 feet of new water main, plus one set from the end of the line and at least one set from each branch. Satisfactory disinfection shall be demonstrated in accordance with the requirements of 35 Ill. Adm. Code 602.310.
2. There are no further conditions to this permit.

DCC:

cc: Christopher B. Burke Engineering, Ltd.
Cook County Health Department
DPWS/Elgin Regional Office

A handwritten signature in black ink, appearing to read "D. Cook".

David C. Cook, P.E.
Acting Manager Permit Section
Division of Public Water Supplies

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS
ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

The Illinois Environmental Protection Agency Act (Illinois Compiled Statutes, Chapter 111-1/2, Section 1039) grants the Environmental Protection Agency authority to impose conditions on permits which it issues.

These standard conditions shall apply to all permits which the Agency issues for construction or development projects which require permits under the Division of Water Pollution Control, Air Pollution Control, Public Water Supplies and Land Pollution Control. Special conditions may also be imposed by the separate divisions in addition to these standard conditions.

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year after this date of issuance unless construction or development on this project has started on or prior to that date. (See standard condition #8 below)
2. The construction or development of facilities covered by this permit shall be done in compliance with applicable provisions of Federal laws and regulations, the Illinois Environmental Protection Act, and Rules and Regulations adopted the Illinois Pollution Control Board.
3. There shall be no deviations from the approved plans and specifications unless a written request for modification of the project, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.
4. The permittee shall allow any agent duly authorized by the Agency upon the presentation of credentials:
 - a. to enter at reasonable times the permittee's premises where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit.
 - b. to have access to and copy at reasonable times any records required be kept under the terms and conditions of this permit.
 - c. to inspect at reasonable times, including during any hours of operation of equipment constructed or operated under this permit, such equipment or monitoring methodology or equipment required to be kept, used, operated, calibrated and maintained under this permit.
 - d. to obtain and remove at reasonable times samples of any discharge or emission of pollutants.
 - e. to enter at reasonable times and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.
5. The issuance of this permit:
 - a. shall not be considered as in any manner affecting the title of the permits upon which the permitted facilities are to be located;
 - b. does not release the permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities;
 - c. does not release the permittee from compliance with the other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations;
 - d. does not take into consideration or attest to the structural stability of any units or parts of the project;
 - e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability directly or indirectly for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.
6. These standard conditions shall prevail unless modified by special conditions.
7. The Agency may file a complaint with Board of modification, suspension or revocation of a permit:
 - a. upon discovery that the permit application misrepresentation or false statements or that all relevant facts were not disclosed; or
 - b. upon finding that any standard or special conditions have been violated; or
 - c. upon any violation of the Environmental Protection Act or any Rules or Regulation effective thereunder as a result of the construction or development authorized by this permit.
8. Division of Public Water Supply Construction Permits expire one year from date of issuance or renewal, unless construction has started. If construction commences within one year from date of issuance or renewal, the permit expires five years from the date of permit issuance or renewal. A request for extension shall be filed prior to the permit expiration date.

SPECIAL CONDITIONS

Watershed Management Permit No. 17-233

This Permit is issued subject to the General Conditions and the attached Special Conditions.

If Permit is granted:

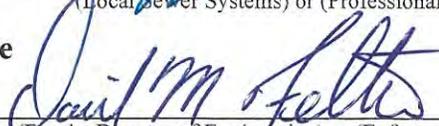
- Please return two (2) copies of the Permit to the Permittee; or
- Please mail one (1) copy to Permittee and one (1) copy to the person designated below:

Name: Luke J. Sherry - Christopher B. Burke Engineering, Ltd.

Address: 9575 W. Higgins Road, Suite 600 Rosemont, IL 60018

CERTIFICATE BY APPLICANTS: We have read and thoroughly understand the conditions and requirements of this Permit application, and agree to conform to the Permit conditions and other applicable requirements of the District. It is understood that construction hereunder, after the Permit is granted, shall constitute acceptance by the applicants of any Special Conditions that may be placed hereon by the District or an Authorized Municipality. It is further understood that this application shall not constitute a Permit until it is approved, signed and returned by the Director of Engineering of the District or Enforcement Officer of an Authorized Municipality.

PERMITTEE	CO-PERMITTEE
<p>The project area is within municipal corporate limits.</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable</p>	<p>(Co-Permittee is Property Owner)</p> <p>Title to property is held in a land trust: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If yes, Co-Permittee shall be beneficiary with Power of Direction</p>
Municipality <u>Village of Schaumburg</u>	Owner <u>VILLAGE OF SCHAUMBURG</u>
Address <u>714 S Plum Grove Road</u>	Address <u>714 S PLUM GROVE ROAD</u>
City <u>Schaumburg</u> Zip <u>60193</u>	City <u>SCHAUMBURG</u> Zip <u>60193</u>
Signature 	Signature 
Name <u>David Lawry</u> (Print)	Name <u>MICHAEL HALL</u> (Print)
Title <u>Director of Engineering and Public Works</u>	Title <u>Assistant Director of Engineering & Public Works</u>
Date <u>6/16/17</u> Phone <u>847-923-6600</u>	Date <u>6/20/17</u> Phone <u>847-923-6616</u>

REVIEW AND APPROVAL BY THE DISTRICT OR AUTHORIZED MUNICIPALITY	
Reviewed by: 	Date <u>9-14-2017</u>
(Local Sewer Systems) or (Professional Engineer)	
Approved for Issue	
Approved by: 	Date <u>9-15-2017</u>
(For the Director of Engineering) or (Enforcement Officer)	

SPECIAL CONDITIONS FOR MWRD PERMIT NO. 17-233

1. Construction must conform to the soil erosion and sediment control requirements of this permit and other local, state, and/or federal agencies. This permit is issued contingent that the EPA NPDES ILR-10 permit shall be submitted to MWRD when secured.
2. This permit is issued subject to the official requirements of the WMO and in reliance of the drainage certification submitted by the design engineer. Development under this permit shall not increase flood elevations or decrease flood conveyance capacity of the area upstream or downstream of the developed property covered under this permit.
3. Construction under this permit consists of storm sewers only.
4. All access hatches/manhole covers on MWRD structures/manholes within project area shall not be buried/covered.
5. Earth retention system shall be designed to prevent any damage to our facilities due to heavy equipment and due to vibrations. The contractor shall be responsible for protecting our facilities from all construction operations and equipment.
6. The MWRD shall have 24 hour-a-day unrestricted access to all MWRD structures/sewers/facilities.
7. No debris shall enter MWRD structures/sewers/facilities/waterways.
8. All access hatches/manhole covers on MWRD structures/manholes within the project area shall not be buried/covered.
9. The Permittee/Co-Permittee shall restore the work site area, including access roads and MWRD structures/facilities, to the condition it was in prior to the completed work.
10. The Contractor shall take precautions during excavation in critical locations (e.g. older interceptors susceptible to damage). The last two (2) feet of excavation in said critical areas shall either be hand excavated or vacuum excavated. The Permittee/Co-Permittee shall be held responsible for any damage to MWRD facilities.
11. District facilities shall be located prior to proceeding with any construction work. For any questions regarding access to our facility or field location, please contact Mr. Steve Whitehead at 847-568-8329.
12. District manholes shall be located, protected and/or adjusted to grade, if necessary. Prior authorization is required to make any structural modifications, including manhole frame and lid adjustments. Authorization may be obtained by contacting Mr. Ed Staudacher, Managing Civil Engineer, at (708) 588-4319.

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 ± 0.063 in. (± 1.6 mm). Variations shall not exceed 0.25 in. (6 mm) from flat (dish, bow, or convoluting edge) or 0.125 in. (3 mm) for bulges or dips in the surface.

1043.05 Expanded Polypropylene (EPP) Adjusting Rings. The EPP adjusting rings shall be manufactured using a high compression molding process to produce a minimum finished density of 7.5 lb/cu ft (120 g/l). The EPP rings shall be made of materials meeting ASTM D 3575 and ASTM D 4819-13. The grade adjustments shall be designed and tested according to the AASHTO Standard Specifications for Highway Bridges (AASHTO M 306 HS-25).

Grade rings shall contain upper and lower keyways (tongue and groove) for proper vertical alignment and sealing. The top ring, for use directly beneath the cast iron frame, shall have keyways (grooves) on the lower surface with a flat upper surface.

Adhesive or sealant used for watertight installation of the manhole grade adjustment rings shall meet ASTM C 920, Type S, Grade NS, Class 25, Uses NT, T, M, G, A, and O.

EPP adjustment rings shall have no void areas, cracks, or tears. The actual diameter or length shall not vary more than 0.125 in. (3 mm) from the specified diameter or length. Variations in height are limited to ± 0.063 in. (± 1.6 mm). Variations shall not exceed 0.25 in. (6 mm) from flat (dish, bow, or convoluting edge) or 0.125 in. (3 mm) for bulges or dips in the surface.”

80382

BITUMINOUS MATERIALS COST ADJUSTMENTS (BDE)

Effective: November 2, 2006

Revised: August 1, 2017

Description. Bituminous material cost adjustments will be made to provide additional compensation to the Contractor, or credit to the Department, for fluctuations in the cost of bituminous materials when optioned by the Contractor. The bidder shall indicate with their bid whether or not this special provision will be part of the contract.

The adjustments shall apply to permanent and temporary hot-mix asphalt (HMA) mixtures, bituminous surface treatments (cover and seal coats), and preventative maintenance type surface treatments that are part of the original proposed construction, or added as extra work and paid for by agreed unit prices. The adjustments shall not apply to bituminous prime coats, tack coats, crack filling/sealing, joint filling/sealing, or extra work paid for at a lump sum price or by force account.

Method of Adjustment. Bituminous materials cost adjustments will be computed as follows.

$$CA = (BPI_P - BPI_L) \times (\%AC_V / 100) \times Q$$

- Where: CA = Cost Adjustment, \$.
- BPI_P = Bituminous Price Index, as published by the Department for the month the work is performed, \$/ton (\$/metric ton).
- BPI_L = Bituminous Price Index, as published by the Department for the month prior to the letting for work paid for at the contract price; or for the month the agreed unit price letter is submitted by the Contractor for extra work paid for by agreed unit price, \$/ton (\$/metric ton).
- %AC_V = Percent of virgin Asphalt Cement in the Quantity being adjusted. For HMA mixtures, the % AC_V will be determined from the adjusted job mix formula. For bituminous materials applied, a performance graded or cutback asphalt will be considered to be 100% AC_V and undiluted emulsified asphalt will be considered to be 65% AC_V.
- Q = Authorized construction Quantity, tons (metric tons) (see below).

For HMA mixtures measured in square yards: $Q, \text{ tons} = A \times D \times (G_{mb} \times 46.8) / 2000$. For HMA mixtures measured in square meters: $Q, \text{ metric tons} = A \times D \times (G_{mb} \times 1) / 1000$. When computing adjustments for full-depth HMA pavement, separate calculations will be made for the binder and surface courses to account for their different G_{mb} and % AC_V.

For bituminous materials measured in gallons: $Q, \text{ tons} = V \times 8.33 \text{ lb/gal} \times SG / 2000$
For bituminous materials measured in liters: $Q, \text{ metric tons} = V \times 1.0 \text{ kg/L} \times SG / 1000$

- Where: A = Area of the HMA mixture, sq yd (sq m).
D = Depth of the HMA mixture, in. (mm).
G_{mb} = Average bulk specific gravity of the mixture, from the approved mix design.

V = Volume of the bituminous material, gal (L).
SG = Specific Gravity of bituminous material as shown on the bill of lading.

Basis of Payment. Bituminous materials cost adjustments may be positive or negative but will only be made when there is a difference between the BPI_L and BPI_P in excess of five percent, as calculated by:

$$\text{Percent Difference} = \{(BPI_L - BPI_P) \div BPI_L\} \times 100$$

Bituminous materials cost adjustments will be calculated for each calendar month in which applicable bituminous material is placed; and will be paid or deducted when all other contract requirements for the work placed during the month are satisfied. The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

80173

BUTT JOINTS (BDE)

Effective: July 1, 2016

Add the following to Article 406.08 of the Standard Specifications.

“(c) Temporary Plastic Ramps. Temporary plastic ramps shall be made of high density polyethylene meeting the properties listed below. Temporary plastic ramps shall only be used on roadways with permanent posted speeds of 55 mph or less. The ramps shall have a minimum taper rate of 1:30 (V:H). The leading edge of the plastic ramp shall have a maximum thickness of 1/4 in. (6 mm) and the trailing edge shall match the height of the adjacent pavement $\pm 1/4$ in. (± 6 mm).

The ramp will be accepted by certification. The Contractor shall furnish a certification from the manufacturer stating the temporary plastic ramp meets the following requirements.

Physical Property	Test Method	Requirement
Melt Index	ASTM D 1238	8.2 g/10 minutes
Density	ASTM D 1505	0.965 g/cc
Tensile Strength @ Break	ASTM D 638	2223 psi (15 MPa)
Tensile Strength @ Yield	ASTM D 638	4110 psi (28 MPa)
Elongation @ Yield ^{1/} , percent	ASTM D 638	7.3 min.
Durometer Hardness, Shore D	ASTM D 2240	65
Heat Deflection Temperature, 66 psi	ASTM D 648	176 °F (80 °C)
Low Temperature Brittleness, F ₅₀	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 ^{1/}	600-749	2002
	750 and up	2006
June 1, 2011 ^{2/}	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006
June 1, 2012 ^{2/}	50-99	2004
	100-299	2003
	300-599	2001
	600-749	2002
	750 and up	2006

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

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

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

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

device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

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

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

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

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

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

Any costs associated with retrofitting any diesel powered off-road equipment with emission control devices shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed. The Contractor's compliance with this notice and any associated regulations shall not be grounds for a claim.

Diesel Retrofit Deficiency Deduction

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

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

If a Contractor accumulates three diesel retrofit deficiency deductions for the same piece of equipment in a contract period, the Contractor will be shutdown until the deficiency is corrected.

Such a shutdown will not be grounds for any extension of the contract time, waiver of penalties, or be grounds for any claim.

80261

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 17.00 % of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

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

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

<http://www.idot.illinois.gov/doing-business/certifications/disadvantaged-business-enterprise-certification/il-ucp-directory/index>.

BIDDING PROCEDURES. Compliance with this Special Provision is required prior to the award of the contract and the failure of the low bidder to comply will render the bid not responsive.

In order to assure the timely award of the contract, the low bidder shall submit:

- (a) The bidder shall submit a DBE Utilization Plan on completed Department forms SBE 2025 and 2026.
 - (1) The final Utilization Plan must be submitted within five calendar days after the date of the letting in accordance with subsection (a)(2) of Bidding Procedures herein.

- (2) To meet the five day requirement, the bidder may send the Utilization Plan electronically by scanning and sending to DOT.DBE.UP@illinois.gov or faxing to (217) 785-1524. The subject line must include the bid Item Number and the Letting date. The Utilization Plan should be sent as one .pdf file, rather than multiple files and emails for the same Item Number. It is the responsibility of the bidder to obtain confirmation of email or fax delivery.

Alternatively, the Utilization Plan may be sent by certified mail or delivery service within the five calendar day period. If a question arises concerning the mailing date of a Utilization Plan, the mailing date will be established by the U.S. Postal Service postmark on the certified mail receipt from the U.S. Postal Service or the receipt issued by a delivery service when the Utilization Plan is received by the Department. It is the responsibility of the bidder to ensure the postmark or receipt date is affixed within the five days if the bidder intends to rely upon mailing or delivery to satisfy the submission day requirement. The Utilization Plan is to be submitted to:

Illinois Department of Transportation
Bureau of Small Business Enterprises
Contract Compliance Section
2300 South Dirksen Parkway, Room 319
Springfield, Illinois 62764

The Department will not accept a Utilization Plan if it does not meet the five day submittal requirement and the bid will be declared not responsive. In the event the bid is declared not responsive due to a failure to submit a Utilization Plan or failure to comply with the bidding procedures set forth herein, the Department may elect to cause the forfeiture of the penal sum of the bidder's proposal guaranty, and may deny authorization to bid the project if re-advertised for bids. The Department reserves the right to invite any other bidder to submit a Utilization Plan at any time for award consideration.

- (b) The Utilization Plan shall indicate that the bidder either has obtained sufficient DBE participation commitments to meet the contract goal or has not obtained enough DBE participation commitments in spite of a good faith effort to meet the goal. The Utilization Plan shall further provide the name, telephone number, and telefax number of a responsible official of the bidder designated for purposes of notification of Utilization Plan approval or disapproval under the procedures of this Special Provision.
- (c) The Utilization Plan shall include a DBE Participation Commitment Statement, Department form SBE 2025, for each DBE proposed for the performance of work to achieve the contract goal. For bidding purposes, submission of the completed SBE 2025 forms, signed by the DBEs and scanned or faxed to the bidder will be acceptable as long as the original is available and provided upon request. All elements of information indicated on the said form shall be provided, including but not limited to the following:

- (1) The names and addresses of DBE firms that will participate in the contract;
- (2) A description, including pay item numbers, of the work each DBE will perform;
- (3) The dollar amount of the participation of each DBE firm participating. The dollar amount of participation for identified work shall specifically state the quantity, unit price, and total subcontract price for the work to be completed by the DBE. If partial pay items are to be performed by the DBE, indicate the portion of each item, a unit price where appropriate and the subcontract price amount;
- (4) DBE Participation Commitment Statements, form SBE 2025, signed by the bidder and each participating DBE firm documenting the commitment to use the DBE subcontractors whose participation is submitted to meet the contract goal;
- (5) If the bidder is a joint venture comprised of DBE companies and non-DBE companies, the Utilization Plan must also include a clear identification of the portion of the work to be performed by the DBE partner(s); and,
- (6) If the contract goal is not met, evidence of good faith efforts; the documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor is selected over a DBE for work on the contract.

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

- (a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors

are not intended to be a mandatory checklist and are not intended to be exhaustive. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases, and will be considered by the Department.

- (1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.
- (2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime Contractor might otherwise prefer to perform these work items with its own forces.
- (3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- (4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.
 - b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable. In accordance with subsection (c)(6) of the above Bidding Procedures, the documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.

- (5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.
 - (6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.
 - (7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.
 - (8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.
- (b) If the Department determines that the apparent successful bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided that it is otherwise eligible for award. If the Department determines that the bidder has failed to meet the requirements of this Special Provision or that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification shall include a statement of reasons for the determination. If the Utilization Plan is not approved because it is deficient as a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no more than a five calendar day period in order to cure the deficiency.
- (c) The bidder may request administrative reconsideration of a determination adverse to the bidder within the five working days after the receipt of the notification date of the determination by delivering the request to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764 (Telefax: (217) 785-1524). Deposit of the request in the United States mail on or before the fifth business day shall not be deemed delivery. The determination shall become final if a request is not made and delivered. A request may provide additional written documentation or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be forwarded to the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person in order to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the

Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

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

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

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

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

- (a) NO AMENDMENT. No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be submitted to the Department of Transportation, Bureau of Small Business Enterprises, Contract Compliance Section, 2300 South Dirksen Parkway, Room 319, Springfield, Illinois 62764. Telephone number (217) 785-4611. Telefax number (217) 785-1524.
- (b) CHANGES TO WORK. Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request for Approval of Subcontractor, Department form BC 260A or AER 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, 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

FUEL COST ADJUSTMENT (BDE)

Effective: April 1, 2009

Revised: August 1, 2017

Description. Fuel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in fuel prices when optioned by the Contractor. The bidder shall indicate with their bid whether or not this special provision will be part of the contract. Failure to indicate "Yes" for any category of work will make that category of work exempt from fuel cost adjustment.

General. The fuel cost adjustment shall apply to contract pay items as grouped by category. The adjustment shall only apply to those categories of work checked "Yes", and only when the cumulative plan quantities for a category exceed the required threshold. Adjustments to work items in a category, either up or down, and extra work paid for by agreed unit price will be subject to fuel cost adjustment only when the category representing the added work was subject to the fuel cost adjustment. Extra work paid for at a lump sum price or by force account will not be subject to fuel cost adjustment. Category descriptions and thresholds for application and the fuel usage factors which are applicable to each are as follows:

(a) Categories of Work.

- (1) Category A: Earthwork. Contract pay items performed under Sections 202, 204, and 206 including any modified standard or nonstandard items where the character of the work to be performed is considered earthwork. The cumulative total of all applicable item plan quantities shall exceed 25,000 cu yd (20,000 cu m). Included in the fuel usage factor is a weighted average 0.10 gal/cu yd (0.50 liters/cu m) factor for trucking.
- (2) Category B: Subbases and Aggregate Base Courses. Contract pay items constructed under Sections 311, 312 and 351 including any modified standard or nonstandard items where the character of the work to be performed is considered construction of a subbase or aggregate, stabilized or modified base course. The cumulative total of all applicable item plan quantities shall exceed 5000 tons (4500 metric tons). Included in the fuel usage factor is a 0.60 gal/ton (2.50 liters/metric ton) factor for trucking.
- (3) Category C: Hot-Mix Asphalt (HMA) Bases, Pavements and Shoulders. Contract pay items constructed under Sections 355, 406, 407 and 482 including any modified standard or nonstandard items where the character of the work to be performed is considered HMA bases, pavements and shoulders. The cumulative total of all applicable item plan quantities shall exceed 5000 tons (4500 metric tons). Included in the fuel usage factor is 0.60 gal/ton (2.50 liters/metric ton) factor for trucking.
- (4) Category D: Portland Cement Concrete (PCC) Bases, Pavements and Shoulders. Contract pay items constructed under Sections 353, 420, 421 and 483 including any

modified standard or nonstandard items where the character of the work to be performed is considered PCC base, pavement or shoulder. The cumulative total of all applicable item plan quantities shall exceed 7500 sq yd (6000 sq m). Included in the fuel usage factor is 1.20 gal/cu yd (5.94 liters/cu m) factor for trucking.

- (5) Category E: Structures. Structure items having a cumulative bid price that exceeds \$250,000 for pay items constructed under Sections 502, 503, 504, 505, 512, 516 and 540 including any modified standard or nonstandard items where the character of the work to be performed is considered structure work when similar to that performed under these sections and not included in categories A through D.

(b) Fuel Usage Factors.

English Units Category	Factor	Units
A - Earthwork	0.34	gal / cu yd
B – Subbase and Aggregate Base courses	0.62	gal / ton
C – HMA Bases, Pavements and Shoulders	1.05	gal / ton
D – PCC Bases, Pavements and Shoulders	2.53	gal / cu yd
E – Structures	8.00	gal / \$1000

Metric Units Category	Factor	Units
A - Earthwork	1.68	liters / cu m
B – Subbase and Aggregate Base courses	2.58	liters / metric ton
C – HMA Bases, Pavements and Shoulders	4.37	liters / metric ton
D – PCC Bases, Pavements and Shoulders	12.52	liters / cu m
E – Structures	30.28	liters / \$1000

(c) Quantity Conversion Factors.

Category	Conversion	Factor
B	sq yd to ton	0.057 ton / sq yd / in depth
	sq m to metric ton	0.00243 metric ton / sq m / mm depth
C	sq yd to ton	0.056 ton / sq yd / in depth
	sq m to metric ton	0.00239 m ton / sq m / mm depth
D	sq yd to cu yd	0.028 cu yd / sq yd / in depth
	sq m to cu m	0.001 cu m / sq m / mm depth

Method of Adjustment. Fuel cost adjustments will be computed as follows.

$$CA = (FPI_P - FPI_L) \times FUF \times Q$$

Where: CA = Cost Adjustment, \$
FPI_P = Fuel Price Index, as published by the Department for the month the work is performed, \$/gal (\$/liter)
FPI_L = Fuel Price Index, as published by the Department for the month prior to the letting for work paid for at the contract price; or for the month the agreed unit price letter is submitted by the Contractor for extra work paid for by agreed unit price, \$/gal (\$/liter)
FUF = Fuel Usage Factor in the pay item(s) being adjusted
Q = Authorized construction Quantity, tons (metric tons) or cu yd (cu m)

The entire FUF indicated in paragraph (b) will be used regardless of use of trucking to perform the work.

Basis of Payment. Fuel cost adjustments may be positive or negative but will only be made when there is a difference between the FPI_L and FPI_P in excess of five percent, as calculated by:

$$\text{Percent Difference} = \{(FPI_L - FPI_P) \div FPI_L\} \times 100$$

Fuel cost adjustments will be calculated for each calendar month in which applicable work is performed; and will be paid or deducted when all other contract requirements for the items of work are satisfied. The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

80229

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	N _{design} = 50	93.0 – 97.4% ^{1/}	91.0%
IL-9.5	N _{design} = 90	92.0 – 96.0%	90.0%
IL-9.5,IL-9.5L	N _{design} < 90	92.5 – 97.4%	90.0%
IL-19.0	N _{design} = 90	93.0 – 96.0%	90.0%
IL-19.0, IL-19.0L	N _{design} < 90	93.0 ^{2/} – 97.4%	90.0%

SMA	Ndesign = 50 & 80	93.5 – 97.4%	91.0%”
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80246

HOT-MIX ASPHALT – LONGITUDINAL JOINT SEALANT (BDE)

Effective: August 1, 2018

Add the following to Article 406.02 of the Standard Specifications.

“(d) Longitudinal Joint Sealant (LJS)1032”

Add the following to Article 406.03 of the Standard Specifications.

- “(k) Longitudinal Joint Sealant (LJS) Pressure Distributor (Note 2)
- (l) Longitudinal Joint Sealant (LJS) Melter Kettle (Note 3)

Note 2. When a pressure distributor is used to apply the LJS, the distributor shall be equipped with a heating and recirculating system along with a functioning auger agitating system or vertical shaft mixer in the hauling tank to prevent localized overheating. The distributor shall be equipped with a guide or laser system to aid in proper placement of the LJS application.

Note 3. When a melter kettle is used to transport and apply the LJS, the melter kettle shall be an oil jacketed double-boiler with agitating and recirculating systems. Material from the kettle may be dispensed through a pressure feed wand with an applicator shoe or through a pressure feed wand into a hand-operated thermal push cart.”

Revise Article 406.06(g)(2) of the Standard Specifications to read:

“(2) Longitudinal Joints. Unless prohibited by stage construction, any HMA lift shall be complete before construction of the subsequent lift. The longitudinal joint in all lifts shall be at the centerline of the pavement if the roadway comprises two lanes in width, or at lane width if the roadway is more than two lanes in width.

When stage construction prohibits the total completion of a particular lift, the longitudinal joint in one lift shall be offset from the longitudinal joint in the preceding lift by not less than 3 in. (75 mm). The longitudinal joint in the surface course shall be at the centerline of the pavement if the roadway comprises two lanes in width, or at lane width if the roadway is more than two lanes in width.

A notched wedge longitudinal joint shall be used between successive passes of HMA binder course that has a difference in elevation of greater than 2 in. (50 mm) between lanes on pavement that is open to traffic.

The notched wedge longitudinal joint shall consist of a 1 to 1 1/2 in. (25 to 38 mm) vertical notch at the lane line, a 9 to 12 in. (230 to 300 mm) wide uniform taper sloped toward and extending into the open lane, and a second 1 to 1 1/2 in. (25 to 38 mm) vertical notch at the outside edge.

The notched wedge longitudinal joint shall be formed by the strike off device on the paver. The wedge shall then be compacted by the joint roller.

Tack coat shall be applied to the entire surface of the notched wedge joint immediately prior to placing the adjacent lift of binder. The material shall be uniformly applied at a rate of 0.05 to 0.1 gal/sq yd (0.2 to 0.5 L/sq m).

When the use of LJS is specified, it shall be applied for the lift(s) of paving as shown on the plans. The surface to which the LJS is applied shall be dry and cleaned of all dust, debris, and any substances that will prevent the LJS from adhering. Cleaning shall be accomplished by means of a sweeper/vacuum truck, power broom, air compressor or by hand. The LJS may be placed before or after the tack or prime coat. When placed after the tack or prime coat, the tack or prime shall be fully cured prior to placement of the LJS.

The LJS shall be centered ± 2 in. (± 50 mm) under the joint of the next HMA lift to be constructed.

The width and minimum application rate of LJS shall be according to the following table.

LJS Application Table		
Overlay Thickness in. (mm)	LJS Width in. (mm)	Application Rate ^{1/} lb/ft (kg/m)
HMA Mixtures		
3/4 (19)	18 (450)	0.88 (1.31)
1 (25)	18 (450)	1.15 (1.71)
1 1/4 (32)	18 (450)	1.31 (1.95)
1 1/2 (38)	18 (450)	1.47 (2.19)
1 3/4 (44)	18 (450)	1.63 (2.43)
2 (50)	18 (450)	1.80 (2.68)
2 1/4 (60)	18 (450)	1.96 (2.92)
2 1/2 (63)	18 (450)	2.12 (3.16)
2 3/4 (70)	18 (450)	2.29 (3.41)
3 (75)	18 (450)	2.45 (3.65)
3 1/4 (83)	18 (450)	2.61 (3.89)
3 1/2 (90)	18 (450)	2.78 (4.14)
3 3/4 (95)	18 (450)	2.94 (4.38)
4 (100)	18 (450)	3.10 (4.62)
SMA Mixtures		
1 1/2 (38)	18 (450)	1.26 (1.88)
1 3/4 (44)	18 (450)	1.38 (2.06)
2 (50)	18 (450)	1.51 (2.25)

- 1/ The application rate has a surface demand for liquid included within it. The thickness of the LJS may taper from the center of the application to a lesser thickness on the edge of the application, provided the correct width and application rate are maintained.

The Contractor shall furnish to the Engineer a bill of lading for each tanker supplying material to the project. The application rate of LJS shall be verified within the first 1000 ft (300 m) of the day's scheduled application length and every 12,000 ft (3600 m) the remainder of the day. For projects less than 3000 ft (900 m), the rate shall be verified once. A suitable paper or pan shall be placed at a random location in the path of the LJS. After application of the LJS, the paper or pan shall be picked up, weighed, and the application rate calculated. The tolerance between the application rate shown in the LJS Application Table and the calculated rate shall be ± 15 percent. The Contractor shall replace the LJS in the area where the sample was taken.

A 1 qt (1 L) sample shall be taken from the pressure distributor or melting kettle at the jobsite once for each contract and sent to the Central Bureau of Materials.

The LJS shall be applied in a single pass with a pressure distributor, melter kettle, or hand applied from a roll for HMA lifts up to 2 in. (50 mm) in thickness. The LJS shall be applied in two passes for HMA lifts between 2 and 4 in. (50 and 100 mm) in thickness. At the time of installation, the pavement surface temperature and the ambient temperature shall be a minimum of 40 °F (4 °C) and rising.

The LJS shall be applied at a width of not less than or greater than 1 1/2 in. (38 mm) of the width specified. If the LJS flows more than 2 in. (50 mm) from the initial placement width, LJS placement shall stop and remedial action shall be taken.

When starting another run of LJS placement, suitable release paper shall be placed over the previous application of LJS to prevent doubling up of thickness of LJS.

The LJS shall be suitable for construction traffic to drive on without pickup or tracking of the LJS within 30 minutes of placement. If pickup or tracking occurs, LJS placement shall stop and damaged areas shall be repaired.

Prior to paving, the Contractor shall ensure the paver end plate and grade control device is adequately raised above the finished height of the LJS.

The LJS shall not flush to the final surface of the HMA pavement.”

Add the following paragraph after the second paragraph of Article 406.13(b) of the Standard Specifications.

“Application of longitudinal joint sealant (LJS) will be measured for payment in place in feet (meters).”

Add the following paragraph after the first paragraph of Article 406.14 of the Standard Specifications.

“Longitudinal joint sealant will be paid for at the contract unit price per foot (meter) for LONGITUDINAL JOINT SEALANT.”

Add the following to Section 1032 of the Standard Specifications.

“1032.12 Longitudinal Joint Sealant (LJS). Longitudinal joint sealant (LJS) will be accepted according to the current Bureau of Materials and Physical Research Policy Memorandum, “Performance Graded Asphalt Binder Acceptance Procedure” with the following exceptions: Article 3.1.9 and 3.4.1.4 of the policy memorandum will be excluded. The bituminous material used for the LJS shall be according to the following table. Elastomers shall be added to a base asphalt and shall be either a styrene-butadiene diblock or triblock copolymer without oil extension, or a styrene-butadiene rubber. Air blown asphalt, acid modification, or other modifiers will not be allowed. LJS in the form of pre-formed rollout banding may also be used.

Test	Test Requirement	Test Method
Dynamic shear @ 82°C (unaged), G*/sin δ, kPa	1.00 min.	AASHTO T 315
Creep stiffness @ -18°C (unaged), Stiffness (S), MPa m-value	300 max. 0.300 min.	AASHTO T 313
Ash, %	1.0 – 4.0	AASHTO T 111
Elastic Recovery, 100 mm elongation, cut immediately, 25°C, %	70 min.	ASTM D 6084 (Procedure A)
Separation of Polymer, Difference in °C of the softening point (ring and ball)	3 max.	ITP Separation of Polymer from Asphalt Binder”

80398

HOT-MIX ASPHALT – OSCILLATORY ROLLER (BDE)

Effective: August 1, 2018

Add the following to Article 406.03 of the Standard Specifications:

“(j) Oscillatory Roller1101.01”

Revise Table 1 and Note 3/ of Table 1 in Article 406.07(a) of the Standard Specifications to read:

“TABLE 1 - MINIMUM ROLLER REQUIREMENTS FOR HMA				
	Breakdown Roller (one of the following)	Intermediate Roller	Final Roller (one or more of the following)	Density Requirement
Level Binder: (When the density requirements of Article 406.05(c) do not apply.)	P ^{3/}	--	V _S , P ^{3/} , T _B , T _F , 3W, O _T	To the satisfaction of the Engineer.
Binder and Surface ^{1/} Level Binder ^{1/} : (When the density requirements of Article 406.05(c) apply.)	V _D , P ^{3/} , T _B , 3W, O _T , O _B	P ^{3/} , O _T , O _B	V _S , T _B , T _F , O _T	As specified in Articles: 1030.05(d)(3), (d)(4), and (d)(7).
IL-4.75 and SMA ^{4/5/}	T _B , 3W, O _T	--	T _F , 3W, O _T	
Bridge Decks ^{2/}	T _B	--	T _F	As specified in Articles 582.05 and 582.06.

3/ A vibratory roller (V_D) or oscillatory roller (O_T or O_B) may be used in lieu of the pneumatic-tired roller on mixtures containing polymer modified asphalt binder.”

Add the following to EQUIPMENT DEFINITION in Article 406.07(a) contained in the Errata of the Supplemental Specifications:

“O_T - Oscillatory roller, tangential impact mode. Maximum speed is 3.0 mph (4.8 km/h) or 264 ft/min (80 m/min).

O_B - Oscillatory roller, tangential and vertical impact mode, operated at a speed to produce not less than 10 vertical impacts/ft (30 impacts/m).”

Add the following to Article 1101.01 of the Standard Specifications:

“(h) Oscillatory Roller. The oscillatory roller shall be self-propelled and provide a smooth operation when starting, stopping, or reversing directions. The oscillatory roller shall be able to operate in a mode that will provide tangential impact force with or without vertical impact force by using at least one drum. The oscillatory roller shall be equipped with water tanks and sprinkling devices, or other approved methods, which shall be used to wet the drums to prevent material pickup. The drum(s) amplitude and frequency of the tangential and vertical impact force shall be approximately the same in each direction and meet the following requirements:

- (1) The minimum diameter of the drum(s) shall be 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

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_L

Color	R_L 1.05/88.76
White	300
Yellow	200

- (c) Color. The material shall meet the following requirements for daylight reflectance and color, when tested, using a color spectrophotometer with 45 degrees circumferential/zero degree geometry, illuminant D65, and a two degree observer angle. The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm.

Color	Daylight Reflectance %Y
White	65 minimum
*Yellow	36-59

*Shall match Federal 595 Color No. 33538 and the chromaticity limits as follows.

x	0.490	0.475	0.485	0.530
y	0.470	0.438	0.425	0.456

- (d) Skid Resistance. The surface of the markings shall provide an average minimum skid resistance of 50 BPN when tested according to ASTM E 303.
- (e) Sampling, Testing, Acceptance, and Certification. Prior to approval and use of the wet reflective, temporary, removable pavement marking tape, the manufacturer shall submit a notarized certification from an independent laboratory, together with the results of all tests, stating that the material meets the requirements as set forth herein. The certification test report shall state the lot tested, manufacturer's name, and date of manufacture.

After approval by the Department, samples and certification by the manufacturer shall be submitted for each batch used. The manufacturer shall submit a certification stating that the material meets the requirements as set forth herein and is essentially identical to the material sent for qualification. The certification shall state the lot tested, manufacturer's name, and date of manufacture.

All costs of testing (other than tests conducted by the Department) shall be borne by the manufacturer."

80298

TRAINING SPECIAL PROVISIONS (BDE) This Training Special Provision supersedes Section 7b of the Special Provision entitled “Specific Equal Employment Opportunity Responsibilities,” and is in implementation of 23 U.S.C. 140(a).

As part of the contractor’s equal employment opportunity affirmative action program, training shall be provided as follows:

The contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved. The number of trainees to be trained under this contract will be 3. In the event the contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor’s needs and the availability of journeymen in the various classifications within the reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to the Illinois Department of Transportation for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g. by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor’s records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Illinois Department of Transportation and the Federal Highway Administration. The Illinois Department of Transportation and the Federal Highway Administration shall approve a program, if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved by not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Illinois Department of Transportation and the Federal Highway Administration. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirement of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program.

It is not required that all trainees be on board for the entire length of the contract. A contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The contractor shall furnish the trainee a copy of the program he will follow in providing the training. The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily complete.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

METHOD OF MEASUREMENT The unit of measurement is in hours.

BASIS OF PAYMENT This work will be paid for at the contract unit price of 80 cents per hour for TRAINEES. The estimated total number of hours, unit price and total price have been included in the schedule of prices.

20338

WARM MIX ASPHALT (BDE)

Effective: January 1, 2012

Revised: April 1, 2016

Description. This work shall consist of designing, producing and constructing Warm Mix Asphalt (WMA) in lieu of Hot Mix Asphalt (HMA) at the Contractor's option. Work shall be according to Sections 406, 407, 408, 1030, and 1102 of the Standard Specifications, except as modified herein. In addition, any references to HMA in the Standard Specifications, or the special provisions shall be construed to include WMA.

WMA is an asphalt mixture which can be produced at temperatures lower than allowed for HMA utilizing approved WMA technologies. WMA technologies are defined as the use of additives or processes which allow a reduction in the temperatures at which HMA mixes are produced and placed. WMA is produced by the use of additives, a water foaming process, or combination of both. Additives include minerals, chemicals or organics incorporated into the asphalt binder stream in a dedicated delivery system. The process of foaming injects water into the asphalt binder stream, just prior to incorporation of the asphalt binder with the aggregate.

Approved WMA technologies may also be used in HMA provided all the requirements specified herein, with the exception of temperature, are met. However, asphalt mixtures produced at temperatures in excess of 275 °F (135 °C) will not be considered WMA when determining the grade reduction of the virgin asphalt binder grade.

Equipment.

Revise the first paragraph of Article 1102.01 of the Standard Specifications to read:

"1102.01 Hot-Mix Asphalt Plant. The hot-mix asphalt (HMA) plant shall be the batch-type, continuous-type, or dryer drum plant. The plants shall be evaluated for prequalification rating and approval to produce HMA according to the current Bureau of Materials and Physical Research Policy Memorandum, "Approval of Hot-Mix Asphalt Plants and Equipment". Once approved, the Contractor shall notify the Bureau of Materials and Physical Research to obtain approval of all plant modifications. The plants shall not be used to produce mixtures concurrently for more than one project or for private work unless permission is granted in writing by the Engineer. The plant units shall be so designed, coordinated and operated that they will function properly and produce HMA having uniform temperatures and compositions within the tolerances specified. The plant units shall meet the following requirements."

Add the following to Article 1102.01(a) of the Standard Specifications.

"(11) Equipment for Warm Mix Technologies.

- a. Foaming. Metering equipment for foamed asphalt shall have an accuracy of ± 2 percent of the actual water metered. The foaming control system shall be electronically interfaced with the asphalt binder meter.

- b. Additives. Additives shall be introduced into the plant according to the supplier's recommendations and shall be approved by the Engineer. The system for introducing the WMA additive shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes."

Mix Design Verification.

Add the following to Article 1030.04 of the Standard Specifications.

"(e) Warm Mix Technologies.

- (1) Foaming. WMA mix design verification will not be required when foaming technology is used alone (without WMA additives). However, the foaming technology shall only be used on HMA designs previously approved by the Department.
- (2) Additives. WMA mix designs utilizing additives shall be submitted to the Engineer for mix design verification."

Construction Requirements.

Revise the second paragraph of Article 406.06(b)(1) of the Standard Specifications to read:

"The HMA shall be delivered at a temperature of 250 to 350 °F (120 to 175 °C).
WMA shall be delivered at a minimum temperature of 215 °F (102 °C)."

Basis of Payment.

This work will be paid at the contract unit price bid for the HMA pay items involved. Anti-strip will not be paid for separately, but shall be considered as included in the cost of the work.

80288

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012

| Revised: April 2, 2015

| The Contractor shall submit a weekly report of Disadvantaged Business Enterprise (DBE) trucks hired by the Contractor or subcontractors (i.e. not owned by the Contractor or subcontractors) that are used for DBE goal credit.

| The report shall be submitted to the Engineer on Department form "SBE 723" within ten business days following the reporting period. The reporting period shall be Monday through Sunday for each week reportable trucking activities occur.

Any costs associated with providing weekly DBE trucking reports shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

80302

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor

performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection

for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#).

The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each

classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a

separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice

performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one

and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of

Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of

Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

Contract Provision - Cargo Preference Requirements

In accordance with Title 46 CFR § 381.7 (b), the contractor agrees—

“(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.”

Provisions (1) and (2) apply to materials or equipment that are acquired solely for the project. The two provisions do not apply to goods or materials that come into inventories independent of the project, such as shipments of Portland cement, asphalt cement, or aggregates, when industry suppliers and contractors use these materials to replenish existing inventories.

