

RETURN WITH BID

State of _____)
) ss.
County of _____)

AFFIDAVIT

_____ (name of affiant), of _____,

_____, being first duly sworn upon oath, states as follows:

1. That I am the _____ (officer or position) of _____ (bidder) and have personal knowledge of the facts herein stated.
2. That, if selected under this proposal, _____ (bidder) will maintain a business office in the State of Illinois which will be located in _____ County, Illinois.
3. That this business office will serve as the primary place of employment for any persons employed in the construction contemplated by this proposal.
4. That this Affidavit is given as a requirement of state law as provided in Section 30-22(8) of the Illinois Procurement Code.

Signature

Print Name of Affiant

This instrument was acknowledged before me on the _____ day of _____,
20 ___ by _____.

Notary Public

(SEAL)

INSTRUCTIONS

ABOUT IDOT PROPOSALS: All proposals are potential bidding proposals. Each proposal contains all certifications and affidavits, a proposal signature sheet and a proposal bid bond.

PREQUALIFICATION

Any contractor who desires to become pre-qualified to bid on work advertised by IDOT must submit the properly completed pre-qualification forms to the Bureau of Construction no later than 4:30 p.m. prevailing time twenty-one days prior to the letting of interest. This pre-qualification requirement applies to first time contractors, contractors renewing expired ratings, contractors maintaining continuous pre-qualification or contractors requesting revised ratings. To be eligible to bid, existing pre-qualification ratings must be effective through the date of letting.

WHO CAN BID ?

Bids will be accepted from only those companies that request and receive written Authorization to Bid from IDOT's Central Bureau of Construction.

REQUESTS FOR AUTHORIZATION TO BID

Contractors wanting to bid on items included in a particular letting must submit the properly completed "Request for Authorization to Bid/or Not For Bid Status" (BDE 124) and the ORIGINAL "Affidavit of Availability" (BC 57) to the proper office no later than 4:30 p.m. prevailing time, three (3) days prior to the letting date.

WHAT CONSTITUTES WRITTEN AUTHORIZATION TO BID?: When a prospective prime bidder submits a "Request for Authorization to Bid/or Not For Bid Status"(BDE 124) he/she must indicate at that time which items are being requested For Bidding purposes. Only those items requested For Bidding will be analyzed. After the request has been analyzed, the bidder will be issued an **Authorization to Bid or Not for Bid Report**, approved by the Central Bureau of Construction and the Chief Procurement Officer that indicates which items have been approved For Bidding. If **Authorization to Bid** cannot be approved, the **Authorization to Bid or Not for Bid Report** will indicate the reason for denial.

ABOUT AUTHORIZATION TO BID: Firms that have not received an Authorization to Bid or Not For Bid Report within a reasonable time of complete and correct original document submittal should contact the department as to the status. Firms unsure as to authorization status should call the Prequalification Section of the Bureau of Construction at the number listed at the end of these instructions. These documents must be received three days before the letting date.

ADDENDA AND REVISIONS: It is the bidder's responsibility to determine which, if any, addenda or revisions pertain to any project they may be bidding. Failure to incorporate all relevant addenda or revisions may cause the bid to be declared unacceptable.

Each addendum or revision will be included with the Electronic Plans and Proposals. Addenda and revisions will also be placed on the Addendum/Revision Checklist and each subscription service subscriber will be notified by e-mail of each addendum and revision issued.

The Internet is the Department's primary way of doing business. The subscription service emails are an added courtesy the Department provides. It is suggested that bidders check IDOT's website at <http://www.dot.il.gov/desenv/delett.html> before submitting final bid information.

IDOT IS NOT RESPONSIBLE FOR ANY E-MAIL FAILURES.

Addenda questions may be directed to the Contracts Office at (217)782-7806 or D&Econtracts@dot.il.gov

Technical questions about downloading these files may be directed to Tim Garman at (217)524-1642 or Timothy.Garman@illinois.gov.

BID SUBMITTAL GUIDELINES AND CHECKLIST

In an effort to eliminate confusion and standardize the bid submission process the Contracts Office has created the following guidelines and checklist for submitting bids.

This information has been compiled from questions received from contractors and from inconsistencies noted on submitted bids. If you have additional questions please refer to the contact information listed below.

ABOUT SUBMITTING BIDS: It is recommended that bidders deliver bid proposals in person to ensure they arrive at the proper location prior to the time specified for the receipt of bids. Any proposals received at the place of letting after the time specified will not be read.

STANDARD GUIDELINES FOR SUBMITTING BIDS

- All pages should be single sided.
- Use the Cover Page that is provided in the Bid Proposal (posted on the IDOT Web Site) as the first page of your submitted bid. This page has the Item number in the upper left-hand corner and lines provided for your company name and address in the upper right-hand corner.
- Do not use report covers, presentation folders or special bindings and do not staple multiple times on left side like a book. Use only 1 staple in the upper left hand corner. Make sure all elements of your bid are stapled together including the bid bond or guaranty check (if required).
- Do not include any certificates of eligibility, your authorization to bid, Addendum Letters or affidavit of availability.
- Do not include the Subcontractor Documentation with your bid (pages i – iii and pages a – g). This documentation is required only after you are awarded the contract.
- Use the envelope cover sheet (provided with the proposal) as the cover for the proposal envelope.
- Do not rely on overnight services to deliver your proposal prior to 10 AM on letting day. It will not be read if it is delivered after 10 AM.
- Do not submit your Substance Abuse Prevention Program (SAPP) with your bid. If you are awarded the contract this form is to be submitted to the district engineer at the pre-construction conference.

Use the following checklist to ensure completeness and the correct order in assembling your bid

Illinois Office Affidavit (Not applicable to federally funded projects) insert your affidavit after page 4 along with your Cost Adjustments for Steel, Bituminous and Fuel (if applicable).

Cover page (the sheet that has the item number on it) **followed by your bid (the Pay Items)**. If you are using special software or CBID to generate your schedule of prices, do not include the blank pages of the schedule of prices that came with the proposal package.

Page 4 (Item 9) – Check “YES” if you will use a subcontractor(s). Include the subcontractor(s) name, address, general type of work to be performed and the dollar amount (if over \$50,000). If you will use subcontractor(s) but are uncertain who or the dollar amount; check “YES” but leave the lines blank.

Page 10 (Paragraph J) – Check “YES” or “NO” whether your company has any business in Iran.

Page 10 (Paragraph K) – (Not applicable to federally funded projects) List the Union Local Name and number or certified training programs that you have in place. **Your bid will not be read if this is not completed.** Do not include certificates with your bid. Keep the certificates in your office in case they are requested by IDOT.

Page 11 (Paragraph L) - A copy of your State Board of Elections certificate of registration is no longer required with your bid.

Page 11 (Paragraph M) – Indicate if your company has hired a lobbyist in connection with the job for which you are submitting the bid proposal.

Page 12 (Paragraph C) – This is a work sheet to determine if a completed Form A is required. It is not part of the form and you do not need to make copies for each Form A that is filled out.

Pages 14-17 (Form A) – One Form A (4 pages) is required for each applicable person in your company. Copies of the Forms can be used and only need to be changed when the financial information changes. The certification signature and date must be original for each letting. Do not staple the forms together.

If you answered “NO” to all of the questions in Paragraph C (page 12), complete the first section (page 14) with your company information and then sign and date the Not Applicable statement on page 17.

Page 18 (Form B) - If you check “YES” to having other current or pending contracts it is acceptable to use the phrase, “See Affidavit of Availability on file”. **Ownership Certification** (at the bottom of the page) - Check N/A if the Form A you submitted accounts for 100 percent of the company ownership. Check YES if any percentage of ownership falls outside of the parameters that require reporting on the Form A. Checking NO indicates that the Form A you submitted is not correct and you will be required to submit a revised Form A.

Page 20 (Workforce Projection) – Be sure to include the Duration of the Project. It is acceptable to use the phrase “Per Contract Specifications”.

Bid Bond – Submit your bid bond using the current Bid Bond Form provided in the proposal package. The Power of Attorney page should be stapled to the Bid Bond. If you are using an electronic bond, include your bid bond number on the form and attach the Proof of Insurance printed from the electronic bond Web Site.

Disadvantaged Business Utilization Plan and/or Good Faith Effort – The last item in your bid should be the DBE Utilization Plan (SBE 2026), followed by the DBE Participation Statement (SBE 2025) and supporting paperwork. If you have documentation for a Good Faith Effort, it should follow the SBE Forms.

The Bid Letting is now available in streaming Audio/Video from the IDOT Web Site. A link to the stream will be placed on the main page of the current letting on the day of the Letting. The stream will not begin until 10 AM. The actual reading of the bids does not begin until approximately 10:20 AM.

Following the Letting, the As-Read Tabulation of Bids will be posted by the end of the day. You will find the link on the main page of the current letting.

QUESTIONS: pre-letting up to execution of the contract

Contractor/Subcontractor pre-qualification -----217-782-3413
Small Business, Disadvantaged Business Enterprise (DBE) -----217-785-4611
Contracts, Bids, Letting process or Internet downloads-----217-782-7806
Estimates Unit -----217-785-3483
Aeronautics -----217-785-8515
IDNR (Land Reclamation, Water Resources, Natural Resources) -----217-782-6302

QUESTIONS: following contract execution

Including Subcontractor documentation, payments -----217-782-3413
Railroad Insurance -----217-785-0275

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Proposal Submitted By
Name
Address
City

Letting June 14, 2013

NOTICE TO PROSPECTIVE BIDDERS

This proposal can be used for bidding purposes by only those companies that request and receive written AUTHORIZATION TO BID from IDOT's Central Bureau of Construction.
BIDDERS NEED NOT RETURN THE ENTIRE PROPOSAL

**Notice to Bidders,
Specifications,
Proposal, Contract
and Contract Bond**



**Illinois Department
of Transportation**

Springfield, Illinois 62764

**Contract No. 60I31
DUPAGE County
Section (112&113)WRS-5
Route FAP 338
District 1 Construction Funds**

PLEASE MARK THE APPROPRIATE BOX BELOW:

- A Bid Bond is included.
- A Cashier's Check or a Certified Check is included.

Prepared by

S

Checked by

(Printed by authority of the State of Illinois)

Page intentionally left blank

RETURN WITH BID



PROPOSAL

TO THE DEPARTMENT OF TRANSPORTATION

1. Proposal of _____

Taxpayer Identification Number (Mandatory) _____ a

For the improvement identified and advertised for bids in the Invitation for Bids as:

**Contract No. 60I31
DUPAGE County
Section (112&113)WRS-5
Route FAP 338
District 1 Construction Funds**

Roadway and interchange reconstruction consisting of construction of retaining walls, bridge replacement, lighting, surveillance, and other related work on IL 59 from 370 ft. north of Diehl Rd to Ferry Road in Naperville (SN 022-2029SB and 022-02030NB).

2. The undersigned bidder will furnish all labor, material and equipment to complete the above described project in a good and workmanlike manner as provided in the contract documents provided by the Department of Transportation. This proposal will become part of the contract and the terms and conditions contained in the contract documents shall govern performance and payments.

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3. **ASSURANCE OF EXAMINATION AND INSPECTION/WAIVER.** The undersigned further declares that he/she has carefully examined the proposal, plans, specifications, addenda, form of contract and contract bond, and special provisions, and that he/she has inspected in detail the site of the proposed work, and that he/she has familiarized themselves with all of the local conditions affecting the contract and the detailed requirements of construction, and understands that in making this proposal he/she waives all right to plead any misunderstanding regarding the same.
4. **EXECUTION OF CONTRACT AND CONTRACT BOND.** The undersigned further agrees to execute a contract for this work and present the same to the department within fifteen (15) days after the contract has been mailed to him/her. The undersigned further agrees that he/she and his/her surety will execute and present within fifteen (15) days after the contract has been mailed to him/her contract bond satisfactory to and in the form prescribed by the Department of Transportation, in the penal sum of the full amount of the contract, guaranteeing the faithful performance of the work in accordance with the terms of the contract.
5. **PROPOSAL GUARANTY.** Accompanying this proposal is either a bid bond on the department form, executed by a corporate surety company satisfactory to the department, or a proposal guaranty check consisting of a bank cashier's check or a properly certified check for not less than 5 per cent of the amount bid or for the amount specified in the following schedule:

<u>Amount of Bid</u>		<u>Proposal Guaranty</u>	<u>Amount of Bid</u>		<u>Proposal Guaranty</u>
Up to	\$5,000	\$150	\$2,000,000	to	\$3,000,000
\$5,000	to	\$10,000	\$3,000,000	to	\$5,000,000
\$10,000	to	\$50,000	\$5,000,000	to	\$7,500,000
\$50,000	to	\$100,000	\$7,500,000	to	\$10,000,000
\$100,000	to	\$150,000	\$10,000,000	to	\$15,000,000
\$150,000	to	\$250,000	\$15,000,000	to	\$20,000,000
\$250,000	to	\$500,000	\$20,000,000	to	\$25,000,000
\$500,000	to	\$1,000,000	\$25,000,000	to	\$30,000,000
\$1,000,000	to	\$1,500,000	\$30,000,000	to	\$35,000,000
\$1,500,000	to	\$2,000,000	over		\$35,000,000

Bank cashier's checks or properly certified checks accompanying proposals shall be made payable to the Treasurer, State of Illinois, when the state is awarding authority; the county treasurer, when a county is the awarding authority; or the city, village, or town treasurer, when a city, village, or town is the awarding authority.

If a combination bid is submitted, the proposal guaranties which accompany the individual proposals making up the combination will be considered as also covering the combination bid.

The amount of the proposal guaranty check is _____ \$(). If this proposal is accepted and the undersigned shall fail to execute a contract bond as required herein, it is hereby agreed that the amount of the proposal guaranty shall become the property of the State of Illinois, and shall be considered as payment of damages due to delay and other causes suffered by the State because of the failure to execute said contract and contract bond; otherwise, the bid bond shall become void or the proposal guaranty check shall be returned to the undersigned.

Attach Cashier's Check or Certified Check Here

In the event that one proposal guaranty check is intended to cover two or more proposals, the amount must be equal to the sum of the proposal guaranties which would be required for each individual proposal. If the guaranty check is placed in another proposal, state below where it may be found.

The proposal guaranty check will be found in the proposal for:

Item _____

Section No. _____

County _____

Mark the proposal cover sheet as to the type of proposal guaranty submitted.

RETURN WITH BID

6. **COMBINATION BIDS.** The undersigned further agrees that if awarded the contract for the sections contained in the following combination, he/she will perform the work in accordance with the requirements of each individual proposal comprising the combination bid specified in the schedule below, and that the combination bid shall be prorated against each section in proportion to the bid submitted for the same. If an error is found to exist in the gross sum bid for one or more of the individual sections included in a combination, the combination bid shall be corrected as provided in the specifications.

When a combination bid is submitted, the schedule below must be completed in each proposal comprising the combination.

If alternate bids are submitted for one or more of the sections comprising the combination, a combination bid must be submitted for each alternate.

Schedule of Combination Bids

Combination No.	Sections Included in Combination	Combination Bid	
		Dollars	Cents

7. **SCHEDULE OF PRICES.** The undersigned bidder submits herewith, in accordance with the rules and instructions, a schedule of prices for the items of work for which bids are sought. The unit prices bid are in U.S. dollars and cents, and all extensions and summations have been made. The bidder understands that the quantities appearing in the bid schedule are approximate and are provided for the purpose of obtaining a gross sum for the comparison of bids. If there is an error in the extension of the unit prices, the unit prices shall govern. Payment to the contractor awarded the contract will be made only for actual quantities of work performed and accepted or materials furnished according to the contract. The scheduled quantities of work to be done and materials to be furnished may be increased, decreased or omitted as provided elsewhere in the contract.

8. **AUTHORITY TO DO BUSINESS IN ILLINOIS.** Section 20-43 of the Illinois Procurement Code (the Code) (30 ILCS 500/20-43) provides that a person (other than an individual acting as a sole proprietor) must be a legal entity authorized to do business in the State of Illinois prior to submitting the bid.

9. **The services of a subcontractor will be used.**

Check box Yes
 Check box No

For known subcontractors with subcontracts with an annual value of more than \$50,000, the contract shall include their name, address, general type of work to be performed, and the dollar allocation for each subcontractor.
 (30 ILCS 500/20-120)

10. **EXECUTION OF CONTRACT:** The Department of Transportation will, in accordance with the rules governing Department procurements, execute the contract and shall be the sole entity having the authority to accept performance and make payments under the contract. Execution of the contract by the Chief Procurement Officer (CPO) or the State Purchasing Officer (SPO) is for approval of the procurement process and execution of the contract by the Department. Neither the CPO nor the SPO shall be responsible for administration of the contract or determinations respecting performance or payment there under except as otherwise permitted in the Code.

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
 CONTRACT
 NUMBER - 60I31

State Job # - C-91-014-10

Project Number

Route

County Name - DUPAGE - -

FAP 338

Code - 43 - -

District - 1 - -

Section Number - (112 & 113) WRS-5

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
A2002916	T-CELTIS OCCID 2	EACH	6.000				
A2004816	T-GLED TRI-I SK 2	EACH	12.000				
A2005015	T-GYMNOCLA DIO 8' MSF	EACH	15.000				
A2005020	T-GYMNOCLA DIO 2-1/2	EACH	22.000				
A2005516	T-NYSSA SYLVAT 2	EACH	5.000				
A2006516	T-QUERCUS BICOL 2	EACH	6.000				
A2006716	T-QUERCUS MACR 2	EACH	5.000				
A2006816	T-QUERCUS MEUH 2	EACH	8.000				
A2007816	T-TILIA AMER 2	EACH	6.000				
A2008468	T-ULMUS AMER PRINC 2	EACH	6.000				
B2001616	T-CRAT CRU-I TF 2	EACH	7.000				
B2001666	T-CRATAE CRU-I SF 6'	EACH	15.000				
B2003316	T-MALUS DW TF 2	EACH	10.000				
B2003766	T-MALUS IS CL 6'	EACH	7.000				
B2006116	T-SYRG PEK M TF 2	EACH	11.000				

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B2006125	T-SYRG ZZ BJG TF 2	EACH	13.000				
D2002784	E-PINUS NIGRA 7'	EACH	4.000				
E20210G1	V-PARTHEN QUIN EM 1G	EACH	240.000				
J1420005	PCC PAVEMENT 10 JOINT	SQ YD	7,420.000				
J1420010	PCC PAVEMENT 12 JOINT	SQ YD	5,274.000				
J1440010	CONC MED BAR BASE REM	FOOT	208.000				
J1440022	SHLDR RUM STRIP REM	SQ YD	9,967.000				
J1442005	HMA PRJ D1 PATCH 12	SQ YD	18.000				
J1481040	AGG SHOULDER TYPE B	TON	951.000				
J1481070	AGG SHLDR SPEC TYPE C	TON	382.000				
J1482004	HMA SHOULDERS 6	SQ YD	11,471.000				
J1602000	INLET SLOPE DRAIN	EACH	1.000				
J1602031	CATCH BSN TG-2 (MOD)	EACH	2.000				
J1602115	CATCH BASIN TG2 TG2FG	EACH	13.000				
J1606010	GUTTER TG-2	FOOT	2,938.000				

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J1606015	GUTTER TG-2,MOD	FOOT	191.000				
J1630002	GSPBGR TA 6FT POSTS	FOOT	8,200.000				
J1631110	TRA BAR TERM,T1 SP TA	EACH	5.000				
J1631120	TRAF BAR TERM,T2	EACH	5.000				
J1631125	TRAF BAR TERM,T5	EACH	3.000				
J1631130	TRAF BAR TERM,T6	EACH	3.000				
J1631135	TRAF BAR TERM TT6B	EACH	1.000				
J1631140	TRAF BAR TERM TT10	EACH	1.000				
J1637017	CONC BAR BASE (SPL)	FOOT	107.000				
J1664305	ROW FENCE T1 6	FOOT	400.000				
J1680121	SLOP HDWL TIII 12 1:3	EACH	5.000				
J1680123	SLOP HDWL TIII 18 1:3	EACH	1.000				
J1680125	SLOP HDWL TIII 24 1:3	EACH	2.000				
J1680130	SLOP HDWL TIII 6 1:4	EACH	9.000				
J1680135	SLOP HDWL TIII 24 1:4	EACH	1.000				

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J1680140	SLOP HDWL TIII 6 1:6	EACH	7.000				
J1780245	POLYUREA MARK TI 10	FOOT	16,265.000				
J1782010	GDRL DELIN REF M TY B	EACH	101.000				
J1782020	CONC B DELIN REF M C	EACH	260.000				
J1782110	TERMINAL MARKER DA	EACH	5.000				
JS120100	TRMF MATPORT CHNGMES	EACH	3.000				
JS250220	SEEDING CLASS 2E	ACRE	4.550				
JS250305	SEEDING CLASS 3E	ACRE	10.000				
JS250314	SEEDING CLASS 4B	ACRE	0.500				
JS250318	SEEDING CLASS 4F	ACRE	1.500				
JS701010	MAINTENANCE OF TRAF	L SUM	1.000				
JS733070	OSS SPAN TY AL 70 FT	FOOT	71.000				
JS733080	OSS SPAN TY AL 80 FT	FOOT	81.000				
JS734A10	FDN OSS - SPAN TYPE	CU YD	29.000				
JS804100	ELECT SERV INSTALL	EACH	1.000				

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JS810100	UNDRGRD C PVC GALVS 4	FOOT	591.000				
JS810837	UNDRGRD C PVC 3	FOOT	23.000				
JS810839	UNDRGRD C PVC 4	FOOT	91.000				
JS811060	CON AS 2 GAL PVC CT	FOOT	117.000				
JS812027	CON EMB STR 4 PVC	FOOT	45.000				
JS813001	JNC BOX SS ES 20X12X8	EACH	3.000				
JS813022	JUN BX SS AS 6X6X4	EACH	4.000				
JS813053	JUN BX SS AS 12X10X6	EACH	8.000				
JS814001	HANDHOLE TOLLWAY	EACH	1.000				
JS816072	UD 2#2#4GXLP USE 2 CNC	FOOT	898.000				
JS816076	UD 4#2#4GXLP USE 2 CNC	FOOT	9,517.000				
JS817211	EC C XLP USE 1C 10	FOOT	532.000				
JS817214	EC C XLP USE 1C 4	FOOT	152.000				
JS817215	EC C XLP USE 1C 2	FOOT	608.000				
JS817218	EC C XLP USE 1C 3/0	FOOT	99.000				

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JS821001	LUM SV HOR MNT 400	EACH	3.000				
JS821002	UNDERPS LUM 150 HP SV	EACH	8.000				
JS821009	TEMP LUM SV HMHM 750W	EACH	28.000				
JS825004	LIGHTING CONTR 200A	EACH	1.000				
JS828002	LIGHTING CONTR FDN TB	EACH	1.000				
JS830003	GM LP ALUM 50H 15MA	EACH	3.000				
JS830025	TEMP WD POLE 40 CL 4	EACH	2.000				
JS830045	TEMP WDPLE 90CL2 15MA	EACH	28.000				
JS836001	LPF (RDWY) SH-7'/CONC	EACH	30.000				
JS842080	REM EX LT UNIT SALV	EACH	28.000				
JS842100	REM UNDERPASS LUM	EACH	8.000				
JS842110	POLE FDN REM METAL	EACH	27.000				
JS845011	REMOV LIGHTING CONTR	EACH	1.000				
JS845012	REMOV ELECT SERV INST	EACH	1.000				
JS845013	REMOV LTG CONTR FDN	EACH	1.000				

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JS846001	MAINTAIN LIGHT SYS	L SUM	1.000				
JT211A04	SUBGRADE AGGREGATE 6	CU YD	551.000				
JT211A11	SUBGRADE AGGREGATE 12	CU YD	8,809.000				
JT420000	WHT WASH FOR CON PVMT	SQ YD	12,694.000				
JT637023	CONC MED BAR TRAN TVF	FOOT	107.000				
JT720120	SIGN INSTALL TYPE 3	SQ FT	700.000				
JT726040	REM & REIN MLPST MRKR	EACH	4.000				
JT830036	LIGHTING UNIT (IO)	EACH	28.000				
K0029634	WEED CONTR PRE-EM GRN	POUND	25.000				
XX006938	OPTIM TRAF SIG SYS SP	EACH	1.000				
X0301834	STORM SEWER FILLED	FOOT	309.000				
X0322141	REM TEMP WOOD POLE	EACH	6.000				
X0322936	REMOV EX FLAR END SEC	EACH	4.000				
X0323583	SPEED INDICATOR SIGN	CAL DA	229.000				
X0323898	CCTV DOME CAMERA	EACH	2.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X0324085	EM VEH P S LSC 20 3C	FOOT	4,357.000				
X0324237	CCTV DOME CAM HM TOW	EACH	2.000				
X0324243	CCTV VIDEO CODEC	EACH	4.000				
X0324455	DRILL/SET SOLD P SOIL	CU FT	22,839.000				
X0324597	CCTV CABINET	EACH	2.000				
X0325034	MH TA 6D W/2 T1FOL RP	EACH	1.000				
X0325040	FO INNERDUCT 1 1/4"	FOOT	400.000				
X0325207	TV INSPECT OF SEWER	FOOT	575.000				
X0326461	CCTV EQPT FBR OPT DST	EACH	4.000				
X0326465	MOD EX VID DSTN SYS	L SUM	1.000				
X0327186	PORT VIDEO TOWER STA	CAL MO	20.000				
X0327486	TEMP WP 60 CL 4 IO	EACH	4.000				
X4023000	TEMP ACCESS- ROAD	EACH	2.000				
X4024100	TEMP ACCESS WINTERIZE	SQ YD	565.000				
X4400500	COMB C&G REMOV SPL	FOOT	54.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X4403800	MEDIAN SURF REMOVAL	SQ FT	27,467.000				
X4420831	CL D PATCH T3 15 SPL	SQ YD	500.000				
X5121800	PERM STEEL SHT PILING	SQ FT	4,354.000				
X5537900	SS CLEANED 15	FOOT	159.000				
X5538400	SS CLEANED 30	FOOT	189.000				
X5610009	PIPE INSULATION SYST	FOOT	507.000				
X5860110	GRANULAR BACKFILL STR	CU YD	1,738.000				
X6020090	MANOLE W/RESTRICT PLT	EACH	1.000				
X6021193	TEMP CATCH BASINS	EACH	15.000				
X6024240	INLETS SPL	EACH	3.000				
X6026500	MAN DT 5 DIA T1F CL	EACH	1.000				
X6061124	CONC MED TSB-6 SPL	SQ FT	2,814.000				
X6064200	COMB CC&G TB6.12 SPL	FOOT	2,821.000				
X6350110	DELINEATORS SPL	EACH	85.000				
X6350120	DELINEATOR REMOVAL	EACH	73.000				

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X6370050	CONC BAR WALL SPL	FOOT	256.000				
X6380205	TEMP MOD GLARE SCREEN	FOOT	8,100.000				
X6640535	CH LK FENCE 6 ATT STR	FOOT	88.000				
X6700410	ENGR FLD OFF A SPL	CAL MO	16.000				
X7010216	TRAF CONT & PROT SPL	L SUM	1.000				
X7013820	TR CONT SURVEIL EXPWY	CAL DA	87.000				
X7030025	WET REF TEM TP T3 L&S	SQ FT	5,032.000				
X7030030	WET REF TEM TAPE T3 4	FOOT	317,950.000				
X7030040	WET REF TEM TAPE T3 6	FOOT	16,845.000				
X7030045	WET REF TEM TAPE T3 8	FOOT	24,062.000				
X7030050	WET REF TEM TPE T3 12	FOOT	628.000				
X7030055	WET REF TEM TPE T3 24	FOOT	996.000				
X8210305	PROT-MAIN UNPASS LTG	L SUM	1.000				
X8251388	LT CT BM 480V200D RS	EACH	1.000				
X8360215	LIGHT POLE FDN 24D OS	FOOT	9.000				

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X8570231	FAC T5 CAB SPL	EACH	1.000				
X8620200	UNINTER POWER SUP SPL	EACH	3.000				
X8630104	CONT CAB TYPE IV SPL	EACH	1.000				
X8710024	FOCC62.5/125 MM12SM24	FOOT	4,412.000				
X8710028	FIB OPT CBL 6F SM	FOOT	401.000				
X8711130	FOCM62.5/125 MM12SM24	FOOT	1,289.000				
X8950205	REBLD EX HANDHOLE SPL	EACH	1.000				
Z0007118	UNTREATED TIMBER LAG	SQ FT	7,570.000				
Z0013798	CONSTRUCTION LAYOUT	L SUM	1.000				
Z0018002	DRAINAGE SCUPPR DS-11	EACH	6.000				
Z0018801	DRAINAGE SYSTEM, N1	EACH	1.000				
Z0018802	DRAINAGE SYSTEM, N2	EACH	1.000				
Z0022800	FENCE REMOVAL	FOOT	500.000				
Z0026402	FUR SOLDIER PILES HP	FOOT	1,106.000				
Z0026404	FUR SOLDIER PILES WS	FOOT	3,278.000				

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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
Z0030850	TEMP INFO SIGNING	SQ FT	109.000				
Z0033020	LUM SFTY CABLE ASMBLY	EACH	13.000				
Z0033028	MAINTAIN LIGHTING SYS	CAL MO	5.000				
Z0033052	COMMUNICATIONS VAULT	EACH	1.000				
Z0046304	P UNDR FOR STRUCT 4	FOOT	1,570.000				
Z0050000	REM REIN IMPACT ATTEN	EACH	2.000				
Z0062456	TEMP PAVEMENT	SQ YD	30,699.000				
Z0073002	TEMP SOIL RETEN SYSTM	SQ FT	1,845.000				
Z0073345	SLEEPER SLAB	FOOT	806.000				
Z0073510	TEMP TR SIGNAL TIMING	EACH	22.000				
20100110	TREE REMOV 6-15	UNIT	247.000				
20100210	TREE REMOV OVER 15	UNIT	170.000				
20101000	TEMPORARY FENCE	FOOT	2,310.000				
20101300	TREE PRUN 1-10	EACH	10.000				
20101350	TREE PRUN OVER 10	EACH	11.000				

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20200100	EARTH EXCAVATION	CU YD	62,450.000				
20201200	REM & DISP UNS MATL	CU YD	4,690.000				
20400800	FURNISHED EXCAVATION	CU YD	88,330.000				
20800150	TRENCH BACKFILL	CU YD	7,403.000				
21001000	GEOTECH FAB F/GR STAB	SQ YD	31,824.000				
21101505	TOPSOIL EXC & PLAC	CU YD	27,900.000				
21101645	TOPSOIL F & P 12	SQ YD	114.000				
21101695	TOPSOIL F & P 30	SQ YD	8,353.000				
25000210	SEEDING CL 2A	ACRE	0.500				
25000400	NITROGEN FERT NUTR	POUND	781.000				
25000500	PHOSPHORUS FERT NUTR	POUND	153.000				
25000600	POTASSIUM FERT NUTR	POUND	1,696.000				
25100630	EROSION CONTR BLANKET	SQ YD	81,070.000				
25200110	SODDING SALT TOLERANT	SQ YD	22,534.000				
25200200	SUPPLE WATERING	UNIT	1,014.000				

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28000250	TEMP EROS CONTR SEED	POUND	1,154.000				
28000305	TEMP DITCH CHECKS	FOOT	590.000				
28000400	PERIMETER EROS BAR	FOOT	17,882.000				
28000500	INLET & PIPE PROTECT	EACH	7.000				
28000510	INLET FILTERS	EACH	178.000				
28001100	TEMP EROS CONTR BLANK	SQ YD	55,804.000				
28200200	FILTER FABRIC	SQ YD	534.000				
28300400	AGGREGATE DITCH	TON	288.000				
30300001	AGG SUBGRADE IMPROVE	CU YD	6,270.000				
30300112	AGG SUBGRADE IMPR 12	SQ YD	31,893.000				
31101200	SUB GRAN MAT B 4	SQ YD	36,343.000				
31200500	STAB SUBBASE HMA 4	SQ YD	3,792.000				
31200502	STAB SUBBASE HMA 4.5	SQ YD	28,188.000				
40600100	BIT MATLS PR CT	GALLON	629.000				
40600300	AGG PR CT	TON	13.000				

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40600635	LEV BIND MM N70	TON	182.000				
40600895	CONSTRUC TEST STRIP	EACH	2.000				
40600982	HMA SURF REM BUTT JT	SQ YD	41.000				
40603080	HMA BC IL-19.0 N50	TON	121.000				
40603335	HMA SC "D" N50	TON	25.000				
40603340	HMA SC "D" N70	TON	438.000				
40603595	P HMA SC "F" N90	TON	483.000				
40701886	HMA PAVT FD 10 1/4	SQ YD	1,975.000				
42000506	PCC PVT 10 1/4 JOINTD	SQ YD	24,008.000				
42001300	PROTECTIVE COAT	SQ YD	53,727.000				
42001420	BR APPR PVT CON (PCC)	SQ YD	1,374.000				
42100340	CONT REINF PCC PVT 12	SQ YD	3,308.000				
42100615	PAVT REINFORCEMENT	SQ YD	3,308.000				
42400200	PC CONC SIDEWALK 5	SQ FT	45,550.000				
42400800	DETECTABLE WARNINGS	SQ FT	491.000				

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44000100	PAVEMENT REM	SQ YD	61,293.000				
44000157	HMA SURF REM 2	SQ YD	3,906.000				
44000160	HMA SURF REM 2 3/4	SQ YD	4,312.000				
44000200	DRIVE PAVEMENT REM	SQ YD	360.000				
44000500	COMB CURB GUTTER REM	FOOT	12,974.000				
44000600	SIDEWALK REM	SQ FT	6,826.000				
44003100	MEDIAN REMOVAL	SQ FT	4,173.000				
44004250	PAVED SHLD REMOVAL	SQ YD	11,824.000				
44201819	CL D PATCH T3 14	SQ YD	69.000				
44300200	STRIP REF CR CON TR	FOOT	7,889.000				
48101620	AGGREGATE SHLDS B 10	SQ YD	409.000				
48300100	PCC SHOULDERS 6	SQ YD	375.000				
50100100	REM EXIST STRUCT	EACH	1.000				
50104400	CONC HDWL REM	EACH	8.000				
50157300	PROTECTIVE SHIELD	SQ YD	3,970.000				

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50200100	STRUCTURE EXCAVATION	CU YD	2,316.000				
50300225	CONC STRUCT	CU YD	1,059.500				
50300255	CONC SUP-STR	CU YD	1,709.000				
50300260	BR DECK GROOVING	SQ YD	3,062.000				
50300280	CONCRETE ENCASEMENT	CU YD	28.000				
50300285	FORM LINER TEX SURF	SQ FT	4,629.000				
50300300	PROTECTIVE COAT	SQ YD	4,433.000				
50400745	F&E PPC BULB T-BM 72	FOOT	4,256.000				
50500505	STUD SHEAR CONNECTORS	EACH	2,099.000				
50800205	REINF BARS, EPOXY CTD	POUND	515,640.000				
50800515	BAR SPLICERS	EACH	236.000				
50901730	BRIDGE FENCE RAILING	FOOT	251.000				
50901735	BR FEN RAIL (SDWALK)	FOOT	251.000				
50901750	PARAPET RAILING	FOOT	538.000				
51100100	SLOPE WALL 4	SQ YD	1,747.000				

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51201800	FUR STL PILE HP14X73	FOOT	5,648.000				
51202305	DRIVING PILES	FOOT	5,514.000				
51203800	TEST PILE ST HP14X73	EACH	6.000				
51500100	NAME PLATES	EACH	2.000				
54002050	EXPAN BOLTS 3/4 X 9	EACH	24.000				
542D0211	P CUL CL D 1 6	FOOT	7.000				
5421C012	P CUL CL C 1 12 TEMP	FOOT	1,026.000				
5421C024	P CUL CL C 1 24 TEMP	FOOT	407.000				
54213657	PRC FLAR END SEC 12	EACH	1.000				
54213675	PRC FLAR END SEC 30	EACH	1.000				
54215436	CIP RC END SEC 36	EACH	1.000				
54215442	CIP RC END SEC 42	EACH	1.000				
54215466	CIP RC END SEC 66	EACH	1.000				
54248510	CONCRETE COLLAR	CU YD	2.400				
550A0050	STORM SEW CL A 1 12	FOOT	735.000				

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550A0090	STORM SEW CL A 1 18	FOOT	96.000				
550A0120	STORM SEW CL A 1 24	FOOT	280.000				
550A0140	STORM SEW CL A 1 30	FOOT	2.000				
550A0190	STORM SEW CL A 1 48	FOOT	144.000				
550A0340	STORM SEW CL A 2 12	FOOT	4,030.000				
550A0360	STORM SEW CL A 2 15	FOOT	597.000				
550A0380	STORM SEW CL A 2 18	FOOT	368.000				
550A0410	STORM SEW CL A 2 24	FOOT	357.000				
550A0450	STORM SEW CL A 2 36	FOOT	434.000				
550A0470	STORM SEW CL A 2 42	FOOT	5.000				
550A0480	STORM SEW CL A 2 48	FOOT	257.000				
550A0500	STORM SEW CL A 2 60	FOOT	174.000				
550A0510	STORM SEW CL A 2 66	FOOT	24.000				
550A0640	STORM SEW CL A 3 12	FOOT	5.000				
550A0660	STORM SEW CL A 3 15	FOOT	235.000				

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550A0680	STORM SEW CL A 3 18	FOOT	155.000				
550A0750	STORM SEW CL A 3 36	FOOT	230.000				
550A0770	STORM SEW CL A 3 42	FOOT	97.000				
550A0800	STORM SEW CL A 3 60	FOOT	460.000				
550A0980	STORM SEW CL A 4 18	FOOT	11.000				
550A1030	STORM SEW CL A 4 30	FOOT	51.000				
550A1050	STORM SEW CL A 4 36	FOOT	102.000				
550A1280	STORM SEW CL A 5 24	FOOT	6.000				
550A2360	SS RG CL A 1 24	FOOT	107.000				
550A2520	SS RG CL A 2 12	FOOT	10.000				
55100500	STORM SEWER REM 12	FOOT	1,965.000				
55100700	STORM SEWER REM 15	FOOT	174.000				
55100900	STORM SEWER REM 18	FOOT	212.000				
55101400	STORM SEWER REM 30	FOOT	291.000				
58700300	CONCRETE SEALER	SQ FT	5,911.000				

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59100100	GEOCOMPOSITE WALL DR	SQ YD	1,005.000				
60109510	P UNDR FAB LINE TR 4	FOOT	6,051.000				
60109520	P UNDR FAB LINE TR 6	FOOT	8,706.000				
60200805	CB TA 4 DIA T8G	EACH	18.000				
60201110	CB TA 4 DIA T11V F&G	EACH	1.000				
60201340	CB TA 4 DIA T24F&G	EACH	39.000				
60207605	CB TC T8G	EACH	2.000				
60218400	MAN TA 4 DIA T1F CL	EACH	14.000				
60221100	MAN TA 5 DIA T1F CL	EACH	9.000				
60223800	MAN TA 6 DIA T1F CL	EACH	9.000				
60224469	MAN TA 9 DIA T1F CL	EACH	6.000				
60236200	INLETS TA T8G	EACH	3.000				
60237470	INLETS TA T24F&G	EACH	28.000				
60240301	INLETS TB T8G	EACH	1.000				
60240328	INLETS TB T24F&G	EACH	6.000				

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60255500	MAN ADJUST	EACH	5.000				
60257900	MAN RECONST	EACH	1.000				
60260100	INLETS ADJUST	EACH	5.000				
60500040	REMOV MANHOLES	EACH	8.000				
60500050	REMOV CATCH BAS	EACH	18.000				
60500060	REMOV INLETS	EACH	32.000				
60500080	REMOV CB - MAIN FLOW	EACH	1.000				
60500090	REM INLET- MAIN FLOW	EACH	2.000				
60602800	CONC GUTTER TB	FOOT	1,132.000				
60603800	COMB CC&G TB6.12	FOOT	384.000				
60605000	COMB CC&G TB6.24	FOOT	7,756.000				
60607400	COMB CC&G TB9.24	FOOT	2,819.000				
60607900	COMB CC&G TB9.24 VWGF	FOOT	476.000				
60608600	COMB CC&G TM6.06	FOOT	58.000				
60609100	COMB CC&G TM6.06 VWGF	FOOT	211.000				

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60609200	COMB CC&G TM6.12	FOOT	261.000				
60610400	COMB CC&G TM6.24	FOOT	46.000				
60618300	CONC MEDIAN SURF 4	SQ FT	1,670.000				
60620000	CONC MED TSB6.24	SQ FT	6,109.000				
60621200	CONC MED TSB9.24	SQ FT	332.000				
61100605	MISC CONCRETE	CU YD	1.800				
63100085	TRAF BAR TERM T6	EACH	1.000				
63100167	TR BAR TRM T1 SPL TAN	EACH	1.000				
63200310	GUARDRAIL REMOV	FOOT	8,874.000				
64200116	SHOULDER RUM STRIP 16	FOOT	31,138.000				
64300240	IMP ATTEN FRD NAR TL2	EACH	1.000				
64300350	IMP ATTEN FRD WID TL2	EACH	2.000				
66400205	CH LK FENCE 5	FOOT	1,207.000				
66900200	NON SPL WASTE DISPOSL	CU YD	900.000				
66900450	SPL WASTE PLNS/REPORT	L SUM	1.000				

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66900530	SOIL DISPOSAL ANALY	EACH	1.000				
67100100	MOBILIZATION	L SUM	1.000				
70103815	TR CONT SURVEILLANCE	CAL DA	609.000				
70106800	CHANGEABLE MESSAGE SN	CAL MO	167.000				
70300210	TEMP PVT MK LTR & SYM	SQ FT	437.000				
70300220	TEMP PVT MK LINE 4	FOOT	33,366.000				
70300240	TEMP PVT MK LINE 6	FOOT	2,538.000				
70300250	TEMP PVT MK LINE 8	FOOT	1,034.000				
70300260	TEMP PVT MK LINE 12	FOOT	829.000				
70300280	TEMP PVT MK LINE 24	FOOT	598.000				
70301000	WORK ZONE PAVT MK REM	SQ FT	138,099.000				
70400100	TEMP CONC BARRIER	FOOT	10,126.000				
70400200	REL TEMP CONC BARRIER	FOOT	14,438.000				
70500665	TEMP TR BAR TERM T6	EACH	1.000				
70600240	IMP ATTN TEMP NRD TL2	EACH	1.000				

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70600255	IMP ATTN TEMP FRN TL2	EACH	5.000				
70600260	IMP ATTN TEMP FRN TL3	EACH	6.000				
70600322	IMP ATTN REL FRN TL2	EACH	13.000				
70600332	IMP ATTN REL FRN TL3	EACH	8.000				
70600340	IMP ATTN REL NRD TL2	EACH	1.000				
72000100	SIGN PANEL T1	SQ FT	749.000				
72000200	SIGN PANEL T2	SQ FT	314.000				
72000300	SIGN PANEL T3	SQ FT	2,020.000				
72400100	REMOV SIN PAN ASSY TA	EACH	9.000				
72400200	REMOV SIN PAN ASSY TB	EACH	10.000				
72400310	REMOV SIGN PANEL T1	SQ FT	162.000				
72400320	REMOV SIGN PANEL T2	SQ FT	70.000				
72400330	REMOV SIGN PANEL T3	SQ FT	48.000				
72400600	RELOC SIN PAN ASSY TB	EACH	2.000				
72400730	RELOC SIGN PANEL T3	SQ FT	252.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
 CONTRACT
 NUMBER - 60I31

State Job # - C-91-014-10

Project Number

Route

County Name - DUPAGE - -

FAP 338

Code - 43 - -

District - 1 - -

Section Number - (112 & 113) WRS-5

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
72700100	STR STL SIN SUP BA	POUND	2,769.000				
72800100	TELES STL SIN SUPPORT	FOOT	992.000				
73000100	WOOD SIN SUPPORT	FOOT	196.000				
73300200	OVHD SIN STR-SPAN T2A	FOOT	295.000				
73400100	CONC FOUNDATION	CU YD	7.900				
73400200	DRILL SHAFT CONC FDN	CU YD	30.600				
73502000	REL GR MT SIN SUPPORT	EACH	4.000				
73700100	REM GR MT SIN SUPPORT	EACH	8.000				
78000100	THPL PVT MK LTR & SYM	SQ FT	437.000				
78000200	THPL PVT MK LINE 4	FOOT	2,346.000				
78000300	THPL PVT MK LINE 5	FOOT	4,010.000				
78000400	THPL PVT MK LINE 6	FOOT	1,763.000				
78000500	THPL PVT MK LINE 8	FOOT	118.000				
78000600	THPL PVT MK LINE 12	FOOT	504.000				
78000650	THPL PVT MK LINE 24	FOOT	140.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
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 CONTRACT
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County Name - DUPAGE - -

FAP 338

Code - 43 - -

District - 1 - -

Section Number - (112 & 113) WRS-5

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
78007100	PERM PVT MK LTR-SYM	SQ FT	1,112.000				
78007110	PERM PVT MK - LINE 4	FOOT	61,600.000				
78007120	PERM PVT MK - LINE 5	FOOT	4,216.000				
78007130	PERM PVT MK - LINE 6	FOOT	24,589.000				
78007140	PERM PVT MK - LINE 8	FOOT	2,381.000				
78007150	PERM PVT MK - LINE 12	FOOT	384.000				
78007180	PERM PVT MK - LINE 24	FOOT	290.000				
78008200	POLYUREA PM T1 LTR-SY	SQ FT	2,349.000				
78008210	POLYUREA PM T1 LN 4	FOOT	49,923.000				
78008230	POLYUREA PM T1 LN 6	FOOT	33,437.000				
78008240	POLYUREA PM T1 LN 8	FOOT	4,614.000				
78008250	POLYUREA PM T1 LN 12	FOOT	5,891.000				
78008270	POLYUREA PM T1 LN 24	FOOT	431.000				
78100100	RAISED REFL PAVT MKR	EACH	334.000				
78100105	RAISED REF PVT MKR BR	EACH	34.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
 CONTRACT
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Route

County Name - DUPAGE - -

FAP 338

Code - 43 - -

District - 1 - -

Section Number - (112 & 113) WRS-5

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
78100200	TEMP RAIS REF PVT MKR	EACH	176.000				
78200300	PRISMATIC CURB REFL	EACH	190.000				
78200410	GUARDRAIL MKR TYPE A	EACH	4.000				
78200530	BAR WALL MKR TYPE C	EACH	85.000				
78201000	TERMINAL MARKER - DA	EACH	1.000				
78300100	PAVT MARKING REMOVAL	SQ FT	49,658.000				
78300200	RAISED REF PVT MK REM	EACH	235.000				
80400100	ELECT SERV INSTALL	EACH	1.000				
80400200	ELECT UTIL SERV CONN	L SUM	1.000		1.000		58,500.000
80500010	SERV INSTALL GRND MT	EACH	2.000				
81028200	UNDRGRD C GALVS 2	FOOT	4,846.000				
81028210	UNDRGRD C GALVS 2 1/2	FOOT	1,087.000				
81028220	UNDRGRD C GALVS 3	FOOT	437.000				
81028240	UNDRGRD C GALVS 4	FOOT	6,033.000				
81100220	CON AT ST 3/4 PVC GS	FOOT	102.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
 CONTRACT
 NUMBER -

State Job # - C-91-014-10

60I31

Project Number

Route

County Name - DUPAGE - -

FAP 338

Code - 43 - -

District - 1 - -

Section Number - (112 & 113) WRS-5

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
81100605	CON AT ST 2 PVC GALVS	FOOT	618.000				
81101000	CON AT ST 4 GALVS	FOOT	1,174.000				
81300550	JUN BX SS AS 12X12X6	EACH	8.000				
81300830	JUN BX SS AS 18X18X8	EACH	8.000				
81400100	HANDHOLE	EACH	16.000				
81400200	HD HANDHOLE	EACH	5.000				
81400300	DBL HANDHOLE	EACH	14.000				
81603030	UD 2#4 #6G XLP USE 1	FOOT	508.000				
81603090	UD 3#4#6G XLP USE 1 1/4	FOOT	3,241.000				
81603136	UD 5#4#6G XLP USE 1.5 P	FOOT	1,385.000				
81702130	EC C XLP USE 1C 6	FOOT	640.000				
81702140	EC C XLP USE 1C 4	FOOT	2,560.000				
81800400	A CBL 4-1C2 MESS WIRE	FOOT	10,774.000				
82102400	LUM SV HOR MT 400W	EACH	13.000				
82105700	LUM SV HM HOR MT 750W	EACH	24.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
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County Name - DUPAGE - -

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District - 1 - -

Section Number - (112 & 113) WRS-5

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
83050800	LT P A 47.5MH 12MA	EACH	13.000				
83501400	LT TOWER 90MH LM 6	EACH	4.000				
83600200	LIGHT POLE FDN 24D	FOOT	108.000				
83700300	LT TOWER FDN 48D	FOOT	64.000				
83800205	BKWY DEV TR B 15BC	EACH	13.000				
85000200	MAIN EX TR SIG INSTAL	EACH	1.000				
86400100	TRANSCEIVER - FIB OPT	EACH	2.000				
87101100	FO CAB M 62.5/125 4F	FOOT	1,181.000				
87300925	ELCBL C TRACER 14 1C	FOOT	4,682.000				
87301215	ELCBL C SIGNAL 14 2C	FOOT	11,276.000				
87301225	ELCBL C SIGNAL 14 3C	FOOT	15,745.000				
87301245	ELCBL C SIGNAL 14 5C	FOOT	35,451.000				
87301255	ELCBL C SIGNAL 14 7C	FOOT	623.000				
87301305	ELCBL C LEAD 14 1PR	FOOT	16,732.000				
87301800	ELCBL C SERV 4 2C	FOOT	340.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
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Project Number

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FAP 338

Code - 43 - -

District - 1 - -

Section Number - (112 & 113) WRS-5

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
87301805	ELCBL C SERV 6 2C	FOOT	221.000				
87301900	ELCBL C EGRDC 6 1C	FOOT	4,026.000				
87502480	TS POST GALVS 14	EACH	13.000				
87502500	TS POST GALVS 16	EACH	1.000				
87502520	TS POST GALVS 18	EACH	5.000				
87700140	S MAA & P 20	EACH	1.000				
87700170	S MAA & P 26	EACH	1.000				
87700190	S MAA & P 30	EACH	1.000				
87700200	S MAA & P 32	EACH	1.000				
87700220	S MAA & P 36	EACH	1.000				
87700230	S MAA & P 38	EACH	1.000				
87700240	S MAA & P 40	EACH	3.000				
87700280	S MAA & P 48	EACH	1.000				
87800100	CONC FDN TY A	FOOT	84.000				
87800150	CONC FDN TY C	FOOT	8.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
 CONTRACT
 NUMBER -

60I31

State Job # - C-91-014-10

Project Number

Route

County Name - DUPAGE - -

FAP 338

Code - 43 - -

District - 1 - -

Section Number - (112 & 113) WRS-5

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
87800400	CONC FDN TY E 30D	FOOT	20.000				
87800415	CONC FDN TY E 36D	FOOT	96.000				
87900200	DRILL EX HANDHOLE	EACH	1.000				
88030020	SH LED 1F 3S MAM	EACH	22.000				
88030050	SH LED 1F 3S BM	EACH	18.000				
88030100	SH LED 1F 5S BM	EACH	2.000				
88030210	SH LED 2F 3S BM	EACH	2.000				
88055160	OPSH LED 1F 3S MAM	EACH	2.000				
88102717	PED SH LED 1F BM CDT	EACH	14.000				
88102747	PED SH LED 2F BM CDT	EACH	1.000				
88200210	TS BACKPLATE LOU ALUM	EACH	24.000				
88500100	INDUCTIVE LOOP DETECT	EACH	34.000				
88600100	DET LOOP T1	FOOT	453.000				
88600700	PREFORM DETECT LOOP	FOOT	1,002.000				
88700200	LIGHT DETECTOR	EACH	6.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
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District - 1 - -

Section Number - (112 & 113) WRS-5

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
88700300	LIGHT DETECTOR AMP	EACH	1.000				
88800100	PED PUSH-BUTTON	EACH	16.000				
89000100	TEMP TR SIG INSTALL	EACH	3.000				
89502300	REM ELCBL FR CON	FOOT	918.000				
89502375	REMOV EX TS EQUIP	EACH	2.000				
89502380	REMOV EX HANDHOLE	EACH	39.000				
89502382	REMOV EX DBL HANDHOLE	EACH	3.000				
89502385	REMOV EX CONC FDN	EACH	17.000				

CONTRACT NUMBER 60131

THIS IS THE TOTAL BID \$ _____

NOTES:

1. Each PAY ITEM should have a UNIT PRICE and a TOTAL PRICE.
2. The UNIT PRICE shall govern if no TOTAL PRICE is shown or if there is a discrepancy between the product of the UNIT PRICE multiplied by the QUANTITY.
3. If a UNIT PRICE is omitted, the TOTAL PRICE will be divided by the QUANTITY in order to establish a UNIT PRICE.
4. A bid may be declared UNACCEPTABLE if neither a unit price nor a total price is shown.

RETURN WITH BID

STATE REQUIRED ETHICAL STANDARDS GOVERNING CONTRACT PROCUREMENT: ASSURANCES, CERTIFICATIONS AND DISCLOSURES

I. GENERAL

A. Article 50 of the Code establishes the duty of all State CPOs, SPOs, and their designees to maximize the value of the expenditure of public moneys in procuring goods, services, and contracts for the State of Illinois and to act in a manner that maintains the integrity and public trust of State government. In discharging this duty, they are charged by law to use all available information, reasonable efforts, and reasonable actions to protect, safeguard, and maintain the procurement process of the State of Illinois.

B. In order to comply with the provisions of Article 50 and to carry out the duty established therein, all bidders are to adhere to ethical standards established for the procurement process, and to make such assurances, disclosures and certifications required by law. Except as otherwise required in subsection III, paragraphs J-M, by execution of the Proposal Signature Sheet, the bidder indicates that each of the mandated assurances have been read and understood, that each certification is made and understood, and that each disclosure requirement has been understood and completed.

C. In addition to all other remedies provided by law, failure to comply with any assurance, failure to make any disclosure or the making of a false certification shall be grounds for the CPO to void the contract, and may result in the suspension or debarment of the bidder or subcontractor. If a false certification is made by a subcontractor the contractor's submitted bid and the executed contract may not be declared void unless the contractor refuses to terminate the subcontract upon the State's request after a finding that the subcontractor's certification was false.

II. ASSURANCES

The assurances hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder.

A. Conflicts of Interest

1. The Code provides in pertinent part:

Section 50-13. Conflicts of Interest.

(a) Prohibition. It is unlawful for any person holding an elective office in this State, holding a seat in the General Assembly, or appointed to or employed in any of the offices or agencies of state government and who receives compensation for such employment in excess of 60% of the salary of the Governor of the State of Illinois, or who is an officer or employee of the Capital Development Board or the Illinois Toll Highway Authority, or who is the spouse or minor child of any such person to have or acquire any contract, or any direct pecuniary interest in any contract therein, whether for stationery, printing, paper, or any services, materials, or supplies, that will be wholly or partially satisfied by the payment of funds appropriated by the General Assembly of the State of Illinois or in any contract of the Capital Development Board or the Illinois Toll Highway authority.

(b) Interests. It is unlawful for any firm, partnership, association or corporation, in which any person listed in subsection (a) is entitled to receive (i) more than 7 1/2% of the total distributable income or (ii) an amount in excess of the salary of the Governor, to have or acquire any such contract or direct pecuniary interest therein.

(c) Combined interests. It is unlawful for any firm, partnership, association, or corporation, in which any person listed in subsection (a) together with his or her spouse or minor children is entitled to receive (i) more than 15%, in the aggregate, of the total distributable income or (ii) an amount in excess of 2 times the salary of the Governor, to have or acquire any such contract or direct pecuniary interest therein.

(d) Securities. Nothing in this Section invalidates the provisions of any bond or other security previously offered or to be offered for sale or sold by or for the State of Illinois.

(e) Prior interests. This Section does not affect the validity of any contract made between the State and an officer or employee of the State or member of the General Assembly, his or her spouse, minor child or any combination of those persons if that contract was in existence before his or her election or employment as an officer, member, or employee. The contract is voidable, however, if it cannot be completed within 365 days after the officer, member, or employee takes office or is employed.

The current salary of the Governor is \$177,412.00. Sixty percent of the salary is \$106,447.20.

RETURN WITH BID

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-13, or that an effective exemption has been issued by the Board of Ethics to any individual subject to the Section 50-13 prohibitions pursuant to the provisions of Section 50-20 of the Code and Executive Order Number 3 (1998). Information concerning the exemption process is available from the Department upon request.

B. Negotiations

1. The Code provides in pertinent part:

Section 50-15. Negotiations.

(a) It is unlawful for any person employed in or on a continual contractual relationship with any of the offices or agencies of State government to participate in contract negotiations on behalf of that office or agency with any firm, partnership, association, or corporation with whom that person has a contract for future employment or is negotiating concerning possible future employment.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-15, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

C. Inducements

1. The Code provides:

Section 50-25. Inducement. Any person who offers or pays any money or other valuable thing to any person to induce him or her not to bid for a State contract or as recompense for not having bid on a State contract is guilty of a Class 4 felony. Any person who accepts any money or other valuable thing for not bidding for a State contract or who withholds a bid in consideration of the promise for the payment of money or other valuable thing is guilty of a Class 4 felony.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-25, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

D. Revolving Door Prohibition

1. The Code provides:

Section 50-30. Revolving door prohibition. CPOs, SPOs, procurement compliance monitors, their designees whose principal duties are directly related to State procurement, and executive officers confirmed by the Senate are expressly prohibited for a period of 2 years after terminating an affected position from engaging in any procurement activity relating to the State agency most recently employing them in an affected position for a period of at least 6 months. The prohibition includes, but is not limited to: lobbying the procurement process; specifying; bidding; proposing bid, proposal, or contract documents; on their own behalf or on behalf of any firm, partnership, association, or corporation. This Section applies only to persons who terminate an affected position on or after January 15, 1999.

2. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-30, and that the bidder has no knowledge of any facts relevant to the kinds of acts prohibited therein.

E. Reporting Anticompetitive Practices

1. The Code provides:

Section 50-40. Reporting anticompetitive practices. When, for any reason, any vendor, bidder, contractor, CPO, SPO, designee, elected official, or State employee suspects collusion or other anticompetitive practice among any bidders, offerors, contractors, proposers, or employees of the State, a notice of the relevant facts shall be transmitted to the Attorney General and the CPO.

2. The bidder assures the Department that it has not failed to report any relevant facts concerning the practices addressed in Section 50-40 which may involve the contract for which the bid is submitted.

F. Confidentiality

1. The Code provides:

Section 50-45. Confidentiality. Any CPO, SPO, designee, or executive officer who willfully uses or allows the use of specifications, competitive bid documents, proprietary competitive information, proposals, contracts, or selection information to compromise the fairness or integrity of the procurement, bidding, or contract process shall be subject to immediate dismissal, regardless of the Personnel code, any contract, or any collective bargaining agreement, and may in addition be subject to criminal prosecution.

2. The bidder assures the Department that it has no knowledge of any fact relevant to the practices addressed in Section 50-45 which may involve the contract for which the bid is submitted.

RETURN WITH BID

G. Insider Information

1. The Code provides:

Section 50-50. Insider information. It is unlawful for any current or former elected or appointed State official or State employee to knowingly use confidential information available only by virtue of that office or employment for actual or anticipated gain for themselves or another person.

2. The bidder assures the Department that it has no knowledge of any facts relevant to the practices addressed in Section 50-50 which may involve the contract for which the bid is submitted.

III. CERTIFICATIONS

The certifications hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder. Section 50-2 of the Code provides that every person that has entered into a multi-year contract and every subcontractor with a multi-year subcontract shall certify, by July 1 of each fiscal year covered by the contract after the initial fiscal year, to the responsible CPO whether it continues to satisfy the requirements of Article 50 pertaining to the eligibility for a contract award. If a contractor or subcontractor is not able to truthfully certify that it continues to meet all requirements, it shall provide with its certification a detailed explanation of the circumstances leading to the change in certification status. A contractor or subcontractor that makes a false statement material to any given certification required under Article 50 is, in addition to any other penalties or consequences prescribed by law, subject to liability under the Whistleblower Reward and Protection Act for submission of a false claim.

A. Bribery

1. The Code provides:

Section 50-5. Bribery.

(a) Prohibition. No person or business shall be awarded a contract or subcontract under this Code who:

(1) has been convicted under the laws of Illinois or any other state of bribery or attempting to bribe an officer or employee of the State of Illinois or any other state in that officer's or employee's official capacity; or

(2) has made an admission of guilt of that conduct that is a matter of record but has not been prosecuted for that conduct.

(b) Businesses. No business shall be barred from contracting with any unit of State or local government, or subcontracting under such a contract, as a result of a conviction under this Section of any employee or agent of the business if the employee or agent is no longer employed by the business and:

(1) the business has been finally adjudicated not guilty; or

(2) the business demonstrates to the governmental entity with which it seeks to contract, or which is signatory to the contract which the subcontract relates, and that entity finds that the commission of the offense was not authorized, requested, commanded, or performed by a director, officer, or high managerial agent on behalf of the business as provided in paragraph (2) of subsection (a) of Section 5-4 of the Criminal Code of 1961.

(c) Conduct on behalf of business. For purposes of this Section, when an official, agent, or employee of a business committed the bribery or attempted bribery on behalf of the business and in accordance with the direction or authorization of a responsible official of the business, the business shall be chargeable with the conduct.

(d) Certification. Every bid submitted to and contract executed by the State, and every subcontract subject to Section 20-120 of the Code shall contain a certification by the contractor or the subcontractor, respectively, that the contractor or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any certifications required by this Section are false. A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

2. The contractor or subcontractor certifies that it is not barred from being awarded a contract under Section 50.5.

B. Felons

1. The Code provides:

Section 50-10. Felons. Unless otherwise provided, no person or business convicted of a felony shall do business with the State of Illinois or any State agency, or enter into a subcontract, from the date of conviction until 5 years after the date of completion of the sentence for that felony, unless no person held responsible by a prosecutorial office for the facts upon which the conviction was based continues to have any involvement with the business.

2. Certification. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder or contractor or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any of the certifications required by this Section are false.

RETURN WITH BID

C. Debt Delinquency

1. The Code provides:

Section 50-11 and 50-12. Debt Delinquency.

The contractor or bidder or subcontractor, respectively, certifies that it, or any affiliate, is not barred from being awarded a contract or subcontract under the Code. Section 50-11 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it knows or should know that it, or any affiliate, is delinquent in the payment of any debt to the State as defined by the Debt Collection Board. Section 50-12 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it, or any affiliate, has failed to collect and remit Illinois Use Tax on all sales of tangible personal property into the State of Illinois in accordance with the provisions of the Illinois Use Tax Act. The bidder or contractor or subcontractor, respectively, further acknowledges that the CPO may declare the related contract void if this certification is false or if the bidder, contractor, or subcontractor, or any affiliate, is determined to be delinquent in the payment of any debt to the State during the term of the contract.

D. Prohibited Bidders, Contractors and Subcontractors

1. The Code provides:

Section 50-10.5 and 50-60(c). Prohibited bidders, contractors and subcontractors.

The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-10.5 that no officer, director, partner or other managerial agent of the contracting business has been convicted of a felony under the Sarbanes-Oxley Act of 2002 or a Class 3 or Class 2 felony under the Illinois Securities Law of 1953 or if in violation of Subsection (c) for a period of five years from the date of conviction. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder, contractor, or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO shall declare the related contract void if any of the certifications completed pursuant to this Section are false.

E. Section 42 of the Environmental Protection Act

The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-14 that the bidder, contractor, or subcontractor, is not barred from being awarded a contract or entering into a subcontract under this Section which prohibits the bidding on or entering into contracts with the State of Illinois or a State agency, or entering into any subcontract, that is subject to the Code by a person or business found by a court or the Pollution Control Board to have committed a willful or knowing violation of Section 42 of the Environmental Protection Act for a period of five years from the date of the order. The bidder or contractor or subcontractor, respectively, acknowledges that the CPO may declare the contract void if this certification is false.

F. Educational Loan

1. Section 3 of the Educational Loan Default Act provides:

§ 3. No State agency shall contract with an individual for goods or services if that individual is in default, as defined in Section 2 of this Act, on an educational loan. Any contract used by any State agency shall include a statement certifying that the individual is not in default on an educational loan as provided in this Section.

2. The bidder, if an individual as opposed to a corporation, partnership or other form of business organization, certifies that the bidder is not in default on an educational loan as provided in Section 3 of the Act.

G. Bid-Rigging/Bid Rotating

1. Section 33E-11 of the Criminal Code of 1961 provides:

§ 33E-11. (a) Every bid submitted to and public contract executed pursuant to such bid by the State or a unit of local government shall contain a certification by the prime contractor that the prime contractor is not barred from contracting with any unit of State or local government as a result of a violation of either Section 33E-3 or 33E-4 of this Article. The State and units of local government shall provide the appropriate forms for such certification.

(b) A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

A violation of Section 33E-3 would be represented by a conviction of the crime of bid-rigging which, in addition to Class 3 felony sentencing, provides that any person convicted of this offense or any similar offense of any state or the United States which contains the same elements as this offense shall be barred for 5 years from the date of conviction from contracting with any unit of State or local government. No corporation shall be barred from contracting with any unit of State or local government as a result of a conviction under this Section of any employee or agent of such corporation if the employee so convicted is no longer employed by the corporation and: (1) it has been finally adjudicated not guilty or (2) if it demonstrates to the governmental entity with which it seeks to contract and that entity finds that the commission of the offense was neither authorized, requested, commanded, nor performed by a director, officer or a high managerial agent in behalf of the corporation.

RETURN WITH BID

A violation of Section 33E-4 would be represented by a conviction of the crime of bid-rotating which, in addition to Class 2 felony sentencing, provides that any person convicted of this offense or any similar offense of any state or the United States which contains the same elements as this offense shall be permanently barred from contracting with any unit of State or local government. No corporation shall be barred from contracting with any unit of State or local government as a result of a conviction under this Section of any employee or agent of such corporation if the employee so convicted is no longer employed by the corporation and: (1) it has been finally adjudicated not guilty or (2) if it demonstrates to the governmental entity with which it seeks to contract and that entity finds that the commission of the offense was neither authorized, requested, commanded, nor performed by a director, officer or a high managerial agent in behalf of the corporation.

2. The bidder certifies that it is not barred from contracting with the Department by reason of a violation of either Section 33E-3 or Section 33E-4.

H. International Anti-Boycott

1. Section 5 of the International Anti-Boycott Certification Act provides:

§ 5. State contracts. Every contract entered into by the State of Illinois for the manufacture, furnishing, or purchasing of supplies, material, or equipment or for the furnishing of work, labor, or services, in an amount exceeding the threshold for small purchases according to the purchasing laws of this State or \$10,000.00, whichever is less, shall contain certification, as a material condition of the contract, by which the contractor agrees that neither the contractor nor any substantially-owned affiliated company is participating or shall participate in an international boycott in violation of the provisions of the U.S. Export Administration Act of 1979 or the regulations of the U.S. Department of Commerce promulgated under that Act.

2. The bidder makes the certification set forth in Section 5 of the Act.

I. Drug Free Workplace

1. The Illinois "Drug Free Workplace Act" applies to this contract and it is necessary to comply with the provisions of the "Act" if the contractor is a corporation, partnership, or other entity (including a sole proprietorship) which has 25 or more employees.

2. The bidder certifies that if awarded a contract in excess of \$5,000 it will provide a drug free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance, including cannabis, is prohibited in the contractor's workplace; specifying the actions that will be taken against employees for violations of such prohibition; and notifying the employee that, as a condition of employment on such contract, the employee shall abide by the terms of the statement, and notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction.

(b) Establishing a drug free awareness program to inform employees about the dangers of drug abuse in the workplace; the contractor's policy of maintaining a drug free workplace; any available drug counseling, rehabilitation, and employee assistance programs; and the penalties that may be imposed upon employees for drug violations.

(c) Providing a copy of the statement required by subparagraph (1) to each employee engaged in the performance of the contract and to post the statement in a prominent place in the workplace.

(d) Notifying the Department within ten (10) days after receiving notice from an employee or otherwise receiving actual notice of the conviction of an employee for a violation of any criminal drug statute occurring in the workplace.

(e) Imposing or requiring, within 30 days after receiving notice from an employee of a conviction or actual notice of such a conviction, an appropriate personnel action, up to and including termination, or the satisfactory participation in a drug abuse assistance or rehabilitation program approved by a federal, state or local health, law enforcement or other appropriate agency.

(f) Assisting employees in selecting a course of action in the event drug counseling, treatment, and rehabilitation is required and indicating that a trained referral team is in place.

(g) Making a good faith effort to continue to maintain a drug free workplace through implementation of the actions and efforts stated in this certification.

RETURN WITH BID

J. Disclosure of Business Operations in Iran

Section 50-36 of the Code, 30ILCS 500/50-36 provides that each bid, offer, or proposal submitted for a State contract shall include a disclosure of whether or not the Company acting as the bidder, offeror, or proposing entity, or any of its corporate parents or subsidiaries, within the 24 months before submission of the bid, offer, or proposal had business operations that involved contracts with or provision of supplies or services to the Government of Iran, companies in which the Government of Iran has any direct or indirect equity share, consortiums or projects commissioned by the Government of Iran, or companies involved in consortiums or projects commissioned by the Government of Iran and either of the following conditions apply:

- (1) More than 10% of the Company's revenues produced in or assets located in Iran involve oil-related activities or mineral-extraction activities; less than 75% of the Company's revenues produced in or assets located in Iran involve contracts with or provision of oil-related or mineral-extraction products or services to the Government of Iran or a project or consortium created exclusively by that government; and the Company has failed to take substantial action.
- (2) The Company has, on or after August 5, 1996, made an investment of \$20 million or more, or any combination of investments of at least \$10 million each that in the aggregate equals or exceeds \$20 million in any 12-month period, which directly or significantly contributes to the enhancement of Iran's ability to develop petroleum resources of Iran.

The terms "Business operations", "Company", "Mineral-extraction activities", "Oil-related activities", "Petroleum resources", and "Substantial action" are all defined in the Code.

Failure to make the disclosure required by the Code shall cause the bid, offer or proposal to be considered not responsive. The disclosure will be considered when evaluating the bid, offer, or proposal or awarding the contract. The name of each Company disclosed as doing business or having done business in Iran will be provided to the State Comptroller.

Check the appropriate statement:

Company has no business operations in Iran to disclose.

Company has business operations in Iran as disclosed the attached document.

K. Apprenticeship and Training Certification (Does not apply to federal aid projects)

In accordance with the provisions of Section 30-22 (6) of the Code, the bidder certifies that it is a participant, either as an individual or as part of a group program, in the approved apprenticeship and training programs applicable to each type of work or craft that the bidder will perform with its own forces. The bidder further certifies for work that will be performed by subcontract that each of its subcontractors submitted for approval either (a) is, at the time of such bid, participating in an approved, applicable apprenticeship and training program; or (b) will, prior to commencement of performance of work pursuant to this contract, begin participation in an approved apprenticeship and training program applicable to the work of the subcontract. The Department, at any time before or after award, may require the production of a copy of each applicable Certificate of Registration issued by the United States Department of Labor evidencing such participation by the contractor and any or all of its subcontractors. Applicable apprenticeship and training programs are those that have been approved and registered with the United States Department of Labor. The bidder shall list in the space below, the official name of the program sponsor holding the Certificate of Registration for all of the types of work or crafts in which the bidder is a participant and that will be performed with the bidder's forces. Types of work or craft work that will be subcontracted shall be included and listed as subcontract work. The list shall also indicate any type of work or craft job category that does not have an applicable apprenticeship or training program. **The bidder is responsible for making a complete report and shall make certain that each type of work or craft job category that will be utilized on the project as reported on the Construction Employee Workforce Projection (Form BC-1256) and returned with the bid is accounted for and listed.**

The requirements of this certification and disclosure are a material part of the contract, and the contractor shall require this certification provision to be included in all approved subcontracts. In order to fulfill this requirement, it shall not be necessary that an applicable program sponsor be currently taking or that it will take applications for apprenticeship, training or employment during the performance of the work of this contract.

TO BE RETURNED WITH BID

L. Political Contributions and Registration with the State Board of Elections

Sections 20-160 and 50-37 of the Code regulate political contributions from business entities and any affiliated entities or affiliated persons bidding on or contracting with the state. Generally under Section 50-37, any business entity, and any affiliated entity or affiliated person of the business entity, whose current year contracts with all state agencies exceed an awarded value of \$50,000, are prohibited from making any contributions to any political committees established to promote the candidacy of the officeholder responsible for the awarding of the contracts or any other declared candidate for that office for the duration of the term of office of the incumbent officeholder or a period 2 years after the termination of the contract, whichever is longer. Any business entity and affiliated entities or affiliated persons whose state contracts in the current year do not exceed an awarded value of \$50,000, but whose aggregate pending bids and proposals on state contracts exceed \$50,000, either alone or in combination with contracts not exceeding \$50,000, are prohibited from making any political contributions to any political committee established to promote the candidacy of the officeholder responsible for awarding the pending contract during the period beginning on the date the invitation for bids or request for proposals is issued and ending on the day after the date of award or selection if the entity was not awarded or selected. Section 20-160 requires certification of registration of affected business entities in accordance with procedures found in Section 9-35 of The Election Code.

By submission of a bid, the contractor business entity acknowledges and agrees that it has read and understands Sections 20-160 and 50-37 of the Code, and that it makes the following certification:

The undersigned business entity certifies that it has registered as a business with the State Board of Elections and acknowledges a continuing duty to update the registration in accordance with the above referenced statutes. If the business entity is required to register, the CPO shall verify that it is in compliance on the date the bid or proposal is due. The CPO shall not accept a bid or proposal if the business entity is not in compliance with the registration requirements.

These requirements and compliance with the above referenced statutory sections are a material part of the contract, and any breach thereof shall be cause to void the contract under Section 50-60 of the Code. This provision does not apply to Federal-aid contracts.

M. Lobbyist Disclosure

Section 50-38 of the Code requires that any bidder or offeror on a State contract that hires a person required to register under the Lobbyist Registration Act to assist in obtaining a contract shall:

- (i) Disclose all costs, fees, compensation, reimbursements, and other remunerations paid or to be paid to the lobbyist related to the contract,
- (ii) Not bill or otherwise cause the State of Illinois to pay for any of the lobbyist's costs, fees, compensation, reimbursements, or other remuneration, and
- (iii) Sign a verification certifying that none of the lobbyist's costs, fees, compensation, reimbursements, or other remuneration were billed to the State.

This information, along with all supporting documents, shall be filed with the agency awarding the contract and with the Secretary of State. The CPO shall post this information, together with the contract award notice, in the online Procurement Bulletin.

Pursuant to Subsection (c) of this Section, no person or entity shall retain a person or entity to attempt to influence the outcome of a procurement decision made under the Code for compensation contingent in whole or in part upon the decision or procurement. Any person who violates this subsection is guilty of a business offense and shall be fined not more than \$10,000.

Bidder acknowledges that it is required to disclose the hiring of any person required to register pursuant to the Illinois Lobbyist Registration Act (25 ILCS 170) in connection with this contract.

Bidder has not hired any person required to register pursuant to the Illinois Lobbyist Registration Act in connection with this contract.

Or

Bidder has hired the following persons required to register pursuant to the Illinois Lobbyist Registration Act in connection with the contract:

Name and address of person: _____
All costs, fees, compensation, reimbursements and other remuneration paid to said person: _____

RETURN WITH BID

IV. DISCLOSURES

- A. The disclosures hereinafter made by the bidder are each a material representation of fact upon which reliance is placed should the Department enter into the contract with the bidder. The bidder further certifies that the Department has received the disclosure forms for each bid.

The CPO may void the bid, or contract, respectively, if it is later determined that the bidder or subcontractor rendered a false or erroneous disclosure. A contractor or subcontractor may be suspended or debarred for violations of the Code. Furthermore, the CPO may void the contract and the surety providing the performance bond shall be responsible for completion of the contract.

B. Financial Interests and Conflicts of Interest

1. Section 50-35 of the Code provides that all bids of more than \$25,000 shall be accompanied by disclosure of the financial interests of the bidder. This disclosed information for the successful bidder, will be maintained as public information subject to release by request pursuant to the Freedom of Information Act, filed with the Procurement Policy Board, and shall be incorporated as a material term of the contract. Furthermore, pursuant to Section 5-5, the Procurement Policy Board may review a proposal, bid, or contract and issue a recommendation to void a contract or reject a proposal or bid based on any violation of the Code or the existence of a conflict of interest as provided in subsections (b) and (d) of Section 50-35.

The financial interests to be disclosed shall include ownership or distributive income share that is in excess of 5%, or an amount greater than 60% of the annual salary of the Governor, of the bidding entity or its parent entity, whichever is less, unless the contractor or bidder is a publicly traded entity subject to Federal 10K reporting, in which case it may submit its 10K disclosure in place of the prescribed disclosure. If a bidder is a privately held entity that is exempt from Federal 10K reporting, but has more than 200 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. The disclosure shall include the names, addresses, and dollar or proportionate share of ownership of each person making the disclosure, their instrument of ownership or beneficial relationship, and notice of any potential conflict of interest resulting from the current ownership or beneficial interest of each person making the disclosure having any of the relationships identified in Section 50-35 and on the disclosure form.
The current annual salary of the Governor is \$177,412.00

In addition, all disclosures shall indicate any other current or pending contracts, proposals, leases, or other ongoing procurement relationships the bidding entity has with any other unit of state government and shall clearly identify the unit and the contract, proposal, lease, or other relationship.

2. Disclosure Forms. Disclosure Form A is attached for use concerning the individuals meeting the above ownership or distributive share requirements. A separate Disclosure Form A must be submitted with the bid for each individual meeting the above requirements. In addition, a second form (Disclosure Form B) provides for the disclosure of current or pending procurement relationships with other (non-IDOT) state agencies and a total ownership certification. **The forms must be included with each bid.**

C. Disclosure Form Instructions

Form A Instructions for Financial Information & Potential Conflicts of Interest

If the bidder is a publicly traded entity subject to Federal 10K reporting, the 10K Report may be submitted to meet the requirements of Form A. If a bidder is a privately held entity that is exempt from Federal 10K reporting, but has more than 200 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. If a bidder is not subject to Federal 10K reporting, the bidder must determine if any individuals are required by law to complete a financial disclosure form. To do this, the bidder should answer each of the following questions. A "YES" answer indicates Form A must be completed. If the answer to each of the following questions is "NO", then the NOT APPLICABLE STATEMENT on Form A must be signed and dated by a person that is authorized to execute contracts for the bidding company. Note: These questions are for assistance only and are not required to be completed.

1. Does anyone in your organization have a direct or beneficial ownership share of greater than 5% of the bidding entity or parent entity? YES ___ NO ___
2. Does anyone in your organization have a direct or beneficial ownership share of less than 5%, but which has a value greater than 60% of the annual salary of the Governor? YES ___ NO ___
3. Does anyone in your organization receive more than 60% of the annual salary of the Governor of the bidding entity's or parent entity's distributive income? YES ___ NO ___

(Note: Distributive income is, for these purposes, any type of distribution of profits. An annual salary is not distributive income.)

4. Does anyone in your organization receive greater than 5% of the bidding entity's or parent entity's total distributive income, but which is less than 60% of the annual salary of the Governor? YES ___ NO ___

(Note: Only one set of forms needs to be completed per person per bid even if a specific individual would require a yes answer to more than one question.)

A "YES" answer to any of these questions requires the completion of Form A. The bidder must determine each individual in the bidding entity or the bidding entity's parent company that would cause the questions to be answered "Yes". Each form must be signed and dated by a person that is authorized to execute contracts for your organization. **Photocopied or stamped signatures are not acceptable.** The person signing can be, but does not have to be, the person for which the form is being completed. The bidder is responsible for the accuracy of any information provided.

If the answer to each of the above questions is "NO", then the NOT APPLICABLE STATEMENT of Form A must be signed and dated by a person that is authorized to execute contracts for your company.

RETURN WITH BID

Form B: Instructions for Identifying Other Contracts & Procurement Related Information

Disclosure Form B must be completed for each bid submitted by the bidding entity. *Note: Checking the NOT APPLICABLE STATEMENT on Form A does not allow the bidder to ignore Form B. Form B must be completed, checked, and dated or the bidder may be considered nonresponsive and the bid will not be accepted.*

The Bidder shall identify, by checking Yes or No on Form B, whether it has any pending contracts (including leases), bids, proposals, or other ongoing procurement relationship with any other (non-IDOT) State of Illinois agency. If "No" is checked, the bidder only needs to complete the check box on the bottom of Form B. If "Yes" is checked, the bidder must do one of the following:

Option I: If the bidder did not submit an Affidavit of Availability to obtain authorization to bid, the bidder must list all non-IDOT State of Illinois agency pending contracts, leases, bids, proposals, and other ongoing procurement relationships. These items may be listed on Form B or on an attached sheet(s). Do not include IDOT contracts. Contracts with cities, counties, villages, etc. are not considered State of Illinois agency contracts and are not to be included. Contracts with other State of Illinois agencies such as the Department of Natural Resources or the Capital Development Board must be included. Bidders who submit Affidavits of Availability are suggested to use Option II.

Option II: If the bidder is required and has submitted an Affidavit of Availability in order to obtain authorization to bid, the bidder may write or type "See Affidavit of Availability" which indicates that the Affidavit of Availability is incorporated by reference and includes all non-IDOT State of Illinois agency pending contracts, leases, bids, proposals, and other ongoing procurement relationships. For any contracts that are not covered by the Affidavit of Availability, the bidder must identify them on Form B or on an attached sheet(s). These might be such things as leases.

**ILLINOIS DEPARTMENT
OF TRANSPORTATION**

**Form A
Financial Information &
Potential Conflicts of Interest
Disclosure**

Contractor Name		
Legal Address		
City, State, Zip		
Telephone Number	Email Address	Fax Number (if available)

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). Vendors desiring to enter into a contract with the State of Illinois must disclose the financial information and potential conflict of interest information as specified in this Disclosure Form. This information shall become part of the publicly available contract file. This Form A must be completed for bids in excess of \$25,000, and for all open-ended contracts. **A publicly traded company may submit a 10K disclosure (or equivalent if applicable) in satisfaction of the requirements set forth in Form A. See Disclosure Form Instructions.**

The current annual salary of the Governor is \$177,412.00.

DISCLOSURE OF FINANCIAL INFORMATION

1. Disclosure of Financial Information. The individual named below has an interest in the BIDDER (or its parent) in terms of ownership or distributive income share in excess of 5%, or an interest which has a value of more than 60% of the annual salary of the Governor. **(Make copies of this form as necessary and attach a separate Disclosure Form A for each individual meeting these requirements)**

FOR INDIVIDUAL (type or print information)	
NAME:	_____
ADDRESS	_____
Type of ownership/distributable income share:	
stock _____	sole proprietorship _____ Partnership _____ other: (explain on separate sheet):
% or \$ value of ownership/distributable income share: _____	

2. Disclosure of Potential Conflicts of Interest. Check "Yes" or "No" to indicate which, if any, of the following potential conflict of interest relationships apply. If the answer to any question is "Yes", please attach additional pages and describe.

- (a) State employment, currently or in the previous 3 years, including contractual employment of services. Yes ___ No ___

If your answer is yes, please answer each of the following questions.

- Are you currently an officer or employee of either the Capitol Development Board or the Illinois State Toll Highway Authority? Yes ___ No ___
- Are you currently appointed to or employed by any agency of the State of Illinois? If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, provide the name the State agency for which you are employed and your annual salary. _____

RETURN WITH BID

3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor?
Yes ___ No ___

4. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the salary of the Governor?
Yes ___ No ___

(b) State employment of spouse, father, mother, son, or daughter, including contractual employment for services in the previous 2 years.
Yes ___ No ___

If your answer is yes, please answer each of the following questions.

1. Is your spouse or any minor children currently an officer or employee of the Capitol Development Board or the Illinois State Toll Highway Authority?
Yes ___ No ___

2. Is your spouse or any minor children currently appointed to or employed by any agency of the State of Illinois? If your spouse or minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, provide the name of your spouse and/or minor children, the name of the State agency for which he/she is employed and his/her annual salary. _____

3. If your spouse or any minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor?
Yes ___ No ___

4. If your spouse or any minor children are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the salary of the Governor?
Yes ___ No ___

(c) Elective status; the holding of elective office of the State of Illinois, the government of the United States, any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois currently or in the previous 3 years.
Yes ___ No ___

(d) Relationship to anyone holding elective office currently or in the previous 2 years; spouse, father, mother, son, or daughter.
Yes ___ No ___

(e) Appointive office; the holding of any appointive government office of the State of Illinois, the United States of America, or any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois, which office entitles the holder to compensation in excess of the expenses incurred in the discharge of that office currently or in the previous 3 years.
Yes ___ No ___

(f) Relationship to anyone holding appointive office currently or in the previous 2 years; spouse, father, mother, son, or daughter.
Yes ___ No ___

(g) Employment, currently or in the previous 3 years, as or by any registered lobbyist of the State government.
Yes ___ No ___

RETURN WITH BID

(h) Relationship to anyone who is or was a registered lobbyist in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___ No ___

(i) Compensated employment, currently or in the previous 3 years, by any registered election or reelection committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes ___ No ___

(j) Relationship to anyone; spouse, father, mother, son, or daughter; who was a compensated employee in the last 2 years by any registered election or re-election committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes ___ No ___

3. Communication Disclosure.

Disclose the name and address of each lobbyist and other agent of the bidder or offeror who is not identified in Section 2 of this form, who is has communicated, is communicating, or may communicate with any State officer or employee concerning the bid or offer. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the process and throughout the term of the contract. If no person is identified, enter "None" on the line below:

Name and address of person(s): _____

RETURN WITH BID

4. Debarment Disclosure. For each of the persons identified under Sections 2 and 3 of this form, disclose whether any of the following has occurred within the previous 10 years: debarment from contracting with any governmental entity; professional licensure discipline; bankruptcies; adverse civil judgments and administrative findings; and criminal felony convictions. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the procurement process and term of the contract. If no person is identified, enter "None" on the line below:

Name of person(s): _____

Nature of disclosure: _____

APPLICABLE STATEMENT

This Disclosure Form A is submitted on behalf of the INDIVIDUAL named on previous page. Under penalty of perjury, I certify the contents of this disclosure to be true and accurate to the best of my knowledge.

Completed by: _____ Date _____
Signature of Individual or Authorized Representative

NOT APPLICABLE STATEMENT

Under penalty of perjury, I have determined that no individuals associated with this organization meet the criteria that would require the completion of this Form A.

This Disclosure Form A is submitted on behalf of the CONTRACTOR listed on the previous page.

_____ Date _____
Signature of Authorized Representative

The bidder has a continuing obligation to supplement these disclosures under Sec. 50-35 of the Code.

RETURN WITH BID

ILLINOIS DEPARTMENT OF TRANSPORTATION

Form B Other Contracts & Financial Related Information Disclosure

Contractor Name, Legal Address, City, State, Zip, Telephone Number, Email Address, Fax Number (if available)

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). This information shall become part of the publicly available contract file. This Form B must be completed for bids in excess of \$25,000, and for all open-ended contracts.

DISCLOSURE OF OTHER CONTRACTS AND PROCUREMENT RELATED INFORMATION

1. Identifying Other Contracts & Procurement Related Information. The BIDDER shall identify whether it has any pending contracts (including leases), bids, proposals, or other ongoing procurement relationship with any other State of Illinois agency: Yes ___ No ___

If "No" is checked, the bidder only needs to complete the signature box on the bottom of this page.

2. If "Yes" is checked. Identify each such relationship by showing State of Illinois agency name and other descriptive information such as bid or project number (attach additional pages as necessary). SEE DISCLOSURE FORM INSTRUCTIONS:

THE FOLLOWING STATEMENT MUST BE CHECKED

Signature of Authorized Representative, Date

OWNERSHIP CERTIFICATION

Please certify that the following statement is true if the individuals for all submitted Form A disclosures do not total 100% of ownership.

Any remaining ownership interest is held by individuals receiving less than \$106,447.20 of the bidding entity's or parent entity's distributive income or holding less than a 5% ownership interest.

Yes No N/A (Form A disclosure(s) established 100% ownership)

RETURN WITH BID

SPECIAL NOTICE TO CONTRACTORS

The following requirements of the Illinois Department of Human Rights' Rules and Regulations are applicable to bidders on all construction contracts advertised by the Illinois Department of Transportation:

CONSTRUCTION EMPLOYEE UTILIZATION PROJECTION

- (a) All bidders on construction contracts shall complete and submit, along with and as part of their bids, a Bidder's Employee Utilization Form (Form BC-1256) setting forth a projection and breakdown of the total workforce intended to be hired and/or allocated to such contract work by the bidder including a projection of minority and female employee utilization in all job classifications on the contract project.
- (b) The Department of Transportation shall review the Employee Utilization Form, and workforce projections contained therein, of the contract awardee to determine if such projections reflect an underutilization of minority persons and/or women in any job classification in accordance with the Equal Employment Opportunity Clause and Section 7.2 of the Illinois Department of Human Rights' Rules and Regulations for Public Contracts adopted as amended on September 17, 1980. If it is determined that the contract awardee's projections reflect an underutilization of minority persons and/or women in any job classification, it shall be advised in writing of the manner in which it is underutilizing and such awardee shall be considered to be in breach of the contract unless, prior to commencement of work on the contract project, it submits revised satisfactory projections or an acceptable written affirmative action plan to correct such underutilization including a specific timetable geared to the completion stages of the contract.
- (c) The Department of Transportation shall provide to the Department of Human Rights a copy of the contract awardee's Employee Utilization Form, a copy of any required written affirmative action plan, and any written correspondence related thereto. The Department of Human Rights may review and revise any action taken by the Department of Transportation with respect to these requirements.

RETURN WITH BID



**Contract No. 60I31
DUPAGE County
Section (112&113)WRS-5
Route FAP 338
District 1 Construction Funds**

PART I. IDENTIFICATION

Dept. Human Rights # _____ Duration of Project: _____

Name of Bidder: _____

PART II. WORKFORCE PROJECTION

A. The undersigned bidder has analyzed minority group and female populations, unemployment rates and availability of workers for the location in which this contract work is to be performed, and for the locations from which the bidder recruits employees, and hereby submits the following workforce projection including a projection for minority and female employee utilization in all job categories in the workforce to be allocated to this contract:

TABLE A

TOTAL Workforce Projection for Contract												
JOB CATEGORIES	TOTAL EMPLOYEES		MINORITY EMPLOYEES						TRAINEES			
			BLACK		HISPANIC		*OTHER MINOR.		APPRENTICES		ON THE JOB TRAINEES	
	M	F	M	F	M	F	M	F	M	F	M	F
OFFICIALS (MANAGERS)												
SUPERVISORS												
FOREMEN												
CLERICAL												
EQUIPMENT OPERATORS												
MECHANICS												
TRUCK DRIVERS												
IRONWORKERS												
CARPENTERS												
CEMENT MASONS												
ELECTRICIANS												
PIPEFITTERS, PLUMBERS												
PAINTERS												
LABORERS, SEMI-SKILLED												
LABORERS, UNSKILLED												
TOTAL												

TABLE B

CURRENT EMPLOYEES TO BE ASSIGNED TO CONTRACT			
TOTAL EMPLOYEES		MINORITY EMPLOYEES	
M	F	M	F

TABLE C

TOTAL Training Projection for Contract								
EMPLOYEES IN TRAINING	TOTAL EMPLOYEES		BLACK		HISPANIC		*OTHER MINOR.	
	M	F	M	F	M	F	M	F
APPRENTICES								
ON THE JOB TRAINEES								

FOR DEPARTMENT USE ONLY	
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* Other minorities are defined as Asians (A) or Native Americans (N). Please specify race of each employee shown in Other Minorities column.

Note: See instructions on page 2

RETURN WITH BID

**Contract No. 60I31
DUPAGE County
Section (112&113)WRS-5
Route FAP 338
District 1 Construction Funds**

PART II. WORKFORCE PROJECTION - continued

- B. Included in "Total Employees" under Table A is the total number of **new hires** that would be employed in the event the undersigned bidder is awarded this contract.

The undersigned bidder projects that: (number) _____ new hires would be recruited from the area in which the contract project is located; and/or (number) _____ new hires would be recruited from the area in which the bidder's principal office or base of operation is located.

- C. Included in "Total Employees" under Table A is a projection of numbers of persons to be employed directly by the undersigned bidder as well as a projection of numbers of persons to be employed by subcontractors.

The undersigned bidder estimates that (number) _____ persons will be directly employed by the prime contractor and that (number) _____ persons will be employed by subcontractors.

PART III. AFFIRMATIVE ACTION PLAN

- A. The undersigned bidder understands and agrees that in the event the foregoing minority and female employee utilization projection included under **PART II** is determined to be an underutilization of minority persons or women in any job category, and in the event that the undersigned bidder is awarded this contract, he/she will, prior to commencement of work, develop and submit a written Affirmative Action Plan including a specific timetable (geared to the completion stages of the contract) whereby deficiencies in minority and/or female employee utilization are corrected. Such Affirmative Action Plan will be subject to approval by the contracting agency and the **Department of Human Rights**.
- B. The undersigned bidder understands and agrees that the minority and female employee utilization projection submitted herein, and the goals and timetable included under an Affirmative Action Plan if required, are deemed to be part of the contract specifications.

Company _____ Telephone Number _____

Address _____

NOTICE REGARDING SIGNATURE

The Bidder's signature on the Proposal Signature Sheet will constitute the signing of this form. The following signature block needs to be completed if revisions are required.

Signature: _____ Title: _____ Date: _____

- Instructions: All tables must include subcontractor personnel in addition to prime contractor personnel.
- Table A - Include both the number of employees that would be hired to perform the contract work and the total number currently employed (Table B) that will be allocated to contract work, and include all apprentices and on-the-job trainees. The "Total Employees" column should include all employees including all minorities, apprentices and on-the-job trainees to be employed on the contract work.
 - Table B - Include all employees currently employed that will be allocated to the contract work including any apprentices and on-the-job trainees currently employed.
 - Table C - Indicate the racial breakdown of the total apprentices and on-the-job trainees shown in Table A.

RETURN WITH BID
Contract No. 60I31
DUPAGE County
Section (112&113)WRS-5
Route FAP 338
District 1 Construction Funds

PROPOSAL SIGNATURE SHEET

The undersigned bidder hereby makes and submits this bid on the subject Proposal, thereby assuring the Department that all requirements of the Invitation for Bids and rules of the Department have been met, that there is no misunderstanding of the requirements of paragraph 3 of this Proposal, and that the contract will be executed in accordance with the rules of the Department if an award is made on this bid.

Firm Name _____

(IF AN INDIVIDUAL) Signature of Owner _____

Business Address _____

Firm Name _____

By _____

(IF A CO-PARTNERSHIP) Business Address _____

Name and Address of All Members of the Firm:

Corporate Name _____

By _____

Signature of Authorized Representative

Typed or printed name and title of Authorized Representative

(IF A CORPORATION)

Attest _____

(IF A JOINT VENTURE, USE THIS SECTION
FOR THE MANAGING PARTY AND THE
SECOND PARTY SHOULD SIGN BELOW) Signature

Business Address _____

Corporate Name _____

By _____

Signature of Authorized Representative

Typed or printed name and title of Authorized Representative

(IF A JOINT VENTURE)

Attest _____

Signature

Business Address _____

If more than two parties are in the joint venture, please attach an additional signature sheet.



Return with Bid

Division of Highways
Proposal Bid Bond
(Effective November 1, 1992)

Item No.
Letting Date

KNOW ALL MEN BY THESE PRESENTS, That We

as PRINCIPAL, and

as SURETY, are held jointly, severally and firmly bound unto the STATE OF ILLINOIS in the penal sum of 5 percent of the total bid price, or for the amount specified in the bid proposal under "Proposal Guaranty" in effect on the date of the Invitation for Bids, whichever is the lesser sum, well and truly to be paid unto said STATE OF ILLINOIS, for the payment of which we bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH, that whereas, the PRINCIPAL has submitted a bid proposal to the STATE OF ILLINOIS, acting through the Department of Transportation, for the improvement designated by the Transportation Bulletin Item Number and Letting Date indicated above.

NOW, THEREFORE, if the Department shall accept the bid proposal of the PRINCIPAL; and if the PRINCIPAL shall, within the time and as specified in the bidding and contract documents, submit a DBE Utilization Plan that is accepted and approved by the Department; and if, after award by the Department, the PRINCIPAL shall enter into a contract in accordance with the terms of the bidding and contract documents including evidence of the required insurance coverages and providing such bond as specified with good and sufficient surety for the faithful performance of such contract and for the prompt payment of labor and material furnished in the prosecution thereof; or if, in the event of the failure of the PRINCIPAL to make the required DBE submission or to enter into such contract and to give the specified bond, the PRINCIPAL pays to the Department the difference not to exceed the penalty hereof between the amount specified in the bid proposal and such larger amount for which the Department may contract with another party to perform the work covered by said bid proposal, then this obligation shall be null and void, otherwise, it shall remain in full force and effect.

IN THE EVENT the Department determines the PRINCIPAL has failed to comply with any requirement as set forth in the preceding paragraph, then Surety shall pay the penal sum to the Department within fifteen (15) days of written demand therefor. If Surety does not make full payment within such period of time, the Department may bring an action to collect the amount owed. Surety is liable to the Department for all its expenses, including attorney's fees, incurred in any litigation in which it prevails either in whole or in part.

In TESTIMONY WHEREOF, the said PRINCIPAL and the said SURETY have caused this instrument to be signed by their respective officers this day of A.D.,

PRINCIPAL SURETY
(Company Name) (Company Name)
By (Signature & Title) By: (Signature of Attorney-in-Fact)

Notary Certification for Principal and Surety

STATE OF ILLINOIS,
County of
I, a Notary Public in and for said County, do hereby certify that
and
(Insert names of individuals signing on behalf of PRINCIPAL & SURETY)

who are each personally known to me to be the same persons whose names are subscribed to the foregoing instrument on behalf of PRINCIPAL and SURETY, appeared before me this day in person and acknowledged respectively, that they signed and delivered said instrument as their free and voluntary act for the uses and purposes therein set forth.

Given under my hand and notarial seal this day of A.D.

My commission expires Notary Public

In lieu of completing the above section of the Proposal Bid Form, the Principal may file an Electronic Bid Bond. By signing the proposal and marking the check box next to the Signature and Title line below, the Principal is ensuring the identified electronic bid bond has been executed and the Principal and Surety are firmly bound unto the State of Illinois under the conditions of the bid bond as shown above.

Electronic Bid Bond ID# Company / Bidder Name Signature and Title

(1) Policy

It is public policy that disadvantageded businesses as defined in 49 CFR Part 26 and the Special Provision shall have the maximum opportunity to participate in the performance of contracts financed in whole or in part with Federal or State funds. Consequently the requirements of 49 CFR Part 26 apply to this contract.

(2) Obligation

The contractor agrees to ensure that disadvantageded businesses as defined in 49 CFR Part 26 and the Special Provision have the maximum opportunity to participate in the performance of contracts or subcontracts financed in whole or in part with Federal or State funds. The contractor shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 and the Special Provision to ensure that said businesses have the maximum opportunity to compete for and perform under this contract. The contractor shall not discriminate on the basis of race, color, national origin or sex in the award and performance of contracts.

(3) Project and Bid Identification

Complete the following information concerning the project and bid:

Route _____

Section _____

Project _____

County _____

Letting Date _____

Contract No. _____

Letting Item No. _____

Total Bid _____

Contract DBE Goal _____

(Percent) (Dollar Amount)

(4) Assurance

I, acting in my capacity as an officer of the undersigned bidder (or bidders if a joint venture), hereby assure the Department that on this project my company : (check one)

- Meets or exceeds contract award goals and has provided documented participation as follows:
Disadvantaged Business Participation _____ percent

Attached are the signed participation statements, forms SBE 2025, required by the Special Provision evidencing availability and use of each business participating in this plan and assuring that each business will perform a commercially useful function in the work of the contract.

- Failed to meet contract award goals and has included good faith effort documentation to meet the goals and that my company has provided participation as follows:
Disadvantaged Business Participation _____ percent

The contract goals should be accordingly modified or waived. Attached is all information required by the Special Provision in support of this request including good faith effort. Also attached are the signed participation statements, forms SBE 2025, required by the Special Provision evidencing availability and use of each business participating in this plan and assuring that each business will perform a commercially useful function in the work of the contract.

Company

By _____

Title _____

Date _____

The "as read" Low Bidder is required to comply with the Special Provision.

Submit only one utilization plan for each project. The utilization plan shall be submitted in accordance with the special provision.

Bureau of Small Business Enterprises **Local Let Projects**
2300 South Dirksen Parkway Submit forms to the
Springfield, Illinois 62764 Local Agency



**Illinois Department
of Transportation**

DBE Participation Statement

Subcontractor Registration _____

Letting _____

Participation Statement

Item No. _____

(1) Instructions

Contract _____

This form must be completed for each disadvantaged business participating in the Utilization Plan. This form shall be submitted in accordance with the special provision and will be attached to the Utilization Plan form. If additional space is needed complete an additional form for the firm.

(2) Work

Pay Item No.	Description	Quantity	Unit Price	Total
Total				

(3) Partial Payment Items

For any of the above items which are partial pay items, specifically describe the work and subcontract dollar amount:

(4) Commitment

The undersigned certify that the information included herein is true and correct, and that the DBE firm listed below has agreed to perform a commercially useful function in the work of the contract item(s) listed above and to execute a contract with the prime contractor. The undersigned further understand that no changes to this statement may be made without prior approval from the Department's Bureau of Small Business Enterprises and that complete and accurate information regarding actual work performed on this project and the payment therefore must be provided to the Department.

Signature for Prime Contractor

Signature for DBE Firm

Title _____

Title _____

Date _____

Date _____

Contact _____

Contact _____

Phone _____

Phone _____

Firm Name _____

Firm Name _____

Address _____

Address _____

City/State/Zip _____

City/State/Zip _____

E _____

WC _____

The Department of Transportation is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under the state and federal law. Disclosure of this information is **REQUIRED**. Failure to provide any information will result in the contract not being awarded. This form has been approved by the State Forms Management Center.

PROPOSAL ENVELOPE



PROPOSALS

for construction work advertised for bids by the
Illinois Department of Transportation

Item No.	Item No.	Item No.

Submitted By:

Name:
Address:
Phone No.

Bidders should use an IDOT proposal envelope or affix this form to the front of a 10" x 13" envelope for the submittal of bids. If proposals are mailed, they should be enclosed in a second or outer envelope addressed to:

Engineer of Design and Environment - Room 326
Illinois Department of Transportation
2300 South Dirksen Parkway
Springfield, Illinois 62764

NOTICE

Individual bids, including Bid Bond and/or supplemental information if required, should be securely stapled.

CONTRACTOR OFFICE COPY OF CONTRACT SPECIFICATIONS

NOTICE

None of the following material needs to be returned with the bid package unless the special provisions require documentation and/or other information to be submitted.

**Contract No. 60I31
DUPAGE County
Section (112&113)WRS-5
Route FAP 338
District 1 Construction Funds**



Illinois Department of Transportation

SUBCONTRACTOR DOCUMENTATION

Public Acts 96-0795, 96-0920, and 97-0895 enacted substantial changes to the provisions of the Code (30 ILCS 500). Among the changes are provisions affecting subcontractors. The Contractor awarded this contract will be required as a material condition of the contract to implement and enforce the contract requirements applicable to subcontractors that entered into a contractual agreement with a total value of \$50,000 or more with a person or entity who has a contract subject to the Code and approved in accordance with article 108.01 of the Standard Specifications for Road and Bridge Construction.

If the Contractor seeks approval of subcontractors to perform a portion of the work, and approval is granted by the Department, the Contractor shall provide a copy of the subcontract to the Illinois Department of Transportation's CPO upon request within 15 calendar days after execution of the subcontract.

Financial disclosures required pursuant to Sec. 50-35 of the Code must be submitted for all applicable subcontractors. The subcontract shall contain the certifications required to be made by subcontractors pursuant to Article 50 of the Code. This Notice to Bidders includes a document incorporating all required subcontractor certifications and disclosures for use by the Contractor in compliance with this mandate. The document is entitled State Required Ethical Standards Governing Subcontractors.

RETURN WITH SUBCONTRACT

STATE ETHICAL STANDARDS GOVERNING SUBCONTRACTORS

Article 50 of the Code establishes the duty of all State CPOs, SPOs, and their designees to maximize the value of the expenditure of public moneys in procuring goods, services, and contracts for the State of Illinois and to act in a manner that maintains the integrity and public trust of State government. In discharging this duty, they are charged by law to use all available information, reasonable efforts, and reasonable actions to protect, safeguard, and maintain the procurement process of the State of Illinois.

The certifications hereinafter made by the subcontractor are each a material representation of fact upon which reliance is placed should the Department approve the subcontractor. The CPO may terminate or void the contract approval if it is later determined that the bidder or subcontractor rendered a false or erroneous certification. If a false certification is made by a subcontractor the contractor's submitted bid and the executed contract may not be declared void unless the contractor refuses to terminate the subcontract upon the State's request after a finding that the subcontractor's certification was false.

Section 50-2 of the Code provides that every person that has entered into a multi-year contract and every subcontractor with a multi-year subcontract shall certify, by July 1 of each fiscal year covered by the contract after the initial fiscal year, to the responsible CPO whether it continues to satisfy the requirements of Article 50 pertaining to the eligibility for a contract award. If a contractor or subcontractor is not able to truthfully certify that it continues to meet all requirements, it shall provide with its certification a detailed explanation of the circumstances leading to the change in certification status. A contractor or subcontractor that makes a false statement material to any given certification required under Article 50 is, in addition to any other penalties or consequences prescribed by law, subject to liability under the Whistleblower Reward and Protection Act for submission of a false claim.

A. Bribery

1. The Code provides:

Section 50-5. Bribery.

(a) Prohibition. No person or business shall be awarded a contract or subcontract under this Code who:

(1) has been convicted under the laws of Illinois or any other state of bribery or attempting to bribe an officer or employee of the State of Illinois or any other state in that officer's or employee's official capacity; or

(2) has made an admission of guilt of that conduct that is a matter of record but has not been prosecuted for that conduct.

(b) Businesses. No business shall be barred from contracting with any unit of State or local government, or subcontracting under such a contract, as a result of a conviction under this Section of any employee or agent of the business if the employee or agent is no longer employed by the business and:

(1) the business has been finally adjudicated not guilty; or

(2) the business demonstrates to the governmental entity with which it seeks to contract, or which is signatory to the contract to which the subcontract relates, and that entity finds that the commission of the offense was not authorized, requested, commanded, or performed by a director, officer, or high managerial agent on behalf of the business as provided in paragraph (2) of subsection (a) of Section 5-4 of the Criminal Code of 1961.

(c) Conduct on behalf of business. For purposes of this Section, when an official, agent, or employee of a business committed the bribery or attempted bribery on behalf of the business and in accordance with the direction or authorization of a responsible official of the business, the business shall be chargeable with the conduct.

(d) Certification. Every bid submitted to and contract executed by the State, and every subcontract subject to Section 20-120 of the Code shall contain a certification by the contractor or the subcontractor, respectively, that the contractor or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any certifications required by this Section are false. A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

2. The contractor or subcontractor certifies that it is not barred from being awarded a contract under Section 50.5.

B. Felons

1. The Code provides:

Section 50-10. Felons. Unless otherwise provided, no person or business convicted of a felony shall do business with the State of Illinois or any State agency, or enter into a subcontract, from the date of conviction until 5 years after the date of completion of the sentence for that felony, unless no person held responsible by a prosecutorial office for the facts upon which the conviction was based continues to have any involvement with the business.

2. Certification. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder or contractor or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO may declare the related contract void if any of the certifications required by this Section are false.

RETURN WITH SUBCONTRACT

C. Debt Delinquency

1. The Code provides:

Section 50-11 and 50-12. Debt Delinquency.

The contractor or bidder or subcontractor, respectively, certifies that it, or any affiliate, is not barred from being awarded a contract or subcontract under the Code. Section 50-11 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it knows or should know that it, or any affiliate, is delinquent in the payment of any debt to the State as defined by the Debt Collection Board. Section 50-12 prohibits a person from entering into a contract with a State agency, or entering into a subcontract, if it, or any affiliate, has failed to collect and remit Illinois Use Tax on all sales of tangible personal property into the State of Illinois in accordance with the provisions of the Illinois Use Tax Act. The bidder or contractor or subcontractor, respectively, further acknowledges that the CPO may declare the related contract void if this certification is false or if the bidder, contractor, or subcontractor, or any affiliate, is determined to be delinquent in the payment of any debt to the State during the term of the contract.

D. Prohibited Bidders, Contractors and Subcontractors

1. The Code provides:

Section 50-10.5 and 50-60(c). Prohibited bidders, contractors and subcontractors.

The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-10.5 that no officer, director, partner or other managerial agent of the contracting business has been convicted of a felony under the Sarbanes-Oxley Act of 2002 or a Class 3 or Class 2 felony under the Illinois Securities Law of 1953 or if in violation of Subsection (c) for a period of five years from the date of conviction. Every bid submitted to and contract executed by the State and every subcontract subject to Section 20-120 of the Code shall contain a certification by the bidder, contractor, or subcontractor, respectively, that the bidder, contractor, or subcontractor is not barred from being awarded a contract or subcontract under this Section and acknowledges that the CPO shall declare the related contract void if any of the certifications completed pursuant to this Section are false.

E. Section 42 of the Environmental Protection Act

The bidder or contractor or subcontractor, respectively, certifies in accordance with 30 ILCS 500/50-12 that the bidder, contractor, or subcontractor, is not barred from being awarded a contract or entering into a subcontract under this Section which prohibits the bidding on or entering into contracts with the State of Illinois or a State agency, or entering into any subcontract, that is subject to the Code by a person or business found by a court or the Pollution Control Board to have committed a willful or knowing violation of Section 42 of the Environmental Protection Act for a period of five years from the date of the order. The bidder or contractor or subcontractor, respectively, acknowledges that the CPO may declare the contract void if this certification is false.

The undersigned, on behalf of the subcontracting company, has read and understands the above certifications and makes the certifications as required by law.

Name of Subcontracting Company

Authorized Officer

Date

RETURN WITH SUBCONTRACT
SUBCONTRACTOR DISCLOSURES

I. DISCLOSURES

- A.** The disclosures hereinafter made by the subcontractor are each a material representation of fact upon which reliance is placed. The subcontractor further certifies that the Department has received the disclosure forms for each subcontract.

The CPO may void the bid, contract, or subcontract, respectively, if it is later determined that the bidder or subcontractor rendered a false or erroneous disclosure. A contractor or subcontractor may be suspended or debarred for violations of the Code. Furthermore, the CPO may void the contract.

B. Financial Interests and Conflicts of Interest

1. Section 50-35 of the Code provides that all subcontracts with a total value of \$50,000 or more from subcontractors identified in Section 20-120 of the Code, shall be accompanied by disclosure of the financial interests of the subcontractor. This disclosed information for the subcontractor, will be maintained as public information subject to release by request pursuant to the Freedom of Information Act, filed with the Procurement Policy Board, and shall be incorporated as a material term of the Prime Contractor's contract. Furthermore, pursuant to this Section, the Procurement Policy Board may recommend to allow or void a contract or subcontract based on a potential conflict of interest.

The financial interests to be disclosed shall include ownership or distributive income share that is in excess of 5%, or an amount greater than 60% of the annual salary of the Governor, of the subcontracting entity or its parent entity, whichever is less, unless the subcontractor is a publicly traded entity subject to Federal 10K reporting, in which case it may submit its 10K disclosure in place of the prescribed disclosure. If a subcontractor is a privately held entity that is exempt from Federal 10K reporting, but has more than 200 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. The disclosure shall include the names, addresses, and dollar or proportionate share of ownership of each person making the disclosure, their instrument of ownership or beneficial relationship, and notice of any potential conflict of interest resulting from the current ownership or beneficial interest of each person making the disclosure having any of the relationships identified in Section 50-35 and on the disclosure form.

The current annual salary of the Governor is \$177,412.00.

In addition, all disclosures shall indicate any other current or pending contracts, subcontracts, proposals, leases, or other ongoing procurement relationships the subcontracting entity has with any other unit of state government and shall clearly identify the unit and the contract, subcontract, proposal, lease, or other relationship.

2. Disclosure Forms. Disclosure Form A is attached for use concerning the individuals meeting the above ownership or distributive share requirements. A separate Disclosure Form A must be submitted with the bid for each individual meeting the above requirements. In addition, a second form (Disclosure Form B) provides for the disclosure of current or pending procurement relationships with other (non-IDOT) state agencies and a total ownership certification. **The forms must be included with each bid.**

C. Disclosure Form Instructions

Form A Instructions for Financial Information & Potential Conflicts of Interest

If the subcontractor is a publicly traded entity subject to Federal 10K reporting, the 10K Report may be submitted to meet the requirements of Form A. If a subcontractor is a privately held entity that is exempt from Federal 10K reporting, but has more than 200 shareholders, it may submit the information that Federal 10K companies are required to report, and list the names of any person or entity holding any ownership share that is in excess of 5%. If a subcontractor is not subject to Federal 10K reporting, the subcontractor must determine if any individuals are required by law to complete a financial disclosure form. To do this, the subcontractor should answer each of the following questions. A "YES" answer indicates Form A must be completed. If the answer to each of the following questions is "NO", then the **NOT APPLICABLE STATEMENT** on the second page of Form A must be signed and dated by a person that is authorized to execute contracts for the subcontracting company. Note: These questions are for assistance only and are not required to be completed.

1. Does anyone in your organization have a direct or beneficial ownership share of greater than 5% of the bidding entity or parent entity? YES ___ NO ___
2. Does anyone in your organization have a direct or beneficial ownership share of less than 5%, but which has a value greater than 60% of the annual salary of the Governor? YES ___ NO ___
3. Does anyone in your organization receive more than 60% of the annual salary of the Governor of the subcontracting entity's or parent entity's distributive income? YES ___ NO ___

(Note: Distributive income is, for these purposes, any type of distribution of profits. An annual salary is not distributive income.)

4. Does anyone in your organization receive greater than 5% of the subcontracting entity's or parent entity's total distributive income, but which is less than 60% of the annual salary of the Governor? YES ___ NO ___

(Note: Only one set of forms needs to be completed per person per subcontract even if a specific individual would require a yes answer to more than one question.)

A "YES" answer to any of these questions requires the completion of Form A. The subcontractor must determine each individual in the subcontracting entity or the subcontracting entity's parent company that would cause the questions to be answered "Yes". Each form must be signed and dated by a person that is authorized to execute contracts for your organization. **Photocopied or stamped signatures are not acceptable.** The person signing can be, but does not have to be, the person for which the form is being completed. The subcontractor is responsible for the accuracy of any information provided.

If the answer to each of the above questions is "NO", then the **NOT APPLICABLE STATEMENT** on page 2 of Form A must be signed and dated by a person that is authorized to execute contracts for your company.

RETURN WITH SUBCONTRACT

Form B: Instructions for Identifying Other Contracts & Procurement Related Information

Disclosure Form B must be completed for each subcontract submitted by the subcontracting entity. *Note: Checking the NOT APPLICABLE STATEMENT on Form A does not allow the subcontractor to ignore Form B. Form B must be completed, checked, and dated or the subcontract will not be approved.*

The Subcontractor shall identify, by checking Yes or No on Form B, whether it has any pending contracts, subcontracts, leases, bids, proposals, or other ongoing procurement relationship with any other (non-IDOT) State of Illinois agency. If "No" is checked, the subcontractor only needs to complete the check box on the bottom of Form B. If "Yes" is checked, the subcontractor must list all non-IDOT State of Illinois agency pending contracts, subcontracts, leases, bids, proposals, and other ongoing procurement relationships. These items may be listed on Form B or on an attached sheet(s). Contracts with cities, counties, villages, etc. are not considered State of Illinois agency contracts and are not to be included. Contracts or subcontracts with other State of Illinois agencies such as the Department of Natural Resources or the Capital Development Board must be included.

**ILLINOIS DEPARTMENT
OF TRANSPORTATION**

**Form A
Subcontractor: Financial
Information & Potential Conflicts
of Interest Disclosure**

Subcontractor Name		
Legal Address		
City, State, Zip		
Telephone Number	Email Address	Fax Number (if available)

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). Subcontractors desiring to enter into a subcontract of a State of Illinois contract must disclose the financial information and potential conflict of interest information as specified in this Disclosure Form. This information shall become part of the publicly available contract file. This Form A must be completed for subcontracts with a total value of \$50,000 or more, from subcontractors identified in Section 20-120 of the Code, and for all open-ended contracts. **A publicly traded company may submit a 10K disclosure (or equivalent if applicable) in satisfaction of the requirements set forth in Form A. See Disclosure Form Instructions.**

The current annual salary of the Governor is \$177,412.00.

DISCLOSURE OF FINANCIAL INFORMATION

1. Disclosure of Financial Information. The individual named below has an interest in the SUBCONTRACTOR (or its parent) in terms of ownership or distributive income share in excess of 5%, or an interest which has a value of more than 60% of the annual salary of the Governor. **(Make copies of this form as necessary and attach a separate Disclosure Form A for each individual meeting these requirements)**

FOR INDIVIDUAL (type or print information)	
NAME:	_____
ADDRESS	_____
Type of ownership/distributable income share:	
stock _____ sole proprietorship _____ Partnership _____ other: (explain on separate sheet):	
% or \$ value of ownership/distributable income share:	_____

2. Disclosure of Potential Conflicts of Interest. Check "Yes" or "No" to indicate which, if any, of the following potential conflict of interest relationships apply. If the answer to any question is "Yes", please attach additional pages and describe.

(a) State employment, currently or in the previous 3 years, including contractual employment of services. Yes ___ No ___

If your answer is yes, please answer each of the following questions.

1. Are you currently an officer or employee of either the Capitol Development Board or the Illinois State Toll Highway Authority? Yes ___ No ___

2. Are you currently appointed to or employed by any agency of the State of Illinois? If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, provide the name the State agency for which you are employed and your annual salary. _____

RETURN WITH SUBCONTRACT

3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you entitled to receive (i) more than 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor?
Yes ___ No ___

4. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the salary of the Governor?
Yes ___ No ___

(b) State employment of spouse, father, mother, son, or daughter, including contractual employment services in the previous 2 years.

Yes ___ No ___

If your answer is yes, please answer each of the following questions.

1. Is your spouse or any minor children currently an officer or employee of the Capitol Development Board or the Illinois Toll Highway Authority?
Yes ___ No ___

2. Is your spouse or any minor children currently appointed to or employed by any agency of the State of Illinois? If your spouse or minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, provide the name of your spouse and/or minor children, the name of the State agency for which he/she is employed and his/her annual salary. _____

3. If your spouse or any minor children is/are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, as of 7/1/07) are you entitled to receive (i) more then 7 1/2% of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 100% of the annual salary of the Governor?
Yes ___ No ___

4. If your spouse or any minor children are currently appointed to or employed by any agency of the State of Illinois, and his/her annual salary exceeds 60% of the annual salary of the Governor, are you and your spouse or minor children entitled to receive (i) more than 15 % in the aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of two times the annual salary of the Governor?
Yes ___ No ___

(c) Elective status; the holding of elective office of the State of Illinois, the government of the United States, any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois currently or in the previous 3 years.
Yes ___ No ___

(d) Relationship to anyone holding elective office currently or in the previous 2 years; spouse, father, mother, son, or daughter.
Yes ___ No ___

(e) Appointive office; the holding of any appointive government office of the State of Illinois, the United States of America, or any unit of local government authorized by the Constitution of the State of Illinois or the statutes of the State of Illinois, which office entitles the holder to compensation in excess of the expenses incurred in the discharge of that office currently or in the previous 3 years.
Yes ___ No ___

(f) Relationship to anyone holding appointive office currently or in the previous 2 years; spouse, father, mother, son, or daughter.
Yes ___ No ___

(g) Employment, currently or in the previous 3 years, as or by any registered lobbyist of the State government.
Yes ___ No ___

RETURN WITH SUBCONTRACT

(h) Relationship to anyone who is or was a registered lobbyist in the previous 2 years; spouse, father, mother, son, or daughter. Yes ___ No ___

(i) Compensated employment, currently or in the previous 3 years, by any registered election or reelection committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes ___ No ___

(j) Relationship to anyone; spouse, father, mother, son, or daughter; who was a compensated employee in the last 2 years by any registered election or re-election committee registered with the Secretary of State or any county clerk of the State of Illinois, or any political action committee registered with either the Secretary of State or the Federal Board of Elections. Yes ___ No ___

3 Communication Disclosure.

Disclose the name and address of each lobbyist and other agent of the bidder or offeror who is not identified in Section 2 of this form, who is has communicated, is communicating, or may communicate with any State officer or employee concerning the bid or offer. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the process and throughout the term of the contract. If no person is identified, enter "None" on the line below:

Name and address of person(s): _____

RETURN WITH SUBCONTRACT

4. Debarment Disclosure. For each of the persons identified under Sections 2 and 3 of this form, disclose whether any of the following has occurred within the previous 10 years: debarment from contracting with any governmental entity; professional licensure discipline; bankruptcies; adverse civil judgments and administrative findings; and criminal felony convictions. This disclosure is a continuing obligation and must be promptly supplemented for accuracy throughout the procurement process and term of the contract. If no person is identified, enter "None" on the line below:

Name of person(s): _____

Nature of disclosure: _____

APPLICABLE STATEMENT

This Disclosure Form A is submitted on behalf of the INDIVIDUAL named on previous page. Under penalty of perjury, I certify the contents of this disclosure to be true and accurate to the best of my knowledge.

Completed by: _____ Date _____
Signature of Individual or Authorized Officer

NOT APPLICABLE STATEMENT

Under penalty of perjury, I have determined that no individuals associated with this organization meet the criteria that would require the completion of this Form A.

This Disclosure Form A is submitted on behalf of the SUBCONTRACTOR listed on the previous page.

_____ Date _____
Signature of Authorized Officer

RETURN WITH SUBCONTRACT

ILLINOIS DEPARTMENT OF TRANSPORTATION

Form B
Subcontractor: Other Contracts & Financial Related Information Disclosure

Form with fields: Subcontractor Name, Legal Address, City, State, Zip, Telephone Number, Email Address, Fax Number (if available)

Disclosure of the information contained in this Form is required by the Section 50-35 of the Code (30 ILCS 500). This information shall become part of the publicly available contract file. This Form B must be completed for subcontracts with a total value of \$50,000 or more, from subcontractors identified in Section 20-120 of the Code, and for all open-ended contracts.

DISCLOSURE OF OTHER CONTRACTS, SUBCONTRACTS, AND PROCUREMENT RELATED INFORMATION

1. Identifying Other Contracts & Procurement Related Information. The SUBCONTRACTOR shall identify whether it has any pending contracts, subcontracts, including leases, bids, proposals, or other ongoing procurement relationship with any other State of Illinois agency: Yes ___ No ___

If "No" is checked, the subcontractor only needs to complete the signature box on the bottom of this page.

2. If "Yes" is checked. Identify each such relationship by showing State of Illinois agency name and other descriptive information such as bid or project number (attach additional pages as necessary). SEE DISCLOSURE FORM INSTRUCTIONS:

THE FOLLOWING STATEMENT MUST BE CHECKED

Signature box with fields: Signature of Authorized Representative, Date

OWNERSHIP CERTIFICATION

Please certify that the following statement is true if the individuals for all submitted Form A disclosures do not total 100% of ownership

Any remaining ownership interest is held by individuals receiving less than \$106,447.20 of the bidding entity's or parent entity's distributive income or holding less than a 5% ownership interest.

Yes No N/A (Form A disclosure(s) established 100% ownership)



NOTICE TO BIDDERS

- 1. TIME AND PLACE OF OPENING BIDS.** Sealed proposals for the improvement described herein will be received by the Department of Transportation at the Harry R. Hanley Building, 2300 South Dirksen Parkway, in Springfield, Illinois until 10:00 o'clock a.m., June 14, 2013. All bids will be gathered, sorted, publicly opened and read in the auditorium at the Department of Transportation's Harry R. Hanley Building shortly after the 10:00 a.m. cut off time.
- 2. DESCRIPTION OF WORK.** The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

**Contract No. 60I31
DUPAGE County
Section (112&113)WRS-5
Route FAP 338
District 1 Construction Funds**

Roadway and interchange reconstruction consisting of construction of retaining walls, bridge replacement, lighting, surveillance, and other related work on IL 59 from 370 ft. north of Diehl Rd to Ferry Road in Naperville (SN 022-2029SB and 022-02030NB).

- 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

Ann L. Schneider,
Secretary

INDEX
 FOR
 SUPPLEMENTAL SPECIFICATIONS
 AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2013

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 1-1-12) (Revised 1-1-13)

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

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STATE OF ILLINOIS **SPECIAL PROVISIONS**

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," adopted January 1, 2012 the "Illinois Tollway Supplemental Specifications", issued February 7, 2012, the latest edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways" in effect on the date of invitation for bids; the "Manual of Test Procedures for Materials" in effect on the date of invitation for bids; and the "Supplemental Specifications and Recurring Special Provisions" indicated on the Check Sheet included herein which apply to and govern the construction of FAP Route 338 (IL Route 59), Section (112 & 113) WRS-5, in DuPage County, Contract 60I31, and in case of conflict with any part of parts of said specifications, the said Special Provisions shall take precedence and shall govern.

FAP Route 338 (IL Route 59)
Diehl Rd. To Ferry Rd.
Section (112 & 113) WRS-5
DuPage County
Contract 60I31

LOCATION OF IMPROVEMENT

IL Route 59, from approximately 380 feet north of Diehl Road to approximately 310 feet south of Ferry Road within the corporate limits of the city of Naperville in DuPage County, Illinois. The improvement also includes the entrance and exit ramps along Interstate 88 to IL 59. The improvement covers a distance of 3,500 feet (0.66 miles) along IL Route 59.

DESCRIPTION OF IMPROVEMENT

The improvement consists of roadway reconstruction, widening, and resurfacing of IL Route 59 as well as the complete reconfiguration of the existing traditional diamond interchange into a proposed Diverging Diamond Interchange. IL 59 over I-88 shall be two independent bridge structures consisting of two spans each and a total length of 253' each. The two structures are separated by 44' of open space median. Five retaining walls are located at the interchange. The improvement includes the installation of proposed storm sewer, pipe culverts, traffic signals, sidewalk, multi-use path and collateral work necessary to complete the project as shown in the plans and described herein.

COORDINATION WITH ADJACENT AND/OR OVERLAPPING CONTRACTS

This contract overlaps with other concurrent and future contracts as listed below. The Contractor shall cooperate with the other contractors in the phasing and performance of his work so as not to delay, interrupt or hinder the progress or completion of work being performed by the other contractors.

No additional compensation will be allowed this Contractor for compliance with the above requirements, nor for any delays or inconvenience resulting from the activities of the other contractors.

1. Contract 60P41 – Pump Station 47 Replacement
2. Contract 60P42 – Retaining Walls
3. Contract 60R30 – Roadway Reconstruction, IL Route 59 from New York St./Aurora Ave. to North Aurora Rd.
4. Contract 60R31 – Roadway Reconstruction, IL Route 59 from North Aurora Rd. to Diehl Rd.

COORDINATION OF THE CONTRACT DOCUMENTS

Coordination of contract documents shall be in accordance with Article 105.05. The Illinois Tollway Supplemental Specifications to the Illinois Department of Transportation Standard Specification for Road and Bridge Construction will be applicable as the supplemental specification designated in Article 105.05 for all items of work within the Tollway jurisdictional limits.

The Illinois State Toll Highway Authority shall have the same coverage and rights as the Department as described in Sections 107.26 and 107.27 of the Standard Specifications.

The Tollway and its officers, agents, directors, and employees shall be listed as additional insured parties in the general liability insurance and the Tollway shall be added as an additional protected party on all performance bonds required by the Contractor. The insurance shall be maintained throughout construction of the project.

PROGRESS SCHEDULE

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

In the event the Contractor falls more than three (3) calendar days behind the approved progress schedule, the Contractor shall be required to work seven (7) days a week at extended hours in order to meet the specified Completion Date.

The Contractor will not be allowed any extra compensation for working longer hours or using extra shifts; and working on weekends or during holidays; working during winter months, etc., to meet the specified Completion Date.

MAINTENANCE OF ROADWAYS

Effective: September 30, 1985

Revised: November 1, 1996

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

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

STATUS OF UTILITIES TO BE ADJUSTED

Utility companies involved in this project have provided the following estimated dates:

Name Of Utility	Type	Location	<u>Estimated Duration of relocation times</u>
AboveNet/ Zayo	Fiber Optic	STA 4045+00, 43 RT to 4055+56, 108 RT STA 4057+00, 132 RT to 4066+75, 78 RT	60-90 working days
AT&T	Fiber Optic	STA 4045+00, 53 LT to 4051+50, 122 LT STA 4063+80, 140 LT to 4067+5, 82 LT STA 4059+13, 97 LT to 4059+47 120 RT	90 working days
G4S	Fiber Optic	STA 4051+53 to 4064+12	30 working days
Commonwealth Edison	Electric	STA 4048+90, 76 RT to 4077+75, 62 RT STA 4071+53, 54 LT to 4071+53 75, RT	40 working days
KDL/ Windstream	Fiber Optic	STA 4051+09, 94 RT to STA 4059+47 121 RT	Work to be included with Above Net/ Zayo
NICOR	Gas	STA 4045+00, 57 RT to 4069+00, 72 RT STA 4063+70, 190 RT to 4064+05, 106 RT STA 4059+74, 80 LT to 4059+97, 108 RT (See Notes 1 and 2) STA 4060+11, 66 LT to 4063+63, 114 RT STA 4060+28, 64 LT to 4060+55, 114 RT	60 working days
Verizon/MCI	Fiber Optic	STA 4045+00, 49 RT to 4055+43, 118 RT STA 4056+85, 117 RT to 4072+19, 34 RT	40-50 working days

The above represents the best information available to the Department and is included for the convenience of the bidder. The applicable portions of Articles 105.07 and 107.31 of the Standard Specifications shall apply.

Note 1 – The Contractor shall contact Nicor’s Asset Protection Supervisor at 815-272-2587 or 630-385-3147 not less than 72 hours in advance of the estimated start of the construction in the vicinity of the existing and/or future 36” transmission pipeline to discuss protection procedures and to arrange for on-site inspection services. At that time, the contractor shall be prepared to discuss his proposed construction methods and his proposed staging of the work, including but limited to storage of materials, marshalling of equipment and construction time line.

Note 2 – The Department will contact Nicor and request Nicor to expose the existing and/or future 36” transmission pipeline within the limits of the Contractor’s proposed work area.

In accordance with 605 ILCS 5/9-113 of the Illinois Compiled Statutes, utility companies have 90 days to complete the relocate their facilities after receipt of written notice from the Department. The 90-day written notice will be sent to the utility companies after the following occurs:

- 1.) Proposed right of way is clear for award.
- 2.) Final plans have been sent to the utility companies.
- 3.) Utility permit is received by the Department and the Department is ready to issue said permit.
- 4.) If the permit has not been submitted, a 15 day letter is sent to the utility company notifying them they have 15 days to provide their permit application. After allowing 15 days for submission of the permit the 90 day notice is sent to the utility company. Any time within the 90 day relocation period the utility company may request a waiver for additional time to complete their relocation.

Utility Company Contacts:

Com Ed – Contact: David Schacht- Tel: 630 437 2129
AT & T - Contact: Hector Garcia – Tel: 630 573 5465
Nicor Gas – Contact: Constance Lane – Tel: 630 388-3830
Windstream - Contact: Jim Kostuch-Tel: 262 792 7938
City of Naperville Electric - Contact: Larry Slate -Tel: 630 420 6192
Above Net/ Zayo – Contact: Tim Payment – Tel: 630 203 8003
G4S – Contact: Lou Urildil – Tel: 815 378 4755, Chance Eiker – Tel: 815 378 1851
MCI – Contact: Marino Fernandez – Tel: 312-612-5216

EXISTING UTILITIES

The Contractor shall familiarize himself with the locations of all utilities and structures that may be found in the vicinity of the construction. The Contractor shall conduct his operations to avoid damage to the above-mentioned utilities and structures. Should any damage occur due to the Contractor’s negligence, repairs shall be made by the Contractor at his expense in a manner acceptable to the Engineer.

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

The Contract is hereby advised that driven retention systems will not be allowed within 15 feet of the existing and/or future 36" gas pipeline located on the north side of Interstate 88 from STA 4059+74, 80 LT to 4059+97, 108 RT. See Status Of Existing Utilities To Be Adjusted special provision and structural plans for additional information.

TOLLWAY PERMIT AND BOND

The Contractor will be required to obtain a permit from the Illinois State Toll Highway Authority (Tollway) in accordance with Article 107.04 of the Standard Specifications prior to initiating any lane closures on the Tollway or doing any work on the Tollway right of way. As part of the permit, the Contractor will be required to post a surety bond with the Tollway.

To perform work under, over, or on the Tollway, the Contractor shall submit in writing to the Tollway requesting a Construction Permit to:

The Illinois State Toll Highway Authority
Permit/Utility Sections
2700 Ogden Avenue
Downers Grove, IL 60515

The Contractor will furnish a copy of the authorized permit to the Engineer.

COMPLETION DATE PLUS WORKING DAYS

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

"When a completion date plus working days is specified, the Contractor shall complete all contract items and safely open all roadways to traffic by 11:59 PM on, September 30, 2015 except as specified herein.

The Contractor will be allowed to complete all clean-up work and punch list items within 10 working days after the completion date for opening the roadway to traffic. Under extenuating circumstances the Engineer may direct that certain items of work, not affecting the safe opening of the roadway to traffic, may be completed within the working days allowed for cleanup work and punch list items. Temporary lane closures for this work may be allowed at the discretion of the Engineer.

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

RESTRICTION ON WORKING DAYS AFTER A COMPLETION DATE

Effective: January 21, 2003

Revised: January 1, 2007

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

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

Failure to Open Traffic Lanes to Traffic: Should the Contractor fail to completely open and keep open all the traffic lanes to traffic in accordance with the limitations specified above, the Contractor shall be liable and shall pay to the Department the amount of \$250 per lane blocked, not as a penalty but as liquidated and ascertained damages, for each and every 15 minute interval or a portion thereof that a lane is blocked outside the allowable time limitations. The

Department may deduct such damages from any monies due the Contractor. These damages shall apply during the period governed by working days after a completion date and any extensions of that contract time.

FAILURE TO OPEN INTERCHANGE RAMPS “B” AND “D” TO TRAFFIC

Closure of Ramp B (I-88 westbound exit ramp at IL Route 59) and Ramp D (eastbound exit ramp at IL Route 59) will be allowed during Stage 3C for the completion of the installation, testing and turn-on of the proposed traffic signals and all work required for the completion of Stage 3C including but not limited to the installation of traffic signal poles and foundations, conduit and wire, signal heads, traffic signal controller equipment, overhead sign structures, guardrail, concrete curb and gutter and pavement required for the completion of Stage 3C. The duration of the closure of Ramps “B” and “D” shall be limited to a maximum of 9.3 calendar days. Ramps “B” and “D” closure to traffic shall commence on a Friday at 8:00 pm and end after two consecutive weekends on the following Monday at 5 am (9.3 calendar days later) or sooner. Prior to the closure of Ramps “B” and “D”, the Contractor shall obtain written from the Engineer and IDOT District One Bureau of Traffic Operations, Illinois Tollway, DuPage County Traffic Division and the City of Aurora. Should the Contractor fail to complete the work and open both Ramps “B” and “D” as specified above, the Contractor shall be liable to the Department in the amount of \$10,000, not as a penalty but as liquidated damages, for each calendar day of overrun of this requirement. In addition to the liquidated damage specified above, the Contractor will be required to keep all traffic control equipment and devices for Stage 3C and for the signed detour routes as shown in the plans in place, fully operational and maintained and will be required to supply, install and maintain any additional traffic control equipment and/or devices as directed by the Engineer until Ramps “B” and “D” are reopened to traffic as specified above. This work shall be at the Contractor’s own expense with no additional compensation for meeting the requirements for the extended duration of the Ramp “B” and “D” closures.

The Contractor shall provide written certification from the traffic signal controller manufacturer which states that the proposed traffic signal controller equipment to be installed under this Contract has been tested in the manufacturer's factory and is completely functional to the Engineer a minimum of twenty one (21) calendar days prior to the closure of Ramp "B" and "D". The Contractor shall also provide a detailed daily work schedule for the completion of the Stage 3C work to the Engineer a minimum of twenty one (21) calendar days prior to the closure of Ramp "B" and "D".

The Contractor shall have all the proposed traffic signal equipment installed, operational and available for testing, by IDOT District One Bureau of Traffic Operations personnel by 5 am on the Thursday prior to the Monday reopening date of Ramps "B" and "D". Should the Contractor fail to have the all the proposed traffic signal equipment installed, operational and available for testing and turn-on and other work as specified above, the Contractor shall be liable to the Department in the amount of \$10,000, not as a penalty but as liquidated damages, for each calendar day of overrun of this requirement.

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

A calendar day shall be defined as every day or any portion thereof shown on the calendar and shall start at 5 am and end at the following day at 5 am, twenty-four hours later.

PUBLIC CONVENIENCE AND SAFETY (DIST 1)

Effective: May 1, 2012

Revised: July 15, 2012

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

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

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

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

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

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

KEEPING ARTERIAL ROADWAYS OPEN TO TRAFFIC

Effective: January 22, 2003

Revised: January 1, 2007

The Contractor shall provide the necessary traffic control devices to warn the public and to delineate the work zone as required in these Special Provisions, the Standard Specifications, and the State Standards.

Daily arterial lane closures shall be in accordance with the Standard Specifications, Highway Standards and the direction of the Engineer. The Contractor shall request and gain approval from the Illinois Department of Transportation's Arterial Traffic Control Supervisor at (847-705-4470) seventy-two (72) hours in advance of all long term (24 hrs. or longer) lane closures.

Arterial lane closures will only be permitted during the **off-peak** traffic volume hours. **Peak traffic volume hours are defined as weekdays (Monday through Friday) from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM.**

Full closure of any arterial lanes will only be permitted for a maximum period of 15 minutes during the off-peak traffic volume hours. During full roadway closures, the Contractor will be required to reduce the roadway to only one open traffic lane in the affected direction of travel using the appropriate State Standard. Police forces shall be notified and requested to close the remaining lane to facilitate the necessary work activities. The Contractor shall notify the District One Arterial Traffic Control Supervisor at (847) 705-4470 seventy-two (72) hours in advance of the proposed road closure.

Private vehicles shall not be parked in the work zone. Contractor's equipment and/or vehicles shall not be parked on the shoulders or in the median during non-working hours. The parking of equipment and/or vehicles on State right-of-way will only be permitted at locations approved by the Engineer.

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

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

STANDARDS:

701101	Off-Road Operations, Multilane, 15' to 24" from Pavement Edge
701106	Off-Road Operations, Multilane, more than 15' from Pavement Edge
701426	Lane Closure, Multilane, Intermittent or Moving Operations for Speeds \geq 45 MPH
701427	Lane Closure, Multilane, Intermittent or Moving Operations for Speeds \leq 40 MPH
701456	Partial Exit Ramp Closure Freeway / Expressway
701601	Urban Lane Closure, Multilane, 1W or 2W with Nontraversable Median
701606	Urban Lane Closure, Multilane, 2W with Mountable Median
701701	Urban Lane Closure, Multilane Intersection
701901	Traffic Control Devices
704001	Temporary Concrete Barrier

DETAILS:

TC10	Traffic Control & Protection for Side Roads, Intersections & Driveways
TC11	Typical Applications Raised Reflective Pavement Markers (Snow-Plow Resistant)
TC13	District One Typical Pavement Markings
TC14	Traffic Control and Protection at Turn Bays (To Remain Open to Traffic)
TC16	Pavement Marking Letters and Symbols for Traffic Staging
TC18	Signing for Flagging Operations at Work Zone Openings
TC21	Detour Signing for Closing State Highways
TC22	Arterial Road Information Sign
TC26	Driveway Entrance Signing

SPECIAL PROVISIONS:

Maintenance of Roadways
Tollway Permit and Bond
Restriction on Working Days After A Completion Date
Failure to Open Interchange Ramps "B" And "D" To Traffic
Public Convenience and Safety (District 1)
Keeping Arterial Roadways Open To Traffic
Traffic Control Plan
Traffic Control and Protection (Arterials)
Traffic Control Surveillance (Expressways)
Temporary Information Signing
Speed Indicator Sign
Removal of Existing Structures
Partial-Depth Deck Slab Repair
Shoulder Rumble Strip Removal
Temporary Raised Reflective Pavement Marker
Permanent Pavement Marking
Thermoplastic Pavement Marking – Line 5"
Combination Concrete Curb and Gutter, Type B-6.12 (Special)
Portable Video Tower Stations
Optimize Traffic Signal System Special
Temporary Traffic Signal Timing
Keeping the Tollway Open to Traffic

Maintenance of Traffic (Tollway)
Trailer Mounted Full Matrix Portable Changeable Message Sign
Aggregate Surface Course For Temporary Access
Temporary Pavement
Winterized Temporary Access
Type III Temporary Tape For Wet Conditions
Traffic Control Deficiency Deduction (BDE)
Pavement Patching (BDE)
Pavement Marking Removal (BDE)

BDE SPECIAL PROVISIONS:

Pavement Patching
Pavement Marking Removal
Polyurea Pavement Marking
Traffic Control Deficiency Deduction

TOLLWAY STANDARDS:

E1-02 Construction Signs
E2-02 Lane Closure Details
E3-02 Shoulder Closure Details
E4-02 Maintenance of Traffic Reverse Curve
E5-02 Temporary Gore Details

TRAFFIC CONTROL AND PROTECTION (ARTERIALS)

Effective: February 1, 1996

Revised: March 1, 2011

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

When traffic is to be directed over a detour route, the Contractor shall furnish, erect, maintain and 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.

TRAFFIC CONTROL SURVEILLANCE (EXPRESSWAYS)

Effective: 10/25/95

Revised: 1/9/98

The contractor shall provide a person with a vehicle to survey, inspect and maintain all temporary traffic control devices when a lane is closed to traffic and when hazards are present adjacent to or within 10 foot of the edge of pavement for more than 24 hours.

The surveillance person is required to drive through the project, to inspect all temporary traffic control devices, to correct all traffic control deficiencies, if possible, or immediately contact someone else to make corrections and to assist with directing traffic until such corrections are made, at intervals not to exceed 4 hours. This person shall list every inspection on an inspection form, furnished by the Engineer, and shall return a completed form on the first working day after the inspections are made.

The Contractor shall supply a telephone staffed on a 24-hour-a-day basis to receive any notification of any deficiencies regarding traffic control and protection or receive any request for improving, correcting or modifying traffic control, installations or devices, including pavement markings. The Contractor shall dispatch additional men, materials and equipment as necessary to begin to correct, improve or modify the traffic control as directed, within one hour of notification by this surveillance person or by the Department. Upon completion of such corrections and/or revisions, the Contractor shall notify the Department's Communication Center at (847) 705-4612.

Method of Measurement.

Traffic Control Surveillance will be measured on calendar day basis. One calendar day is equal to a minimum of six (6) inspections. The inspections shall start within 4 hours after the lane is closed to traffic or a hazard exists within 10 foot from the edge of pavement and shall end when the lane closure or hazard is removed.

Basis of Payment.

Surveillance will be paid for at the contract unit price per calendar day or fraction thereof for TRAFFIC CONTROL SURVEILLANCE (EXPRESSWAYS). The price shall include all labor and equipment necessary to provide the required inspection and maintenance on the expressway and on all cross streets which are included in the project. The cost of the materials for the maintenance of traffic control devices shall be included in the traffic control pay items.

TEMPORARY INFORMATION SIGNING

Effective: November 13, 1996

Revised: January 2, 2007

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

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

	<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 REQUIREMENTS

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

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

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

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

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

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

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

SPEED INDICATOR SIGN

Description: This work shall consist of furnishing, placing, and maintaining speed indicator measurement and display units. The units shall be trailer mounted. These units will be deployed as shown on the plans or as directed by the Engineer. Construction speed limit signs will still be required at the locations shown on the Standards or at locations as indicated on the plans.

The speed measurement shall be by radar and provide a detection distance of one quarter (1/4) to one half (1/2) mile.

The speed indicator display shall face approaching traffic and shall have a sign legend of "Your Speed" above the speed display, and "MPH" below the speed display. The digital display between the fixed messages shall show two digits (00 to 99). The minimum height of the numerals shall be twelve (12) inches, and the nominal legibility distance shall be at least 750 feet. Whenever the signs are in use, they shall be considered as traffic control devices(s). When they are not required for use, they shall be considered as equipment.

The speed indicator measurement and display functions shall be equipped with a power supply capable of providing 24 hours of uninterrupted service.

The Contractor is required to provide all preventive maintenance effort that is necessary to achieve uninterrupted service. If service is interrupted for any cause and not restored within 24 hours, the engineer shall cause such work to be performed as may be necessary to provide this service. The cost of such work shall be borne by the Contractor or deducted from current or future compensation due the Contractor.

Basis of Payment: The furnishing, placing, and maintenance of speed indicator measurement and display units will be measured per calendar day of service provided. A partial day shall be counted as one calendar day. This work will be paid for at the contract unit price per calendar day for SPEED INDICATOR SIGN.

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES

Revise Article 669.01 of the Standard Specifications to read:

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

Revise Article 669.08 of the Standard Specifications to read:

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

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

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

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

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

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

- (a) Soil Analytical Results Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels exceed the most stringent maximum allowable concentration (MAC) for chemical constituents in uncontaminated soil established pursuant to Subpart F of 35 Illinois Administrative Code 1100.605, the soil shall be managed as follows:
- (1) When analytical results indicate inorganic chemical constituents exceed the most stringent MAC but they are still considered within area background levels by the Engineer, the excavated soil can be utilized within the construction limits as fill, when suitable. Such soil excavated for storm sewers can be placed back into the excavated trench as backfill, when suitable, unless trench backfill is specified. If the soils cannot be utilized within the construction limits, they shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable.
 - (2) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for a Metropolitan Statistical Area (MSA) County, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an uncontaminated soil fill operation within an MSA County provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (3) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, or the MAC within the Chicago corporate limits, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an uncontaminated soil fill operation within an MSA County excluding Chicago or within the Chicago corporate limits provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (4) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, the excavated soil can be utilized within the construction limits as fill, when suitable, or managed and disposed of off-site as "uncontaminated soil" at a CCDD facility or an uncontaminated soil fill operation within an MSA County excluding Chicago provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (5) When the Engineer determines soil cannot be managed according to Articles 669.09(a)(1) through (a)(4) above, the soil shall be managed and disposed of off-site as a non-special waste, special waste, or hazardous waste as applicable.
- (b) Soil Analytical Results Do Not Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels do not exceed the most stringent MAC but the pH of the soil is less than 6.25 or greater than 9.0, the excavated soil can be utilized within the construction limits or managed and disposed of off-site as "uncontaminated soil" according to Article 202.03. However the excavated soil cannot be taken to a CCDD facility or an uncontaminated soil fill operation.

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

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

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

Revise Article 669.14 of the Standard Specifications to read:

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

- (a) Measures taken to identify, monitor, handle, and dispose of soil or groundwater containing regulated substances, to prevent further migration of regulated substances, and to protect workers,
- (b) Cost of identifying, monitoring, handling, and disposing of soil or groundwater containing regulated substances, the cost of preventing further migration of regulated substances, and the cost for worker protection from the regulated substances. All cost should be in the format of the contract pay items listed in the contract plans (identified by the preliminary environmental site investigation (PESA) site number),
- (c) Plan sheets showing the areas containing the regulated substances,
- (d) Field sampling and testing results used to identify the nature and extent of the regulated substances,
- (e) Waste manifests (identified by the preliminary environmental site investigation (PESA) site number) for special or hazardous waste disposal, and

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

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

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

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

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

All contaminated materials shall be managed as either “uncontaminated soil” or non-special waste. This work shall include monitoring and potential sampling, analytical testing, and management of a material contaminated by regulated substances. The Environmental Firm shall continuously monitor all soil excavation for worker protection and soil contamination.

Phase I Preliminary Engineering information is available through the District’s Environmental Studies Unit. Soil samples or analysis without the approval of the Engineer will be at no additional cost to the Department. The lateral distance is measured from centerline and the farthest distance is the offset distance or construction limit whichever is less.

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

- Station 4075+50 to Station 4077+50 0 to 80 feet RT (Amata Office Center, 2135 Citygate Lane, Site 1496V2-11). This material meets the criteria of Article 669.09(a)(1) and shall be managed in accordance to Article 669.09. Contaminants of concern sampling parameters: Manganese.

ENGINEER'S FIELD OFFICE TYPE A (SPECIAL)

Description. This item shall consist of furnishing and maintaining in good condition for the exclusive use of the Engineer a weatherproof building hereinafter described for the purpose of a field office.

The engineer's field office for IDOT Contract 60P41 shall be utilized for this Contract until the March 30, 2014, which is the scheduled completion date for IDOT Contract 60P41. On April 1, 2014 or a maximum of thirty calendar days prior to April 1, 2014, the Contractor shall assume the role of Primary Lessee and Tenant through reassignment of the Office Lease Agreement entered into by the IDOT Contract 60P41 contractor.

The location of the IDOT Contract 60P41 field office is 1701 Quincy Avenue, Suites 29 and 31, Naperville, IL 60540.

The Contractor shall assume in their entirety the existing Office Lease Agreements between Landlord and Tenant on behalf of the Engineer, and fulfill all obligations and perform all duties stated therein as Primary Lessee and Tenant of the subject office spaces. Any and all keys provided to the Contractor upon assumption of the Lease Agreement shall immediately be turned over to the Engineer.

670.02 Engineer's Field Office Type A. Revise the first paragraph of this Article to read:

Engineer's Field Office Type A (Special). Type A (Special) field offices shall have a ceiling height of not less than 2 m (7 ft.) and a floor space of not less than 4000 sq. ft. with a minimum of three separate offices. The office shall also have a separate storage room capable of being locked for the storage of the nuclear measuring devices. The office shall be provided with sufficient heat, natural and artificial light, and air conditioning. Doors and windows shall be equipped with locks approved by the Engineer.

Revise the first sentence of the second paragraph of this Article to read:

The office shall have an electronic security system that will respond to any breach of exterior doors and windows with an on-site alarm shall be provided.

Revise the second sentence of the third paragraph of this Article to read:

Adequate all-weather parking space shall be available to accommodate a minimum of 25 vehicles.

Add the following to the fourth paragraph of this Article:

A weekly cleaning service for the office shall be provided.

Revise the second sentence of the fifth paragraph of this Article to read:

Provide solid waste disposal, consisting of twenty waste baskets and an outside trash container of sufficient size, to accommodate a weekly provided pick-up service.

Revise subparagraph (a) of this Article to read:

- (a) Twenty four (24) desks with minimum working surface (60 in. x 30 in.) each and twenty four (24) non-folding chairs with upholstered seats and backs.

Revise subparagraph (b) of this Article to read:

- (b) Two desks with minimum working surface 1.1m x 750mm (42 in. x 30 in) each with height adjustment of 23 in. to 30 in. for computer use.

Revise the first sentence of subparagraph (c) of this Article to read:

- (c) Two four-post drafting table with minimum top size of 950 mm x 1.2 m (37 ½ in. x 48 in.) with adjustable height drafting stools.

Revise subparagraph (d) of this Article to read:

- (d) Twelve (12) free standing four drawer file cabinets with lock and twelve (12) underwriters' laboratories insulated file devices with 350 degrees one hour rating.

Revise subparagraph (e) of this Article to read:

- (e) Ten folding tables (8 foot) and Twenty four (24) folding chairs.

Revise subparagraph (f) of this Article to read:

- (f) Two equipment cabinets of minimum inside dimension of 44 in. high x 24 in. wide x 30 in. deep with lock. The walls shall be of steel with a 3/32 in. minimum thickness with concealed hinges and enclosed lock constructed in such a manner as to prevent entry by force. The cabinet assembly shall be permanently attached to a structural element of the field office in a manner to prevent theft of the entire cabinet.

Revise subparagraph (g) of this Article to read:

- (g) Two refrigerators with a minimum size of 16 cu. Ft. with a freezer unit.

Revise subparagraph (h) of this Article to read:

- (h) Two electric desk type tape printing calculator and two pocket scientific notation calculators with a 1000 hour battery life or with a portable recharger.

Revise subparagraph (i) of this Article to read:

- (1) Internet Connection. An internet service connection using telephone DSL, cable broadband, or CDMA wireless technology. Additionally, an 802.11b/N wireless router shall be provided, which will allow connection by the Engineer and up to four Department staff.

(2) Six telephone lines including one line for the fax machine, and two lines for the exclusive use of the Engineer.

Revise subparagraph (j) of this Article to read:

(j) 1 dry process copy machine capable of reproducing prints up to 280 mm x 430 mm (11 in. x 17 in.) from nontransparent master sheets, as black or blue lines on white paper, including maintenance, reproduction paper, activating agent and power source.

Revise subparagraph (k) of this Article to read:

(k) One plain paper fax machine including maintenance and supplies.

Revise subparagraph (l) of this Article to read:

(l) Six telephones, with touch tone, where available, two digital telephone answering machines.

Add the following subparagraphs to this Article:

(s) Four (4) 1.2m x 1.8m (4 ft. x 6 ft.) chalkboard or dry erase board.

(t) One office type conference table with a minimum size of 5 foot x 16 foot (or approved equivalent)

(u) Three plan racks capable of holding multiple sets of full size plans.

(v) A color scanner capable of scanning 11 x 17 plan sheets and producing PDF files for electronic transfer/submittal.

670.07 Basis of Payment. Revise the fourth sentence of the first paragraph of this Article to read:

The building or buildings fully equipped, will be paid for at the contract unit price per calendar month or fraction thereof for ENGINEER'S FIELD OFFICE, TYPE A (SPECIAL).

REMOVAL OF EXISTING STRUCTURES

Description. This work consists of furnishing all labor, tools, equipment and materials necessary for the removal of the existing concrete median in Pre-Stage 1 and the complete removal of the existing bridge structure, referred to as SN 022-9900, carrying FAP Route 338 (IL 59) over I-88 in Stage 3. The existing bridge structure is located at Sta. 4058+30.47. This work shall be performed in accordance with Section 501 of the Standard Specifications, the details shown on plans, as specified herein and as directed by the Engineer.

Add the following to Article 501.05 of the Standard Specifications:

“501.05 (e) Concrete Median, Complete Removal. Concrete median removal may be performed by chipping with power driven hand tools or by hydro-scarification equipment. Sufficient cutting passes shall be made so that all irregularities or high spots are eliminated to provide a suitable driving surface to the satisfaction of the Engineer. Any projecting bars shall be cut off flush with the surface of the concrete to the satisfaction of the Engineer.

The equipment used shall be subject to the approval of the Engineer and shall meet the following requirements:

- (1) Sawing Equipment. Sawing equipment shall be a concrete saw capable of sawing concrete to the specified depth.
- (2) Power-Driven Hand Tools. Power-driven hand tools will be permitted including jackhammers lighter than the nominal 45 lb. class. Chipping hammers heavier than a nominal 15 lb. class shall not be used for removal within 1 ft of existing beams, girders or other supporting structural members that are to remain in service. Jackhammers or chipping hammers shall not be operated at an angle in excess of 45 degrees measured from the surface of the slab.
- (3) Hydro-Demolition Equipment. The hydro-demolition equipment shall consist of filtering and pumping units operating with a remote-controlled robotic device. The equipment shall use water according to Section 1002.”

Add the following to Article 501.07 of the Standard Specifications:

“Removal of existing concrete median will not be paid for separately, but will be included in the contract unit price for REMOVAL OF EXISTING STRUCTURES.”

PARTIAL-DEPTH DECK SLAB REPAIR

When directed by the Engineer, partial-depth deck slab repairs shall be performed by the Contractor during Pre-Stage 1 to provide a smooth riding surface after the concrete median removal on the existing bridge is completed. This work shall consist of hot-mix asphalt surface removal, when required, the removal and disposal of all loose and deteriorated concrete from bridge deck and the replacement with new concrete flush with the existing wearing surface. The work shall be done according to the applicable requirements of Sections 501, 503 and 1020 of the Standard Specifications and this Special Provision.

Partial-depth deck slab repairs shall consist of removing the loose and unsound deck concrete, disposing of the concrete removed and replacing with new concrete. The removal may be performed by chipping with power driven hand tools or by hydro-scarification equipment. The depth shall be measured from the top of the concrete deck surface, at least 3/4 in. but not more than 1/2 the concrete deck thickness.

Materials.

Materials shall be according to Article 1020.02.

Portland cement concrete for partial and full-depth repairs shall be according to Section 1020. Class PP-1, PP-2, PP-3, PP-4, PP-5 or BS concrete shall be used at the Contractor's option unless noted otherwise on the contract plans. For Class BS concrete, a CA 13, 14, or 16 shall be used.

Equipment:

The equipment used shall be subject to the approval of the Engineer and shall meet the following requirements:

- (a) Surface Preparation Equipment. Surface preparation and concrete removal equipment shall be according to the applicable portions of Section 1100 and the following:
 - (1) Sawing Equipment. Sawing equipment shall be a concrete saw capable of sawing concrete to the specified depth.
 - (2) Blast Cleaning Equipment. The blast cleaning may be performed by wet sandblasting, high-pressure waterblasting, shotblasting or abrasive blasting. Blast cleaning equipment shall be capable of removing rust and old concrete from exposed reinforcement bars, and shall have oil traps.
 - (3) Power-Driven Hand Tools. Power-driven hand tools will be permitted including jackhammers lighter than the nominal 45 lb. class. Chipping hammers heavier than a nominal 15 lb. class shall not be used for removing concrete from below any reinforcing bar for partial depth repairs, or for removal within 1 ft. of existing beams, girders or other supporting structural members that are to remain in service or within 1 ft. of the boundaries of full-depth repairs. Jackhammers or chipping hammers shall not be operated at an angle in excess of 45 degrees measured from the surface of the slab.
 - (4) Hydraulic Impact Equipment. Hydraulic impact equipment with a maximum rated striking energy of 360 ft-lbs may be permitted only in areas of full depth removal more than 1 ft. away from existing beams, girders or other supporting structural members that are to remain in service or more than 1 ft. from the boundaries of full-depth repairs.
 - (5) Hydro-Demolition Equipment. The hydro-demolition equipment shall consist of filtering and pumping units operating with a remote-controlled robotic device. The equipment shall use water according to Section 1002. The equipment shall be capable of being controlled to remove only unsound concrete.
- (b) Concrete Equipment: Equipment for proportioning and mixing the concrete shall be according to Article 1020.03.

- (c) Finishing Equipment: Finishing equipment shall be according to Article 1103.17. Adequate hand tools will be permitted for placing and consolidating concrete in the patch areas and for finishing small patches.

Construction Requirements: Sidewalks, curbs, drains, reinforcement and/or existing transverse and longitudinal joints which are to remain in place shall be protected from damage during removal and cleaning operations.

The Contractor shall control the runoff water generated by the various construction activities in such a manner as to minimize, to the maximum extent practicable, the discharge of untreated effluent into adjacent waters, and shall properly dispose of the solids generated according to Article 202.03. The Contractor shall submit a water management plan to the Engineer specifying the control measures to be used. The control measures shall be in place prior to the start of runoff water generating activities. Runoff water shall not be allowed to constitute a hazard to adjacent or underlying roadways, waterways, drainage areas or railroads nor be allowed to erode existing slopes.

- (a) Hot-Mix Asphalt Surface Removal.

The hot-mix asphalt surface course and all waterproofing membrane shall be removed and disposed of according to applicable portions of Articles 440.04 and 440.06, except milling equipment will not be allowed if the deck is to receive a waterproofing membrane system. If the overlay or waterproofing membrane contains asbestos fibers, removal shall be in accordance with the Special Provision for "Asbestos Waterproofing Membrane or Asbestos Hot-mix Asphalt Surface Removal". Removal of the hot-mix asphalt surface by the use of radiant or direct heat will not be permitted.

- (b) Surface Preparation:

All loose, disintegrated and unsound concrete shall be removed from portions of the deck slab shown on the plans or as designated by the Engineer. The Engineer will determine the limits of removal as the work progresses.

The Contractor shall take care not to damage reinforcement bars or expansion joints which are to remain in place. Any damage to reinforcement bars or expansion joints shall be corrected at the Contractor's expense. All loose reinforcement bars, as determined by the Engineer, shall be retied at the Contractor's expense.

- (1) Areas to be repaired will be determined and marked by the Engineer. A concrete saw shall be used to provide vertical edges approximately 3/4 in. deep around the perimeter of the area to be patched when a concrete overlay is not specified. Where high steel is present, the depth may be reduced as directed by the Engineer. A saw cut will not be required on those boundaries along the face of the curb, parapet or joint or when sharp vertical edges are provided by hydro-demolition.

The loose and unsound concrete shall be removed by chipping, with power driven hand tools or by hydro-demolition equipment. All exposed reinforcing bars and newly exposed concrete shall be thoroughly blast cleaned. Where, in the judgment of the Engineer, the bond between existing concrete and reinforcement steel within the patch area has been destroyed, the concrete adjacent to the bar shall be removed to a depth that will permit new concrete to bond to the entire periphery of the exposed bar. A minimum of 1 in. clearance will be required. The Engineer may require enlarging a designated removal area should inspection indicate deterioration beyond the limits previously designated. In this event, a new saw cut shall be made around the extended area before additional removal is begun. The removal area shall not be enlarged solely to correct debonded reinforcement or deficient lap lengths.

- (2) Reinforcement Treatment. Care shall be exercised during concrete removal to protect the reinforcement bars and structural steel from damage. Any damage to the reinforcement bars or structural steel to remain in place shall be repaired or replaced. All existing reinforcement bars shall remain in place except as herein provided for corroded bars. Tying of loose bars will be required. Reinforcing bars which have been cut or have lost 25 percent or more of their original cross sectional area shall be supplemented by new in kind reinforcement bars. New bars shall be lapped a minimum of 32 bar diameters to existing bars. An approved mechanical bar splice capable of developing in tension at least 125 percent of the yield strength of the existing bar shall be used when it is not feasible to provide the minimum bar lap. No welding of bars will be permitted.
- (3) Cleaning. Immediately after completion of the concrete removal and reinforcement repairs, the repair areas shall be cleaned of dust and debris. Once the initial cleaning is completed, the repair areas shall be thoroughly blast cleaned to a roughened appearance free from all foreign matter. Particular attention shall be given to removal of concrete fines. Any method of cleaning which does not consistently produce satisfactory results shall be discontinued and replaced by an acceptable method. All debris, including water, resulting from the blast cleaning shall be confined and shall be immediately and thoroughly removed from all areas of accumulation. If concrete placement does not follow immediately after the final cleaning, the area shall be carefully protected with well-anchored polyethylene sheeting.

Exposed reinforcement bars shall be free of dirt, detrimental scale, paint, oil, or other foreign substances which may reduce bond with the concrete. A tight non-scaling coating of rust is not considered objectionable. Loose, scaling rust shall be removed by rubbing with burlap, wire brushing, blast cleaning or other methods approved by the Engineer.

(c) Placement & Finishing of Concrete Repair:

(1) Bonding Method. The patch area shall be cleaned to the satisfaction of the Engineer and shall be thoroughly wetted and maintained in a dampened condition with water for at least 12 hours before placement of the concrete. Any excess water shall be removed by compressed air or by vacuuming prior to the beginning of concrete placement. Water shall not be applied to the patch surface within one hour before or at any time during placement of the concrete.

(2) Concrete Placement.

The concrete shall be placed and consolidated according to Article 503.07 and as herein specified. Article 1020.14 shall apply.

When an overlay system is not specified, the patches shall be finished according to Article 503.16 (a), followed by a light brooming.

(d) Curing and Protection.

Concrete patches shall be cured by the Wetted Burlap or Wetted Cotton Mat Method according to Article 1020.13 (a)(3) or Article 1020.13 (a)(5). The curing period shall be 3 days for Class PP-1, PP-2, PP-3, PP-4, and PP-5 concrete. The curing period shall be 7 days for Class BS concrete. In addition to Article 1020.13, when the air temperature is less than 55° F, the Contractor shall cover the patch according to Article 1020.13 (d)(1) with minimum R12 insulation. Insulation is optional when the air temperature is 55° F. - 90° F. Insulation shall not be placed when the air temperature is greater than 90° F. A 72-hour minimum drying period shall be required before placing waterproofing or hot-mix asphalt surfacing.

(e) Opening to Traffic.

No traffic will be permitted on a patch until after the specified cure period, and the concrete has obtained a minimum compressive strength of 4000 psi or flexural strength of 675 psi.

Construction equipment will be permitted on a patch during the cure period if the concrete has obtained the minimum required strength. In this instance, the strength specimens shall be cured with the patch.

Measurement and Payment.

Partial-depth deck slab repairs will not be measured or paid for separately, but shall be included in the contract unit price for REMOVAL OF EXISTING STRUCTURES.

MEDIAN SURFACE REMOVAL

Description. This work shall consist of the removal and satisfactory disposal of the existing median surface, approximately 4 inches thick, at the locations shown on the plans and as directed by the Engineer.

Method of Measurement. This item of work will be measured for payment per square foot for removing the median surface as required in the plans, specifications, and these Special Provisions. No adjustment to quantity shall be made for variation in thickness.

Basis of Payment. This work will be paid for at the contract unit price per square foot for MEDIAN SURFACE REMOVAL. No additional compensation shall be made for additional thickness.

CONCRETE MEDIAN BARRIER AND BASE REMOVAL

Description: This work shall consist of the removal and satisfactory disposal of existing concrete median and base and incidental reinforcing steel, anchor bolts, junction boxes, wiring and conduit as shown on the Plans or as directed by the Engineer.

Equipment and methods used for removing concrete median barrier and base shall be such as to prevent damage to the concrete median barrier and base remaining in place. If it is necessary to sawcut the concrete median barrier and base to prevent damage, the Contractor shall provide the equipment and perform the work at no additional cost.

All materials removed shall be considered excess and shall be legally disposed off-site by the Contractor.

Method of Measurement: Concrete Median Barrier and Base Removal shall be measured in feet whose length shall be the difference between the end stations as shown on the Plans or as determined by the Engineer.

Basis of Payment: This work will be paid for at the contract unit price per foot for CONCRETE MEDIAN BARRIER AND BASE REMOVAL.

SHOULDER RUMBLE STRIP REMOVAL

Description: This work shall consist of the scarification of existing shoulder rumble strips constructed in hot-mix asphalt shoulders, and the furnishing and placement of hot-mix asphalt in the scarified area, prior to placing traffic onto the shoulder in a construction stage. This work shall take place per the limits shown on the Plans and/or as directed by the Engineer.

General Requirements: The nominal depth of scarification of the hot-mix asphalt shoulders shall be 2 inches. Unless otherwise shown in the plans, the width of scarification shall be three (3) feet.

After removing all millings from the scarified limits, the surface shall be primed in accordance with Article 406.05(b) of the Standard Specifications. The scarified area shall then be filled with hot-mix asphalt surface course and compacted flush with the adjoining pavement and shoulder surfaces. The mix to be used for this item shall be IDOT Hot Mix Asphalt Surface Course, Mix D, N70, unless otherwise specified in the Contract.

After traffic has returned to the normal configuration, the shoulder rumble strips shall be reinstalled. This work shall be in accordance with the Standard Specifications for SHOULDER RUMBLE STRIPS, 16 INCH and Illinois Tollway Standard D6-01. This work shall be paid for separately under SHOULDER RUMBLE STRIPS, 16 INCH.

Method of Measurement: This work will be measured for payment in square yards. Any portion of this work constructed outside the dimensions shown on the Plans or as directed by the Engineer will not be measured for payment.

Basis of Payment: This work will be paid at the contract unit price per square yard for SHOULDER RUMBLE STRIP REMOVAL, which payment shall constitute full compensation for scarifying the designated portion of hot-mix asphalt shoulder; cleaning the scarified area and removing all debris; applying prime tack; furnishing, placing and compacting hot-mix asphalt surface mix; and for all labor, equipment, tools and incidentals necessary to complete the work as specified. Lane/shoulder closures required for this item will not be paid for separately, but will be included in the Contract unit price for TRAFFIC CONTROL AND PROTECTION (SPECIAL). Reinstallation of the shoulder rumble strips following temporary traffic control shall be paid for separately under SHOULDER RUMBLE STRIPS, 16 INCH.

FENCE REMOVAL

This work shall consist of the satisfactory removal of portions of existing fence and its appurtenances at locations shown in the plans or as directed by the Engineer. This work shall be completed according to the applicable portions of Section 201 of the Standard Specifications and as noted herein.

The Contractor will be required to transport all removed material off the project site as specified in applicable portions of Article 202.03 of the Standard Specifications.

Method of Measurement: This work shall be measured for payment in feet, along the base of the existing fence.

Basis of Payment: This work will be paid for at the contract unit price per foot for FENCE REMOVAL.

DELINEATORS (SPECIAL)

Description: This work shall consist of furnishing and installing delineator posts and reflectors at the locations shown on the plans.

General Requirements: Work shall be in accordance with the applicable portions of Section 635 of the Standard Specifications and Illinois Tollway Standard D4-02.

Method of Measurement: This work will be measured for payment in place in units of each. Double unit delineators will be measured for payment as one unit.

Basis of Payment: The work of furnishing and installing new delineator posts and reflectors will be paid for at the contract unit price per each for DELINEATORS (SPECIAL).

REMOVE AND REINSTALL MILEPOST MARKER

Description: This work shall consist of removing an existing milepost marker assembly, storing the existing milepost marker panel and reinstalling the existing milepost marker panel on a new telescoping steel support at the locations shown on the plans.

General Requirements: This work shall be in accordance with applicable portions of section 728 of the Standard Specifications and Illinois Tollway Standard F11-02.

The Contractor shall load, transport, and re-erect the milepost marker panels in the new locations as shown in the plans and as directed by the Engineer. If interim storage of the existing milepost marker panels is necessary for any reason the Contractor shall store the panels and be solely responsible for them until they are acceptably re-erected.

The Contractor shall exercise due care in handling the existing milepost marker panels during all phases of this operation. Any existing milepost marker panel that is damaged due to the Contractor's handling or operations shall be repaired by the Contractor to the satisfaction of the Engineer and Tollway, at no additional cost to the Contract, and without cause for the Contractor claiming delay.

Any existing milepost marker panel that is lost or damaged beyond use shall be replaced by the Contractor at no additional cost to the Contract and without cause for the Contractor claiming delay.

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

Basis of Payment: This work will be paid for at the contract unit price per each for REMOVE AND REINSTALL MILEPOST MARKER, which price shall include the removal of existing milepost marker assembly, storage of the existing marker panel and the furnishing and installation of a new telescoping steel support and mounting hardware.

TEMPORARY RAISED REFLECTIVE PAVEMENT MARKER

This work shall be performed in accordance with the applicable portions of Section 781 of the Standard Specifications, except as modified herein.

Revise the first sentence of the third paragraph of Article 781.03 (b) of the Standard Specifications to read "Markers shall be monodirectional when placed adjacent to lane lines or edge lines and bidirectional when placed adjacent to double yellow center lines."

Added the following to Article 781.03 (b) of the Standard Specifications:

"Where bidirectional units (two reflective surfaces) are specified, the Contractor may, at no additional cost to the Department, furnish two separate monodirectional units (single reflective surface) and mount them back to back.

When markers placed on existing pavements to remain or the proposed pavements are no longer needed, the Contractor shall remove the markers by a method approved by the Engineer. The cost of removing the markers shall be included in the contract unit price for TEMPORARY RAISED REFLECTIVE PAVEMENT MARKER."

Basis of Payment. This work will be paid for at the contract unit price per each for TEMPORARY RAISED REFLECTIVE PAVEMENT MARKER

PERMANENT PAVEMENT MARKING

Description: This work shall consist of the removal of temporary pavement markings, the placement of pavement markings of a permanent material (not tape or paint) during all winter staging months (November 1 through April 1) and the removal of the permanent pavement markings following winter staging months as required for subsequent stages.

General Requirements: This work shall be in accordance with the applicable portions of Section 780 of the Standard Specifications and Supplemental Special Provisions.

The pavement marking material shall be either epoxy or polyurea on all PCC pavements. The pavement marking material shall be either epoxy, thermoplastic or preformed thermoplastic on HMA pavements.

Removal of the temporary pavement marking tape shall be in accordance with applicable portions of Section 703 of the Standard Specifications.

Removal of pavement marking other than temporary pavement marking tape shall be in accordance with applicable portions of Section 783 of the Standard Specifications and BDE Special Provisions.

Method of Measurement: Pavement marking lines will be measured for payment in place in feet. Double yellow lines will be measured as two separate lines. Ten inch (10") lines will be measured as two, five inch (5") lines. Letters and symbols will be measured based on the total areas indicated in Table 1 of Article 780.13 of the Standard Specifications or as specified in the plans. The removal of temporary pavement marking tape and permanent pavement markings required for winter staging months will not be measured for payment.

Basis of Payment: This work will be paid at the contract unit price per foot of applied line for PERMANENT PAVEMENT MARKING – LINE of the type specified and per square foot for PERMANENT PAVEMENT MARKING – LETTERS AND SYMBOLS. The removal of temporary pavement marking tape and permanent pavement markings required for winter staging months will not be paid for separately; but shall be included in the contract unit price for PERMANENT PAVEMENT MARKING – LINE of the type specified and PERMANENT PAVEMENT MARKING – LETTERS AND SYMBOLS.

THERMOPLASTIC PAVEMENT MARKING – LINE 5"

Description: This item applies when thermoplastic pavement marking 10 inch lines are called for on the pavement marking and/or maintenance of traffic plans. Pavement striping shall be in accordance with all applicable portions of Section 780 of the Standard Specifications.

Add the following sentence to Article 780.12(b):

10" thermoplastic lines will be measured for payment in place as two (2) separate 5" thermoplastic lines.

SUBGRADE AGGREGATE SPECIAL, 6"

DESCRIPTION. This work shall consist of a compacted subgrade at the locations shown in the plans

MATERIALS. Aggregate for this item shall conform to the requirements of Article 1004.01, except as modified herein. The aggregate for SUBGRADE AGGREGATE 6 IN. shall be crushed gravel, crushed stone, or crushed concrete, of Class C Quality or better. The gradation shall be CA 6, as shown in Article 1004.01, the percent passing the No. 200 sieve shall be 6 ± 2.

MEASUREMENT. SUBGRADE AGGREGATE 6 IN. will be measured in place and computed in cubic yards

PAYMENT. This work will be paid for at the contract unit price per cubic yard for SUBGRADE AGGREGATE 6 IN

CONCRETE BARRIER WALL (SPECIAL)

Description. This work shall consist of constructing a concrete barrier wall at the locations and to the dimensions indicated on the Plans. This work shall be in accordance with Article 637 of the Standard Specifications. Reinforcing steel shall be in accordance with Article 537. A parapet railing shall be installed in accordance with Article 509 and as shown in the plan detail.

Method of Measurement. The barrier and parapet railing shall be measured for payment in feet in place, along the centerline of the barrier.

Basis of Payment. This work will be paid for at the contract unit price per foot for CONCRETE BARRIER WALL (SPECIAL) and PARAPET RAILING, which price shall be payment in full for all labor, equipment, and materials necessary to complete the work as specified herein. No additional payment shall be made for reinforcing steel.

COMBINATION CURB AND GUTTER REMOVAL (SPECIAL)

Description. This work shall consist of removing and replacing the curb and gutter at the locations shown on the plans or as directed by the Engineer. This work shall be in accordance with the applicable portions of Sections 406, 440 and 606 of the Standard Specifications and the detail included in the plans.

Method of Measurement. Combination curb and gutter removal will be measured in place along the flow line of the existing concrete curb at time of removal. The in place measurement shall be the payment quantity for the construction, removal and legal disposal of the combination curb and gutter and adjacent pavement.

Basis of Payment. This work will be paid for at the contract unit price per foot for COMBINATION CURB AND GUTTER REMOVAL (SPECIAL).

COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.12 (SPECIAL)

This work shall consist of the construction, removal and disposal of temporary combination concrete curb and gutter at the locations shown on the maintenance of traffic plans. This work shall be performed in accordance with the applicable portions of Section 440 and Section 606 of the Standard Specifications and the Highway Standards and details included in the plans and the following:

The temporary combination concrete curb and gutter shall not be tied to the adjacent existing, proposed or temporary pavements.

Method of Measurement. Temporary combination concrete curb and gutter will be measured for payment in place in accordance with the first paragraph of Article 606.14 (b) except that transitions to or from existing or proposed curb and gutter shall be considered included in the cost for COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.12 (SPECIAL). The in place measurement shall be the payment quantity for the construction, removal and legal disposal of the temporary combination concrete curb and gutter.

Basis of Payment. This work will be paid for at the contract unit price per foot for COMBINATION CONCRETE CURB AND GUTTER, TYPE B-6.12 (SPECIAL).

CONCRETE MEDIAN, TYPE SB-6 (SPECIAL)

Description. This work shall consist of constructing concrete medians in accordance with the applicable portions of Section 606 of the Standard Specifications, the applicable portions of Standard 606301, the details shown in the plans and as directed by the Engineer.

Method of Measurement. Concrete medians will be measured for payment in place and the area computed in square feet.

Basis of Payment. This work shall be paid for at the contract unit price per square foot for CONCRETE MEDIAN, TYPE SB-6 (SPECIAL), which price shall include all materials, labor and equipment necessary to perform the work as here in specified.

GUTTER TYPE G

Description. This work shall be in accordance with the applicable portions of Tollway Standard Drawing B1-04 Gutter and Curb Details, Tollway Standard Drawing B28-01 Gutter Transition at Traffic Barrier Terminal Type T1 (Special), and Section 606 of the Standard Specifications. Protective coat when required shall be constructed according to Article 420.18 of the Standard Specifications.

Method of Measurement. Gutter, Type G-2; Gutter, Type G-2, Modified; shall be measured for payment as defined in Article 606.14 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per foot for GUTTER, TYPE G-2; or GUTTER, TYPE G-2, MODIFIED.

Protective coat will be paid for at the contract unit price per square yard for PROTECTIVE COAT.

HOT-MIX ASPHALT PRESSURE RELIEF JOINT

Description: This work shall consist of placing a hot-mix asphalt pressure relief joint to the dimensions and at the locations shown in the plans. This work shall be performed in accordance with Tollway Standard A3-00.

Materials: Hot-mix asphalt mixes shall be as specified in the Hot-Mix Asphalt Mixture Requirements table.

Basis of Payment: This work shall be paid for at the contract unit price per square yard of HOT-MIX ASPHALT PRESSURE RELIEF JOINT, CLASS D1 PATCHES, 12 INCHES, which price shall include all labor, materials and equipment necessary to perform the work as described.

CLASS D PATCHES, TYPE III, 15 INCH (SPECIAL)

Description: This work shall consist of placing Class D Patches at the locations shown in the plans. The work shall be performed in accordance with Section 442 of the Standard Specifications, except as modified herein.

Delete Note 2 from Article 442.02 of the Standard Specification and replace with the following:

Note 2. The mixture composition of the HMA used shall be binder course and surface course as specified in the Hot-Mix Asphalt Mixture Requirements table.

Basis of Payment: This work shall be paid for at the contract unit price per square yard of CLASS D PATCHES, TYPE III, 15 INCH (SPECIAL), which price shall include all labor, materials and equipment necessary to perform the work as described.

PROTECTION OF EXISTING DRAINAGE FACILITIES DURING CONSTRUCTION

Unless otherwise noted in the contract plans, the existing drainage facilities shall remain in use during the period of construction.

Locations of existing drainage structures and sewers as shown on the contract plans are approximate. Prior to commencement of work, the Contractor, at his own expense, shall determine the exact location of existing structures that are within the proposed construction site.

All drainage structures are to be kept free from any debris resulting from construction operations. All work and materials necessary to prevent accumulation of debris in the drainage structures will be considered as included in the cost of the associated drainage pay items of the contract. Any accumulation of debris in the drainage structure resulting from construction operations shall be removed at the Contractor's own expense, and no extra compensation will be allowed.

Existing frames and grates are to remain unless otherwise noted in the contract plans or as directed by the Engineer. Frames and grates that are missing or damaged prior to construction shall be replaced. The type of replacement frame or grate shall be determined by the Engineer, and replacement and payment for same shall be in accordance with Section 604 and Article 109.04 of the Standard Specification respectively, unless otherwise noted in the plans or Special Provisions.

The Contractor shall take the necessary precautions when working near or above existing sewers and culverts in order to protect these pipes during construction from any damage resulting from his operations. All work and materials necessary to repair or replace existing pipes damaged because of noncompliance with this provision shall be as directed by the Engineer in accordance with Section 542 or 550 of the Standard Specifications and at the Contractor's own expense, and no extra compensation will be allowed.

During construction, if the Contractor encounters or otherwise becomes aware of any sewers, culverts, or underdrains within the right-of-way other than those shown on the plans, he shall so inform the Engineer who shall direct the work necessary to maintain the facilities in service and to protect them from damage during construction. Complying with this requirement shall be considered as included in the costs of the various pay items involved.

REMOVE EXISTING FLARED END SECTION

Description. This work shall consist of the removal and disposal of existing flared end sections (FES) at the locations shown on the plans and as directed by the Engineer. At locations where the end section to be removed is connected to storm sewer pipe to remain, the Contractor shall take care not to damage the storm sewer pipe. Any damage to elements to remain beyond the limits of removal shall be repaired at the Contractor's own expense. All work shall otherwise conform to applicable articles of Section 551 of the Standard Specifications.

Basis of Payment. This work shall be paid for at the contract unit price per each for REMOVE EXISTING FLARED END SECTION, regardless of size, location, or material.

PIPE INSULATION SYSTEM

Description: This item shall consist of furnishing and installation of all materials, labor, and equipment necessary to install the 2" pipe insulation system in accordance with the details included the plans and this special provision. The pipe insulation system shall be applied to the section of pipe that is supported by the structure and shall extend from abutment to abutment.

Materials: The pipe insulation shall be 2" rigid cellular polystyrene insulation (min compressive strength of 40psi per ASTM C578-05a or latest edition).

Construction: The Contractor shall expose the top of the existing pipe and excavate a trench of a sufficient to install the proposed pipe insulation system. The Contractor's excavation/trenching methods shall be approved by the Engineer and the owner of the existing pipe prior to starting any excavation/trenching operations. The Contractor shall exercise extreme care as to not damage the existing pipe. If the existing pipe is damage during the Contractor's excavation/trenching operations, the Contractor will be responsible to repair the existing pipe to the satisfaction of the Engineer and owner of the existing pipe at his own expense.

Bedding material shall be placed as shown and specified on the Pipe Insulation Detail included in the plans and compacted in accordance with the applicable portions of Article 550.07 of the Standard Specifications.

After the pipe insulation system has been installed the trench shall be backfilled in accordance with Article 550.07 of the Standard Specifications.

Basis of Payment: This work shall be paid for at the contract unit price per foot of PIPE INSULATION SYSTEM, which price shall include all labor, materials and equipment necessary to install the insulation as specified including the stainless steel bands, joint sealant, coating, stainless steel jackets, excavation/trenching, bedding material, backfilling of the trench and any additional trench backfill material required. No additional payment shall be made for trenching or backfill, as these shall be included in the contract unit price for this item.

PIPE UNDERDRAIN, FABRIC LINED TRENCH

Description: This work shall consist of furnishing and installing pipe underdrain at the locations shown in the plans. The perforated pipe shall be enclosed in a fabric envelope with CA-16 trench backfill to the dimensions shown on the plans. The work shall be performed in accordance with Section 601 of the Standard Specifications, and the IDOT Recurring Special Provision for Pipe Underdrain, except as modified herein.

Materials: The perforated pipe underdrain shall be according to Article 601.02 of the Standard Specifications. Outlet pipes or pipes connecting to a separate storm sewer system shall not be perforated.

Method of Measurement: PIPE UNDERDRAIN, FABRIC LINED TRENCH shall be measured for payment in feet, in place. No distinction between perforated underdrain and non-perforated outlet drain shall be made upon measurement.

Basis of Payment: This work shall be paid for at the contract unit price per foot of PIPE UNDERDRAIN, FABRIC LINED TRENCH, of the specified diameter, which price shall include all labor, materials and equipment necessary to install the underdrain. No additional payment shall be made for the fabric sleeve lining the pipe, or the fabric lining the trench.

INLET, SPECIAL

Description. This work shall consist of furnishing and installing perforated inlets at the locations shown in the plans. These inlets shall be constructed to the sizes and dimensions shown in the plan details. This work shall be performed in accordance with Section 602 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per each for INLET, SPECIAL.

TEMPORARY CATCH BASINS

Description. This work shall consist of furnishing, installing, maintaining and removing catch basins, inlets, manholes, frames, grates and lids of the type specified and at the locations shown in the Erosion Control Plans and the plans for the purpose of providing positive pavement drainage during construction. This work shall be performed in accordance with Section 602 of the Standard Specifications.

When the temporary catch basins and temporary inlets are no longer required and have been removed, the Engineer shall inspect the catch basins and inlets to determine if they are suitable to be incorporated into the proposed improvements. The Contractor shall relocate the catch basins and inlets determined to be suitable by the Engineer, to a proposed catch basin or inlet location of the same type as the temporary catch basin/temporary inlet. The proposed locations for the reinstallation of the catch basin/inlet shall be approved by the Engineer.

Basis of Payment. This work will be paid for at the contract unit price per each for TEMPORARY CATCH BASINS.

Frames, grates and lids for temporary catch basins will not be paid for separately and shall be included in the contract unit price for TEMPORARY CATCH BASINS.

The removal of temporary catch basins will not be paid for separately and shall be included in the contract unit price for TEMPORARY CATCH BASINS.

MANHOLES, TYPE A, 6' – DIAMETER, WITH 2 TYPE 1 FRAME, OPEN LIDS, RESTRICTOR PLATE

Description. This work shall consist of constructing a 6 ft. diameter Type A manhole with two Type 1 frames and open lids in accordance with Section 602 of the Standard Specifications. A restrictor plate shall be installed in the manhole in accordance with the detail shown in the plans and as directed by the Engineer.

Materials. Materials shall be in accordance with Section 602.02 of the Standard Specifications. Metal materials shall be in accordance with all applicable portion of Section 1006 of the Standard Specifications.

Basis of Payment. This work shall be paid for at the contract unit price each for MANHOLES, TYPE A, 6' – DIAMETER, WITH 2 TYPE 1 FRAME, OPEN LIDS, RESTRICTOR PLATE, which price shall be payment in full for all labor, equipment and materials necessary to complete the work as specified herein.

MANHOLES, DROP TYPE, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID

Description. This work shall consist of constructing manholes with frames and closed lids in accordance with Section 602 of the Standard Specifications, the details in the plans and as directed by the Engineer.

Materials. Materials shall be in accordance with Section 602.02 of the Standard Specifications. Metal materials shall be in accordance with all applicable portion of Section 1006 of the Standard Specifications.

Basis of Payment. This work shall be paid for at the contract unit price each for MANHOLES, DROP TYPE, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID, which price shall be payment in full for all labor, equipment and materials necessary to complete the work as specified herein.

MANHOLES, WITH RESTRICTOR PLATE

Description. This work shall consist of constructing manhole, of the size and type specified in the plans, in accordance with Section 602 of the Standard Specifications. A restrictor plate shall be installed in the manhole in accordance with the detail shown in the plans and as directed by the Engineer.

Materials. Materials shall be in accordance with Section 602.02 of the Standard Specifications. Metal materials shall be in accordance with all applicable portion of Section 1006 of the Standard Specifications.

Basis of Payment. This work shall be paid for at the contract unit price each for MANHOLES, WITH RESTRICTOR PLATE, which price shall be payment in full for all labor, equipment and materials necessary to complete the work as specified herein.

STORM SEWER TO BE FILLED

Description. The work shall consist of filling abandoned storm sewer pipes at the locations shown on the plans and as directed by the Engineer. All storm sewer pipes to be abandoned in place shall be completely filled with Controlled Low Strength Material (CLSM), per section 1019 of the Standard Specifications. The ends of the storm sewer pipe shall be sealed with cement bricks and mortar, a poured concrete plug, or other means approved by the Engineer.

Basis of Payment. This work will be measured and paid for at the contract unit price per foot for STORM SEWER TO BE FILLED. This price shall include all costs for providing and injecting CLSM, capping and all other labor, equipment, and materials necessary to abandon and fill the pipe in accordance with the Specifications.

STORM SEWERS TO BE CLEANED

Description. This work consists of cleaning existing storm sewers at the locations shown on the plans.

Construction Requirements. The Contractor shall clean the existing storm sewers of all silt, debris and/or foreign matter of any kind, and shall be free from such accumulations at the time of final inspection. The method of cleaning shall not damage the existing storm sewers and shall be submitted to the Engineer for approval. Any damage to the existing storm sewers shall be repaired by the Contractor at no additional cost to the Department.

The Contractor shall dispose of the silt, debris and/or foreign matter removed from the existing storm sewers offsite in accordance with Article 202.03 of the Standard Specifications.

Basis of Measurement and Payment. This work will be measured and paid for at the contract unit price per foot for STORM SEWERS TO BE CLEANED, of the diameter specified.

The disposal of the silt, debris and/or foreign matter removed from the existing storm sewers shall be included in the contract unit price for STORM SEWERS TO BE CLEANED and shall not be paid for separately.

TELEVISION INSPECTION OF SEWER

This item consists of providing all labor, equipment, and material necessary to televise an existing field tile at the locations shown on the plans and other locations as directed by the Engineer. The Contract shall provide two (2) copies each of a digital video and audio on DVD and a written video inspection report to the Engineer.

If any deficiencies are found the Contract shall either repair or replace the existing field tile as directed by the Engineer. The cost of the repairs or replacement for the existing field tile shall be paid in accordance with Article 109.04 of the Standard Specifications. After the Contractor

has completed the any repairs or replacement of the existing field tile, the Contractor shall televise the field tile as directed by the Engineer. The Contract shall provide two (2) copies each of a digital video and audio on DVD and a written video inspection report of the re-inspection of the field tile to the Engineer. The cost of televising the field tile after any repairs or replacement will not be paid for separately and shall be included in the contract unit price for TELEVISION INSPECTION OF SEWER.

All labor, equipment, and material required for this work shall be paid for at the Contract unit price per FOOT for TELEVISION INSPECTION OF SEWER regardless of sewer diameter.

SLEEPER SLAB

Description. This work shall consist of constructing a sleeper slab (reinforced concrete grade beam) at the locations shown on the plans and as directed by the Engineer. This work shall be performed in accordance with the applicable portions of Section 420 of the Standard Specifications, the details in the plans and as herein specified.

Materials. Concrete shall be Class SI meeting the requirements of Section 1020. Reinforcement bars shall be Grade 60 meeting the requirements of Section 1006.10.

Method of Measurement. This work will be measured in feet along the expansion joint. Reinforcement bars, polyethylene bond breaker and preformed joint filler shall not be paid for separately, but shall be included in the unit price for the sleeper slab. Excavation, except excavation in rock, shall be paid as Earth Excavation.

Basis of Payment. This work will be paid for at the contract unit price per foot for SLEEPER SLAB, which price shall be payment in full for all materials, labor, and equipment necessary to complete the work as specified.

DRAINAGE SCUPPERS

Description. This work shall consist of furnishing and installing Drainage Scuppers along with all necessary hardware, labor and equipment in accordance with the Plans and as directed by the Engineer.

The materials and other requirements are as shown on the plans.

Method of Measurement. Drainage Scuppers, of the type specified, will be measured for payment per each installed, completed and accepted.

Basis of Payment. The work will be paid for at the contract unit price per each for DRAINAGE SCUPPERS, of the type specified, which payment shall constitute full compensation for furnishing and installing the scupper (frame and grate), downspouts, anchor studs and accessories, and for furnishing all labor, equipment, tools and incidentals necessary to complete the work as specified.

DRAINAGE SYSTEM

Description. This work shall consist of furnishing and installing a bridge drainage system as shown on the plans, including all piping, fittings, support brackets, inserts, bolts, and splash blocks when specified.

Material. The pipe and fittings shall be reinforced fiberglass according to ASTM D 2996 RTRP with a 30,000 psi minimum short-time rupture strength hoop tensile stress. The reinforced fiberglass shall also have an apparent stiffness factor at 5 percent deflection exceeding 200 cu inch-lbf/sq. inch and a minimum wall thickness of 0.10 inch. All pipe supports and associated hardware shall be hot dip galvanized according to AASHTO M 232. The fiberglass pipe and fittings furnished shall be pigmented throughout, or have a resin-rich pigmented exterior coat, specifically designed for overcoating fiberglass, as recommended by the manufacturer. The color shall closely match the precast prestressed concrete (PPC) bulb T-beams as specified by the Engineer. The resin in either case shall have an ultraviolet absorber designed to prevent ultraviolet degradation. The supplier shall certify the material supplied meets or exceeds these requirements.

Design. The drainage system shall be designed as an open system with allowances for the differential expansion and contraction expected between the superstructure and the substructure to which the drainage system is attached.

Installation. All connections of pipes and fittings shown on the plans to facilitate future removal for maintenance cleanout or flushing shall be made with a threaded, gasketed coupler or a bolted gasketed flange system. Adhesive bonded joints will be permitted for runs of pipe between such connections. The end run connection shall feature a minimum nominal 6 inch female threaded fiberglass outlet. Straight runs may utilize a 45 degree reducing saddle bonded to the pipe. The female outlet shall be filled with a male threaded PVC plug.

Runs of pipe shall be supported at spacings not exceeding those recommended by the manufacturer of the pipe. Supports that have point contact or narrow supporting areas shall be avoided. Standard slings, clamps, clevis hangers and shoe supports designed for use with steel pipe may be used. A minimum strap width for hangers shall be 1 1/2 inch for all pipe under 12 inch in diameter and 2 inch for diameters 12 inch or greater. Straps shall have 120 degrees of contact with the pipe. Pipes supported on less than 120 degrees of contact shall have a split fiberglass pipe protective sleeve bonded in place with adhesive.

All reinforced fiberglass pipe, fittings, and expansion joints shall be handled and installed according to guidelines and procedures recommended by the manufacturer or supplier of the material.

Basis of Payment. This work will be paid for at the contract unit price each for DRAINAGE SYSTEM at the locations specified.

FIELD SPLICING OF SOLDIER PILES

The cost of any field splices in the retaining wall soldier piles required due to the aerial utility lines will not be paid for separately, but shall be included in the cost of "Furnishing Soldier Piles" of the type specified.

ARCHITECTURAL FINISH FOR RETAINING WALLS

This work consists of providing an architectural finish on retaining walls in accordance with the details shown in the plans and the Special Provisions.

Forms shall be constructed so that the completed concrete structures conform to the shape, lines and dimensions of the members as shown on the plans. Forms shall be properly braced or tied together to maintain position and shape. Forms shall be made sufficiently tight to prevent leakage of mortar.

Formliners shall be used to obtain the architectural finish on the retaining walls. Formwork shall have the strength and stability to ensure finished concrete dimensions within the tolerances specified herein. The quality of the formwork shall be maintained throughout the entire project.

Variations in dimensions for the wall sections with an architectural finish shall be within the following tolerances: the width and depth of joints shall be within $\pm 1/8$ inch, the location of the joints shall be within $\pm 1/2$ inch, the maximum variation of a joint from a straight line shall be $\pm 1/4$ inch in 10 feet.

The Contractor shall submit proposed construction procedures for the architectural finish on the outside face of retaining walls. The Contractor's method of obtaining the surface texture specified on the plans shall be subject to approval by the Engineer.

Upon approval of the construction procedures by the Engineer, the Contractor shall pour a 30 foot (9 m) long test section of retaining wall at a location directed by the Engineer. The test shall section shall be constructed to match the architectural finish of the retaining wall mock-up constructed by Contract 60P41 which is located within Pump Station No. 47 construction site. After removal of the formwork, the Engineer will examine the test section of the wall and instruct the Contractor if the architectural finish is acceptable or if future wall sections need further modifications. If necessary, the Contractor shall pour additional test sections of wall at locations designated by the Engineer until a wall section meets with the Engineer's approval. The architectural finish of all subsequently installed wall sections shall match the approved test section. All deviations from the approved architectural finish shall be repaired by the Contractor at no additional cost to the Department.

The Contractor shall notify the Engineer at least 40 hours prior to placing concrete. Concrete shall not be placed until the Engineer has inspected the formwork and the placement of reinforcing bars for compliance with the plans.

Method of Measurement. Architectural finish will be measured in place and the area computed in square feet. The dimensions used to compute the area of architectural finish will be the dimensions indicated on the plans or directed by the Engineer which outline plane area. Measurement will not be made on the actual surface area of architectural finish.

Basis of Payment. This work will be paid for at the contract unit price per square foot for FORM LINER TEXTURED SURFACE.

REBUILD EXISTING HANDHOLE, SPECIAL

This item shall consist of adjusting a handhole down and plating it for temporary pavement installation; upon removal of the temporary pavement, the existing handhole shall be rebuilt and brought to the final grade at a location shown on the plans or as directed by the Engineer.

This work will include removing the handhole frame and cover and the walls of the handhole to a depth to the bottom of the temporary pavement elevation. A steel plate 36" x 36" x $3/4$ " (ASTM A36) shall be placed over the opening and bolted to the remaining portion of the existing handhole with 4-3/4" diameter epoxy anchor bolts with nuts and washers located at the four corners with minimum embedment of 4 inches.

Temporary pavement will be placed over the steel plate during the temporary traffic signal installation. Upon removal of the temporary pavement and replacement, the existing handhole shall be rebuilt to the final grade.

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

All concrete debris shall be removed from the right-of-way to a location approved by the Engineer.

The area adjacent to each side of the handhole shall be excavated to allow forming. All steel hooks, handhole frame, cover, and concrete shall be provided to construct a rebuilt handhole according to applicable portions of the current District One Traffic Signal Specifications. (The existing frame and cover shall be replaced if it was damaged during removal or as determined by the Engineer.)

Basis of Payment. This work shall be paid for at the contract unit price each for REBUILD EXISTING HANDHOLE, SPECIAL, which contract unit price shall be payment in full for all labor, materials, and equipment necessary to complete the work described above and as indicated.

PORTABLE VIDEO TOWER STATIONS

Description. This work shall consist of furnishing, installing, maintaining, relocating, and removing a system of video surveillance stations as well as providing web-based viewing and control for each individual station for incident management and traffic operations. The purpose of the system is to provide real-time, full motion video surveillance of traffic operations at various locations along the project route via the internet to multiple IDOT facilities.

Equipment. The video surveillance equipment shall consist of trailer-mounted mobile video camera systems. The system shall be easily transported and set up quickly by one individual.

Cameras shall consist of full pan-tilt-zoom cameras capable of transmitting a minimum of 20 frames per second. Camera stations shall be capable of 360° panning, 90° tilt, and a minimum 25X zoom. For video monitoring, each camera shall be capable of auto-switching between user-defined preset positions as well as full manual control. At least half of all stations shall include infrared video capability for use in unlit regions of the contract.

This contract shall have a total of six (6) individual trailered video stations. All stations shall be capable of raising the camera(s) to a height of 40'. Two of the stations shall also include infrared cameras for use in unlit sections of highway. Each station should be designed to be stable during normal winds (up to 50MPH) keeping camera wobble to a minimum.

Each station shall have battery power with solar charging for continuous operation.

Communications. Each station shall have the necessary communication equipment required for transmitting and receiving information via the internet. Data upload/download requirements with the service provider shall be sufficient to ensure the 20 frames per second continuous transmission.

General. Stations shall be operational 24-hours per day for the entire duration of the contract, 7 days per week or until such time the Department determines.

Video shall be accessible via the internet. No additional software shall be needed to access the website for viewing or controlling cameras. Secure logins shall be capable for full viewing and control as well as view-only.

Still Picture Capture. The station shall be capable of capturing a still image in JPEG format and automatically transferring this image to an FTP site. The resolution of the image shall be user selectable with a default size of 704x480 pixels. The frequency of captures shall be user settable and shall as a minimum range from 1 picture every 120 seconds to 1 picture every five minutes. As a part of the still image capture, a graphic overlay image shall be added to the captured image. The graphic image shall be user selectable, in JPEG, or GIF formats. The overlay shall also be user positional. The image will be provided by the Department.

Trailers should be located as directed by the Engineer. Positioning should be to maximize the field of view and coverage along the project corridor. Once installed and operational, the Contractor shall provide the latitude and longitude of each device to the Engineer unless the stations self-transmit GPS locations. Relocation of the stations should be minimized, however it may be necessary based upon traffic characteristics or operational issues. Additionally, if and when a unit is relocated, the coordinates must also be updated.

The contractor may be required to periodically clean the protective clear shroud surrounding the camera to ensure visibility and proper operation which is included in the cost of the item.

Method of Measurement.

Portable Video Tower Stations will be measured on calendar month basis for the entire system. One calendar month is defined as thirty-one (31) calendar days where the system is fully functional. In the event that all or a portion of the system is not fully functional, the full month payment will be deducted as follows wheras:

- 'X' equals the number of stations not functioning
- 'N' equals the total stations in the contract
- 'D' equals the number of 6-hour periods where a station doesn't work

$$\text{Deduction} = \frac{X}{N} \times \frac{D}{4} \times \frac{1}{31}$$

Deductions will begin when the entire system or portion thereof is not functional for over 2 hours and will be rounded up to the nearest 6 hours. Fully functional shall mean that full video is being transmitted and received on a remote computer via the internet, images are not obscured due to lack of maintenance or cleaning, and stations maintain pan-tilt-zoom control via the internet. Internet service failures not due to the Contractor or this pay item will not be included for deduction.

Basis of Payment. PORTABLE VIDEO TOWER STATIONS shall be paid at the contract unit price per calendar month or fraction thereof for the entire system.

OPTIMIZE TRAFFIC SIGNAL SYSTEM SPECIAL

Effective: November 9, 2012

This work shall consist of optimizing a partial closed loop traffic signal system for the opening and operation of a DDI Interchange as contained in this contract.

This work shall be in accordance with all applicable portions of the IDOT District 1 Traffic Signal Specifications, as contained in this contract, for Optimize Traffic Signal System except as modified herein.

This contract overlaps with other concurrent and future contracts as listed below. The Contractor and SCAT Consultant shall cooperate with the other Contractors and SCAT Consultants in the phasing and performance of his work so as not to delay, interrupt or hinder the progress or completion of work being performed by the other contractors.

1. Contract 60P41 – Pump Station 47 Replacement.
2. Contract 60P42 – Retaining Walls
3. Contract 60R30 – Roadway Reconstruction, ILL. Rte. 59 from north of North Aurora Road to New York Street.
4. Contract 60R31 – Roadway Reconstruction, ILL. Rte. 59 from north of North Aurora Road to north of Diehl Road.

This item shall include the following intersections in the partial closed loop traffic signal system optimization of the traffic signal system:

1. ILL. Rte. 59 @ Ferry Road.
2. ILL. Rte. 59 @ I-88 Diverging Diamond Interchange (Including both the I-88 North Ramps and the I-88 South Ramps).
3. ILL. Rte. 59 @ Diehl Road (Completion of roadway work and proposed signals at this intersection is unknown at this time).

The following intersections will need signal timing and traffic signal system adjustments made when the ILL. Rte. 59 @ I-88 Diverging Diamond Interchange is opened to traffic. Cooperation of the Contractors and SCAT Consultants will be required for this work. This work will be performed by the Contractors and SCAT Consultants under each contract as listed below.

1. Contract 60R30 – ILL. Rte. 59 @ North Aurora Road Intersection.
2. Contract 60R31 – ILL. Rte. 59 @ Brookdale Road / Bruce Lane Intersection

Cooperation of the Contractor and SCAT Consultant will be required under Contract 60R31, as the master controller is located at ILL. Rte. 59 @ Diehl Road. The SCAT Consultant under Contract 60I31 will be revising the intersection timing at this intersection and also downloading Traffic Signal System Programs into the master controller at this intersection. This work is required in order for the ILL. Rte. 59 @ I-88 Diverging Diamond Interchange to open to traffic and to be Optimized. The SCAT Consultant under Contract 60I31 shall only be responsible for signal timings and Traffic Signal System Programs at this intersection for when the Diverging Diamond Interchange opens to traffic and for the completion of Contract 60I31.

The SCAT Consultant shall contact the Traffic Signal Engineer at (847) 705-4424 before starting work on this item. Synchro Analysis and Vissim is available for the consultant to use in preparing initial Traffic Signal System Programs before the Diverging Diamond Interchange opens to traffic. Traffic Signal System Programs shall be prepared and be ready to download into the master controller before the Diverging Diamond Interchange opens to traffic.

This item will included making adjustments to the traffic signal timings and Traffic Signal System Programs during construction and completion of this contract, as there will be lane closures and construction still going on when the Diverging Diamond Interchange opens to traffic.

After all construction is completed under Contract 60I31 and all lanes are opened to traffic, the Contractor and SCAT Consultant shall follow and deliver all items as outlined under the requirements for Optimize Traffic Signal System as contained in the IDOT District 1 Traffic Signal Specifications.

Basis of Payment.

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

TEMPORARY TRAFFIC SIGNAL TIMING

Effective: November 28, 2012

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 impacts to existing traffic signal timings caused by construction, detours or other temporary conditions.

This work shall be in accordance with all applicable portions of the IDOT District 1 Traffic Signal Specifications, as contained in this contract, for Temporary Traffic Signal Timings except as modified herein.

This item shall include the following intersections, which are also on the detour route:

1. I-88 Eastbound Ramps @ Diehl Road
2. I-88 Westbound Ramps @ Bilter Road
3. Diehl Road @ Eola Road
4. Eola Road @ Bilter Road / Ferry Road
5. ILL. Rte. 56 @ Eola Road
6. Winfield Road @ Diehl Road
7. I-88 Eastbound Ramps @ Winfield Road
8. I-88 Westbound Ramps @ Winfield Road
9. Winfield Road @ Ferry Road
10. Winfield Road @ Torch Parkway
11. Winfield Road @ Warrenville Road
12. ILL. Rte. 56 @ Winfield Road
13. ILL. Rte. 56 @ Batavia Road
14. ILL. Rte. 56 @ ILL. Rte. 59
15. ILL. Rte. 59 @ Ferry Road

This item shall include the following intersections which have multiply temporary traffic signal setups, for the various construction stages, for the intersections listed:

1. I-88 Eastbound Ramps @ ILL. Rte. 59
2. I-88 Westbound Ramps @ ILL. Rte. 59

This item shall include the following intersections on adjacent routes:

1. Ferry Road @ Raymond Drive
2. Diehl Road @ Raymond Drive

This work shall include making all timings and adjustments to the above intersections necessary from the first day of construction until the completion of construction on this contract. This will include the period when the detour route is in place during the closure of the ILL. Rte. 59 @ I-88 Ramps.

The consultant shall make all timings and adjustments necessary to the intersections listed below from the first day of construction under contract 60I31, until the start of construction on contract 60R30 and/or contract 60R31 or as directed by the Area Traffic Signal Operations Engineer. Once construction starts on each of the contracts, 60R30 and 60R31 independently, the requirements for these intersections will be transferred to the appropriate contract. This item shall include the following intersections, which are in adjacent contracts on ILL. Rte. 59, which have not started construction at the time of letting for this contract:

1. ILL. Rte. 59 @ North Aurora Road (Contract 60R30)
2. ILL. Rte. 59 @ Brookdale Road / Bruce Lane (Contract 60R31)
3. ILL. Rte. 59 @ Diehl Road (Contract 60R31)

The consultant shall make timing adjustments and prepare comment responses as directed by the Area Traffic Signal Operations Engineer.

Basis of Payment.

This 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, 50 percent of the bid price will be paid. All other listed intersections will be paid 50 percent of the bid price after 2 weeks from the start of construction on this contract. The remaining 50 percent of the bid price will be paid following the removal of the temporary traffic signal installation and/or after returning the traffic signal timing to its existing condition at all other intersections listed at the completion of construction on this contract.

FULL-ACTUATED CONTROLLER AND TYPE V CABINET, SPECIAL

Description: This work shall consist of furnishing, testing and installing a new traffic actuated solid state digital controller in a new Super R, Type V controller cabinet with peripheral equipment. The controllers and cabinet shall be NEMA TS2 Type 1 design.

Work shall be in accordance with Section 857 of the Standard Specifications except as further modified herein these special provisions.

Add the following to Article 857.02 of the Standard Specifications:

Controllers shall be NTCIP compliant NEMA TS2 Type 1, Econolite ASC/3S-1000 unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District One approved closed loop equipment manufacturers will be allowed. The controller shall be the most recent model and software version supplied by the manufacturer at the time of the approval and include the standard data key. The traffic signal controller shall provide features to inhibit simultaneous display of a circular yellow ball and a yellow arrow display. Individual load switches shall be provided for each vehicle, pedestrian, and right turn over lap phase. The controller shall prevent phases from being skipped during program changes and after all preemption events.

Materials shall be according to Article 1074.03 as modified in CONTROLLER CABINET AND PERIPHERAL EQUIPMENT in Division 1000 of these specifications and as herein modified.

The Contractor shall furnish and install a Signal Indication LED Display Board, and it shall be in accordance with the following requirements:

1. The display board shall show a schematic of all the diverging diamond interchange intersection approaches for both the north and south intersections. The diagram shall be oriented with north in the same direction as north in the field from the signal technician's point of view.
2. Red, yellow and green LEDs shall be provided for each corresponding vehicular intersection approach signal indications with the corresponding signal phases indicated for each movement. A white LED shall be provided for each pedestrian walk indication and an orange LED shall be provided for each pedestrian don't walk indication. A green and yellow LED shall be utilized for the right turn overlap indications with a right arrow indicated immediately adjacent to the LEDs representing the overlap indications.
3. A RED LED shall be provided for each preemptor, the LED shall be energized while the preemptor is active. The preemptors LEDs shall be numbered as programmed in the traffic signal controller.
4. The display board shall show the instantaneous output of the cabinet's load switches from the controller cabinet for all vehicular and pedestrian phase indications.
5. The display board shall be of a sturdy, weatherproof design, and be able to operate reliably in a traffic signal cabinet environment.
6. The display board shall be shelf-mountable and retractable, which will allow it to be viewed only when required by the traffic signal technician and/or maintenance personnel.
7. The display board shall have a power switch that is clearly marked with an "ON" and "OFF" position. When this switch is in the OFF position, all LEDs on the display board shall be de-energized. This switch shall no way affect the operation of traffic signal load switches, traffic signal controller and/or traffic signal operation.
8. The display board shall have a lamp test button or switch that when pushed or flipped to test illuminates all the LEDs on the board simultaneously.
9. The display board shall be connected to the cabinet panel with a plug and receptacle connector of the "pin and sleeve" type.

Prior to fabrication, the Contractor shall submit shop drawings detailing the appearance of the Signal Indication LED Display Board and mounting hardware required to attach it to the traffic signal cabinet shelf. The Engineer will review the shop drawings and furnish written approval or disapproval to the Contractor within 30 calendar days after receipt of the submittal. If the shop drawings are disapproved, the Contractor shall resubmit corrected shop drawings within 15 calendar days of receipt of disapproval.

The traffic signal cabinet shall be assembled only by an approved traffic signal equipment supplier. The controller and cabinet shall be new, built, tested and approved by the controller equipment vendor, in the vendor's District One facility, prior to field installation. IDOT personnel shall be present during the testing at the vendor's facility. The vendor shall provide the technical equipment and assistance as required by the Engineer to fully test this equipment.

The Contractor will not be allowed to close any ramps for Maintenance of Traffic Stage 3C until the signal cabinet and controller tests are satisfactory to the Engineer / IDOT personnel at the vendor's facility. After the ramps are closed, the Contractor shall have all the proposed traffic signal equipment installed, operational and available for testing in the field, by IDOT District One Bureau of Traffic personnel by 5 am on the Thursday prior to the reopening date of Ramps "B" and "D". See FAILURE TO OPEN INTERCHANGE RAMPS "B" AND "D" TO TRAFFIC special provision for additional information.

Basis of Payment: This work will be paid for at the contract unit price per each for FULL-ACTUATED CONTROLLER AND TYPE V CABINET, SPECIAL. The transceiver required for the fiber optic interconnect system shall be paid for separately at the unit cost for TRANSCIVER – FIBER OPTIC. All fiber optic equipment and connections required to transmit the detection data from the inductive loop detectors by means of fiber optic cable to the traffic signal controller shall be included in the cost for CONTROLLER CABINET TYPE IV, SPECIAL. Fiber optic connections and associated equipment required to connect the high mast light tower PTZ cameras to the fiber optic interconnect cable shall be included in the contract unit cost for FIBER OPTIC CABLE 6 FIBERS, SINGLE MODE.

CONTROLLER CABINET TYPE IV, SPECIAL

This work shall consist of furnishing and installing a traffic signal cabinet complete, which will include and house all equipment required to transmit the vehicular detection data from the inductive loop detectors to the traffic signal controller by way of fiber optic cable. The signal cabinet will contain applicable peripheral equipment, power supply and uninterruptible power supply.

The controller cabinet shall be a Super P, Type IV and be in accordance with applicable sections of Article 1074.03(a) as modified in CONTROLLER CABINET AND PERIPHERAL EQUIPMENT.

The Contractor shall furnish, test and install peripheral equipment including but not limited to a cabinet power supply for cabinet control equipment, TS2 detector rack, inductive loop detectors, contact closure fiber transceivers and any additional equipment required to transmit the detection data from the detector rack to the traffic signal controller by way of fiber optic cable.

Applicable peripheral equipment shall be in accordance with applicable sections of Article 1074.03 as modified in CONTROLLER CABINET AND PERIPHERAL EQUIPMENT.

The contact closure fiber transceiver(s) shall meet the requirements specified herein:

The contact closure fiber transceiver shall be of a sturdy, weatherproof design, able to operate reliably in the harsh cabinet environment. The device shall have an operating temperature at least between -40 degrees Fahrenheit (-40 C) and 167 degrees Fahrenheit (75 C) and operate within a relative humidity of 0 to 95% (non-condensing). All fiber optic components shall have the manufacturer's name, address, type, style, model or serial number, and catalog number secured to the equipment.

Each contact closure transceiver shall be capable of transmitting a minimum of 8 channels over one multimode or single-mode fiber. The contact closure transceiver shall have LED indicators that clearly show the contact status per channel (open/off, closed/on) and a power indicator for the device.

Contact Closure Properties

Input Type: Dry Contact / TTL Logic (positive)
Default Output Type: Normally Open / Logic Low
Maximum Contact Output Response Time: 2 ms

Optical Properties

Emitter Type: Laser Diode
Wavelength: 1310 or 1310/1550nm
Number of Fibers per Transceiver: 1

Connectors

Contact Closure: 8-pin screw terminal
Optical: ST

Contact closure fiber transceivers and all other fiber optic components, except for the interconnect cable itself, required to provide proper communications between the inductive loop detectors and the traffic signal controller shall be furnished and installed as part of this item.

The traffic signal communications cabinet shall be assembled only by an approved traffic signal equipment supplier. The cabinet shall be new, built, tested and approved by the controller equipment vendor, in the vendor's District One facility, prior to field installation. IDOT personnel shall be present during the testing at the vendor's facility. The vendor shall provide the technical equipment and assistance as required by the Engineer to fully test this equipment. The vendor shall ensure that the data from the detection channels are being transmitted to the controller by means of fiber optic cable and that the controller is receiving and interpreting the data correctly.

Basis of Payment: This work will be paid for at the contract unit price per each for CONTROLLER CABINET TYPE IV, SPECIAL, which shall include the cabinet housing and all peripheral equipment and fiber optic connections required to transmit the detection data from the inductive loop detectors by means of fiber optic cable to the traffic signal controller. The uninterruptible power supply shall be paid for separately at the contract unit price for UNINTERRUPTIBLE POWER SUPPLY SPECIAL. The electrical service required to power the cabinet and its peripheral equipment shall be paid for separately at the contract unit price for ELECTRICAL SERVICE GROUND MOUNT. Fiber optic connections and related equipment required to connect the high mast light tower PTZ cameras to the fiber optic interconnect cable shall be included in the contract unit cost for FIBER OPTIC CABLE 6 FIBERS, SINGLE MODE.

UNINTERRUPTIBLE POWER SUPPLY

This special provision supersedes the IDOT District 1 Traffic Signal Specifications dated January 1, 2012 included within this Contract's Special Provisions.

Add the following to Article 862.01 of the Standard Specifications:

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

Add the following to Article 862.02 of the Standard Specifications:

Materials shall be according to Article 1074.04 as modified in UNINTERRUPTIBLE POWER SUPPLY (UPS).

Add the following to Article 862.03 of the Standard Specifications:

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

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

Revise Article 862.04 of the Standard Specifications to read:

Installation.

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

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

At locations where UPS is installed and Emergency Vehicle Priority System is in use, any existing incandescent confirmation beacons shall be replaced with LED lamps in accordance with the District One Emergency Vehicle Priority System specification at no additional cost to the contract. A concrete apron 67 in. x 50 in. x 5 in. (1702mm x 1270mm x 130mm) shall be provided on the side of the existing Type D Foundation, where the UPS cabinet is located. The concrete apron shall follow the District 1 Standard Traffic Signal Design Detail, Type D for Ground Mounted Controller Cabinet and UPS Battery Cabinet. The concrete apron shall follow Articles 424 and 202 of the Standard Specifications.

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

Revise Article 862.05 of the Standard Specifications to read:

Basis of Payment.

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

CONTROLLER CABINET AND PERIPHERAL EQUIPMENT

This special provision supersedes the IDOT District 1 Traffic Signal Specifications dated January 1, 2012 included within this Contract's Special Provisions.

Add the following to Article 1074.03 of the Standard Specifications:

- (a) (1) The Super R, Type V Cabinet and Super P, Type IV Cabinet shall be manufactured to the dimensions as shown on the plans.
- (a) (6) Cabinets shall be designed for NEMA TS2 Type 1 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian and four (4) phases of overlap operation.
- (b) (5) Cabinets – Provide 1/8" (3.2 mm) thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel.
- (b) (6) Controller Harness – Provide a TS2 Type 2 "A" wired harness in addition to the TS2 Type 1 harness.
- (b) (7) Surge Protection – Plug-in type EDCO SHA-1250 or Atlantic/Pacific approved equal.
- (b) (8) BIU – Containment screw required.
- (b) (9) Transfer Relays – Solid state or mechanical flash relays are acceptable.
- (b) (10) Switch Guards – All switches shall be guarded.
- (b) (11) Heating – One (1) 200 watt, thermostatically-controlled, Hoffman electric heater, or approved equivalent.
- (b) (12) Lighting – One (1) LED Panel shall be placed inside the cabinet top panel and one (1) LED Panel shall be placed on each side of the pull-out drawer/shelf assembly located beneath the controller support shelf. The LED Panels shall be controlled by a wall switch. Relume Traffic Control Box LED Panels and power supply or approved equivalent.

- (b) (13) The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1 ½ inch (38mm) deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lbs. (23 kg) in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 24 inches (610mm) wide.
- (b) (14) Plan & Wiring Diagrams – 12” x 16” (3.05mm x 4.06mm) moisture sealed container attached to door.
- (b) (15) Detector Racks – Fully wired and labeled for four (4) channels of emergency vehicle pre-emption and sixteen channels (16) of vehicular operation.
- (b) (16) Field Wiring Labels – All field wiring shall be labeled.
- (b) (17) Field Wiring Termination – Approved channel lugs required.
- (b) (18) Power Panel – Provide a nonconductive shield.
- (b) (19) Circuit Breaker – The circuit breaker shall be sized for the proposed load but shall not be rated less than 30 amps.
- (b) (20) Police Door – Provide wiring and termination for plug in manual phase advance switch.
- (b) (21) Railroad Pre-Emption Test Switch – Eaton 8830K13 SHA 1250 or equivalent.

UNINTERRUPTIBLE POWER SUPPLY (UPS)

This special provision supersedes the IDOT District 1 Traffic Signal Specifications dated January 1, 2012 included within this Contract’s Special Provisions.

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

The UPS shall be line interactive and provide voltage regulation and power conditioning when utilizing utility power. The UPS shall be sized appropriately for the intersection’s normal traffic signal operating connected load, plus 20 percent (20%). The total connected traffic signal load shall not exceed the published ratings for the UPS. The UPS shall provide a minimum of six (6) hours of normal operation run-time for signalized intersections with LED type signal head optics at 77 °F (25 °C) (minimum 1400 W/2000 VA active output capacity, with 90 percent minimum inverter efficiency).

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

The UPS shall have a minimum of four (4) sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) relay contact closures, available on a panel mounted terminal block or locking circular connectors, rated at a minimum 120 V/1 A, and labeled so as to identify each contact according to the plans.

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

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

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

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

All equipment required to transmit interconnect data to/from the master controller over the fiber optic cable shall be powered by the UPS in the event of loss of utility power. All fiber optic and other equipment required to maintain the communications between the pump station SCADA system, PTZ cameras and the District's office shall remain energized by the UPS in the event of a utility power failure.

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

The inverter/charger and power transfer relay shall be installed inside the integrated battery cabinet and the manual bypass switch shall be installed inside the traffic signal cabinet except for the following:

For intersections requiring additional battery capacity due to a larger connected operating load, the installation of the inverter/charger and power transfer relay may be installed inside the traffic signal cabinet if ample physical space in the integrated battery cabinet is unavailable.

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

Batteries shall be housed in the integrated battery cabinet. The cabinet shall be Aluminum alloy, 5052-H32, 0.125-inch thick and have a natural mill finish.

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

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

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

A minimum of three shelves shall be provided. Each shelf shall support a load of 198 lbs (90 kg) minimum.

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

The integrated battery cabinet housing shall be to the dimensions as shown on the plans. Clearance between shelves shall be a minimum of 10 in. (250 mm). The door shall be equipped with a two position doorstop, one at 90° and one at 120°.

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

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

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

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

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

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

(9) The UPS shall incorporate a flanged electric generator inlet for charging the batteries and operating the UPS. The generator connector shall be male type, twist-lock, rated as 15A, 125VAC with a NEMA L5-15P configuration and weatherproof lift cover plate (Hubbell model HBL4716C or approved equal). Access to the generator inlet shall be from a secured weatherproof lift cover plate or behind a locked battery cabinet police panel.

Battery System.

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

Individual batteries shall be 12V type, 79 amp-hour minimum capacity at 20 hours, and shall be easily replaced and commercially available off the shelf.

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

Batteries used for the UPS shall consist of four to twelve batteries with a cumulative minimum rated capacity of 300 amp-hours.

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

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

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

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

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

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

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

- (e) Warranty. The warranty for an uninterruptible 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 from the date the traffic signal and UPS are placed into service.

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

Description: This work shall consist of furnishing and installing lead-in cable for light detectors installed at existing and/or proposed traffic signal installations as part of an emergency vehicle priority system. The work includes installation of the lead-in cables in existing and/or new conduit. The electric cable shall be shielded and have three (3) stranded conductors colored blue, orange and yellow with a stranded tinned copper drain wire. The cable shall meet the requirements of the manufacturer of the Emergency Vehicle Priority System Equipment.

Basis of Payment: This work will be paid for at the contract unit price per foot for EMERGENCY VEHICLE PRIORITY SYSTEM LINE SENSOR CABLE, NO. 20 3/C, which price shall be payment in full for furnishing, installing and making all electrical connections necessary for proper operation.

GENERAL ELECTRICAL REQUIREMENTS

The following codes and standards shall be applicable for the proposed lighting improvements installation at IL Route 59, Ferry Road to Diehl Road.

IDOT "Standard Specifications for Road and Bridge Construction" adopted January 1, 2012
IDOT "Supplemental Specifications and Recurring Special Provisions",
IES RP-8 Roadway Lighting Standard.
National Electrical Code (ANSI/NFPA 70).
National Electrical Safety Code (NESC/ANSI C2).
American National Standards Institute (ANSI).
Institute of Electrical and Electronics Engineers (IEEE).
Insulated Cable Engineers Association (ICEA).
National Electrical Manufacturers Association (NEMA).
Illuminating Engineering Society (IES).
Underwriters Laboratories, Inc. (UL).
Occupational Safety and Health Administration (OSHA).

FIBER OPTIC CABLE INNERDUCT

1. Description.

This item shall consist of furnishing, installing, splicing, connecting and demonstrating continuity of fiber optic cable innerduct of sizes specified herein and as shown on the contract drawings. The innerduct shall be High Density Polyethylene.

2. Materials.

2.1 General:

The duct shall be a spiral ribbed plastic duct which is intended for underground use and which can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance. The ribbed duct shall have internally designed longitudinal ribs for reduced pulling frictions and increased lubrication effectiveness

The duct shall be made of high density polyethylene which shall meet the requirements of ASTM D 3035. The innerduct material shall be composed of high density polyethylene meeting the requirements of PE334470E/C as defined in ASTM D3350.

Submittal information shall demonstrate compliance with the details of these requirements.

2.2 Dimensions:

Duct dimensions shall conform to the standards listed in ASTM D3035, SDR-11. Submittal information shall demonstrate compliance with these requirements.

Nominal Size (Diameter)	Inside Diameter (minimum)	Outside Diameter (Average)	Wall Thickness (Min.)	Bend Radius (minimum)	Pull Strength	Weight Average (lbs/100ft.)
1"	1.030"	1.315"	0.120"	14"	500	19
1.25"	1.313"	1.660"	0.151"	17"	750	31
1.5"	1.506"	1.900"	0.173"	19"	1000	40
2"	1.885"	2.375"	0.216"	24"	1600	60

2.3 Marking:

As specified in NEMA Standard Publication No. TC-7, the duct shall be clearly and durably marked at least every 10 feet with the material designation (HDPE for high density polyethylene), nominal size of the duct, and the name and/or trademark of the manufacturer.

2.4 Color:

Innerduct shall be colored as follows or as directed by the Engineer.

Usage Designation	Color
Fiber Optic Trunk Cable (Ducts containing cables of 96 fibers)	Orange
Fiber Optic Distribution Cable (Ducts containing cables of 12, 6 or 4 fibers and 96 fiber ducts designated as distribution fibers)	Blue

3. Installation.

3.1 Pulling Tension.

Pulling tension of the duct shall be monitored throughout the pull and pulling tension shall not exceed those listed in the table or the specific manufacturer maximum pulling tensions as indicated in the catalog cut submittals. Failure to monitor the pulling tension will result in non-payment of that particular duct span and the span may be reinstalled with new duct at no additional cost to the State. Lubricants used shall be compatible with the duct.

3.2 Junction boxes.

Where duct passes through junction and/or pull boxes, the duct shall remain continuous unless a break is specifically indicated in the plans or as directed by the Engineer.

3.3 Handholes.

Where duct passes through handholes, the duct shall be looped uncut within the handhole unless otherwise indicated on the Plans or directed by the Engineer.
Bends.

Minimum bending radius shall be in accordance with the above table or the manufacturer's recommended radius, whichever is larger. Bends shall be made so that the duct will not be damaged and the internal diameter of the duct will not be effectively reduced. The degrees of bend in one duct run shall not exceed 360° between termination points.

3.4 In Trench

Where duct is installed in trench, it shall be placed in the bottom of the trench after all loose stones have been removed and all protruding stones have been removed or covered with backfill material as directed by the Engineer.

Where duct is shown to be installed in trench, it shall be installed at a depth not less than 30 inches unless otherwise indicated or specifically directed by the Engineer.

Where the specification for trench and backfill permits plowing in lieu of trench and backfill, the inner duct may be plowed into place. Unless otherwise indicated or specifically approved by the Engineer, plowing of inner duct shall lay the duct in place and shall not pull the duct through the length of the cut behind a bullet-nose mandrel or similar apparatus. In all cases, plowing operations shall be non-injurious to the duct.

3.5 In Raceway

Where duct is installed in raceways, lubricating compounds shall be used where necessary to assure smooth installation.

3.6 Encased in Concrete

Concrete shall be class SI complying with Section 720 of the Standard Specifications.

Steel Reinforcement Bars. Steel reinforcement bars shall comply with Section 706.10 of the Standard Specifications.

Underground concrete-encased conduit shall be supported on interlocking plastic spacers specifically designed for the purpose spaced along the length of the run as recommended by the manufacturer. Spacing between raceways within a common duct bank shall be not less than 2 inches. The interlocking spacers shall be used at a minimum interval of 8 ft.

Concrete cover overall shall not be less than 3 inches all around the encased run. Space below the conduit, and concrete fill shall be assured. Care shall be exercised during concrete placement to assure that there are no voids, so that spacers are undisturbed, and so that conduit joints stay secure and unbroken. Concrete shall be deflected during placement to minimize the possible damage to or movement of the conduits.

Conduit encased in concrete shall have steel reinforcing where installed below roadway or other paved vehicle areas (including shoulder) and the reinforcement shall extend not less than 5 feet additional from the edge of pavement unless otherwise indicated. Steel reinforcement shall not be less than No. 4 bars at corners and otherwise spaced on 12-inch centers, tied with No. 4 bars on 12-inch centers.

The Engineer shall examine all conduit joints for compliance with section 5 of this specification before concrete is poured.

3.7 Embedded

Conduit embedded in structure shall be supported on interlocking plastic spacers specifically designed for the purpose spaced along the length of the run as recommended by the manufacturer. Spacing between raceways within a common structure shall be not less than 2 inches. The interlocking spacers shall be used at a minimum interval of 8 ft.

Concrete cover overall shall not be less than 3 inches all around the embedded run. Space below the conduit, and concrete fill shall be assured. Care shall be exercised during concrete placement to assure that there are no voids, so that spacers are undisturbed, and so that conduit joints stay secure and unbroken. Concrete shall be deflected during placement to minimize the possible damage to or movement of the conduits.

The Engineer shall examine all conduit joints for compliance with section 5 of this specification before concrete is poured.

4. Joints

4.1 All HDPE duct to HDPE duct joints shall be made with an approved duct fusion splicing device.

4.2 HDPE coilable non-metallic conduit to non-HDPE coilable non-metallic conduit joints shall be either made with an approved mechanical connector or with a chemical compound. Both methods must be specifically designed for joining HDPE coilable non-metallic conduit. Minimum pullout force for the chemical compound shall be as listed in the following table.

Nominal Size		Pullout Force	
mm	in	N	Lbs
31.75	1.25	2400	540
38.1	1.50	2535	570
50.8	2.0	3335	750
63.5	2.5	4445	1,000
76.2	3.0	6225	1,400
101.6	4.0	8890	2,000

5. Measurement.

The duct shall be measured for payment in feet in place as described herein. Measurements shall be made in straight lines between horizontal changes in direction between the centers of the terminating points (poles, cabinets, junction boxes). Vertical measurement of the duct shall be as follows:

For runs terminating at junction boxes and/or control cabinets, the vertical measurement shall be taken from the bottom of the trench, or horizontal raceway, to a point 18-inches beyond the center of the junction box or control cabinet.

For runs terminating at poles, the vertical measure shall be taken from the bottom of the trench, or horizontal raceway, to a point 18-inch beyond the center of the light pole handhole regardless of light pole mounting method

Innerduct installed in excess of the limits describes herein shall not be paid for.

6. Basis of Payment.

This item will be paid for at the contract unit price per foot for **INNERDUCT**, of the size of duct as indicated, which shall be payment in full for all material and work as specified herein.

CITY OF NAPERVILLE ELECTRICAL PERMIT

The Contract will be required to obtain an electrical permit from the City of Naperville for the proposed Electric Utility Service Connections required for the project. The following are the City of Naperville’s requirements to obtain the permit:

1. The Contract will be required to prepare and submit the electrical permit form(s) and any required documents and pay the required electrical permit application fee(s). The application form and fee information is available at <http://www.naperville.il.us> or (630) 420-6046.
2. The Contractor or his sub-contractor performing the electrical work under this contract must be a registered Class A Electrical Contractor with the City of Naperville. Electrical contractor registration information is available at <http://www.naperville.il.us/electricalcontractorreg.aspx> or (630) 420-6046.

3. The Contractor or his sub-contractor must submit in person an Electrical Contractor Certification form to the City of Naperville Development Services located at 400 South Eagle Street; Naperville, Illinois 60540. The information Electrical Contractor Certification form can be obtained at <http://www.naperville.il.us/contractorforms.aspx>.
4. The Contractor or his sub-contractor shall be required to pay the IAC fee and any inspection fees require by the City of Naperville. The IAC fee has been estimated to be \$452 for the Electric Utility Services for this project.

Basis of Payment: The cost of meeting these requirements shall be included in the contract unit price for ELECTRIC UTILITY SERVICE CONNECTION. No additional compensation will be paid to the Contractor for any increase in the fees specified above or any additional fees required by the City of Naperville to obtain this permit.

ELECTRIC UTILITY SERVICE CONNECTION (CITY OF NAPERVILLE AND COMED)

Description. This item shall consist of payment for work performed by Department of Public Utilities – Electric (DPU-E) of said City of Naperville and ComEd, in providing new electric service(s) 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 DPU-E and ComEd. The Contractor shall coordinate his work fully with both the DPU-E and ComEd 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 DPU-E and ComEd, 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 to make arrangements with DPU-E and ComEd for service. In the event of delay by DPU-E and/or 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 for the exact amount of money as billed by DPU-E and 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 \$76,350.00 for the Electrical Utility Service Connections for Traffic Signals and \$15,000.00 for the Electrical Utility Service Connection for Lighting for a total of **\$91,350.00**.

Basis Of Payment. This work will be paid for at the contract lump sum price for **ELECTRIC UTILITY SERVICE CONNECTION** which shall be reimbursement in full for electric utility service charges.

ELECTRIC SERVICE INSTALLATION

Effective: January 1, 2012

Description. This item shall consist of all material and labor required to extend, connect or modify the electric services, as indicated or specified, which is over and above the work performed by the utility. Unless otherwise indicated, the cost for the utility work, if any, will be reimbursed to the Contractor separately under ELECTRIC UTILITY SERVICE CONNECTION. This item may apply to the work at more than one service location and each will be paid separately.

Materials. Materials shall be in accordance with the Standard Specifications.

CONSTRUCTION REQUIREMENTS

General. The Contractor shall ascertain the work being provided by the electric utility and shall provide all additional material and work not included by other contract pay items required to complete the electric service work in complete compliance with the requirements of the utility.

No additional compensation will be allowed for work required for the electric service, even though not explicitly shown on the Drawings or specified herein

Method Of Measurement. Electric Service Installation shall be counted, each.

Basis Of Payment. This work will be paid for at the contract unit price each for **ELECTRIC SERVICE INSTALLATION** which shall be payment in full for the work specified herein.

LIGHT POLE FOUNDATION, 24" DIAMETER, OFFSET

LIGHT POLE FOUNDATION, 24" DIAMETER, OFFSET shall be installed along IL 59 as shown on the plans in accordance with the applicable portions of Section 836 of the Standard Specification.

Basis of Payment. This work will be paid for at the unit price per foot installed for LIGHT POLE FOUNDATION, 24" DIAMETER, OFFSET.

TEMPORARY WOOD POLE, 90 FT, CLASS 2, 15 FT MAST ARM, EMBEDDED

Description. This work will consist of furnishing and installing a wood pole with a 15 Ft mast arm as shown on the plans or as directed by the Engineer. The pole will be used to support street light equipment.

Material. The wood pole must be 90 feet in length and meet the requirements of Section 1069.04 of the Standard Specifications. The mast arm assembly must be 15 feet in length, together with mounting hardware and meet the requirements of Section 1069.02 (a).

Installation. A hole must be augered for the pole. The pole must be embedded to a depth of 10 feet and set plumb. The backfill must be tamped and compacted around the pole in 6 inch layers. Any debris must be removed and properly disposed of according to Section 202.03 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per each TEMPORARY POLE, WOOD, 90 FOOT, CLASS 2, 15 FOOT MAST ARM, EMBEDDED, which price will include all labor and material necessary to install the pole.

TEMPORARY WOOD POLE, 40 FT, CLASS 4

Description. This work will consist of furnishing and installing a wood pole as shown on the plans or as directed by the Engineer. The pole will be used to support street light equipment.

Material. The wood pole must be 40 feet in length and meet the requirements of Section 1069.04 of the Standard Specifications.

Installation. A hole must be augered for the pole. The pole must be embedded to a depth of 7 feet and set plumb. The backfill must be tamped and compacted around the pole in 6 inch layers. Any debris must be removed and properly disposed of according to Section 202.03 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per each TEMPORARY POLE, WOOD, 40 FOOT, CLASS 4, which price will include all labor and material necessary to install the pole.

REMOVE TEMPORARY WOOD POLES

Description. This item shall consist of the removal of temporary wood poles, cameras including video signaling processing and power cabinet (on traffic signal poles), and fiber optic cable and span wire as applicable, as specified herein and as indicated on the plans.

REMOVAL REQUIREMENTS

Inspection And Acceptance. The Contractor shall examine the wood poles, cameras and video signaling processing and power cabinet, in the presence of the Engineer and after removing the poles, cameras, video signaling processing and power cabinet, and fiber optic cables/span wire shall be held responsible for preservation of the condition of the poles cameras and video signaling processing and power cabinet until they are turned over to IDOT. The contractor shall dispose of the fiber optic cable/span wire per industry standard disposal requirements.

Transportation. The Contractor shall transport, handle the wood poles, cameras and video signaling processing and power cabinet in complete conformance with industry standard recommendations. The Contractor shall make arrangements to transfer the wood poles, cameras and video signaling processing and power cabinet from the construction site to the State's storage facility located within District 1 on weekdays between the hours of 8:00 a.m. and 4:00 p.m., excluding State holidays applicable to the Department.

Method Of Measurement. Removal of wood poles, cameras, video signaling processing and power cabinet and fiber optic cable/span wire shall be counted as lump sum removed.

Basis Of Payment. This item shall be paid at the contract lump sum price for **REMOVE TEMPORARY WOOD POLES**, of the quantities and lengths indicated, **(REMOVE ONLY)**.

UNDERPASS LUMINAIRE, HPS, STAINLESS STEEL HOUSING

Effective: January 1, 2012

1. Description. This item shall consist of furnishing, testing as required, and installing a luminaire suitable for roadway underpasses as specified herein.

2. General.

- 2.1 The luminaire shall be optically sealed, mechanically strong and easy to maintain.
- 2.2 All wiring within the fixture shall have a minimum temperature rating of 125° C. In addition, the unit shall be designed to allow for a maximum supply wire rating of 90° C.
- 2.3 All hardware of the housing, reflector, and ballast assembly shall be captive
- 2.4 The luminaire shall be UL Listed for Wet Locations.
- 2.5 The underpass luminaire shall be suitable for lighting a roadway underpass at approximate mounting height of 16 feet from a position suspended directly above the roadway.
- 2.6 The luminaire shall be certified by the U.L. testing laboratory to meet the IP66 criteria of the International Electro technical Commission Standard 529.

3. Housing.

- 3.1 The housing shall be stainless steel and be made of 16 gauge minimum thickness stainless steel, Type 304, #2B finish.
- 3.2 Since the installed location of the luminaires has severe space limitations that prohibit servicing the luminaire from the top or side of the fixture, the luminaire must be serviceable from the bottom of the housing when in the installed position. Both ballast and optical compartments must be serviceable from the bottom of the fixture. Fixtures which open from the top or sides are not acceptable.
- 3.3 The housing shall have a maximum width of 13"
- 3.4 All internal and external hardware, unless specifically specified otherwise, shall be made of stainless steel.
- 3.5 Stainless Steel Housing
 - 3.5.1 The stainless steel housing, and lens frame shall be made of 16 gauge minimum thickness stainless steel, Type 304 #2B.
 - 3.5.2 All housing and frame components shall be cut within with a laser with a positioning accuracy of +/- .004" for assembly accuracy and machine welded to minimize irregularities in the weld joint.
 - 3.5.3 All seams in the housing enclosure shall be welded by continuous welding. Stainless steel weld wire shall be used for all welds. A sample weld shall be submitted for review and approval.
 - 3.5.4 The luminaire lens shall be flush, within 3.1 mm (0.122"), of the lens frame.
 - 3.5.5 The lens frame shall be flat and the frame and luminaire housing shall not have any protruding flanges.
 - 3.5.6 The lens frame assembly shall consist of a one-piece 16 gauge 304 stainless steel external frame with the lens facing toward the housing and a 16 gauge 304 stainless internal frame with the legs facing away from the housing. The internal frame shall have seam welded corners for added strength. The two panels will sandwich the glass lens and be fastened together with the use of no less than 10 #10 stainless steel fasteners.
 - 3.5.7 The lens frame and the door frame shall each be secured through the use of two stainless steel draw latches secured to the fixture housing.

- 3.5.8 When in open position, it shall be possible to un-hinge and remove the lens frame for maintenance. The lens frame hinge shall be stainless steel and designed so that there must be a conscious action of the maintenance personnel to remove the lens frame. The frame hinging method shall not be designed so that bumping the frame accidentally could allow the frame to fall to the roadway surface. The removal method must be accomplished without the use of tools or hardware. The hinge pin shall be a minimum of 6.35 mm (0.250") in diameter. The pin shall be spring loaded and retractable with a safety catch to hold the pin in the retracted position for ease of maintenance.
- 3.5.9 The suspended housing shall be divided into two compartments, one for the ballast and optical assembly, the other for wire connections. The optical chamber shall be sealed from the environment. The wire portal between compartments shall be sealed so as to prevent air exchange through the portal. There shall be an internally mounted breather mechanism to allow internal and external air pressure to equalize without permitting dust or water into the unit.
- 3.5.10 The ballast and all electrical equipment shall be mounted to a removable aluminum chassis with a minimum thickness of 3.175, (0.125"). The chassis shall be held in place with captive stainless steel hardware. The hardware shall include a bracket that can be loosened and shifted to allow the chassis to pivot away from fastened position for removal. The splice box shall include a heavy-duty 3 pole terminal block to accommodate #6 conductors and a KTK 2 amp fuse with HPC fuse holder or approved equal. Quick-connect power distribution terminal blocks shall be a molded thermoset plastic, rated 70A, 600V and have 3 poles, each with (4) .250 quick connect terminals. Operating temperature rating to be 150° C. Input wire size shall accommodate #2-#14 AWG. Torque rating shall be 45 in./lb. Maximum. Agency approvals shall be UL E62622; CSA LR15364.
- 3.5.11 Ballast compartment surfaces shall be deburred and free of sharp edges, points or corners that may come in contact with installers or service personnel.

4. Gasketing:

- 4.1 The junction between the lens frame and the ballast housing door and the housing shall be sealed with a one-piece vulcanized or molded high temperature solid silicone rubber gasket with the equivalent of a 60 Shore A durometer rating. The gasket between the lens frame and the luminaire housing shall be securely attached by mechanical means, such a retaining lip to prevent the movement of the gasket. The gasket may not be secured by adhesive means exclusively. The lens and ballast housing doors shall be designed and constructed so they seal to the gasket on a flat surface. The frame shall not seal to the gasket using the edge of leg on a doorframe. The lens shall be sealed inside of the lens frame with the use of a one-piece solid silicone rubber gasket with ribbed flanges and a rating of 60 Shore A Durometer

- 4.2 The junction between conduit connections to the luminaire and the lens frame junction to the housing shall withstand entry of water when subjected to a water jet pressure of 207 kPa (30 lbs. Per sq. inch), tested under laboratory conditions. Submittal information shall include data relative to gasket thickness and density and the means of securing it in place.

5. Mounting Brackets

- 5.1 The brackets shall be properly sized to accommodate the weight of the luminaire with calculations or other suitable reference documentation submitted to support the material choice.
- 5.2 The luminaire shall have an opening in the housing for installation (by others) of a 28.1 mm (3/4 inch) diameter flexible conduit. The location of the opening will be determined by the Engineer during the shop drawing review.

6. Lamp Socket:

- 6.1 The lamp socket shall be a 4KV pulse rated mogul type, porcelain glazed enclosed, and be provided with grips, or other suitable means to hold the lamp against vibration. The rating of the socket shall exceed the lamp starting voltage, or starting pulse voltage rating.
- 6.2 If the lamp socket is of the sealed removable type, proper alignment of the socket shall be provided and molded into the socket assembly and indicated in a contrasting color.
- 6.3 If the lamp socket is adjustable, the factory setting must be indicated legibly in the luminaire housing.

7. ANSI Identification Decal:

A decal, complying to ANSI standard C136-15 for luminaire wattage and distribution type, shall be factory attached permanently to the luminaire. The information contained in the decal shall enable a viewer, from the ground level, to identify the lamp wattage and type of luminaire distribution.

8. Optical Assembly:

- 8.1 Lens and Lens Frame. The lens shall be made of crystal clear, impact and heat resistant tempered glass a minimum of 6.35 mm (0.25") thick. The lens shall be held in such a manner as to allow for its expansion and contraction, due to temperature variation. The lens shall be a flat glass design.

8.2 Reflector:

- 8.2.1 The reflector shall be hydro formed aluminum, 0.063" thick, bright-dip and clear anodized finish.
- 8.2.2 The reflector shall be secured with a stainless steel aircraft cable during maintenance operations.

- 8.2.3 If the reflector has multiple light distribution positions, each position must have positive stop/mounting with the original factory distribution identified.
- 8.2.4 The luminaire shall be photometrically efficient. Luminaire efficiency, defined by the I.E.S. as "the ratio or luminous flux (lumens) emitted by a luminaire to that emitted by the lamp or lamps used within", shall not be less than 67%. Submittal information shall include published efficiency data.
- 8.2.5 The reflector, the refractor or lens, and the entire optical assembly shall not develop any discoloration over the normal life span of the luminaire.
- 8.2.6 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

9. Ballast:

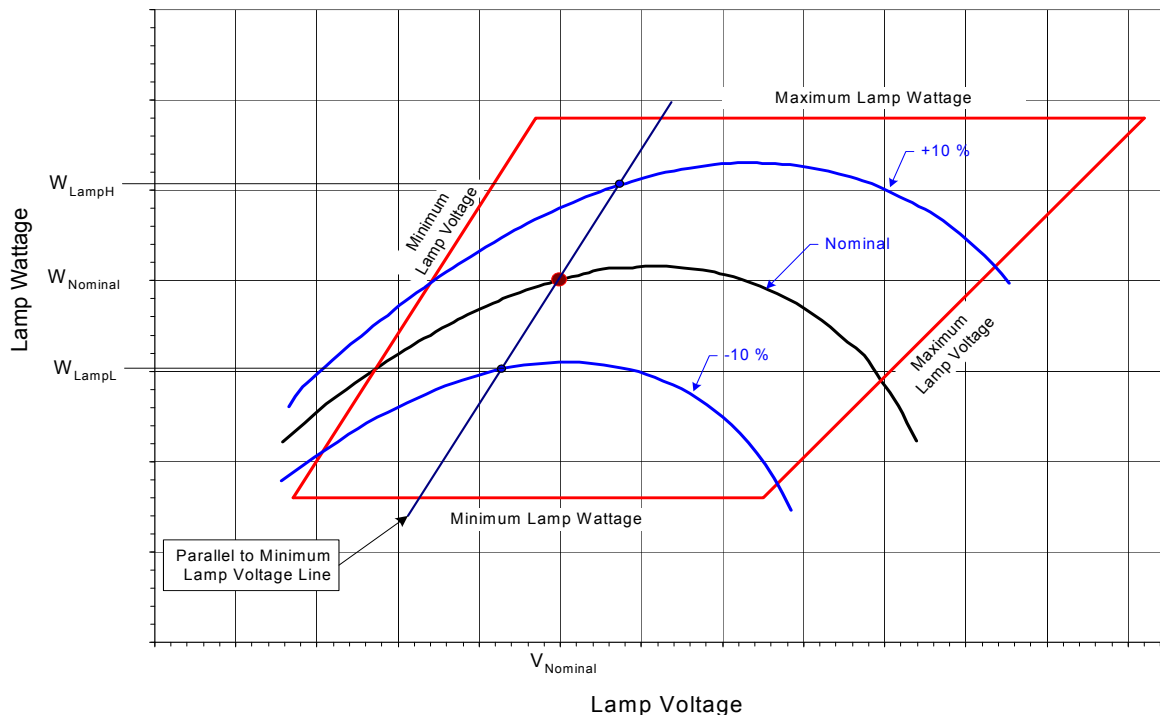
- 9.1 The ballast shall be a High Pressure Sodium, high power factor, lead type, Isolated Regulator Ballast (CWI) or a Constant Wattage Auto-regulator (CWA), for operation on a nominal 480 volt system.
- 9.2 The ballast shall be designed to furnish proper electrical characteristics for starting and operating a high pressure sodium vapor lamp of the specified rating at ambient temperatures of -29 degrees to +40 degrees C. The ballast windings shall be adequately impregnated and treated for protection against the entrance of moisture, insulated with Class H insulation, and able to withstand the NEMA standard dielectric test.
- 9.3 The ballast shall include an electronic starting assembly. The starter assembly shall be comprised of solid state devices capable of withstanding ambient temperatures of 85 degrees C. The starter shall provide timed pulsing with sufficient follow-through current to completely ionize and start all lamps. Minimum amplitude of the pulse shall be 2,500 volts, with a width of one (1) microsecond at 2,250 volts, and shall be applied within 20 electrical degrees of the peak of the open circuit voltage wave with a repetition rate as recommended by the lamp manufacturer for the 60 cycle wave. The lamp peak pulse current shall be a minimum of 0.2 amperes. Proper ignition shall be provided over a range of input voltage from 432 to 528 volts. The starter component shall be field replaceable and completely interchangeable with no adjustment necessary for proper operation. The starter component shall have push-on type electrical terminations to provide good electrical and mechanical integrity and ease of replacement. Terminal configuration shall preclude improper insertion of plug-in components. The starter circuit board shall be treated in an approved manner to provide a water and contaminant-resistant coating.
- 9.4 The ballast shall have an overall power factor of at least 0.9 when operated under rated lamp load.
- 9.5 The ballast shall withstand a 2,500 volt dielectric test between the core and windings without damage to the insulation.

9.6 The ballast shall not subject the lamp to a crest factor exceeding 1.8 and shall operate the lamp without affecting adversely the lamp life and performance.

9.7 The ballast shall be designed to ANSI Standards and shall be designed and rated for operation on a nominal 480 volt system. The ballast shall provide positive lamp ignition at the input voltage of 432 volts. It shall operate the lamp over a range of input voltages from 432 to 528 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
400	25%
310	26%
250	22%
150	22%
70	17%

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 (528v)

W_{LampL} = lamp watts at - 10% line voltage (432v)
 W_{lampN} = lamp watts at 480v”

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

Nominal Ballast Wattage	Maximum Ballast Losses
400	16.0%
310	19.0%
250	17.5%
150	26.0%
70	34.0%

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 480v

W_{lamp} = lamp watts at 480v

9.9 Ballast output to lamp. At nominal system voltage and a lamp voltage of 52v, the ballast shall deliver a lamp wattage within $\pm 4\%$ of the nominal lamp wattage. For a 70w luminaire, the ballast shall deliver 70 watts $\pm 4\%$ at a lamp voltage of 52v for the nominal system voltage of 480v.

9.10 Ballast output over lamp life. Over the life of the lamp the ballast shall produce an average of the nominal lamp rating $\pm 5\%$. Lamp wattage readings shall be taken at 5-volt increments throughout the ballast trapezoid. The lamp wattage values shall then be averaged within the trapezoid and shall be within $\pm 5\%$ of the nominal ballast rating. Submittal documents shall include a tabulation of the lamp wattage vs. lamp voltage readings.

9.11 The ballast shall be integral to the luminaire. The ballast components shall be mounted on a removable door or on a removable mounting tray. The ballast tray or mounting door shall be manufactured with dissimilar metal conflicts kept to a minimum.

9.12 Ballast wiring and lamp socket wiring shall be connected by means of keyed plugs. Upon unplugging the ballast wiring the entire ballast assembly shall be removable for maintenance. The plugs shall not be interchangeable to avoid improper connection of the assemblies.

9.13 The mounting adjustments and wiring terminals shall be readily accessible. The removable door or pad shall be secure when fastened in place and all individual components shall be secure upon the removable element. Upon ballast assembly removal, each component shall be readily removable for replacement.

- 9.14 The luminaire shall be completely wired. All wiring connections within the luminaire shall be made with insulated compression connectors or insulated terminal blocks. An insulated terminal block shall be provided to terminate the incoming supply wires. The terminal block shall be rated for 600 volts and shall accommodate wire sizes from #10 to #6 AWG. The use of "wire nuts" is unacceptable. A ground terminal shall be provided for the connection of a ground wire.
- 9.15 Ballast and lamp Leads shall not be smaller than #16 AWG conductors rated at a minimum temperature rating of 90° C.
- 9.16 All wires shall be coded by tagging and/or color coding for proper identification. A complete legible permanently attached wiring diagram (no smaller than 3" x 4" with a min. font size of 8 pts.) coordinated with the wire identifications shall be displayed at the convenient location on the interior of the luminaire. The wiring diagram shall be oriented so that it is right side up and readable when the luminaire is in the installed position.
- 9.17 The ballast shall not be excessively noisy. Noticeable noisy ballasts, as determined by the Engineer, shall be replaced at no additional cost to the State.
- 9.18 The ballast shall provide lamp operation within lamp specifications for the rated lamp life at the input design voltage range. It shall have a 6 month operation capability with a cycling lamp.
- 9.19 Submittal information shall include manufacturer's literature and data to confirm compliance with all specified requirements including an ANSI Standard Ballast Characteristic Graph (Trapezoid) diagram, with all items clearly identified.

10. Photometric Performance:

- 10.1 The luminaire photometric performance shall produce results equal to or better than those listed in the included Luminaire Performance Table. Submittal information shall include computer calculations based on the controlling given conditions which demonstrate achievement of all listed performance requirements. The computer calculations shall be done according to I.E.S. recommendations and the submitted calculations shall include point-by-point illuminance, luminance and veiling luminance as well as listings of all indicated averages and ratios as applicable. Calculations shall be performed with AGI32. The program used to perform the calculations shall be identified on the submittal. The submittal data shall also include all photometric calculations files with the proposed photometric data on a CD ROM. The performance requirements shall define the minimum number of decimal places used in the calculations. Rounding of calculations shall not be allowed.
- 10.2 In addition to computer printouts of photometric performance, submittal information shall include: Descriptive literature; an Isofootcandle chart of horizontal lux (footcandles); Utilization curve; Isocandela diagram; Luminaire classification per ANSI designation; Candlepower values at every 2.5 degree intervals; Candlepower tables are to be provided on CD ROM in the IES format as specified in IES publication LM-63.

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

IDOT DISTRICT 1 LUMINAIRE PERFORMANCE TABLE
 I-88 Underpass Roadway Section

GIVEN CONDITIONS		
ROADWAY DATA	Pavement Width	37.5 ft.
	Number of Lanes	3
	I.E.S. Surface Classification	R3
	Q-Zero Value	0.07
LIGHT POLE DATA	Mounting Height	16 (ft)
	Mast Arm Length	0 (ft)
	Pole Set-Back From Edge of Pavement	13.5
LUMINAIRE DATA	Lamp Type	H.P.S.
	Lamp Lumens	16000
	I.E.S. Vertical Distribution	Asymmetrical
	I.E.S. Control Of Distribution	Medium Cut Off
	I.E.S. Lateral Distribution	Type IV
	Total Light Loss Factor	.7
LAYOUT DATA	Spacing	30 (ft)
	Configuration	Median Pier
	Luminaire Overhang over edge of pavement	-12.5 (ft)

NOTE: Variations from the above specified I.E.S. distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

PERFORMANCE REQUIREMENTS		
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NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

ILLUMINATION	Average Horizontal Illumination, E_{AVE}	1.0 (fc)
	Uniformity Ratio, E_{AVE}/E_{MIN}	3.0 (fc)
LUMINANCE	Average Luminance, L_{AVE}	0.6 Cd/m ²
	Uniformity Ratio, L_{AVE}/L_{MIN}	3.50 Cd/m ²
	Uniformity Ratio, L_{MAX}/L_{MIN}	6.00 Cd/m ²
	Max. Veiling Luminance Ratio, L_V/L_{AVE}	0.30 Cd/m ²

11. Independent Testing:

11.1 Independent testing of luminaires shall be required whenever the quantity of luminaires of a given wattage and distribution, 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 quantity of 75 luminaires would dictate that 2 to be tested; 135 luminaires would dictate that three be tested.*

11.2 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.

11.3 Commitment to test. The Vendor 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 manufacturer's 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:

- ▶ 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.
- ▶ Be a member of IESNA in good standing.
- ▶ Provide a list of professional references.

d. Engineer Factory Selection and Witness of Manufacturer Testing: The Contractor may select this option if the 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.

In all cases, the selection of luminaires shall be a random selection from the entire completed lot of luminaires required for the contract. Selections from partial lots will not be allowed. The selection of the testing option shall be presented with the information submitted for approval. The proposed independent laboratory or independent witness shall be included with that information. The selection of the testing option shall be presented with the information submitted for approval. The proposed independent laboratory or independent witness shall be included with that information.

11.4 The testing performed shall include photometric, electrical, heat and water jet testing.

11.5 Photometric testing shall be in accordance with IES recommendations except that the selected luminaire(s) shall be tested as manufactured without any disassembly or modification and, as a minimum shall yield an Isofootcandle chart, with max candela point and half candela trace indicated, an Isocandela diagram, maximum plane and cone plots of candela, a candlepower table (house and street side), a coefficient of utilization chart, a luminous flux distribution table, and complete calculations based on specified requirements and tests.

11.6 Electrical testing shall conform to NEMA and ANSI standards and as a minimum, shall yield a complete check of wiring connections, a ballast dielectric test, total ballast losses in watts and percent of input, a lamp volt-watt trace, regulation data, a starter test, lamp current crest factor, power factor (minimum over the design range of input voltage at nominal lamp voltage) and, a table of ballast characteristics showing input amperes, watts and power factor, output volts, amperes, watts and lamp crest factor as well as ballast losses over the range of values required to produce the lamp volt-watt trace. Ballast test data shall also be provided in an electronic format acceptable to the Engineer to demonstrate compliance with sections 9.7, 9.8, 9.9 and 9.10.

11.7 Heat Testing. Heat testing shall be conducted to ensure that the luminaire complies with UL 1572. An ambient temperature of 40 degrees centigrade (104 degrees F) shall be used for the test.

11.8 Water spray test. The luminaires must pass the following water spray test.:

A spray apparatus consisting of four spray nozzles set at an angle of 30 degrees from the vertical plane space 30 inches apart on a 2 inch pipe, each delivering 12 gallons of water per minute at a minimum of 100 psi at each nozzle in a 90 degree cone. A water pressure gauge shall be installed at the first nozzle.

The luminaires shall be mounted in a ceiling configuration and with each nozzle set a distance of 18 inches below the fixture in the vertical plane and 18 inches away in the horizontal plane from the fixture lens, apply spray for a duration of 3 minutes at a minimum of 100 psi. When opened, the fixture shall not show any signs of leakage.

The above test shall be repeated in the opposite horizontal plane from the fixture lens with no signs of leakage.

The summary report and the test results shall be certified by the independent test laboratory or the independent witness, as applicable, and shall be sent by certified mail directly to the Engineer. A copy of this material shall be sent to the Contractor and luminaire manufacturer at the same time.

11.9 Should any of the tested luminaires of a given distribution type and wattage fail to satisfy the specifications and perform according to approved submittal information, the luminaire of that distribution type and wattage shall be unacceptable and be replaced by alternate equipment meeting the specifications with the submittal and testing process repeated in their entirety; or corrections made to achieve required performance. In the case of corrections, the Vendor 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. Luminaires which are not modified or corrected shall not be re-tested without prior approval from the Engineer.

Coordination shall be the Vendor's responsibility. Failure to coordinate arrangements and notice shall not be grounds for additional compensation or extension of time.

Submittal information shall include a statement of intent to provide the testing as well as a request for approval of the chosen laboratory.

12. Installation.

12.1 Underpass luminaires shall be either attached to structures (such as piers, etc.) or suspended from structures (such as bridge decks) as indicated or implied by the configuration on the Plans. Mounting, including all hardware and appurent items, shall be included as part of this item.

12.2 Unless otherwise indicated, suspended underpass luminaires shall be installed one-inch above the lowest underpass beam and shall be mounted using vibration dampening assemblies. All mounting hardware shall be corrosion resistant and shall be stainless steel unless otherwise indicated.

12.3 The Engineer reserves the right to select the final light distribution pattern, luminaire aiming angle and change it as deemed necessary to produce the proper pavement luminance.

12.4 Surface mounted luminaires, all luminaires not mounted on suspension rods, shall have one-inch thick stainless steel spacers installed between the luminaire and the deck or wall.

13. Guarantee.

The Vendor shall provide a written guarantee for materials and workmanship for a period of 6 months after final acceptable of the lighting system.

14. Documentation.

All instruction sheets required to be furnished by the manufacturer for materials and supplies and for operation of the equipment shall be delivered to the Engineer.

The manufacturer shall have been incorporated for at least five years and shall have at least five years in the design and manufacturing of roadway underpass lighting. The manufacturer shall provide evidence of financial strength to finance the production of the project by submitting the name of at least three projects completed in the previous calendar year of greater than \$250,000 each. All steel used in the project shall be certified to be provided domestically, and all fixture components used shall be manufactured domestically.

15. Method of Measurement. Luminaires shall be counted, as per each.

16. Basis of Payment. This item shall be paid at the contract unit price each for **UNDERPASS LUMINAIRE**, of the wattage specified, **HIGH PRESSURE SODIUM VAPOR**, which shall be payment in full for the material and work described herein.

PROTECTION AND MAINTENANCE OF EXISTING UNDERPASS LUMINAIRES

Effective: January 1, 2012

Description: This item shall consist of providing protection, temporary support, removal and reattachment as required, of the existing underpass lighting system. The system consists of, but not limited to, luminaires, junction boxes, raceways, support equipment and conductors. Any wiring required to maintain the operation of the underpass or other circuits feed through the underpass lighting system shall be included in this item.

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

Item	Article/Section
(a) Electric Raceway Material.....	1088
(b) Conductors.....	1066.02
(c) Insulation.....	1066.03

CONSTRUCTION REQUIREMENTS

General. Before performing any work, an inventory of all missing hardware of the existing lighting system shall be taken jointly by the Contractor and the Engineer.

Protection During Deck Reconstruction: Luminaires and conduit hangers attached to the bridge deck shall be removed prior to the removal of the existing bridge deck. The luminaires and the conduits shall be temporarily supported during bridge deck reconstruction. The method of support shall be structurally equivalent to the existing system and shall be approved by the Engineer. Existing vertical clearances shall be maintained at all times.

The underpass luminaires and hardware shall be protected from overhead debris during the removal and reconstruction of the bridge deck. The underpass luminaire protection shall be coordinated with the protective shield as described elsewhere in these Special Provisions.

The underpass lighting system shall be protected from spills and over-spray during any painting operations. Spills and over-spray shall be removed by the Contractor at no additional expense to the State. If spills or over-spray occur on the luminaire lens, the luminaire lens shall be replaced with new lens from the luminaire manufacturer at no additional cost to the State.

Prior to bridge deck removal the Contractor shall measure and log the location of all existing conduit and luminaire hangers for reattachment purposes. Upon completion of the bridge deck reconstruction, the existing underpass lighting system shall be permanently reattached at these locations. New heavy duty expansion anchors, as approved by the Engineer, shall be used. New hangers may be installed at the option of the Contractor. The new hangers shall be equivalent to the existing hangers or as approved by the Engineer. The cost of the new expansion anchors and hangers shall be included in this pay item.

Damage to Underpass Lighting System: Should the lighting system be damaged through the Contractor's operations, repairs shall be made by the Contractor at no additional cost to the State.

All repairs shall be performed expeditiously and shall be approved by the Engineer. The Contractor shall conduct his work in a manner as not to keep out of service any of the lighting between 4:00 PM and 8:00 AM. All lights shall be tested daily and any necessary repairs shall be made immediately without delay.

Damaged cable shall be replaced in complete spans, no underground splices will be allowed. Temporary aerial quadraplex cable may be used to maintain luminaires operational provided it does not interfere with traffic or other operations as determined by the Engineer.

Grounding of Existing Lighting System: As indicated on the plans, the Contractor shall furnish and install a grounding conductor for the underpass lighting system in all existing conduits, junction boxes and luminaires. The ground conductor shall be a 1/C #10 AWG EPR (Type-RHW) green insulated conductor. The new ground conductor shall be connected to the existing ground conductor in the main junction box. The cost of this work shall be included in this pay item.

The continuity and continued operation of the adjacent lighting system shall be the responsibility of the Contractor. Any temporary wiring required to comply with this requirement shall be included in this item.

Basis of Payment: This work shall be paid for at the contract lump sum price for **PROTECT AND MAINTAIN EXISTING UNDERPASS LUMINAIRE**, which shall be payment for the work as described herein and as indicated in the plans.

**UNIT DUCT, 600V, 2-1/C NO.4, 1/C NO.6 GROUND, (XLP-TYPE USE), 1" DIA.
POLYETHYLENE**

UNIT DUCT, 600V, 2-1/C NO.4, 1/C NO.6 GROUND, (XLP-TYPE USE), 1" DIA.
POLYETHYLENE shall be installed adjacent to the roadway at the new interchange as shown on the plans in accordance with the applicable portions of Section 816 and Section 1066 of the Standard Specification

Basis of Payment. This work will be paid for at the contract unit price per foot installed for UNIT DUCT, 600V, 2-1/C NO.4, 1/C NO.6 GROUND, (XLP-TYPE USE), 1" DIA. POLYETHYLENE.

**UNIT DUCT, 600V, 3-1/C NO.4, 1/C NO.6 GROUND, (XLP-TYPE USE), 1 ¼” DIA.
POLYETHYLENE**

UNIT DUCT, 600V, 3-1/C NO.4, 1/C NO.6 GROUND, (XLP-TYPE USE), 1 ¼” DIA.
POLYETHYLENE shall be installed adjacent to the roadway at the new interchange as shown on the plans in accordance with the applicable portions of Section 816 and Section 1066 of the Standard Specification

Basis of Payment. This work will be paid for at the contract unit price per foot installed for UNIT DUCT, 600V, 3-1/C NO.4, 1/C NO.6 GROUND, (XLP-TYPE USE), 1 ¼” DIA. POLYETHYLENE.

**UNIT DUCT, 600V, 5-1/C NO.4, 1/C NO.6 GROUND, (XLP-TYPE USE), 1 ½” DIA.
POLYETHYLENE**

UNIT DUCT, 600V, 5-1/C NO.4, 1/C NO.6 GROUND, (XLP-TYPE USE), 1 ½” DIA.
POLYETHYLENE shall be installed adjacent to the roadway at the new interchange as shown on the plans in accordance with the applicable portions of Section 816 and Section 1066 of the Standard Specification.

Basis of Payment. This work will be paid for at the contract unit price per foot installed for UNIT DUCT, 600V, 5-1/C NO.4, 1/C NO.6 GROUND, (XLP-TYPE USE), 1 ½” DIA. POLYETHYLENE.

CLOSED CIRCUIT TELEVISION DOME CAMERA

1. **Description.**

This item shall consist of furnishing and installing an integrated Closed-Circuit Television (CCTV) Dome Camera Assembly for use during the construction period and removal of same at the completion of construction as described herein and as indicated in the Plans. Provide decoders, equipment IP distribution, and CCTV Cabinet specified under separate Special Provisions.

2. **Definitions:**

CCTV Dome Camera	The complete camera assembly including the camera, PTZ mechanism, upper and lower dome housings, and any mounts.
Dome, lower dome, dome bubble	Clear dome (bubble) on the lower portion of the CCTV dome camera which the camera views through
Dome housing, upper dome	The upper portion of the CCTV dome cameras which houses the camera and PTZ Mechanism.
PTZ	The motorized Pan, Tilt and Zoom mechanism
Camera	The color camera

3. Materials.

3.1 General. The CCTV Dome Color Camera shall be a rugged, non-pressurized, outdoor surveillance domed camera system. The CCTV Dome Camera shall be designed to perform over a wide range of environmental and lighting conditions and automatically switches from color daytime to monochrome nighttime operation. For compatibility with the existing CCTV cameras, the dome cameras shall be manufactured by Phillips/Bosch (AutoDome Series 600) or equal approved by the Engineer. The equivalent shall comply with all the requirements herein and shall provide the same operation/functionality as the installed cameras without the use of any external devices for the modification/translation of video and PTZ commands.

All equipment and materials used shall be standard components that are regularly manufactured and utilized in the manufacturer's system.

The manufacturer shall be ISO 14001 Certified. The manufacturer's quality system shall be in compliance with the I.S./ISO 9001/EN 29001, QUALITY SYSTEM. The manufacturer shall provide a three year (3) warranty. The manufacturer shall pay inbound and outbound shipping charges during the warranty period for products returned as warranty claims. The manufacturer shall also provide an advance exchange program for warranty claims.

The warranty period shall begin on the date of final acceptance of the video distribution system. This warranty shall include repair or replacement of all failed components via a factory authorized repair facility. All items sent to the repair facility for repair shall be returned within two weeks of the date of receipt at the facility. The repair facility location shall be in the United States. Any extended warranty coverage required to comply with the specified warranty period shall be provided as a part of this pay item at no additional cost to the State.

3.2 Physical construction. The CCTV Dome Camera shall be provided in a NEMA 4X or IP66 certified, rugged, weather-resistant package. The CCTV Dome Camera shall also comply with the following requirements:

Environmental	Requirement
IP Rating	IP 66
Weight (max.)	10 lbs
Overall Dimensions	10" dia. x 14"
Humidity	0 to 100%
Operating temperature	-40°C to 50°C
Mount	1 ½" NPT

The CCTV dome camera shall be equipped with a fan and heater controlled by a thermostat. The heater shall prevent internal fogging of the lower dome throughout the operating temperature range of the camera.

An optional rugged clear dome bubble shall be available from the CCTV camera manufacturer. The rugged dome shall be made from 3mm thick polycarbonate, designed to meet stringent strength standards without compromising optical clarity. The dome, by itself, shall withstand a 100 foot-pound impact. This energy is equivalent to that of a 10 lb sledgehammer being dropped from a height of 10 feet. The dome, when installed in the CCTV camera, shall exceed the UL 1598 horizontal impact standard for lighting fixtures, by a factor of 10. The submittal needs to indicate compliance with this requirement.

- 3.3 Power. The CCTV Dome Camera shall be designed to operate from a 120v power source. The appropriate power supply, if required for the CCTV Dome Camera to operate, shall be included as a part of this item. The power requirements for the camera shall comply with the following:

Electrical	Requirement
Voltage	18 to 30 VAC
Load	25 VA
Heater Load	45 VA
Listing	UL Listed
FCC	Class B

Surge Suppression Requirements

Source	Minimum Requirements
Video	Peak current 10 kA (Gas Tube Arrester), peak power 1000 W (10/1000 μ)
RS-232/485, Biphase	Peak current 10 A, peak power 300 W (8/20 μ)
Alarm Inputs	Peak current 17 A, peak power 300 W (8/20 μ)
Alarm Outputs	Peak current 2 A, peak power 300 W (8/20 μ)
Relay Outputs	Peak current 7.3 A, peak power 600 W (10/1000 μ)
Power Input (Dome)	Peak current 7.3 A, peak power 600 W (10/1000 μ)
Power Output (Alarm Power Supply)	Peak current 21.4 A, peak power 1500 W(10/1000 μ)

- 3.4 Camera.

The CCTV Dome Camera shall incorporate a solid state CDD imaging camera with the following requirements.

- 3.4.1 The camera shall automatically switch from daylight color operation to a higher sensitivity nighttime monochrome mode when light levels fall below a user adjustable threshold level.
- 3.4.2 The camera shall provide a selectable slow shutter (frame integration) function that increases the camera's sensitivity up to 50 times by reducing the shutter speed as well as fully automatic.

3.4.3 Digital image stabilization shall be provided using electronic compensation that filters out vibrations caused by wind and other environmental conditions.

3.4.4 The camera shall feature a Sodium Vapor White Balance mode.

The camera shall also comply with the following requirements:

Camera	Requirement
Imager	1/4" HAD CCD
Effective Pixels	768H x 494V
Zoom Lens Power (Optical only)	36x
Aperture	f1.6 to f4.5
Focus	Auto / Manual
Iris	Auto / Manual
Max. Field of View Horizontal	57°
Video Output	1.0v +/- 0.07v
Gain Control	Auto / off
Synchronization	Internal / AC line lock, phase adj. via remote control, V-Sync
Digital Zoom	12x
Horizontal Resolution	550 TVL
Signal – Noise Ratio	>50dB
White Balance	Auto / Manual, 2000 K to 10,000K
Shutter Speed	1/1 to 1/10,000 sec

Min Illumination		Values in lux
Day	SensUp (Off)	0.66
	SensUp (On)	0.04
Night	SensUp (Off)	0.104
	SensUp (On)	0.0052

3.5 PTZ Mechanical

The CCTV dome camera shall have an integrated motorized PTZ mechanism as specified herein and shall be compatible and coordinated with the control system described elsewhere herein. The camera's 360° pan rotation shall be divided into 16 independent sectors with 16-character titles per sector. Any or all of the 16 sectors may be blanked from the operator. In addition to the blanking function, a privacy masking feature shall be provided that allows creation of up to six (6) rectangular masks that prohibit areas of the field of view from being seen even if the camera is panned, tilted, or zoomed.

Mechanical (Dome Drive)		Requirement
Pan		360°
Tilt		Up to 18° above horizon
Continuous PTZ Operation		Yes
Pre-position speed	Pan	360°/sec
	Tilt	200°/sec
Accuracy	Pan	+/- 0.1°
Variable speed	Pan	80°/sec or 150°/sec
	Tilt	40°/sec

3.6 Functionality

Camera Commands

- 3.6.1 The camera shall allow the storage of up to 99 preset scenes with each preset programmable for 16 character titles. A tour function shall be available to consecutively display each of the preset scenes for a programmed dwell time. Any or all of the presets may be included or excluded from the tour.
- 3.6.2 The camera shall be capable of recording two (2) separate tours of an operator's keyboard movements consisting of, tilt, and zoom activities for a total combined duration time of 15 minutes. Recorded tours can be continuously played back.
- 3.6.3 When an operator stops manual control of the camera, and a programmed period of time is allowed to expire, the camera will execute one of the following programmable options: 1) return to preset #1 or 2) return to the automated tour previously executed or 3) do nothing and remain at the present position.
- 3.6.4 The camera shall ensure that any advanced commands required to program the camera are accessed via three levels of password protection ranging from low to high security.
- 3.6.5 The camera system shall provide a feature that automatically rotates, or pivots, the camera to simplify tracking of a person walking directly under the camera.
- 3.6.6 The camera's 360° pan rotation shall be divided into 16 independent sectors with 16-character titles per sector. Any or all of the 16 sectors may be blanked from the operator.

- 3.6.7 In addition to the blanking function, a privacy masking feature shall be provided that allows creation of up to six (6) rectangular masks that prohibit areas of the field of view from being seen even if the camera is panned, tilted, or zoomed

Visual Effects	Requirement
Sectors/Zones	8
Titling	20 characters
Max Presets	99
Motion Detection	Yes
Password Protection	Yes
On Screen Configuration Menus	Yes
Image Stabilization	Yes
Preset Tour / max presets	
Recorded Variable PTZ Tour	2
Auto Flip	Yes
Auto Return to preset after operator inactivity	Yes
Window Blanking	
Quantity	6
Grey out	Yes
Alarms	Yes

- 3.6.8 The manufacturer shall fully document and provide to the Department the communication protocol implemented by the CCTV dome camera. This protocol shall be open and allow third-party development of control software. If the current protocol is not NTCIP compliant, the manufacturer shall supply upgrades to make the software compliant in the future at no cost to the Department.

- 3.6.9 Diagnostic software shall be provided with each CCTV camera which shall allow all camera functions accessible via a Windows XP based PC. A RS232 cable, or a USB cable if available, shall be provided to connect to CCTV dome camera assembly. A copy of the diagnostic software shall be supplied for each CCTV camera. The program shall be capable of configuring and controlling the CCTV dome camera assembly and its functions (position, zoom, focus, iris, power, color balance, etc.) from within it. This includes storing and recalling preset positions for fast system configuration.

3.7 Interface

Control System. Camera commands shall be transmitted over twisted pair, RS 232, RS 422 and RS 485. The method of transmission shall be user selectable.

The camera shall provide four (4) normally open or normally closed alarm input contacts and one (1) relay output. Any or all of the input contacts may be programmed upon activation to automatically move the camera to any preposition location, close the output relay for a programmed period of time, and display an alarm indication on the on-screen display of the display monitor.

4. Testing.

The Contractor shall test each CCTV Dome Camera Assembly in the presence of the Engineer after the camera is installed. This test may be done locally at the camera support structure.

5. Product Support.

The manufacturer shall provide technical support via email, fax and toll-free telephone. The above forms of support shall be provided Monday through Friday, 8:00am to 8:00pm EST.

6. Installation.

The Contractor shall submit shop drawings for the camera mounting adapter. Installation shall be included in the pay item. Provide 2 cables for power and control from the control panel to the camera housing. One cable would be a Belden 5499X5 (video & control) and the other would be a Belden 5140U1 (power).

7. Measurement.

Closed-Circuit Television (CCTV) Dome Cameras shall be counted as each upon successful completion of the installation and testing described herein and for the removal of all equipment at the end of the construction period, for payment.

8. Basis of Payment.

This item will be paid for at the contract unit price each for **CLOSED CIRCUIT TELEVISION DOME CAMERA** which shall be payment in full for all material and work as specified herein.

CCTV CAMERA HIGH MAST TOWER INSTALLATION

Description. This work consists of installing and coordinating the installation of a CCTV camera and high mast tower luminaire power cable replacement. This item shall also include retrieving and installing a special CCTV power cable from State Stock.

Submittals. The Contractor shall submit shop drawings for the camera mounting adapter, and all components used for the installation. The shop drawings shall include installation of the electrical and fiber optic components within the video signal processing and power cabinet. The drawings shall include cabinet plans and schematics with each cable and conductor labeled as they will be in the enclosure, and special care taken to show the routing of the fiber optic cable to avoid bending the fiber optic cable to a radius smaller than recommended by the fiber optic cable manufacturer.

Materials. The CCTV camera to be mounted on the high mast tower ring is furnished separately under Closed Circuit Television Camera.

The camera mounting bracket shall consist of standard PVC coated rigid steel conduit and PVC coated conduit bodies.

The camera mounting bracket, counterweight, and dome camera shall all have provisions for attaching a safety chain.

The special cable luminaire power conductors shall be terminated identically to the standard cable except that the video power cable shall be equipped with a plug and socket, Amphenol 97-3106A-12DS-3P or approved equal. The video signal cable shall terminate into a standard 75 ohm BNC connector and plug.

CONSTRUCTION REQUIREMENTS

A form 7 PVC coated galvanized steel type LB conduit body shall be connected to the luminaire ring tenon via an 8-inch long threaded on one end section of 2½" diameter PVC coated galvanized steel conduit. This section of conduit shall have 4 set screws to secure the mount to the tenon. The other end of the LB shall have a 2½" diameter to 1½" diameter reducer installed to facilitate the installation of a 12" section of 1½" diameter PVC rigid steel conduit which in turn is connected to the CCTV camera. These sizes and dimensions are included as guides, and the actual mount shall be fully coordinated with the tenon arm and CCTV camera. The length of vertical conduit shall be sized such that the top of the lower dome of the CCTV camera is lower than the lowest point of any luminaire installed on the luminaire ring.

The connection of the 1½" diameter vertical conduit to the camera shall be made in accordance with the camera manufacturer's directions with respect to conduit sealing.

Adjustment of the counterweight, if needed, shall be included as a part of this item to ensure that the luminaire ring remains level.

The camera mounting bracket shall be installed on the high mast tower ring under the supervision of the Engineer. The camera shall be attached to the luminaire ring by a safety chain that is completely independent of the joints and fasteners that normally connect them together and to the luminaire ring. The safety chain shall be rated to support at a minimum 10 times the combined weight of all three components.

The special high mast tower CCTV/lighting power cable shall be installed in place of the standard high mast tower luminaire cable.

The standard lighting power cable, if furnished with the light tower, shall be returned to the Engineer in its original packaging. At existing towers, the standard lighting power cable shall be removed, coiled and shall be returned to the Engineer.

It shall be the Contractor's responsibility to request the required length(s) of CCTV/lighting power cable from the Engineer at least fifteen (15) working days in advance of date needed. The request shall include the calculation(s) that was used to arrive at the cable length. The calculation shall clearly indicate the required cable length and any slack. Excessive slack will not be allowed. After the cable request is approved, the Contractor shall be responsible for the transportation of the cable from State Stock to the job site.

The special cable shall be trained and attached in an identical fashion to the standard cable. All connections at the luminaire ring shall be made inside the luminaire ring junction box and inside the camera mounting bracket. The end of the cable inside the tower shall be connected to the power connector, the video power and signal cables to the pigtail connectors extending from the video equipment cabinet.

Coordination. This item shall be closely coordinated with the CCTV camera, light tower installation, and the CCTV cabinet equipment.

Configuration and testing. The operation of the CCTV camera shall be tested as part of the testing required under Closed Circuit Television Camera. All equipment shall be tested and verified as operational in accordance with the manufacturer's specifications and so that the video signal is produced and control of the camera from a remote location enabled to the satisfaction of the Engineer.

Method of Measurement. CLOSED CIRCUIT TELEVISION CAMERA HIGH MAST TOWER INSTALLATION will be counted as each upon successful completion of the testing described herein for payment.

Basis of Payment. This work will be paid for at the contract unit price each for **CLOSED CIRCUIT TELEVISION DOME CAMERA HIGH MAST TOWER INSTALLATION**, which shall be payment in full for all material and work as specified herein.

CCTV EQUIPMENT CABINET, HIGH MAST LIGHT TOWER MOUNTING

Description. The Contractor provide a closed-circuit television cabinet on a high mast light tower as shown in the plans and specified herein.

Materials.

General. The Contractor shall furnish the following items as specified.

CCTV Cabinet. The CCTV Cabinet shall be a Hoffman Enclosures Model A20H1610SS6LP, Electromate Enclosures Model E-20H1610SSLP, or approved equal. The cabinet shall be NEMA 4X compliant.

The nominal dimensions of the cabinet shall be 20 inches high by 16 inches wide by 10 inches deep.

The cabinet shall be fabricated of 14 gauge Type 304 or Type 316L stainless steel. All seams shall be continuously welded and ground smooth with no holes or knockouts. The cabinet shall be fabricated with a rolled lip around three sides of the door and on all sides of the enclosure openings to exclude liquids and contaminants. A stainless steel door clamp assembly shall assure a watertight seal. A seamless gasket shall be included to assure a watertight and dust-tight seal.

The cabinet shall have provisions for padlocking in the closed position. The lock shall be Corbin #2 and two keys shall be supplied to the Department with each lock. The keys shall be removable in the locked position only.

A data pocket of high impact thermoplastic material shall be provided. The nominal dimensions of this pocket shall be 12 inches by 12 inches.

Collar studs shall be provided for mounting the stainless steel backboard panel.

The cabinet shall be unpainted. Cover, sides, top, and bottom shall have a smooth brushed finish.

The cabinet shall mount on the high-mast lighting towers, using the fabricated bolt pattern.

CONSTRUCTION REQUIREMENTS

General. The Contractor shall prepare and submit a shop drawing detailing the complete closed-circuit television cabinet installation. The shop drawings shall identify the installation and specifications of all components to be supplied, for approval of the Engineer.

The Contractor shall install the CCTV cabinet as indicated in the Plans. The Contractor shall verify the mounting criteria and dimensions based upon the tower or pole being provided. Any adjustments in the dimensions for the mounting brackets shall be approved by the Engineer.

Basis of Payment. This work shall be paid for at the contract unit price each for **CLOSED CIRCUIT TELEVISION CABINET** as specified.

EROSION CONTROL BLANKET

This Special Provision revises Section 251 of the Standard Specifications for Road and Bridge Construction to eliminate the use of Excelsior Blanket for Erosion Control Blanket.

Delete Article 251.04(a) Excelsior Blanket.

CHAIN LINK FENCE, 6' ATTACHED TO STRUCTURE

Description. This work shall consist of furnishing installing chain link fence at the locations shown on the plans or as described by the Engineer.

Construction Requirements. Work shall follow all applicable portions of Section 664 of the Standard Specifications for Road and Bridge Construction, and shall further comply with the detail as shown in the Plans.

Method of Measurement. The fence shall be measured in place along the top of the structure.

Basis of Payment. CHAIN LINK FENCE, 6' ATTACHED TO STRUCTURE" will be paid for at the contract unit price per foot which shall include all labor, materials, and equipment necessary to perform the work as specified.

SODDING, SALT TOLERANT

This Special Provision revises Section 252 of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction to specify the application rates of fertilizer nutrients for sodded areas.

Modify the following Articles:

252.03 Ground Preparation.

Revise the fourth paragraph and the table to read.

When fertilizer is specified, 120 lb of fertilizer nutrients per acre shall be applied as follows.

Nitrogen Fertilizer Nutrients	60 lb/acre
Potassium Fertilizer Nutrients	60 lb/acre

SEEDING, CLASS 2A

This Special Provision revises Section 250 of the Standard Specifications to specify the application rates of fertilizer nutrients for seeded areas.

Modify the following Articles:

250.04 Fertilizer and Agricultural Ground Limestone Application.

Revise the third paragraph and the table to read.

When fertilizer is specified, 180 lb of fertilizer nutrients per acre shall be applied as follows.

Nitrogen Fertilizer Nutrients	90 lb/acre
Potassium Fertilizer Nutrients	90 lb/acre

KEEPING THE TOLLWAY OPEN TO TRAFFIC

Whenever work is in progress on or adjacent to an expressway, the Contractor shall provide the necessary traffic control devices to warn the public and to delineate the work zone as required in these Special Provision, the Standard Specifications, the State Standards, Tollway Standards. All Contractors' personnel shall be limited to these barricaded work zones and shall not cross the expressway. When these documents refer to "Expressway", they shall also signify "Tollway".

The Contractor shall request and gain approval from the Illinois Tollway prior to enacting lane closures in accordance with the Illinois Tollway Lane Closure Reference Guide, dated April 2012.

Allowable Temporary Lane Closures
 IDOT Contract 60I31
 (I-88/IL 59 Interchange Reconstruction)
 I-88, M.P. 121.4 to 125.2

DAY	ALLOWABLE 1-LANE CLOSURE TIMES	
	Eastbound	Westbound
Monday	7:00 p.m. – 5:00 a.m. Tues.	8:00 p.m. – 6:00 a.m. Tues
Tuesday	7:00 p.m. – 5:00 a.m. Wed.	8:00 p.m. – 6:00 a.m. Wed.
Wednesday	7:00 p.m. – 5:00 a.m. Thru.	8:00 p.m. – 6:00 a.m. Thru.
Thursday	7:00 p.m.- 5:00 a.m. Fri.	8:00 p.m.- 6:00 a.m. Fri.
Friday	10:00 p.m.- 9:00 a.m. Sat.	10:00 p.m.- 9:00 a.m. Sat.
Saturday	9:00 a.m.- 9:00 a.m. Sun.	9:00 a.m.- 9:00 a.m. Sun.
Sunday	9:00 a.m.- 5:00 a.m. Mon.	9:00 a.m.- 6:00 a.m. Mon.

DAY	ALLOWABLE 2-LANE CLOSURE TIMES	
	Eastbound	Westbound
Monday	10:00 p.m. – 5:00 a.m. Tues.	11:00 p.m. – 5:00 a.m. Tues.
Tuesday	10:00 p.m. – 5:00 a.m. Wed.	11:00 p.m. – 5:00 a.m. Wed.
Wednesday	10:00 p.m. – 5:00 a.m. Thurs.	11:00 p.m. – 5:00 a.m. Thurs.
Thursday	10:00 p.m. – 5:00 a.m. Fri.	11:00 p.m. – 5:00 a.m. Fri.
Friday	11:00 p.m. – 6:00 a.m. Sat.	11:00 p.m. – 6:00 a.m. Sat.
Saturday	11:00 p.m. – 8:00 a.m. Sun.	11:00 p.m. – 8:00 a.m. Sun.
Sunday	10:00 p.m. – 5:00 a.m. Mon.	10:00 p.m. – 5:00 a.m. Mon.

MAINTENANCE OF TRAFFIC (TOLLWAY)

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Replace this section in its entirety with the following:

701.01 Description and Special Conditions

(a.) General.

This work shall consist of the furnishing, installation, maintenance, relocation and removal of all standard signs, barricades, cones, warning lights, flaggers and other devices which are used for the purpose of warning, regulating, directing or otherwise controlling the flow of traffic where a public trafficway must be established and maintained through construction on the Tollway and Local and State Roads included in the work. Standard signs are those signs which appear in the MUTCD and the Illinois Supplement except those in Section 2E through 2J.

The Contractor shall furnish, install, maintain, and remove all specified traffic control devices as well as any additional devices determined necessary by the Engineer in accordance with the Contract Plans, Special Provisions, and the latest edition of the “Manual on Uniform Traffic Control Devices for Streets and Highways” with Illinois Supplement (MUTCD), which manual shall be understood to be a contract document. The Contractor shall also follow the procedures set forth in the Illinois Tollway Roadway Traffic Control and Communications Manual, the Illinois Tollway Quality Standard for Work Zone Traffic Control Devices, the Illinois Tollway Signage Guidelines, the Illinois Tollway Lane Closure Guide, and the Illinois Tollway Lane Closure Reference Guide. This work shall also include the furnishing of flaggers for the installation and removal of temporary pavement markings, as required by the Engineer, unless otherwise provided.

In the event of severe weather conditions, the Contractor shall provide additional personnel and equipment to maintain all traffic control devices. In such conditions and in addition to general maintenance requirements, Contractor personnel shall maintain continuous surveillance and shall continuously realign and relocate all traffic control devices displaced by wind, traffic, Contractor operations, or any other cause.

The existence of general roadway illumination shall not relieve the Contractor of his responsibility for furnishing and maintaining any of the protective facilities hereinafter specified.

Whenever workmen are working within 30 feet of the traffic flow, the Contractor shall use a radar emulator to affect reduced traffic speed.

(a) Penalties

- (1) Non Compliance with Specifications. The Contractor will be subject to a penalty of \$1000 or 0.05 percent of the awarded contract value, whichever is greater, per incident per day, to be deducted from the next pay estimate due the Contractor, for each occurrence when the Engineer determines that the Contractor or his Subcontractor is not in full compliance with the Maintenance of Traffic Specifications.
- (2) Failure to Respond. The Contractor shall be required to respond within 1/2 hour to any request from the Engineer for re-aligning, replacing or moving traffic control devices or Temporary concrete barrier, or otherwise re-establishing compliance with the Maintenance of Traffic Specifications. "Respond" is interpreted to mean on the job preparing to make repairs. Failure by the Contractor to so respond shall be grounds for a penalty of \$1000 or 0.05 percent of the awarded contract value, whichever is greater, for each and every occurrence, to be deducted from the next pay estimate due the Contractor.
- (3) Failure to Repair Impact Attenuators, Temporary. If during the term of the Contract, any Impact Attenuators, Temporary furnished and installed by the Contractor is damaged or displaced by any cause or event, the Contractor shall be responsible for repairing, replacing and/or realigning the component modules and restoring the system to the intended configuration.

The Contractor shall complete all such necessary system restoration within 24 hours of notification by the Engineer. Failure to comply with this requirement shall be grounds for a daily penalty of \$1000 or 0.05 percent of the awarded contract value, whichever is greater for each day or portion thereof (after the initial 24 hour period) that the directed restoration remains incomplete, to be deducted from the next pay estimate due the Contractor.

- (4) Loss or Damage to Tollway-Owned Devices. The Contractor will be required to remove all traffic control devices furnished by the Tollway which are installed and maintained by him under the contract and deliver them to the Tollway's Sign Shop in Naperville, IL. All such traffic control devices shall remain in place until specific authorization to relocate the traffic control devices is received from the Engineer for stage changes or modifications of lane closures.

The cost of any Tollway-owned signs damaged beyond re-use or lost due to the Contractor's negligence will be deducted from the monies due the Contractor under the item Maintenance of Traffic pay item at the rate of \$100.00 per square foot of sign so lost or damaged or the sign shall be replaced in - kind.

- (5) Non-Compliance with IDOT Maintenance of Traffic. To ensure a prompt response to incidents involving the integrity of the work zone traffic control devices, the Contractor shall provide a telephone number where a responsible individual can be contacted on a 24-hour-a-day basis. When the Engineer is notified or determines a deficiency exists, he/she shall be the sole judge as to whether the deficiency is an immediate safety hazard. The Contractor shall dispatch sufficient resources within 2 hours of notification to make needed corrections of deficiencies that constitute an immediate safety hazard. Other deficiencies shall be corrected within 12 hours. If the Contractor fails to restore the required traffic control and protection within the time limits specified above, the Engineer will impose a daily monetary deduction for each 24-hour period (or portion thereof) the deficiency exists. This time period will begin with the time of notification to the Contractor and end with the Engineer's acceptance of the corrections. The daily deduction will be \$1000 or 0.05 percent of the awarded contract value, whichever is greater, per day. In addition, if the Contractor fails to respond, the Engineer may correct the deficiencies and the cost thereof will be deducted from monies due or which may become due the Contractor. This corrective action will in no way relieve the Contractor of his/her contractual requirements or responsibilities.

701.02 Materials.

All materials used for the various traffic control devices shall conform to the applicable requirements of Materials, Division 1000 of the Standard Specifications.

701.03 Devices

- (a) Barricades. Barricade sheeting shall meet the initial minimum brightness values of Article 1106.02.

Type II barricades shall be constructed of non-metallic materials and shall have no rigid stay bracing for the "A" frames. Details of barricade fabrication are to be submitted and approved by the Tollway. Type I barricades shall be constructed of lightweight materials and shall not utilize rigid stay bracing for the "A" frames.

Barricades shall be weighted as required to resist knock-down from wind-blast generated by passing vehicles. Under no circumstances shall weights be placed on top of the barricades.

Unless otherwise specifically provided in these Specifications, the Plans, or the Special Provisions, barricades shall be equipped with steady burning lights meeting the requirements of Article 701.03 (e).

- (b) Cones. Cones used to channelize traffic on the Tollway shall have a nominal height of 28 inches. All cones shall have a broadened, weighted base and shall be made of material that is able to withstand impact without damage to the cones or to vehicles. The Contractor shall certify that they are NCHRP 350 compliant.

The dominant color of cones shall be fluorescent orange. All cones shall be kept clean and bright for maximum visibility. The use of cones for lane closures or traffic control during hours of darkness will not be permitted, except in extreme emergency conditions.

- (c) Plastic Drums. Drums shall be 18" minimum diameter, 36" high in accordance to Standard 701901. Drums shall be non-metallic and have alternating reflectorized orange and reflectorized white horizontal, circumferential stripes 4 inches to 8 inches in width. There shall be at least three orange and at least two white stripes on each drum. If nonreflective spaces are left between the orange and white stripes, they shall be no more than 2 inches in width. All nonreflectorized portions of the drums shall be orange or white. Drums may be slightly conical in shape and may have one or more flat surfaces to minimize rolling when hit.

Drum sheeting shall meet the initial minimum brightness values as shown in Article 1106.02.

Where plastic drums are specified, Type II barricades may be used in lieu of drums. If flashing or steady burning lights are required for drums, this requirement shall be extended to the Type II barricades. Drums and Type II barricades shall not be intermixed within an individual taper or string of devices. This does not prohibit drums from being used in a taper section with Type II barricades being used in the tangent section, or vice versa. If flashing or steady burning lights are not required, the Contractor shall certify the plastic drums are NCHRP 350 compliant.

- (d) Signs. All signs must meet the approval of the Engineer. Such signs shall be either plywood or aluminum for signs under 24 square feet and plywood only for signs over 24 square feet. Signs utilizing a base of fabric, fiberboard or other flexible or frangible material will not be permitted.

Plywood shall be exterior type B-B high density overlay plywood or better conforming to NIST specification PS-1 for construction and industrial plywood. Use 0.50 inch thick plywood for all sign panels.

Abrade, clean, and degrease the face of the plywood panel according to methods recommended by the manufacturer of the retroreflective sheeting. Treat the edges of the plywood panel with an approved edge sealant.

Aluminum shall be flat aluminum sheet conforming to ASTM B209, alloy 6061-T6 or 5052-H38. Thickness shall be 0.080 inch for panels having no dimension greater than 48 inches and 0.125 inch for panels having any dimension more than 48 inches.

Sign faces shall be reflective sheeting meeting the requirements of Section 1106, with appropriate legend and/or symbols. The design features of the signs including such items as shape, color, corner radius, border width, letter size, legend placement and symbol dimensions shall be in accordance with the Plan details and with the publications entitled "Standard Highway Signs" and "Standard Alphabets for Highway Signs" published by the Federal Highway Administration. All sign sheeting shall meet the initial minimum brightness values as shown in Article 1106.01. All diamond-shaped construction warning signs used on mainline, crossroads and ramps shall be fluorescent orange in color.

All temporary sign supports shall be furnished by the Contractor. Portable supports shall be designed and constructed to yield upon impact to minimize hazard to motorists, but shall be sturdy enough to resist knock-down from wind-blast generated by passing vehicles. Sandbags shall be used as needed to provide stability.

Temporary post-mounted signs shall be mounted on wood posts no larger than 4 x 4 inches or on steel or aluminum supports of a size that will not constitute a hazard to motorists and shall be approved by the Engineer.

Construction traffic signs necessary only during working hours shall be removed or covered during non-working hours.

- (e) Warning Lights. There are three types of warning lights which may be specified for use in connection with barricades and signs: Type A, Low Intensity; Type B, High Intensity and Type C, Steady Burn. All are defined as portable, lens directed, enclosed lights emitting a yellow color. Lights shall be in accordance with the current requirements of the ITE Standard for Flashing and Steady Burn Warning Lights.

Unless otherwise shown in the Plans or directed by the Engineer, Type A and Type C lights shall be uni-directional, visible from one side only.

Warning lights shall consist of a metal or plastic case, transistorized electrical circuit, and head. Lights shall be visible from 3000 feet under both day and night conditions. All lights shall meet the approval of the Engineer.

Warning lights utilizing an internal power source (batteries) shall be so constructed that when batteries are installed, the terminals are on top of the battery. Batteries shall be confined within the case. Terminals on the batteries may be either plug or spring type. All electrical connections shall be of noncorrosive material.

The case for the battery shall be constructed of aluminum, galvanized steel or high impact-resistant plastic. The case shall have vandal-proof fastenings for mounting on barricades or signs. The case shall be weatherproof.

Batteries shall be provided by the Contractor but shall not be installed until the light is ready to be used. The Contractor shall replace all batteries at such times as may be directed by the Engineer.

Each light shall utilize a removable transistor circuit which shall be in a weatherproof, hermetically sealed container. Each light shall have a separate, concealed manual switch that can be activated externally by a special key.

The head for each light shall consist of a housing, reflector, light bulb, and lens(es). The head shall be capable of rotation up to 180 degrees about its vertical axis. The head shall be sealed against outside atmospheric conditions and attached to the case by an acceptable and approved means. The lens shall be 7 inches in diameter and shall be amber in color, in accordance with the requirements of the MUTCD.

Type A and Type C lights shall be equipped with a 0.35 to 0.55 watt bulb or L.E.D. equivalent. Bulbs for high intensity Type B units shall be at least 4 watts or L.E.D. equivalent.

Where warning lights on barricades are required, they shall be installed at a minimum mounting height of 36 inches to the bottom of the lens.

Any lights reported out of order by the Engineer shall be replaced or repaired by the Contractor within 12 hours after notification.

- (f) Arrow Boards. Arrow boards shall be used where shown in the plans.

Flashing "pass right" or "left" patterns, other than simultaneous shaft, shall not be used.

It shall be capable of displaying a simultaneously flashing shaft to the right and to the left, as well as a flashing shaft with simultaneous right and left. In addition, each board shall be capable of operating in a caution mode with four or more flashing lamps arranged in a pattern which will not indicate direction.

The boards shall be rectangular in shape and finished in nonreflective flat black with the lamps recess-mounted or with hoods surrounding at least the upper half of the lamps.

The lamps shall be amber 12-volt, sealed beam units, hooded and spaced so as to substantially fill the board. The board shall have a flat black background. All arrow boards shall be composed of at least 5 lighted lamps at an angle of 35 to 60 degrees measured from the horizontal. Shafts for Patterns 2 and 3 shall be composed of at least 4 lighted lamps (3rd pulse) and shall be composed of at least 3 lighted lamps for Pattern 4. Shafts in the bidirectional mode shall be composed of 3 lighted lamps for Types B and C units. A dimmer control shall be provided and shall be capable of varying the lamp voltage from 6.0 volts to 12 volts. Trailer-mounted units shall be equipped with a photoelectrically operated switch capable of varying the lamp voltage from 6 Volts for nighttime use to 12 Volts for daylight use. Roof-mounted units may be equipped with a manually operated voltage control switch.

The power to operate the arrow board shall be supplied from self-contained batteries, (with or without a solar panel generator), a vehicle's electrical system, a gasoline or diesel fueled generator, or an external power source. Trailer mounted units may be equipped with permanently-mounted fuel tanks no greater than 25 gallons (U.S.) in capacity. Additional fuel shall not be stored near the trailer.

Where external power is used, the cable placement shall meet the approval of the Engineer and all electrical codes applicable to the area shall be observed. When greater than 24 volts is supplied externally, the service cable shall be fused at a location sufficiently removed from the unit so as to leave no live wires exposed at or near the unit in the event of a vehicular collision.

Where batteries are used as the primary power source, they shall be of sufficient capacity to provide, between charging, 11 volts or greater to each of the lamps in any mode for a period of at least 72 continuous hours of operation at full daylight intensity. Units that operate on battery power shall have a permanently-mounted voltmeter which shall be wired so as to measure the voltage available to the lamps.

Trailer-mounted units, utilizing gasoline or diesel fueled generators or external power source, shall be equipped with storage batteries wired so that the unit will automatically switch to battery power in the event of failure of the primary power source. The batteries shall be capable of providing sufficient capacity to operate the units for a minimum of three continuous hours in any mode at 11 volts or greater.

Operations and components of the boards shall be as follows:

Flash Rate: 25 to 40 Flashes/Minute (no lamps shall remain illuminated during "off" time).

Percent on Time: 1st Pulse - 75%
 2nd Pulse - 50% Sequencing
 3rd Pulse - 25% Patterns
 Bidirectional - 50%
 Simultaneous - 50%

Board Type:	B	C
Mounting	Truck or Trailer	Trailer
Minimum Bd. Size:	2.5' X 5'	4' X 8'
Minimum Lamp Size:	PAR 36,	PAR 46,
Minimum Candle Power at Design Voltage:	7,000	8,800
Minimum Mounting Height: (Pavement to bottom of board)	6' Truck 7' Trailer	7'

- (g) Portable Changeable Message Signs (PCMS). PCMS used to provide advance warning and information on the Tollway should have the front face of the sign covered with a protective material. The color of the elements should be yellow or orange on a black background.

The PCMS should be visible from 3000 feet under both day and night conditions. Each sign character shall be clearly legible from a minimum distance of 600 feet for nighttime conditions and 800 feet for normal daylight conditions. The message should have adjustable display rates, so that the entire message can be read at least twice at the posted speed or the anticipated speed.

The control system should include a display screen for reviewing messages and be capable of maintaining memory when power is interrupted.

The message sign operating software shall be National Transportation Communication Infrastructure Protocol (NTCIP) compliant and must be compatible and functional with Illinois Tollway Traffic Operation Center (TOC) Sign Control Software.

The PCMS should be equipped with a power source and battery back-up to provide continuous operations.

The bottom of the PCMS shall be a minimum of 7 feet above the roadway when operating. This height may be reduced to a minimum of 5 feet during high wind conditions to assure stability of the PCMS.

(h) Personal Protective Equipment. All personnel on foot, excluding flaggers, within the Contract limits shall wear a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of ANSI/ISEA 107-2004 for Conspicuity Class 2 garments. Other types of garments may be substituted for the vest as long as the garments have a manufacturer's tag identifying them as meeting the ANSI Class 2 requirements.

(i) Flagging Equipment. Whenever a flagger is required to be assigned to traffic control for daytime operations, the flagger(s) shall be equipped with a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of ANSI/ISEA 107-2004 for Conspicuity Class 2 garments and flagger traffic control paddles. If the flagger is required during nighttime operations, the flagger shall be equipped with a full-body garment of fluorescent orange or fluorescent orange and fluorescent yellow-green meeting the requirements of ANSI/ISEA 107-2004 for Conspicuity Class 3 garments. All maintenance workers are required to wear ANSI Class 3 apparel during nighttime operations.

Hard hats shall be worn by all persons in a construction or maintenance area.

(j) Truck Mounted Attenuators. Truck mounted attenuators, equivalent to Model ALPHA 60 MD manufactured by Energy Absorption Systems, Incorporated of Chicago, Illinois shall be mounted on a vehicle meeting the recommendations of the attenuator manufacturer. These vehicles shall not be used to haul liquid marking materials, solvents or fuels.

(k) Radar Emulator. This device will alert drivers with radar detectors. Devices originally designed or intended for applications in the measurement of speed, security systems, ingress/egress controls, traffic counting or traffic signal activations shall not be used. The device's configuration shall accommodate an efficient combined forward and rear facing coupled application, resulting in a single, horizontally mounted two-way operational unit.

Devices and mounting brackets considered under this specification shall be constructed of DOW-555 ABS or equivalent material and shall not possess painted or unpainted exposed metallic parts or surfaces. All internal components shall be encapsulated in Thermoset Type EP-281 epoxy potting material or equivalent, and shall comply with the UL Standard Flame Retardant Test. Shore hardness shall be rated at a minimum of 60 by the ASTM-D-2240 method. The device shall meet or exceed the horizontal burning test of 94HB at a 1/8" test section. The device shall possess rigidity characteristics and impact resistance commensurate with the Military Drop Test, Mil/Std - 331, Test 111.1. The device shall not exceed outside dimensions of 6 inches by 3 inches.

The device shall be capable of uninterrupted performance in diverse and extreme climatic conditions. The unit shall operate efficiently from -40 degrees Fahrenheit to +185 degrees Fahrenheit, and shall not exceed a maximum frequency of 5 MHZ throughout these temperature ranges. All devices considered under this specification shall be waterproof, and upon the application of power, immediately operate per specification.

The maximum field strength of the primary beam shall not cause it to exceed 2,600 feet as measured from the front of the device. The device shall have provision for an optional accessory remote intrusion alarm signal. The primary beam width shall not exceed 160 degrees, or be less than 80 degrees on the horizontal plane, and shall be at least 40 degrees on the vertical plane. The device shall employ BeamVaricator™ or equivalent circuitry, enabling continuous verification of the device's operational status. Confirmation of status shall be evidenced via a bi-polar light emitting diode located to the front of the device, confirming a primary beam transmission, field disturbance and self-evaluation. All devices considered shall possess a 'self-testing capability' - enabling visual confirmation of a positive indication of a system failure.

This specification specifically excludes devices employing oscillating GUNN diode sources' as the signal source. The device shall not create interference for operating police radar. All devices considered must operate per specification from power sources ranging from 6 Volts DC to 28 Volts DC and shall not exceed a current consumption of 65 mA maximum - 50 mA typical.

A device meeting these requirements is available from The Toman Group, Inc., 636-386-2278.

- (l) Barrier Delineators. Barrier delineators are to be installed by the Contractor in accordance with IDOT Recurring Special Provision titled "Guardrail and Barrier Wall Delineation". All barrier delineators, new and existing, shall be kept clean for optimal visibility.

701.04 General Requirements

- (a) Coordination. Prior to beginning construction and periodically thereafter, the Contractor may be required to attend meetings arranged by the Tollway and the Engineer with representatives of adjoining Contracts. The purpose of such meetings is to coordinate construction staging to provide consistent roadway conditions. It is mandatory that any intermediate traffic phase changes, staging changes or other disruptions of traffic flow will be coordinated at these meetings. No changes or disruptions will be allowed unless prior approval in writing is given by the Tollway.

Traffic staging, lane closures, the placement and removal of signs, pavement striping, or the placement and removal of other traffic control devices within the limits of the Contract may require coordination with other Contracts in adjacent sections. The provisions of Article 105.08 of the Tollway Supplemental Specifications will apply at those locations. Should a conflict arise between Contracts with respect to sequence of construction or maintenance of traffic requirements, said conflicts shall be resolved by, or at the direction of the Engineer.

During initial traffic staging and all intermediate traffic phase changes, the Contractor shall provide direct radio contact between the Engineer and all of his traffic control vehicles and personnel.

- (b) Lanes and Ramps. The Contractor shall schedule his construction operations so as to maintain the minimum number of lanes as shown in the Maintenance of Traffic Plans exclusive of acceleration lanes, deceleration lanes, or weaving lanes, in both mainline directions, subject to the conditions specified for each construction stage. Construction scheduling shall also be such as to maintain a single lane of traffic on all ramps.

The Contractor shall be required to maintain the ramp acceleration and deceleration taper lengths shown in the Plans as a minimum. The Contractor shall be permitted to use shorter lengths for a maximum of three (3) continuous hours with prior written approval of the Engineer.

- (c) Construction Delays. The Contractor will be expected to prosecute the work without undue delays or extended time intervals between activities, whenever lane closures are in effect. If, in the judgment of the Engineer, the lack of Contractor's activities is, or is expected to be of an unacceptably lengthy duration, the Contractor, when so instructed by the Engineer, shall remove all lane closures until such time as the Contractor is ready to resume his activities.
- (d) Responsibility for Traffic Movement. The Contractor shall be solely responsible for maintenance of traffic on the Tollway within the limits of the Contract during the term of the Contract. The Contractor may submit his own maintenance of traffic plan, but will not be permitted to change or alter the construction staging and barricade system detailed in the Plans without prior written approval of the Engineer. Ramps may not be closed to traffic without the Engineer's prior approval.

No work which will require movement of vehicles to and from work sites, or which will otherwise interfere with Tollway traffic will be permitted during the holiday periods specified in Article 701.12.

- (e) Traffic Lanes, Shoulders and Gores. The Contractors must, during the term of the contract, inspect on a daily basis, repair and maintain all traffic lanes. This includes, but is not limited to, pothole & pavement de-lamination, repair & maintenance and repair of any other pavement defects. Contractors shall coordinate the scheduling of such repairs with the Engineer. This work requires traffic control and will be treated as emergency repairs for the purpose of obtaining any necessary lane closures. The repair and maintenance operations shall be performed within 12 hours of the defect being identified. The contractor shall follow the procedure described in the Tollway Lane Closure Guide for Emergency Lane Closure/or After Business Hours Request. In addition, during construction, a portion of the existing Tollway shoulders and gore areas may be used for traffic lanes. When this is necessary, shoulder repairs shall be made as required in order to bring the shoulder to a useable condition. The shoulders shall be repaired at locations noted in the Plans and/or as directed by the Engineer. This work will be measured and paid for in accordance with the provisions of Section 442. Where shown in the Plans or as directed by Engineer, gore areas shall be temporarily filled to provide a smooth riding surface for use as a traffic lane. Slotted drains shall be securely covered with 0.024" aluminum flashing, 12" wide to prevent intrusion of bituminous material into the pipe. A paper bond breaker shall be used, except at edges, to facilitate removal of such temporary fill when no longer required. This installation and the subsequent removal of such temporary fill shall be considered as included in the Contract lump sum price for Maintenance of Traffic. The Contractor shall be responsible for the continuous maintenance of the lanes, shoulders and gore areas while they are utilized for traffic and make all necessary repairs as requested and directed by the Engineer. This work will be paid for according to Article 109.04. After the shoulders are no longer required for traffic lanes, the Contractor will repair shoulder areas as directed by the Engineer. This work shall be measured and paid for in accordance with the provisions of Section 442.
- (f) Altered Conditions and Temporary Lane Closures. It is the intention of the Tollway to provide consistent stage changing throughout all contracts. In the event of construction changes and with the approval of the Chief Engineer, the Contractor may be allowed to proceed into subsequent stages or continue in a particular stage that may be inconsistent with the traffic flow through adjoining contracts. The implementation of any such deviations and inconsistencies shall be understood to be for the convenience of the Contractor and, unless otherwise specifically agreed in writing between the parties to the Contract, shall be undertaken without additional cost to the Tollway and without cause for the Contractor claiming delay.

The Contractor shall notify the Engineer two (2) weeks in advance of beginning his work, and shall obtain written approval of the Engineer of his intended work; however, the Engineer may require alteration of the intended work procedure as dictated by prevailing traffic conditions. Temporary, daytime, off-peak hour, one-lane closures must be requested in writing by the Contractor.

The Contractor shall notify the Engineer at least 72 hours prior to establishing any two-lane closure. Two-lane closures on a three-lane directional roadway for any purpose will only be permitted during off-peak night-time hours and only with the specific approval of the Engineer. The Contractor shall be required to schedule the implementation of any traffic stage or subsequent stage change which requires two-lane closures on a three-lane directional roadway to ensure that such lane closures are limited to a single night-time period per direction of traffic.

Temporary two-lane closures will be permitted on three-lane directional roadways during the off-peak hours stipulated in the Special Provisions or directed by the Engineer for cutting temporary pavement pressure relief joints, when such cutting is included in the Contract or directed by the Engineer.

- (g) Intermediate Phase Changes. The Contractor will be allowed one intermediate phase change per direction per stage, subject to the requirements herein specified. An intermediate phase change shall be defined as an interim traffic transition or jog within a stage and shall be implemented with 83:1 taper rates, transition edge lines and transition barricades on 50 foot centers. The location of the shift and the installation of proper signing shall be approved by the Engineer. If a conflict with adjoining Contracts should arise, construction staging as shown in the Plan Typical Sections shall take precedence over any intermediate phase change.
- (h) Work Zone Speed Limit Signing. Whenever workers are present and so close (12' or less) to moving traffic that an undue hazard exists, Sign Assemblies (Construction Speed Limit Sign), as detailed in the IDOT Standard Drawings, shall be placed adjacent to the open traffic lane(s) at a distance of 500 feet to a maximum of 2500 feet in advance of the workers throughout the work area. Moving operations will require continuous adjustment of the Sign Assembly location in order to maintain the above interval.

An additional Sign Assembly shall be placed 500 feet beyond the last entrance ramp for each interchange that falls within the 2500 foot interval.

The Sign Assembly shall be placed no closer than 500 feet from any other sign.

The Sign Assembly shall not be utilized when workers are behind a temporary (movable barrier) wall.

The Sign Assembly shall be promptly removed or covered when workers are not present so close to moving traffic. All conflicting speed limit signs shall be covered or removed.

Signs R2-5a, R 2-1 with G20-I102 and G20 - I103 shall be in place when the Sign Assembly (Construction Speed Limit Sign) is up. These signs shall also be removed or covered when the Sign Assembly is removed or covered, unless otherwise required by the maintenance of traffic plan.

701.05 Construction Sequences and Traffic Staging

The governing factor in the execution and staging of construction is to provide the motoring public with safe possible travel conditions on both the Tollway and interchange ramps. In case of conflict in sequence of construction between Contractors, work items and/or Plans, this will be the governing consideration. The Engineer shall have sole authority in resolving such conflicts.

All construction sequences and traffic staging shall be as shown in the Maintenance of Traffic Plans and described in detail in the Special Provisions. No deviation therefrom will be permitted, except as provided in Article 701.04.

Simultaneous work activities on both side of the same direction of Tollway traffic shall not be allowed. The Contractor shall be subject to a penalty under Article 701.01 (b)(1) whenever the Contractor or his/her Sub-Contractor is found to be in non-compliance.

701.06 Construction Traffic Management

- (a) General Requirements. All signs, markings, barricades, warning lights, flaggers, or other devices that are used for the purpose of regulating, warning and guiding Tollway traffic shall be in accordance with the Contract Plans, Special Provisions, and the MUTCD.

All flaggers engaged in work zone traffic control operations are required to be certified by IDOT or by an agency approved by the IDOT. While on the job site, each flagger shall have in his/her possession a current driver's license and a current flagger certification I.D. meeting IDOT requirements. For non-drivers, the Illinois Identification Card issued by the Secretary of State will meet the requirement for a current driver's license. This flagger certification requirement may be waived by the Engineer for emergency situations that arise due to actions beyond the Contractor's control where flagging is needed to maintain safe traffic control on a temporary basis.

Whenever the operation of the Contractor endangers or interferes with vehicular traffic on the Tollway as determined by the Engineer, the Contractor shall place and subsequently remove all traffic control devices necessary to guide vehicular traffic and protect the motoring public at no additional cost to the Tollway. Sandbags which are used to secure barricades and sign stands shall be included. The Engineer shall have the right to inspect all traffic control equipment furnished by the Contractor before the start of general construction. In addition, the Contractor shall furnish additional flaggers on a continuous basis whenever any construction operations encroach on traveled lanes.

A flagger will be required 200' in advance of any work area where construction vehicles and trucks are entering or leaving the work site and at all times during which workers are present where traffic is restricted to less than the normal number of lanes on a multi-lane pavement and the workers are not separated from the traffic by physical barriers, flaggers shall be furnished at the Contractor's expense to protect the workers and to warn and direct traffic. The flagger shall be stationed to the satisfaction of the Engineer and equipped as specified in 701.03(i). Except as otherwise shown on the plans, one flagger will be required for each separate activity of an operation that requires frequent encroachment in a lane open to traffic. "FLAGGER AHEAD" signs will be required in advance of a flagger station (500' on mainline; 200' on ramps) at all times that a flagger is used to control traffic. Such signs shall be removed or covered when the flagger is not present.

All temporary signing and marking shall be in place and approved by the Engineer prior to beginning any other work on the Contract. The Contractor shall be responsible for the proper location, installation and arrangement for all traffic control devices used for the project. The Engineer will inspect the placement of traffic control devices before work begins on each construction stage. Any deficiencies shall be corrected by the Contractor before starting work in any stage.

Whenever particular work or procedures dictate a relocation of proposed or existing traffic control devices, including barricades, signs, signals, markings, and flaggers, as determined by the Engineer, the Contractor shall remove, relocate and re-erect the identified devices. After such work or procedure has been completed, the Contractor, at the Engineer's direction, shall return and re-erect such devices in their original locations. All advance warning signs for lane closures, detour guide signs, intermediate information signs, and standard signs shall be erected at a height of 7 feet measured to the bottom of the sign, unless otherwise specified in the Plans. Signs shall be installed in a manner to resist damage or knock down in severe wind conditions and also to allow ease of relocation during stage changes.

The Contractor shall be responsible for the proper maintenance of all traffic control devices installed by him including proper location, installation, arrangement, and conditions as designated in the Contract Plans and Special Provisions, or required by the Engineer, for the duration of the Contract. The Contractor shall provide the necessary manpower, vehicles, equipment, and supplies of extra traffic control devices to adequately fulfill this responsibility. As a minimum, the Contractor shall have a Worksite Traffic Supervisor who will be responsible for initiating, installing and maintaining all traffic control devices including pavement markings as described in this Section and in the plans.

The Worksite Traffic Supervisor or his designee shall have at least one year of experience directly related to worksite traffic control in a supervisory or responsible capacity and shall be certified by the American Traffic Safety Services Association Worksite Traffic Supervisor Certification Program or an equal approved by the Tollway. Approved alternate Worksite Traffic Supervisors may be used when necessary.

The Worksite Traffic Supervisor shall be available on a 24-hour per day, seven days per week basis and shall review the project on a day to day basis as well as being involved in all changes to traffic control. The Worksite Traffic Supervisor shall have access to all equipment and materials needed to maintain traffic control and manage traffic related situations. The Worksite Traffic Supervisor or his/her designee shall ensure that routine deficiencies are corrected within the time limit specified in Article 701.01(b)(2). The Worksite Traffic Supervisor or his/her designee shall be accessible at all times to the Engineer. Acceptable methods are dedicated answering/paging service, or personal cell/after hour phone information. The Contractor shall supply a telephone staffed on a 24-hour a day, seven days per week basis to receive any notification of any deficiencies regarding traffic control and receive any request for improving, correcting or modifying traffic control, installations or devices, including pavement markings. The Contractor shall dispatch additional personnel, material and equipment as necessary to begin to correct, improve or modify the traffic control as directed, within one-half (1/2) hour of notification by the Worksite Traffic Supervisor, his/her designee or the Engineer. In addition, the Contractor shall provide the Engineer the names and telephone numbers of two individuals who will be available 24-hours per day, 7 days per week to respond to calls from the Engineer to correct traffic control deficiencies during those periods of time when the Worksite Traffic Supervisor cannot be reached.

All barrier delineators including those mounted on guardrail, whether existing or installed under this Contract, shall be kept clean for optimal visibility. Barrier delineators shall be oriented so as to be visible to motorists in the traffic lanes.

- (b) Placement of Barricades. All barricades shall conform to the requirements of Article 701.03 (a) and shall be placed in accordance with the Maintenance of Traffic Plans and the MUTCD.

The Contractor will not be permitted to erect, change or remove any barricades or barricade systems without prior approval of the Engineer. The Contractor will be required to leave and maintain all traffic control devices in place until all construction operations have been completed in each stage shown in the Contract Plans. The Contractor shall schedule and conduct his operations so that full access is provided at all interchanges, unless otherwise directed by the Engineer. The Contractor shall arrange and manipulate barricade placement and schedule construction operations to permit continuous operation of all lanes designated as open to traffic, unless otherwise directed by the Engineer.

Minor modifications of barricade placement at entrance and exit ramps and at runarounds will be allowed; however, such modifications shall be approved by the Engineer. Barricade placement in connection with such modifications must be consistent with all advance guide or detour signs.

Placement of all barricades shall proceed in the direction of traffic flow. Removal shall proceed toward oncoming traffic. A shadow vehicle equipped with a Truck Mounted Attenuator in accordance with Article 701.03(j) will be required whenever markings are being applied or a moving lane closure is being used.

The height of the barricades shall not be less than 3 feet above pavement or shoulder elevation. Barricades that must be placed in excavated or "below-grade" areas shall be equipped with leg extensions to raise the top bar to this minimum height. The cost for furnishing leg extensions where necessary shall be considered as included in the Contract lump sum price for Maintenance of Traffic and no additional compensation will be allowed. All barricades shall be kept clean for maximum visibility. Barricades shall be cleaned at least weekly. The Engineer shall be notified of the barricade cleaning schedule.

- (c) Placement of Cones. All traffic cones shall conform to the requirements of Article 701.03 (b). When and where allowed, the traffic cones shall be placed in accordance with the Maintenance of Traffic Plans. Paragraphs 2, 3, and 4 of Article 701.06(b) shall also govern the placement of cones. When dictated by wind or traffic conditions, cones shall be "doubled" or otherwise satisfactorily weighted at their bases to prevent their being blown into the path of vehicles in adjacent open lanes. Placing tires over cones for added stability will not be permitted. If the Contractor is unable to successfully prevent the migration of cones into live traffic lanes, and when so directed by the Engineer, their use shall be discontinued and weighted barricades used in their place.
- (d) Construction Traffic Signs. All signs shall conform to the requirements of Article 701.03(d) and shall be placed in accordance with the Maintenance of Traffic Plans and the MUTCD.

The Contractor shall be required to cover traffic sign legends which are inconsistent with intended traffic flow patterns. Each cover shall be a blank 1/4" plywood panel bolted to the sign face in such a manner so as to cover the inconsistent message.

All signs shall be kept clean for maximum visibility. Signs shall be cleaned at least weekly. The Engineer shall be notified of the sign cleaning schedule.

All diamond-shaped construction warning signs used on mainline, crossroads and ramps shall be fluorescent orange in color.

- (e) Warning Lights. All warning lights shall conform to the requirements of Article 701.03 (e). Barricades and signs will be equipped with warning lights as required by the Maintenance of Traffic Plans and the MUTCD.

All lights shall be kept clean for maximum visibility. Lights shall be cleaned at least weekly. The Engineer shall be notified of the light cleaning schedule.

701.07 Maintenance of Traffic on Crossroads.

Maintenance of traffic and lane closures on crossroads shall be in accordance with the latest edition of the MUTCD.

Prior to commencing any work on, adjacent to, or over any crossing roadway, the Contractor shall contact the appropriate agency and shall secure all required permits, as determined by such agency. The Contractor shall supply the Tollway and the Engineer with copies of all permits. Costs incurred in connection therewith will be paid for separately in accordance with the TRAFFIC CONTROL AND PROTECTION (ARTERIALS) Special Provision.

When a lane closure is necessary, the Contractor shall notify the agency having jurisdiction at least 48 hours in advance. The Contractor shall furnish, erect and maintain all barricades, cones, temporary pavement markings, traffic control signs and all other fixtures and devices which may be required for the safe movement of traffic on the crossroads.

701.08 Contractor Vehicular and Pedestrian Movements.

Except as provided in Article 701.06 (b), the Contractor's vehicles shall move with and not across or against the flow of traffic. These vehicles will not be permitted to make U-turns or cross the median at any location and all vehicles will be required to use local exits and local streets to reverse direction except when both median lanes are closed to traffic. U-turns will be permitted at the existing crossovers shown in the Contract Plans only with the prior approval of the Tollway and subject to the conditions or constraints concomitant to such approval.

Vehicles shall enter or leave work areas in a manner which will not be hazardous to, or interfere with, normal Tollway traffic. Vehicles shall not park or stop except within designated work areas.

Parking of personal vehicles within the right-of-way will not be permitted except when specific areas are designated by the Engineer. The Contractor's personnel will be prohibited from crossing operational lanes on foot. All pedestrian movement on the Tollway will be limited to within barricaded work areas. Failure by the Contractor's personnel to comply with these requirements will be considered non-compliance with the Maintenance of Traffic Specifications and shall render the Contractor subject to the applicable penalty cited in Article 701.01 (b).

701.09 Temporary Concrete Barrier.

When the Contractor is required to pick-up or deliver precast concrete barrier sections from or to the Tollway's storage facilities, the Contractor will be required to install and maintain lane and/or shoulder closures and advance warning signs, and to furnish flaggers for the safe ingress and egress of vehicles transporting the barrier sections at both the storage site and the construction site. Furnishing such traffic control devices together with their removal, and furnishing flaggers in connection therewith shall be considered as included in the Contract unit price for Temporary Concrete Barrier as provided in Section 704.

The Contractor shall have and maintain appropriate equipment to be able to adjust and/or relocate temporary barrier sections in an emergency situation as provided in Section 704. In the event any temporary concrete barrier sections are damaged, dislodged, and/or misaligned by traffic or by the Contractor's operations, the Contractor's forces shall begin the necessary operations for replacement and/or realignment of such sections within 30 minutes after notification by the Engineer, at no additional cost to the Tollway. Failure by the Contractor to comply with this requirement will be grounds for assessment of maintenance of traffic fine in accordance with the provisions of Article 701.01 (b)(2).

701.10 Bridge Repair Operations.

During bridge repair operations, any work to be done over operational traffic lanes shall be done over only one lane at a time, with that lane being closed to traffic.

The Contractor will be required to coordinate such repair operations with the construction staging shown in the Maintenance of Traffic Plans.

Impact Attenuators, Temporary shall be in place prior to placing Temporary Concrete Barrier sections for bridge construction as shown in the Plans. Temporary Concrete Barrier sections must be in place prior to parapet removal and may not be removed until all bridge widening and other repair work is complete. When removal is permitted, the Temporary Concrete Barrier sections shall be completely removed prior to removal of the Impact Attenuators, Temporary.

When any bridge repair or construction operation or feature is likely to cause the vertical clearance over any operational traffic lane(s) to be reduced, the Contractor shall contact both the Tollway and the agency of jurisdiction over such operational lanes not less than 10 working days prior to the start of such construction for permission and instructions with respect to signing and Maintenance of Traffic requirements. The cost therefore shall be considered as included in the Contract lump sum price for Maintenance of Traffic.

701.11 Bridge Painting Operations.

Any bridge painting to be done over operational traffic lanes shall be done one lane at a time, with that lane being closed to traffic in accordance with the procedures specified herein as may be modified by the Special Provisions.

The Contractor will be required to coordinate such painting operations with the construction staging shown in the Maintenance of Traffic Plans.

701.12 Holiday Periods. No work which will require movement of vehicles to and from the work site or which will otherwise interfere with Tollway traffic will be allowed during the following holiday periods without specific written authorization from the Tollway:

Easter Weekend - 12:00 Noon Thursday through 9:00 A.M. Monday

Memorial Day Weekend - 12:00 Noon Friday through 9:00 A.M. Tuesday

Independence Day

12:00 Noon Wednesday, July 3, 2013 through 9:00 A.M, Monday, July 8 2013

12:00 Noon Thursday, July 3, 2014 through 9:00 A.M, Monday July 7, 2014

12:00 Noon Thursday, July 2, 2015 through 9:00 A.M, Monday July 6, 2015

Labor Day Weekend - 12:00 Noon Friday through 9:00 A.M. Tuesday

Thanksgiving Weekend -12:00 Noon Wednesday through 9:00 A.M. Monday

Christmas-New Year's Day period - as specified in the Special Provisions

12:00 Noon Friday, December 21, 2012 through 9:00 A.M. Wednesday, December 26, 2012

12:00 Noon Tuesday, December 24, 2013 through 9:00 A.M. Thursday, December 26, 2013

701.13 Storage of Equipment and Materials.

During working hours, all vehicles and/or non-operating equipment and material stockpiles which are parked or stored for 2 hours or less shall be located at least 8 feet from the edge of the nearest moving traffic lane.

During non-working hours, or during working hours for periods of more than 2 hours, all vehicles and/or non-operating equipment and material stockpiles shall be parked or stored outside the "clear zone" or shall be located at least four feet behind man-made or natural barriers which in the opinion of the Engineer serve to fully protect the storage area and not constitute a hazard to motorists. Temporary concrete barrier sections which are installed in conjunction with lane closures or as protection for work areas will be considered an acceptable means of protection of storage areas, subject to approval of the Engineer.

When adequate right-of-way does not exist to accommodate this requirement, and when in the opinion of the Engineer no practical alternative exists, the storage area may be located a minimum of 15 feet from the edge of the nearest traffic lane and shall be delineated with barricades and flashing lights at no additional cost to the Tollway. The Contractor shall protect the stored materials from errant vehicles with an approved means of protection also at no additional cost to the Tollway.

With the exception of the special condition with respect to 2 hour periods, no parked Contractor vehicles, non-operating equipment, or material stockpiles will be allowed to remain closer than 15 feet to any operational traffic lane under any circumstances. Failure by the Contractor to comply with these requirements will be considered non-compliance with the Maintenance of Traffic Specifications and shall render the Contractor subject to the applicable penalty cited in Article 701.01 (b)

701.14 Work Above Active Roadways.

Procedures to enable erection of any items of work above roadways with vehicular and/or pedestrian traffic shall be subject to the provisions of Articles 733.05 (b) and 733.05 (c) of these Supplemental Specifications. The Contractor shall submit to the Engineer the erection and maintenance of traffic methods he proposes to use.

Along with erection drawings, the Contractor shall submit for the Tollway's approval a detailed traffic control plan for the erection period. Although specific requirements are dependent upon the Agency(s) whose facility the beams/girders or trusses are to be erected over, the number of lanes, the type of erection equipment used, etc., the following minimum requirements shall be complied with by the Contractor.

- (a) Any erection of beams/girders over a Tollway road shall require a complete closure to traffic, regardless of location or time of day.
- (b) The Contractor shall erect beams/girders only between the hours of 12:01 A.M. and 5:00 A.M. Monday through Sunday. Forty-eight (48) hours advance written notice to the Tollway, together with the Engineer's written approval, will be required prior to erection of any beam/girder.
- (c) The maximum allowable time limit for a full closure on a Tollway road shall be fifteen (15) minutes, ten (10) minutes for sign truss erection.
- (d) For any Beam/Girder and truss erection over a non-Tollway road or facility, written approval from the appropriate Agency shall accompany the submission to the Tollway for its approval.
- (e) The Contractor shall not reopen lanes below newly erected members until the members are securely in place. In the event the full-width Tollway closure exceeds the allowable time period, the Contractor will be subject to a penalty cited in Article 701.01(b)(1) per minute for any part of a minute exceeding the allowable time.

701.15 Method of Measurement and Basis of Payment.

The work described herein will be measured and paid for as MAINTENANCE OF TRAFFIC. MAINTENANCE OF TRAFFIC will be measured on a lump sum basis and paid for at the Contract lump sum price, which payment shall constitute full compensation for all labor, equipment, materials and incidentals necessary to furnish, install, maintain, clean, relocate, and remove all traffic control devices, including but not limited to barricades, cones, standard signs, warning lights, arrow boards, truck mounted attenuators, all traffic canalization required for temporary and permanent pavement marking, for furnishing and equipping flaggers, and for complying in all respects with the requirements of the Contract for the safe and expeditious movement of vehicular traffic through the zones of construction.

Payment for this work will be made in the following manner:

(a) Upon furnishing and installing equipment and materials for the first major stage of construction, 25% of this pay item will be paid.

(b) The remaining 75% will be pro-rated over the remaining contract period and paid in monthly installments.

Non-standard signs shall not be paid for separately and will be included in the cost for MAINTENANCE OF TRAFFIC. Any temporary shifting of existing guide signs along the IL Route 59 ramps as indicated on the maintenance of traffic plans shall be included in the cost for MAINTENANCE OF TRAFFIC and will not be paid for separately.

CATCH BASINS (TOLLWAY)

Description. This work shall consist of constructing catch basins in accordance with Section 602 of the Standard Specifications and in accordance with the applicable Tollway standard drawings B7 and B8 for catch basins of type specified. If a conflict is encountered between the Standard Specifications and the Tollway's Standard Drawings, the Tollway's Standard Drawings shall hold over the Standard Specifications.

Materials. Materials should be in accordance with Section 602.02 of the Standard Specifications for Road and Bridge Construction.

Construction Requirements. Work shall follow the applicable portions of Section 602 of the Standard Specifications for Road and Bridge Construction.

Method of Measurement. Catch basins, of the type specified with the necessary frame and grates or lids will be measured for payment, in place, per each.

Basis of Payment. Catch Basins will be paid for at the contract unit price per each for CATCH BASIN, of the type specified with the necessary frame and grates or lids.

SUBGRADE AGGREGATE, 12 IN. (TOLLWAY)

DESCRIPTION

This work shall consist of the furnishing, placement and compaction of an aggregate subgrade of porous granular embankment material capped with 3 inches of a CA-6 grade aggregate constructed on the finished subgrade in accordance with this special provision and to the lines, dimensions, and cross sections shown on the Plans, and as required by the Engineer.

MATERIALS

The materials used for SUBGRADE AGGREGATE, (12 In.) shall consist of coarse aggregate for porous granular embankment in accordance with Article 1004.05 of the IDOT Standard Specifications except as follows:

1. Crushed Stone, Crushed Blast Furnace Slag, and Crushed Concrete* will be permitted. Steel slag and other expansive materials as determined through testing by the Tollway will not be permitted.

<u>Sieve Size</u>	<u>Percent Passing With all Materials Processed Through a Stationary Crusher</u>	<u>Percent Passing With Recycled Concrete Processed Through a Mobile Crusher</u>
6 inches (150 mm)	97±3	97±3
4 inches (100 mm)	90±10	90±10
2 inches (50 mm)	45±25	40±20
#4 (4.75 mm)	-	15±10
#200 (75 µm)	5±5	5±5

2. Gravel, Crushed Gravel, and Pit Run Gravel

<u>Sieve Size</u>	<u>Percent Passing</u>
6 inches (150 mm)	97±3
4 inches (100 mm)	90±10
2 inches (50 mm)	55±25
#4 (4.75 mm)	30±20
#200 (75 µm)	5±5

3. Crushed Concrete* with Bituminous Materials**

<u>Sieve Size</u>	<u>Percent Passing</u>
6 inches (150 mm)	97±3
4 inches (100 mm)	90±10
2 inches (50 mm)	45±25
#4 (4.75 mm)	20±20
#200 (75 µm)	5±5

- * The production of crushed concrete shall be through mechanical means that complies with the current Bureau of Materials and Physical Research Policy Memorandum, "Recycling Portland Cement Concrete Into Aggregate". The Engineer shall approve the concrete removal method prior to crushing. Stockpile pads shall be provided at the crushing location to assure that acceptable material is not contaminated prior to use. Existing subbase aggregates shall not be intermixed with the recycled concrete either when picking up the broken concrete, feeding the concrete into the crusher, or when stockpiling the recycled aggregate.
- ** The bituminous material shall be separated and mechanically blended with the crushed concrete so that the bituminous material does not exceed 40% of the final product. The top size of the bituminous material in the final product shall be less than 4 inches (100 mm) and shall not contain more than 10.0% steel slag RAP or any material that is considered expansive by the Tollway.

The capping aggregate shall have a gradation of CA-6 for processed material from an approved source with the Contractor having the option to use Reclaimed Asphalt Pavement (RAP). The CA-6 may be blended as follows. The bituminous materials shall be separated and mechanically blended with interlocking feeders with crushed concrete or natural aggregate, in a manner that the bituminous material does not exceed 40% of the final product. This process shall be approved by the engineer prior to start of production. The top size of the bituminous material in the final products shall be less than 1 ½ inches and shall not contain more than 10% steel slag RAP or any material considered expansive by the Tollway. Reclaimed Asphalt Pavement (RAP)(having a maximum of 10% steel slag RAP) meeting the requirements of Article 1004.07 and having 100% passing the 3 inch (75 mm) sieve and well graded down through fines may also be used as capping aggregate.

The source of subgrade aggregate materials shall be optional to the Contractor unless otherwise noted on the Plans.

CONSTRUCTION REQUIREMENTS

The aggregate subgrade shall be placed in two lifts consisting of a 9 inch (225 mm) nominal thickness lower lift and a 3 inch (75 mm) variable nominal thickness top lift of capping aggregate having a gradation of CA-6, or any RAP which meets expansive characteristic criteria and has 100% passing the 3 inch (75 mm) sieve and be well graded down through the fines. With the placement of all lifts, the material shall be spread uniformly free from segregation. The thickness of the capping aggregate under bituminous shoulders will vary as a result of shoulder pavement thicknesses and shoulder surface or shoulder subgrade slope requirements as shown on the Plans. If used as the capping aggregate, the RAP shall be separated and stockpiled before use. A vibratory roller meeting the requirements of Article 1101.01(g) of the IDOT Standard Specifications shall be used to roll each lift of material to obtain the desired keying or interlock and necessary compaction. The Engineer will verify that adequate keying has been obtained.

When a recommended remedial treatment for unstable subgrades is included in the contract, the lower lift of Subgrade Aggregate may be placed simultaneously with the material for Porous Granular Embankment, Subgrade when the total thickness to be placed is 2 feet (600 mm) or less.

METHOD of MEASUREMENT

1. Contract Quantities. When a project is to be constructed essentially to the lines, grades, or dimensions shown on the plans and the Contractor and the Engineer have agreed in writing that the plan quantities are accurate, no further measurement will be required, and payment will be made for the quantities shown in the Contract for the various items involved except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured.

2. Measured Quantities. SUBGRADE AGGREGATE, (12 In.) will not be measured for payment, but will be computed in cubic yards for the various thicknesses from the Plan cross-sections and dimensions when completed essentially to the lines and dimensions shown in the Plans and as directed by the Engineer for undercuts as defined herein.

Should the Engineer direct a change in the Plan limits, that volume of material involved in the change shall be measured for adjustment to the calculated quantity. The volumes involved in the change shall be computed in cubic yards from cross-sections taken before and after placement and compaction of the material to the revised limits.

BASIS of PAYMENT

This work will be paid at the contract unit price per cubic yard for SUBGRADE AGGREGATE 12 IN, which payment shall constitute full compensation for furnishing, transporting, placing, compacting and finishing the subgrade aggregate materials, including the capping aggregate and undercuts, as specified or as directed by the Engineer.

PORTLAND CEMENT CONCRETE PAVEMENT (TOLLWAY BDE)

Effective: March 1, 2007

Revised: May 1, 2009

DESCRIPTION

This work shall consist of construction Portland Cement Concrete Pavement according to Section 420 of the Standard Specifications except as modified herein.

Revise Article 420.09(e)(1) to read:

“Type A. Texturing of the plastic concrete shall be obtained by the use of an artificial turf drag followed immediately by a mechanically operated metal comb longitudinal tining device.

The artificial turf shall be made of molded polyethylene with synthetic turf blades approximately 0.85 in (22-mm) long and contain approximately 7,200 individual blades per square foot (77,500 blades per square meter). The drag shall be suitably attached to an approved device that will permit control of the time and rate of texturing. The artificial turf shall be full pavement width and of sufficient size that during the finishing operations, approximately 2 ft (0.6 m) of the turf parallel to the pavement centerline will be in contact with the pavement surface. The drag shall be operated in a longitudinal direction so as to produce a uniform appearing finish meeting the approval of the Engineer. If necessary for maintaining intimate contact with the pavement surface, the drag may be weighted using lumber, rebar, or other suitable material.

The metal comb shall consist of a single line of tempered spring steel tines spaced at 0.75-in (19-mm) centers and securely mounted in a suitable head. The tines shall be flat and of a size and stiffness sufficient to produce a groove of the specified dimensions in the plastic concrete without tearing of the pavement edge or surface. The Contractor shall modify the equipment or operations if an acceptable pavement edge or surface is not produced. The mechanically operated metal comb shall be attached to an exclusive piece of equipment which is mechanically self-propelled.

The tining device shall be operated so as to produce a relatively uniform pattern of grooves parallel to the pavement centerline spaced at approximately 0.75-in (19-mm) centers, 0.13 to 0.19 in (3.2 to 4.8 mm) deep, and 0.13 in (3.2 mm) wide. Longitudinal tining shall stop at the edge of travel lanes. Tining devices shall be maintained clean and free from encrusted mortar and debris to ensure uniform groove dimensions. The tining finish shall not be performed too soon after pavement placement whereby the grooves may close up. The tining grooves shall be neat in appearance, parallel with the longitudinal joint, uniform in depth and in accordance with these specifications.”

Add the following paragraph to Article 420.05(c)(2) of the Standard Specifications to read:

“A dowel bar inserter used with a formless paver meeting the requirements of Article 1103.16 may be used in lieu of the assemblies specified above. When a dowel bar inserter is used to install load transfer bars, space the bars according to design requirements. Dowel bar inserters shall insert dowel bars into plastic concrete which has been placed and consolidated to full depth. The bars shall be inserted ahead of the finishing beam or screed and the installing device shall so consolidate the concrete that no voids exist around the dowel bars. The forward movement of the finishing beam or screed shall not be interrupted by the inserting of the dowel bars.”

DOWEL BARS (TOLLWAY BDE)

Effective: June 9, 2008

Revise the fifth and sixth sentences of Article 1006.11(b) of the Standard Specifications to read:

“The bars shall be epoxy coated according to AASHTO M 284, except the thickness of the epoxy shall be 7 to 12 mils (0.18 to 0.30 mm) and patching of the ends will be required. The epoxy coating applicator shall be certified according to the current Bureau of Materials and Physical Research Policy Memorandum, “Epoxy Coating Plant Certification Procedure”. The Illinois Department of Transportation will maintain an approved list.”

HOT-MIX ASPHALT (HMA) PRESSURE RELIEF JOINT (TOLLWAY BDE)

Effective: June 27, 2006

Revised : February 5, 2008

This work shall consist of sawcutting full depth and satisfactorily removing existing pavement and reinforcement, restoration of substrate, tack coating exposed surfaces, and furnishing, placing, and compacting hot-mix concrete mixtures in sufficient lifts with adequate equipment to obtain the specified densities. HOT-MIX ASPHALT PRESSURE RELIEF JOINTS shall be classified as Class D1 or D3 patches of the type specified at designated locations. Removal and replacement of pavement shall be in accordance with Section 442 of the Standard Specifications except as modified herein.

Revise Article 442.01 of the Standard Specifications to read.

442.01 Description. This work shall consist of the removal of the existing pavement, the necessary excavation and the replacement with the class and type of patch specified at designated locations.

This work will be classified as follows:

- Class A Patches: Pavement Removal and Continuously Reinforced Portland Cement Concrete Replacement
- Class B Patches: Pavement Removal and Portland Cement Concrete Replacement Using Dowels or Tie Bars
- Class C Patches: Pavement Removal and Portland Cement Concrete Replacement
- Class D1 Patches: Pavement Removal and Hot-Mix Asphalt (HMA) Replacement with HMA Binder Course below Top 2 inches and HMA Surface Course for the Top 2 inches
- Class D2 Patches: Pavement Removal Following Shoulder Scarification and HMA Replacement with HMA Concrete Binder Course up to the elevation of the scarified surface
- Class D3 Patches: Pavement Removal and HMA Replacement with HMA Binder Course

For each of the above classifications, the work on a lane width or less shall be further quantified by size as follows:

- Type I Less than 5 sq yd
- Type II 5 sq yd or more, but less than 15 sq yd
- Type III 15 sq yd or more, but less than 25 sq yd
- Type IV 25 sq yd or more

Revise Article 442.08(a) of the Standard Specifications to read.

- (a) Filling Holes. Each properly prepared hole shall be filled with at least two layers of binder course mixture. The HMA mixture shall be placed only when the temperature in the shade is at least 40 °F and the forecast is for rising temperature and when the subgrade is not frozen. Each layer shall be compacted with a mechanical tamper, a vibrating tamper, or a self-propelled roller. Trucks may be used to supplement the tampers or roller. If the required density is not obtained, the Contractor shall increase the number of layers and/or compactive efforts.

For Class D1 patches constructed as a HOT-MIX ASPHALT PRESSURE RELIEF JOINT for the roadways and ramps within highway corridor's that have 20 year ESAL's levels less than 30 million, the patch mix shall be a binder course, IL-19.0, N90 mixture with the top layer consisting of a surface course, IL-12.5, N90 mixture that shall be not less than 2 in. compacted thickness. For Class D1 patches constructed as a HOT-MIX ASPHALT PRESSURE RELIEF JOINT for the roadways and ramps within highway corridor's that have 20 year ESAL's levels that exceed 30 million, the patch mix shall be a binder course, IL-19.0, N105 mixture with the top layer consisting of a surface course, IL-12.5, N105 mixture that shall be not less than 2 in. compacted thickness. To facilitate possible extra Pavement Patching, Art. 442.10 compaction and consolidation by traffic, the surface of the completed patch may be finished up to 1/2 in. above the existing pavement.

Revise the second paragraph of Article 442.11 of the Standard Specifications to read.

This work will be paid for at the contract unit price per square yard for HOT-MIX ASPHALT PRESSURE RELIEF JOINT, CLASS D1 PATCHES, of thickness specified, and HOT-MIX ASPHALT PRESSURE RELIEF JOINT, CLASS D3 PATCHES, of thickness specified.

WHITEWASHING FOR CONCRETE PAVEMENT (TOLLWAY RECURRING)

Effective: May 1, 2007

DESCRIPTION

This work shall consist of whitewashing the hot-mix asphalt base prior to placement of Portland cement concrete (PCC) pavement.

MATERIALS

All materials shall conform to Materials, Division 1000 of the Standard Specifications. Specific references are as follows:

Item	Article/Section
Water.....	1002
Hydrated Lime.....	1012
Calcium Carbonate Pigments.....	(Note 1)

Note 1. ASTM D-1199, Type GC or PC, Grade II or finer. Other materials or grades may be used with the approval of the Engineer provided the resulting coating is bright white and uniform in nature. By-product lime will not be allowed.

EQUIPMENT

Equipment shall be capable of mixing, continuously agitating, and applying the prepared solution in a uniform manner.

SURFACE PREPARATION

Prior to placement of whitewashing the hot-mix asphalt base course shall be free of loose debris by means acceptable to the Engineer.

CONSTRUCTION REQUIREMENTS

When PCC pavement (jointed plain or continuously reinforced) will be placed between May 15 and October 15, the surface of the hot-mix asphalt base underlying the pour shall be whitewashed. Whitewashing shall be completed prior to placing the reinforcing steel or load transfer devices. Whitewashing shall not be applied when rain is imminent.

The whitewash shall be prepared by combining two parts water to one part pigment by weight. The ingredients shall be mixed until smooth in consistency and free of lumps. If sufficient coating can be demonstrated, the ratio may be increased up to three parts water to one part pigment by weight with the approval of the Engineer. After mixing, the whitewash shall be continually agitated until applied.

The whitewash shall be uniformly applied to the entire hot-mix asphalt base at a minimum rate of 0.075 gal/sq yd. The method of application shall be approved by the Engineer. Thick films from spills or over-application shall be removed by means that does not damage the base or subbase.

If a truck is used to apply the whitewash, a medium to long nap carpet shall be dragged behind the spray bar. The carpet shall be pre-dampened with whitewash and sufficiently weighted to ensure uniform application.

Once the whitewash coating is applied, it shall be maintained until placement of the reinforcing steel, load transfer devices or pavement.

METHOD of MEASUREMENT

This work will be measured for payment in place and the area computed in square yards. The measured dimensions will be the length and width made along the top of hot-mix asphalt base whitewashed.

BASIS OF PAYMENT

This work will be made at the Contract unit price per square yard for WHITEWASHING FOR CONCRETE PAVEMENT, which payment shall constitute full compensation for furnishing, preparing, mixing, and placing all materials as specified herein and shall include the furnishing of all equipment, tools, labor, and incidentals necessary for the satisfactory completion of the work specified.

CONCRETE BARRIER (TOLLWAY BDE)

Effective: October 23, 2006

Revised: May 13, 2008

Revise Article 637.02 of the Standard Specifications to read:

“637.02 Materials. Materials for the barrier and the Portland cement concrete base shall conform to the requirements of the following Articles of Section 1000 - Materials:

Item	Article/Section
(a) Portland Cement Concrete.....	1020
(b) Tie Bars (Note 1).....	1006.10(a)(b)
(c) Dowel Bars.....	1006.11(b)
(d) Protective Coat.....	1023
(e) Non-Shrink Grout.....	1024
(f) Chemical Adhesive Resin System.....	1027.01
(g) Preformed Expansion Joint Filler.....	1051.01 – 1051.08

Note 1. Tie bars shall meet the requirements of AASHTO M312, Grade 60 (400).

The coarse aggregate to be used in the concrete barrier walls shall conform to the requirements for the coarse aggregate that is used for superstructure concrete.

Hot mix asphalt (HMA) base shall not be allowed...”

Add the following to Article 637.06 of the Standard Specifications:

“When a reinforced single face barrier is specified, the required reinforcing shall be as detailed in the plans.”

Revise Article 637.11(b) of the Standard Specifications to read:

Measured Quantities. Concrete barrier base will be measured for payment in feet in place, along the centerline of the barrier base.

Concrete barrier will be measured for payment in feet in place, along the centerline of the concrete barrier.

Concrete barrier transition will be measured for payment in feet in place, along the centerline of the transition.

Concrete gutter when used in conjunction with variable height barrier and base will be measured and paid for separately.

“The cost of reinforcing bars shall be included in the cost of the CONCRETE BARRIER, SINGLE FACE, REINFORCED.”

Protective coat will be measured for payment in place and the area computed in square yards.

Revise Article 637.12 of the Standard Specifications to read as follows:

“637.12 Basis of Payment. This work will be paid for at the contract unit price per foot for CONCRETE BARRIER BASE; CONCRETE BARRIER, DOUBLE FACE, of the height specified; CONCRETE BARRIER, DOUBLE FACE, SPECIAL; CONCRETE BARRIER, SINGLE FACE, of the height specified; CONCRETE BARRIER, SINGLE FACE, SPECIAL of the height specified; CONCRETE BARRIER, SINGLE FACE, REINFORCED of the height specified; and CONCRETE BARRIER TRANSITION, CONCRETE BARRIER, DOUBLE FACE, VARIABLE HEIGHT, CONCRETE BARRIER BASE, VARIABLE HEIGHT, CONCRETE GUTTER (SPECIAL).

Protective coat will be paid for according to Article 420.23.”

CONCRETE MEDIAN BARRIER TRANSITION, TYPE V-F (TOLLWAY)

Description. This work shall consist of constructing concrete median barrier transition in accordance with the applicable portions of Tollway Standard Drawings C13 and Section 637 of the Standard Specifications.

Construction Requirements. Work shall follow the applicable portions of Section 637 of the Standard Specifications for Road and Bridge Construction.

Method of Measurement. This work will be measured for payment in feet in place along the centerline of the transition.

Basis of Payment. This work shall be paid for at the contract unit price per foot for CONCRETE MEDIAN BARRIER TRANSITION, TYPE V-F, and CONCRETE BARRIER BASE (SPECIAL) which price will constitute full compensation for the satisfactory completion of the work specified herein.

**CONCRETE BARRIER DELINEATOR, REFLECTOR MARKER TYPE C (TOLLWAY
RECURRING)**

Effective: January 12, 2010

Description: This work shall consist of furnishing and installing concrete barrier delineator, reflector marker Type C on concrete barrier wall and temporary concrete barrier as shown in the Plans and/or as directed by the Engineer.

Materials: Materials for concrete barrier delineator, reflector marker Type C shall be in accordance with Section 1097 of the Standard Specifications, except as modified herein.

Construction Requirements.

Prismatic Barrier Reflectors. The unit shall have a minimum of 9.0 sq. in. of effective reflective area.

Reflectors shall be according to minimum specific intensities per Article 1097.02 of the Standard Specifications.

The Contractor shall furnish, when requested to do so, a certification from the manufacturer stating that all reflectors conform to these requirements. The reflectors shall be furnished in either amber or crystal as specified and shall be ready for mounting. The plastic reflector units shall be free of cracks and checks, and fabrication shall be accomplished in a uniform and professional manner.

The direct applied concrete barrier delineator reflector marker shall be mono-directional, molded of methyl methacrylate (acrylic) plastic into the following shape in accordance with Tollway Standard Drawing D4.

- Reflector Marker Type C lens shall be rectangular in shape.

The base material shall be fabricated from high impact thermoplastic, lexan, nylon, or other approved material which shall not shatter or crack under impact at temperatures of -30 °F.

The rear surface of the lens shall provide reflectivity by a prismatic configuration such that it will affect total retrodirective internal reflection of light incident to the lens surface without the necessity of any plating or separate reflector.

The manufacturer's trademark shall be molded in the face of the lens or on the reflector body so it is visible after installation.

The back side of the reflector shall be protected by a plastic back fused to the lens under heat and pressure around the entire perimeter to form a unit permanently sealed against dust, water, and water vapor.

For qualification purposes only, ten (10) samples required for tests set forth in these Specifications shall be submitted by the Contractor. In addition, the Engineer will have the right to select 10 samples at random from each shipment for acceptance purposes.

Testing. The reflector marker unit shall meet the requirements for sealing and heat resistance per Article 1097.03(b) and Article 1097.03(c) of the Standard Specifications.

Installing Barrier Reflectors. Concrete barrier delineator, reflector marker Type C shall be installed at the spacing and elevations shown in the Plans or as directed by the Engineer.

Only the Tollway's specified type of reflector and geometric shape will be permitted within the limits of a contract.

Concrete barrier delineator, reflector marker Type C shall be installed using an adhesive. The surface of the guardrail to which the marker is to be applied shall be free of foreign matter and any material which would adversely affect the bond of the adhesive. Cleaning of the surfaces shall be to the satisfaction of the Engineer.

An adhesive meeting the reflector unit manufacturer's specifications shall be placed either on the surface or the bottom of the marker in sufficient quantity to ensure complete coverage of the contact area with no voids present and with a slight excess after the marker is pressed firmly in place.

The Contractor shall exercise care that the delineators are placed in a satisfactory and uniform alignment both horizontally and vertically. Acceptance of the delineator installation will include, in addition to ordinary inspection, a night inspection shall be made by the Engineer and Contractor from an automobile. Delineators not having satisfactory and uniform night appearance shall be moved and adjusted or replaced as required at the Contractor's expense until they do conform to the requirements herein and are found to be acceptable to the Engineer.

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

Basis of Payment. This work will be paid for at the contract unit price per Each, for CONCRETE BARRIER DELINEATOR, REFLECTOR MARKER TYPE C, complete in place, accepted, which payment shall constitute full compensation for furnishing and installing the reflector marker of the lens color specified, adhesive, for cleaning placement surfaces and for all labor, equipment, tools, and incidentals necessary to complete the work as specified.

GALVANIZED STEEL PLATE BEAM GUARDRAIL (TOLLWAY RECURRING)

Effective: October 1, 2009

Revised: September 23, 2011

Description. This work shall consist of furnishing and erecting steel plate beam guardrail and posts in accordance with the details shown on the Plans.

Materials. Materials shall be according to Article 630.02 of the Standard Specifications.

General Requirements. General requirements for steel plate beam guardrail and posts shall be according to the following Article 630.03 of the Standard Specifications, except as modified herein:

Add the following to Article 630.03: The rail elements shall be of uniform section. Warped or deformed elements will be rejected. The edges of the elements shall be rolled or rounded so that they present no sharp edges. All connections and splices shall be made with button head bolts with oval shoulders in such a manner that there will be no appreciable projection on the road side of the guard rail.

When guardrail posts are to be placed within concrete or hot mix asphalt (HMA), a leave-out area shall be provided as shown on the Tollway Standard Drawing C1. The construction of the leave-out shall be considered incidental to this pay item.

Fabrication. Fabrication of plates for the rail element shall be according to Article 630.04 of the Standard Specifications, except as modified herein:

Revise the last paragraph to read: Rail elements shall be furnished in lengths of 12.5 feet

Erection. Materials or hardware, including posts, on which the galvanizing has been damaged, shall be replaced with new materials having properly galvanized surfaces, except that, subject to the approval of the Engineer, minor damage to galvanized surfaces may be repaired by field galvanizing in accordance with the recommendations of the American Hot Dip Galvanizers Association.

The rail and post elements shall be erected to the required elevation. The top of the rail shall be visually straight in horizontal alignment and shall be continuously parallel to the roadway profile grade in vertical alignment. If insufficient adjustment is available in the holes, posts shall be reset, at no additional cost to the Tollway, until the guard rail is properly aligned. The brackets may be loosely bolted to the posts and, after erection of rail elements, the rail shall be carefully aligned and the bolts then fully tightened. Nuts shall be drawn up tight on all bolts.

Posts. All posts shall be steel. Steel posts may be driven by hand or mechanical methods provided they are protected by a suitable driving cap and the earth around the posts compacted, if necessary, after driving. When steel posts are driven to incorrect alignment or grade, they shall be removed and set according to Article 634.05.

Block-outs. All block-outs shall be wooden. Plastic and/or steel block-outs shall not be permitted.

Post Spacing. Posts for Type A and B shall be spaced as indicated on Standard C1. Type C posts shall be spaced at 1'-6 ¾" .

Contractor's Responsibility for Underground Facilities. It shall be the Contractor's responsibility to ascertain in advance of any work, by any and all possible means, the presence of underground electrical or telecommunications cables in or near the vicinity of the work. It shall be the Contractor's further responsibility to notify the Tollway at least ten days in advance of setting new posts when working near underground electrical or telecommunications cables. Tollway technicians will then locate any such cables which may be in jeopardy. It shall be the Contractor's responsibility to preserve cable location markings and all information relating thereto given to him, and to effectively communicate such information to his workers. If the Contractor cuts or damages any such cables, either through carelessness or failure to follow the foregoing procedures, he will then be held responsible for repairing all damages or replacing the cable without splicing, at the Tollway's option, and all at no cost to the Tollway or cause for the Contractor claiming delay.

Such repair or replacement shall include the immediate installation by the Contractor, without further notice to him, of temporary cables satisfactory to the Tollway, the temporary cables to remain in service until the directed repairs or replacements are made. Stringing temporary cables on the ground will not be allowed in any circumstances. Temporary cables shall be:

(a) Suitable for direct burial installation, acceptable to the Tollway, and shall be buried to a depth not less than 12 inches;

or

(b) Weather-proof cable, acceptable to the Tollway, and shall be suspended not less than 8 feet above the highest point of terrain between supports, unless otherwise directed by the Tollway. Suspended temporary cables may be attached to existing poles, or, in their absence, shall be attached to supports acceptable to the Engineer, furnished and installed by the Contractor.

Any posts that are to be located near or over any buried cable shall be installed by first digging a hole by hand, and then installing the post and backfilling the hole. No posts shall be driven under such conditions. Care shall be taken while digging by hand so as not to damage the cable.

All efforts on the Tollway's part to advise the Contractor as to the locations of underground cables notwithstanding, it shall be understood that such locations are at best approximate, may be in error, and that such efforts by the Tollway shall not relieve the Contractor of any responsibility for restoring damage resulting from the activities of any employee, Subcontractor, agent, or representative of the Contractor.

The Contractor shall also be responsible for notifying owners of other cables and underground facilities which may be jeopardized by the Contractor's operations in the same manner as required for notice to the Tollway.

Method of Measurement. This work will be measured for payment, complete in place, in feet. The length shall be the overall length of installed rail, measured along the top edge of the top rail element from end to end of the total rail.

Basis of Payment. This work will be paid for at the contract unit price per foot, for GALVANIZED STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS; GALVANIZED STEEL PLATE BEAM GUARDRAIL, TYPE A, 9 FOOT POSTS; GALVANIZED STEEL PLATE BEAM GUARDRAIL, TYPE B, 6 FOOT POSTS; GALVANIZED STEELPLATE BEAM GUARDRAIL, TYPE B, 9 FOOT POSTS GALVANIZED STEEL PLATE BEAM GUARDRAIL, TYPE C, 6 FOOT POSTS; or GALVANIZED STEELPLATE BEAM GUARDRAIL, TYPE C, 9 FOOT POSTS, which payment shall constitute full compensation for furnishing and installing all material, including rail, posts, block-outs and hardware; and for all labor, equipment, tools and incidentals necessary to complete the work as specified.

TRAFFIC BARRIER TERMINAL, TYPE T1 (SPECIAL) TANGENT (TOLLWAY RECURRING)

Effective: October 1, 2009

Description: This work shall consist of furnishing and erecting traffic barrier terminal as shown in the Plans and/or directed by the Engineer.

Materials: Materials shall be in accordance with Article 631.02 of the Standard Specifications.

Construction Requirements.

General. General requirements for traffic barrier terminal shall be according to the following Article 631.03 of the Standard Specifications, except as modified herein:

Add the following to Article 631.03. The rail elements shall be of uniform section. Warped or deformed elements will be rejected. The edges of the elements shall be rolled or rounded so that they present no sharp edges. All connections and splices shall be made with button head bolts with oval shoulders in such a manner that there will be no appreciable projection on the road side of the guard rail.

Traffic Barrier Terminal, Type T1 (Special). This terminal shall meet the testing criteria contained in the National Cooperative Highway Research Program (NCHRP) Report 350 and be approved by the Tollway.

The terminal shall conform to the individual manufacturer's specifications and shall be installed according to the manufacturer's instructions. The terminal shall include all necessary transitions between the terminal and the item to which it is attached and shall be installed at the taper rate shown in the plans.

The terminal shall be delineated with a terminal marker direct applied. No other guardrail delineation shall be attached to the terminal section.

The traffic barrier terminals shall be as described in the following table.

Terminal	NCHRP 350 Test Level	Model No.	Manufacturer
Traffic Barrier Terminal, Type T1 (Special)	3	ET-PLUS	Trinity Industries, Inc.
		SKT-MGS	Road Systems, Inc.

Fabrication. The plates for the rail element shall be blanked to proper shape, fabricated, and ready for assembly when received. No punching, drilling, cutting, or welding will be permitted in the field.

Plates in lap splices shall make contact throughout the entire area of the splice.

Erection. Materials or hardware, on which the galvanizing has been damaged shall be replaced with new materials having properly galvanized surfaces, except that, subject to the approval of the Engineer, minor damage to galvanized surfaces may be repaired by field galvanizing in accordance with the recommendations of the American Hot Dip Galvanizers Association.

The rail and post elements shall be erected to the required elevation. The top of the rail shall be visually straight in horizontal alignment and shall be continuously parallel to the roadway profile grade in vertical alignment. If insufficient adjustment is available in the holes, posts shall be reset, at no additional cost to the Tollway, until the traffic barrier terminal is properly aligned. The brackets may be loosely bolted to the posts and, after erection of rail elements, the rail shall be carefully aligned and the bolts then fully tightened. Nuts shall be drawn up tight on all bolts.

Posts. Terminal posts (end and line) shall be a steel system. Wood posts shall not be permitted. Posts shall be erected according to Article 634.05.

Foundation Tubes. Foundation tubes (with or without soil plates) shall be steel and installed at post locations per manufacturer's specifications. The top of the foundation tube shall not project more than 4" above the ground line when measured along a 5' cord, in compliance with AASHTO specifications.

Block-outs. All block-outs shall be wooden. Plastic and/or steel block-outs shall not be permitted.

Contractor's Responsibility For Underground Facilities. It shall be the Contractor's responsibility to ascertain in advance of any work, by any and all possible means, the presence of underground electrical or telecommunications cables in or near the vicinity of the work. It shall be the Contractor's further responsibility to notify the Tollway at least ten days in advance of setting new posts when working near underground electrical or telecommunications cables. Tollway technicians will then locate any such cables which may be in jeopardy. It shall be the Contractor's responsibility to preserve cable location markings and all information relating thereto given to him, and to effectively communicate such information to his workers. If the Contractor cuts or damages any such cables, either through carelessness or failure to follow the foregoing procedures, he will then be held responsible for repairing all damages or replacing the cable without splicing, at the Tollway's option, and all at no cost to the Tollway or cause for the Contractor claiming delay.

Such repair or replacement shall include the immediate installation by the Contractor, without further notice to him, of temporary cables satisfactory to the Tollway, the temporary cables to remain in service until the directed repairs or replacements are made. Stringing temporary cables on the ground will not be allowed in any circumstances. Temporary cables shall be:

(a) Suitable for direct burial installation, acceptable to the Tollway, and shall be buried to a depth not less than 12 inches;

or

(b) Weather-proof cable, acceptable to the Tollway, and shall be suspended not less than 8 feet above the highest point of terrain between supports, unless otherwise directed by the Tollway. Suspended temporary cables may be attached to existing poles, or, in their absence, shall be attached to supports acceptable to the Engineer, furnished and installed by the Contractor.

Any posts that are to be located near or over any buried cable shall be installed by first digging a hole by hand, and then installing the post and backfilling the hole. No posts shall be driven under such conditions. Care shall be taken while digging by hand so as not to damage the cable.

All efforts on the Tollway's part to advise the Contractor as to the locations of underground cables notwithstanding, it shall be understood that such locations are at best approximate, may be in error, and that such efforts by the Tollway shall not relieve the Contractor of any responsibility for restoring damage resulting from the activities of any employee, Subcontractor, agent, or representative of the Contractor.

The Contractor shall also be responsible for notifying owners of other cables and underground facilities which may be jeopardized by the Contractor's operations in the same manner as required for notice to the Tollway.

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

The pay limits between the traffic barrier terminal and the adjacent guardrail shall be as shown on Tollway Standard Drawing C6.

Basis of Payment: This work will be paid for at the contract unit price per each, for TRAFFIC BARRIER TERMINAL, TYPE T1 (SPECIAL) TANGENT, which payment shall constitute full compensation for furnishing and installing all material, including rail, posts, block-outs and hardware; and for all labor, equipment, tools and incidentals necessary to complete the work as specified.

Terminal markers-direct applied will be paid for separately.

TRAFFIC BARRIER TERMINAL, TYPE T2 (TOLLWAY RECURRING)

Effective: October 1, 2009

Description: This work shall consist of furnishing and erecting traffic barrier terminal as shown in the Plans and/or directed by the Engineer.

Materials: Materials shall be in accordance with Article 631.02 of the Standard Specifications.

Construction Requirements.

General. General requirements for traffic barrier terminal shall be according to the following Article 631.03 of the Standard Specifications, except as modified herein:

Add the following to Article 631.03. The rail elements shall be of uniform section. Warped or deformed elements will be rejected. The edges of the elements shall be rolled or rounded so that they present no sharp edges. All connections and splices shall be made with button head bolts with oval shoulders in such a manner that there will be no appreciable projection on the road side of the guard rail.

Traffic Barrier Terminal, Type T2. The terminal shall conform to the individual manufacturer's specifications and shall be installed according to the manufacturer's instructions. The terminal shall include all necessary transitions between the terminal and the item to which it is attached.

Fabrication. The plates for the rail element shall be blanked to proper shape, fabricated, and ready for assembly when received. No punching, drilling, cutting, or welding will be permitted in the field.

Plates in lap splices shall make contact throughout the entire area of the splice.

Erection. Materials or hardware, on which the galvanizing has been damaged shall be replaced with new materials having properly galvanized surfaces, except that, subject to the approval of the Engineer, minor damage to galvanized surfaces may be repaired by field galvanizing in accordance with the recommendations of the American Hot Dip Galvanizers Association.

The rail and post elements shall be erected to the required elevation. The top of the rail shall be visually straight in horizontal alignment and shall be continuously parallel to the roadway profile grade in vertical alignment. If insufficient adjustment is available in the holes, posts shall be reset, at no additional cost to the Tollway, until the traffic barrier terminal is properly aligned. The brackets may be loosely bolted to the posts and, after erection of rail elements, the rail shall be carefully aligned and the bolts then fully tightened. Nuts shall be drawn up tight on all bolts.

Posts. Terminal posts shall be wood. Wood posts shall be treated. The posts shall be cut to the proper dimensions before treatment. No cutting of the posts will be permitted after treatment. Posts shall be erected according to Article 634.05.

Block-outs. When the terminal is installed behind a gutter, blockouts are required. All block-outs shall be wooden. Plastic and/or steel block-outs shall not be permitted.

Foundation Tubes. Foundation tubes shall be steel and installed at post locations per manufacturer's specifications. The top of the foundation tube shall not project more than 4" above the ground line when measured along a 5' cord, in compliance with AASHTO specifications.

Contractor's Responsibility For Underground Facilities. It shall be the Contractor's responsibility to ascertain in advance of any work, by any and all possible means, the presence of underground electrical or telecommunications cables in or near the vicinity of the work. It shall be the Contractor's further responsibility to notify the Tollway at least ten days in advance of setting new posts when working near underground electrical or telecommunications cables. Tollway technicians will then locate any such cables which may be in jeopardy. It shall be the Contractor's responsibility to preserve cable location markings and all information relating thereto given to him, and to effectively communicate such information to his workers. If the Contractor cuts or damages any such cables, either through carelessness or failure to follow the foregoing procedures, he will then be held responsible for repairing all damages or replacing the cable without splicing, at the Tollway's option, and all at no cost to the Tollway or cause for the Contractor claiming delay.

Such repair or replacement shall include the immediate installation by the Contractor, without further notice to him, of temporary cables satisfactory to the Tollway, the temporary cables to remain in service until the directed repairs or replacements are made. Stringing temporary cables on the ground will not be allowed in any circumstances. Temporary cables shall be:

- (a) Suitable for direct burial installation, acceptable to the Tollway, and shall be buried to a depth not less than 12 inches;
- or
- (b) Weather-proof cable, acceptable to the Tollway, and shall be suspended not less than 8 feet above the highest point of terrain between supports, unless otherwise directed by the Tollway. Suspended temporary cables may be attached to existing poles, or, in their absence, shall be attached to supports acceptable to the Engineer, furnished and installed by the Contractor.

Any posts that are to be located near or over any buried cable shall be installed by first digging a hole by hand, and then installing the post and backfilling the hole. No posts shall be driven under such conditions. Care shall be taken while digging by hand so as not to damage the cable.

All efforts on the Tollway's part to advise the Contractor as to the locations of underground cables notwithstanding, it shall be understood that such locations are at best approximate, may be in error, and that such efforts by the Tollway shall not relieve the Contractor of any responsibility for restoring damage resulting from the activities of any employee, Subcontractor, agent, or representative of the Contractor.

The Contractor shall also be responsible for notifying owners of other cables and underground facilities which may be jeopardized by the Contractor's operations in the same manner as required for notice to the Tollway.

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

The pay limits between the traffic barrier terminal and the adjacent guardrail shall be as shown on Tollway Standard Drawing C7.

Basis of Payment: This work will be paid for at the contract unit price per each, for TRAFFIC BARRIER TERMINAL, TYPE T2 as specified, which payment shall constitute full compensation for furnishing and installing all material, including rail, posts, blockouts, foundation tubes, cable and hardware; and for all labor, equipment, tools and incidentals necessary to complete the work as specified.

TRAFFIC BARRIER TERMINAL, TYPE T5 (TOLLWAY RECURRING)

Effective: October 1, 2009

Description: This work shall consist of furnishing and erecting traffic barrier terminal as shown in the Plans and/or directed by the Engineer.

Materials: Materials shall be in accordance with Article 631.02 of the Standard Specifications.

Construction Requirements.

General. General requirements for traffic barrier terminal shall be according to the following Article 631.03 of the Standard Specifications, except as modified herein:

Add the following to Article 631.03. The rail elements shall be of uniform section. Warped or deformed elements will be rejected. The edges of the elements shall be rolled or rounded so that they present no sharp edges. All connections and splices shall be made with button head bolts with oval shoulders in such a manner that there will be no appreciable projection on the road side of the guard rail.

Traffic Barrier Terminal, Type T5. The terminal shall include all necessary transitions between the terminal and the item to which it is attached. The face of the guardrail shall be installed flush with the face of the bridge rail or parapet and attached to anchor bolts that had previously been cast into the end of the parapet.

Fabrication. The plates for the rail element shall be blanked to proper shape, fabricated, and ready for assembly when received. No punching, drilling, cutting, or welding will be permitted in the field.

Plates in lap splices shall make contact throughout the entire area of the splice.

Erection. Materials or hardware, on which the galvanizing has been damaged shall be replaced with new materials having properly galvanized surfaces, except that, subject to the approval of the Engineer, minor damage to galvanized surfaces may be repaired by field galvanizing in accordance with the recommendations of the American Hot Dip Galvanizers Association.

The rail and post elements shall be erected to the required elevation. The top of the rail shall be visually straight in horizontal alignment and shall be continuously parallel to the roadway profile grade in vertical alignment. If insufficient adjustment is available in the holes, posts shall be reset, at no additional cost to the Tollway, until the traffic barrier terminal is properly aligned. The brackets may be loosely bolted to the posts and, after erection of rail elements, the rail shall be carefully aligned and the bolts then fully tightened. Nuts shall be drawn up tight on all bolts.

Posts. All posts shall be steel. Steel posts may be driven by hand or mechanical methods provided they are protected by a suitable driving cap and the earth around the posts compacted, if necessary, after driving. When steel posts are driven to incorrect alignment or grade, they shall be removed and set according to Article 634.05.

Block-outs. All block-outs shall be wooden. Plastic and/or steel block-outs shall not be permitted.

Contractor's Responsibility For Underground Facilities. It shall be the Contractor's responsibility to ascertain in advance of any work, by any and all possible means, the presence of underground electrical or telecommunications cables in or near the vicinity of the work. It shall be the Contractor's further responsibility to notify the Tollway at least ten days in advance of setting new posts when working near underground electrical or telecommunications cables. Tollway technicians will then locate any such cables which may be in jeopardy. It shall be the Contractor's responsibility to preserve cable location markings and all information relating thereto given to him, and to effectively communicate such information to his workers. If the Contractor cuts or damages any such cables, either through carelessness or failure to follow the foregoing procedures, he will then be held responsible for repairing all damages or replacing the cable without splicing, at the Tollway's option, and all at no cost to the Tollway or cause for the Contractor claiming delay.

Such repair or replacement shall include the immediate installation by the Contractor, without further notice to him, of temporary cables satisfactory to the Tollway, the temporary cables to remain in service until the directed repairs or replacements are made. Stringing temporary cables on the ground will not be allowed in any circumstances. Temporary cables shall be:

- (a) Suitable for direct burial installation, acceptable to the Tollway, and shall be buried to a depth not less than 12 inches;
- or
- (b) Weather-proof cable, acceptable to the Tollway, and shall be suspended not less than 8 feet above the highest point of terrain between supports, unless otherwise directed by the Tollway. Suspended temporary cables may be attached to existing poles, or, in their absence, shall be attached to supports acceptable to the Engineer, furnished and installed by the Contractor.

Any posts that are to be located near or over any buried cable shall be installed by first digging a hole by hand, and then installing the post and backfilling the hole. No posts shall be driven under such conditions. Care shall be taken while digging by hand so as not to damage the cable.

All efforts on the Tollway's part to advise the Contractor as to the locations of underground cables notwithstanding, it shall be understood that such locations are at best approximate, may be in error, and that such efforts by the Tollway shall not relieve the Contractor of any responsibility for restoring damage resulting from the activities of any employee, Subcontractor, agent, or representative of the Contractor.

The Contractor shall also be responsible for notifying owners of other cables and underground facilities which may be jeopardized by the Contractor's operations in the same manner as required for notice to the Tollway.

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

The pay limits between the traffic barrier terminal and the adjacent guardrail shall be as shown on Tollway Standard Drawing C8.

Basis of Payment: This work will be paid for at the contract unit price per each, for TRAFFIC BARRIER TERMINAL, TYPE T5 as specified, which payment shall constitute full compensation for furnishing and installing all material, including rail, posts, block-outs, plates and hardware; and for all labor, equipment, tools and incidentals necessary to complete the work as specified.

**TRAFFIC BARRIER TERMINAL, TYPE T6 (TOLLWAY RECURRING)
TRAFFIC BARRIER TERMINAL, TYPE T6B**
Effective: October 1, 2009

Description: This work shall consist of furnishing and erecting traffic barrier terminal as shown in the Plans and/or directed by the Engineer.

Materials: Materials shall be in accordance with Article 631.02 of the Standard Specifications.

Construction Requirements.

General. General requirements for traffic barrier terminal shall be according to the following Article 631.03 of the Standard Specifications, except as modified herein:

Add the following to Article 631.03. The rail elements shall be of uniform section. Warped or deformed elements will be rejected. The edges of the elements shall be rolled or rounded so that they present no sharp edges. All connections and splices shall be made with button head bolts with oval shoulders in such a manner that there will be no appreciable projection on the road side of the guard rail.

Traffic Barrier Terminal, Type T6. The terminal shall include all necessary transitions between the terminal and the item to which it is attached.

When attaching the end shoe to concrete, constructed with forms and with a thickness of 12 in. or less, the holes may be formed, core drilled, or an approved 3/4 in. cast-in-place insert may be used.

When attaching the end shoe to concrete, constructed with forms and with a thickness greater than 12 in. an approved 3/4 in. bolt with an approved expansion device may be used in lieu of core drilled or formed holes.

When attaching the end shoe to concrete constructed by slipforming, the holes shall be core drilled.

The tapered, parapet, wood blockout shall be used on all appurtenances with a sloped face.

Fabrication. The plates for the rail element shall be blanked to proper shape, fabricated, and ready for assembly when received. No punching, drilling, cutting, or welding will be permitted in the field.

Plates in lap splices shall make contact throughout the entire area of the splice.

Erection. Materials or hardware, on which the galvanizing has been damaged shall be replaced with new materials having properly galvanized surfaces, except that, subject to the approval of the Engineer, minor damage to galvanized surfaces may be repaired by field galvanizing in accordance with the recommendations of the American Hot Dip Galvanizers Association.

The rail and post elements shall be erected to the required elevation. The top of the rail shall be visually straight in horizontal alignment and shall be continuously parallel to the roadway profile grade in vertical alignment. If insufficient adjustment is available in the holes, posts shall be reset, at no additional cost to the Tollway, until the traffic barrier terminal is properly aligned. The brackets may be loosely bolted to the posts and, after erection of rail elements, the rail shall be carefully aligned and the bolts then fully tightened. Nuts shall be drawn up tight on all bolts.

Posts. Posts shall be steel. Steel posts may be driven by hand or mechanical methods provided they are protected by a suitable driving cap and the earth around the posts compacted, if necessary, after driving. When steel posts are driven to incorrect alignment or grade, they shall be removed and set according to Article 634.05.

Block-outs. All block-outs shall be wooden. Plastic and/or steel block-outs shall not be permitted.

Contractor's Responsibility For Underground Facilities. It shall be the Contractor's responsibility to ascertain in advance of any work, by any and all possible means, the presence of underground electrical or telecommunications cables in or near the vicinity of the work. It shall be the Contractor's further responsibility to notify the Tollway at least ten days in advance of setting new posts when working near underground electrical or telecommunications cables. Tollway technicians will then locate any such cables which may be in jeopardy. It shall be the Contractor's responsibility to preserve cable location markings and all information relating thereto given to him, and to effectively communicate such information to his workers. If the Contractor cuts or damages any such cables, either through carelessness or failure to follow the foregoing procedures, he will then be held responsible for repairing all damages or replacing the cable without splicing, at the Tollway's option, and all at no cost to the Tollway or cause for the Contractor claiming delay.

Such repair or replacement shall include the immediate installation by the Contractor, without further notice to him, of temporary cables satisfactory to the Tollway, the temporary cables to remain in service until the directed repairs or replacements are made. Stringing temporary cables on the ground will not be allowed in any circumstances. Temporary cables shall be:

(a) Suitable for direct burial installation, acceptable to the Tollway, and shall be buried to a depth not less than 12 inches;

or

(b) Weather-proof cable, acceptable to the Tollway, and shall be suspended not less than 8 feet above the highest point of terrain between supports, unless otherwise directed by the Tollway. Suspended temporary cables may be attached to existing poles, or, in their absence, shall be attached to supports acceptable to the Engineer, furnished and installed by the Contractor.

Any posts that are to be located near or over any buried cable shall be installed by first digging a hole by hand, and then installing the post and backfilling the hole. No posts shall be driven under such conditions. Care shall be taken while digging by hand so as not to damage the cable.

All efforts on the Tollway's part to advise the Contractor as to the locations of underground cables notwithstanding, it shall be understood that such locations are at best approximate, may be in error, and that such efforts by the Tollway shall not relieve the Contractor of any responsibility for restoring damage resulting from the activities of any employee, Subcontractor, agent, or representative of the Contractor.

The Contractor shall also be responsible for notifying owners of other cables and underground facilities which may be jeopardized by the Contractor's operations in the same manner as required for notice to the Tollway.

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

The pay limits between the traffic barrier terminal and the adjacent guardrail shall be as shown on Tollway Standard Drawing C9 or C10.

Basis of Payment: This work will be paid for at the contract unit price per each, for TRAFFIC BARRIER TERMINAL, TYPE T6 or TRAFFIC BARRIER TERMINAL, TYPE T6B as specified, which payment shall constitute full compensation for furnishing and installing all material, including rail, posts, block-outs, plates and hardware; and for all labor, equipment, tools and incidentals necessary to complete the work as specified.

TRAFFIC BARRIER TERMINAL, TYPE T10 (TOLLWAY RECURRING)

Effective: October 1, 2009

Description: This work shall consist of furnishing and erecting traffic barrier terminal as shown in the Plans and/or directed by the Engineer.

Materials: Materials shall be in accordance with Article 631.02 of the Standard Specifications.

Construction Requirements.

General. General requirements for traffic barrier terminal shall be according to the following Article 631.03 of the Standard Specifications, except as modified herein:

Add the following to Article 631.03. The rail elements shall be of uniform section. Warped or deformed elements will be rejected. The edges of the elements shall be rolled or rounded so that they present no sharp edges. All connections and splices shall be made with button head bolts with oval shoulders in such a manner that there will be no appreciable projection on the road side of the guard rail.

Traffic Barrier Terminal, Type T10. The terminal shall include all necessary transitions between the terminal and the item to which it is attached.

If any portion of the existing name plate of the bridge will be covered by the end shoe, the name plate shall be moved to an adjacent area along the rail or end post before the end shoe is installed.

The standard end shoe shall be attached to the existing concrete with pre-drilled or self-drilling anchor bolts. The anchor cone shall be set flush with the surface of the concrete. Externally threaded studs protruding from the surface of the concrete will not be permitted. The standard end shoe shall be placed between the splice plate and the rail element.

The distance between any anchor and the edge of existing concrete shall be 6 inches.

When a bridge expansion joint exists between the end shoe and the first post, all splice bolts at the end shoe shall be fitted with a lock nut or double nuts and tightened only to a point that will allow guardrail movement.

Fabrication. The plates for the rail element shall be blanked to proper shape, fabricated, and ready for assembly when received. No punching, drilling, cutting, or welding will be permitted in the field.

Plates in lap splices shall make contact throughout the entire area of the splice.

Erection. Materials or hardware, on which the galvanizing has been damaged shall be replaced with new materials having properly galvanized surfaces, except that, subject to the approval of the Engineer, minor damage to galvanized surfaces may be repaired by field galvanizing in accordance with the recommendations of the American Hot Dip Galvanizers Association.

The rail and post elements shall be erected to the required elevation. The top of the rail shall be visually straight in horizontal alignment and shall be continuously parallel to the roadway profile grade in vertical alignment. If insufficient adjustment is available in the holes, posts shall be reset, at no additional cost to the Tollway, until the traffic barrier terminal is properly aligned. The brackets may be loosely bolted to the posts and, after erection of rail elements, the rail shall be carefully aligned and the bolts then fully tightened. Nuts shall be drawn up tight on all bolts.

Posts. Posts shall be steel. Steel posts may be driven by hand or mechanical methods provided they are protected by a suitable driving cap and the earth around the posts compacted, if necessary, after driving. When steel posts are driven to incorrect alignment or grade, they shall be removed and set according to Article 634.05.

Block-outs. All block-outs shall be wooden. Plastic and/or steel block-outs shall not be permitted.

Contractor's Responsibility For Underground Facilities. It shall be the Contractor's responsibility to ascertain in advance of any work, by any and all possible means, the presence of underground electrical or telecommunications cables in or near the vicinity of the work. It shall be the Contractor's further responsibility to notify the Tollway at least ten days in advance of setting new posts when working near underground electrical or telecommunications cables. Tollway technicians will then locate any such cables which may be in jeopardy. It shall be the Contractor's responsibility to preserve cable location markings and all information relating thereto given to him, and to effectively communicate such information to his workers. If the Contractor cuts or damages any such cables, either through carelessness or failure to follow the foregoing procedures, he will then be held responsible for repairing all damages or replacing the cable without splicing, at the Tollway's option, and all at no cost to the Tollway or cause for the Contractor claiming delay.

Such repair or replacement shall include the immediate installation by the Contractor, without further notice to him, of temporary cables satisfactory to the Tollway, the temporary cables to remain in service until the directed repairs or replacements are made. Stringing temporary cables on the ground will not be allowed in any circumstances. Temporary cables shall be:

- (a) Suitable for direct burial installation, acceptable to the Tollway, and shall be buried to a depth not less than 12 inches;
- or
- (b) Weather-proof cable, acceptable to the Tollway, and shall be suspended not less than 8 feet above the highest point of terrain between supports, unless otherwise directed by the Tollway. Suspended temporary cables may be attached to existing poles, or, in their absence, shall be attached to supports acceptable to the Engineer, furnished and installed by the Contractor.

Any posts that are to be located near or over any buried cable shall be installed by first digging a hole by hand, and then installing the post and backfilling the hole. No posts shall be driven under such conditions. Care shall be taken while digging by hand so as not to damage the cable.

All efforts on the Tollway's part to advise the Contractor as to the locations of underground cables notwithstanding, it shall be understood that such locations are at best approximate, may be in error, and that such efforts by the Tollway shall not relieve the Contractor of any responsibility for restoring damage resulting from the activities of any employee, Subcontractor, agent, or representative of the Contractor. The Contractor shall also be responsible for notifying owners of other cables and underground facilities which may be jeopardized by the Contractor's operations in the same manner as required for notice to the Tollway.

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

The pay limits between the traffic barrier terminal and the adjacent guardrail shall be as shown on Tollway Standard Drawing C11.

Basis of Payment: This work will be paid for at the contract unit price per each, for TRAFFIC BARRIER TERMINAL, TYPE T10 as specified, which payment shall constitute full compensation for furnishing and installing all material, including rail, posts, block-outs and hardware; and for all labor, equipment, tools and incidentals necessary to complete the work as specified.

GUARDRAIL DELINEATOR, REFLECTOR MARKER TYPE B (TOLLWAY RECURRING)

Effective: January 12, 2010

Description: This work shall consist of furnishing and installing guardrail barrier delineator, reflector marker Type B on guardrail as shown in the Plans and/or as directed by the Engineer.

Materials: Materials for guardrail barrier delineator, reflector marker Type B shall be in accordance with Section 1097 of the Standard Specifications, except as modified herein.

Construction Requirements.

Prismatic Barrier Reflector. Reflectors shall be according to minimum specific intensities per Article 1097.02 of the Standard Specifications.

The Contractor shall furnish, when requested to do so, a certification from the manufacturer stating that all reflectors conform to these requirements. The reflectors shall be furnished in either amber or crystal as specified and shall be ready for mounting. The plastic reflector units shall be free of cracks and checks, and fabrication shall be accomplished in a uniform and professional manner.

The direct applied guardrail barrier delineator reflector marker shall be mono-directional, molded of methyl methacrylate (acrylic) plastic into the following shape in accordance with Tollway Standard Drawing D4.

- Reflector Marker Type B lens shall be circular in shape.

The lexan mounting bracket base material shall be fabricated from high impact thermoplastic, lexan, nylon, or other approved material which shall not shatter or crack under impact at temperatures of -30 °F. The bracket shall be white in color.

The rear surface of the lens shall provide reflectivity by a prismatic configuration such that it will affect total retrodirective internal reflection of light incident to the lens surface without the necessity of any plating or separate reflector.

The manufacturer's trademark shall be molded in the face of the lens or on the reflector body so it is visible after installation.

The back side of the reflector shall be protected by a plastic back fused to the lens under heat and pressure around the entire perimeter to form a unit permanently sealed against dust, water, and water vapor.

For qualification purposes only, ten (10) samples required for tests set forth in these Specifications shall be submitted by the Contractor. In addition, the Engineer will have the right to select 10 samples at random from each shipment for acceptance purposes. Testing. The reflector marker unit shall meet the requirements for sealing and heat resistance per Article 1097.03(b) and Article 1097.03(c) of the Standard Specifications. Installing Barrier Reflectors. Guardrail delineator, reflector marker Type B shall be installed at the spacing and elevations shown in the Plans or as directed by the Engineer. The face of the marker shall be vertical and oriented so the reflector face shall be at 90° to the centerline of the guardrail web.

Only the Tollway's specified type of reflector and geometric shape will be permitted within the limits of a contract.

Guardrail delineator, reflector marker Type B shall be installed using an adhesive.

The surface of the guardrail to which the marker is to be applied shall be free of foreign matter and any material which would adversely affect the bond of the adhesive. Cleaning of the surfaces shall be to the satisfaction of the Engineer.

An adhesive meeting the reflector unit manufacturer's specifications shall be placed either on the surface or the bottom of the marker in sufficient quantity to ensure complete coverage of the contact area with no voids present and with a slight excess after the marker is pressed firmly in place.

The Contractor shall exercise care that the delineators are placed in a satisfactory and uniform alignment both horizontally and vertically. Acceptance of the delineator installation will include, in addition to ordinary inspection, a night inspection shall be made by the Engineer and Contractor from an automobile. Delineators not having satisfactory and uniform night appearance shall be moved and adjusted or replaced as required at the Contractor's expense until they do conform to the requirements herein and are found to be acceptable to the Engineer.

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

Basis of Payment. This work will be paid for at the contract unit price per Each, for GUARDRAIL DELINEATOR, REFLECTOR MARKER TYPE B, complete in place, accepted, which payment shall constitute full compensation for furnishing and installing the reflector marker of the lens color specified, adhesive, for cleaning placement surfaces and for all labor, equipment, tools, and incidentals necessary to complete the work as specified.

AGGREGATE SHOULDERS (TOLLWAY RECURRING)

Effective: October 23, 2006

Revised : September 27, 2011

Revise Section 481 of the Standard Specifications to read:

“SECTION 481. AGGREGATE SHOULDERS

481.01 Description. This work shall consist of the furnishing and placing filter fabric (for new shoulders where specified) furnishing, placing, shaping and compacting aggregate on a prepared subgrade adjacent to the edges of the completed pavement structure or stabilized shoulder.

481.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Coarse Aggregate (Note 1).....	1004.04
(b) RAP Material (Note 2)	1031
(c) Filter Fabric (Note 3)	1080.02

Note 1. Grading shall be CA-6 with aggregate shoulders Type A and B, and CA-1 for aggregate shoulders special, Type C.

Note 2. Reclaimed asphalt pavement (RAP) may be used as aggregate wedge shoulders Type B and Aggregate Shoulders, Type B.

Note 3. Filter fabric shall meet the requirements of Article 1080.02 for ground stabilization.

481.03 Equipment. Equipment shall be according to the following.

Item	Article/Section
(a) Tamping Rollers	1101.01
(b) Pneumatic-Tired Rollers	1101.01
(c) Three-Wheel Rollers (Note 1)	1101.01
(d) Tandem Rollers (Note 1)	1101.01
(e) Vibratory Machine (Note 2)	
(f) Aggregate Spreaders	1102.04

Note 1. Three-wheel or tandem rollers shall weigh from 6 to 10 tons and not less than 200 lb/in. nor more than 325 lb/in. of width of roller.

Note 2. The vibratory machine shall meet the approval of the Engineer.

CONSTRUCTION REQUIREMENTS

481.04 Subgrade Preparation. The subgrade shall be prepared in a manner approved by the Engineer and any required filter fabric shall be placed.

481.05 Moisture Content. Prior to being placed on the subgrade, the aggregate shall contain sufficient moisture to provide satisfactory compaction.

For Type A shoulders, the water and aggregate shall be mixed through a controlled aggregate mixing system. The system shall consist of a mechanical mixing device and aggregate and water measuring devices, meeting the approval of the Engineer. Wetting the aggregate in cars, bins, stockpiles, or trucks will not be permitted.

481.06 Aggregate Shoulders With and Without Filter Fabric, Type A and Type B. The shoulders shall be constructed in lifts of not more than 6 in. thick when compacted, except that if tests indicate the desired results are being obtained, the compacted thickness of any lift may be increased to a maximum of 8 in. The aggregate shall be placed with a spreader.

Each lift of material shall be compacted with a tamping roller, a pneumatic-tired roller, a vibratory machine, or a combination of any of the three, until the compaction has been approved by the Engineer. If the moisture content of the material is not such as to permit satisfactory compaction during the compacting operations, water shall be added in such quantity that satisfactory compaction can be obtained. The top lift shall be given a final rolling with a three-wheel or tandem roller.

If any subgrade material is worked into the aggregate during the compacting or finishing operation, all granular material within the affected area shall be removed and replaced with new aggregate.

The shoulders shall be constructed to the thicknesses shown on the plans. Thickness determinations shall be made at such points as the Engineer may select. When the constructed thicknesses are less than 90 percent of the thicknesses shown on the plans, aggregate shall be added to obtain the required thicknesses; however, the surface elevation of the completed shoulders shall not exceed by more than 1/8 in. the surface elevation shown on the plans or authorized by the Engineer.

481.07 Aggregate Wedge Shoulders, Type B. Prior to placing the aggregate wedge shoulder, Type B, the weeds and grass on the area to be covered shall be cut. The aggregate shall be deposited in its final position with a spreader and compacted to the satisfaction of the Engineer. If the moisture content of the aggregate is not such as to permit satisfactory compaction during the rolling operations, water shall be added in such quantity that satisfactory compaction can be obtained.

481.08 Aggregate Shoulders Special, Type C. The aggregate shoulder special, Type C, shall be placed along the edge of paved shoulders or as a backfill behind curbs constructed at the edge of shoulder only where there is to be existing or new guardrail at the completion of The Work or in other specific locations such as large wash-outs at the edge of shoulders.

Before any aggregate is placed, weeds, grass, and miscellaneous vegetation shall be removed from the area in a manner acceptable to the Engineer. The Contractor shall give the Engineer at least 48 hours' notice that an area will be prepared to receive treatment, prior to the placement of the aggregate.

The aggregate shall be placed along the existing pavement or behind the existing curb in sufficient quantity and in such a manner that after compaction the aggregate shall have the configuration shown on the Plans. If any subgrade material is worked into the aggregate during the compacting or finishing operation, all granular material within the affected area shall be removed and replaced with new aggregate.

Aggregate containing free water at the time of delivery will be rejected by the Engineer and shall not be incorporated in the work.

481.08 Opening to Traffic. The road shall be open to traffic according to Article 701.07.

481.09 Method of Measurement. This work will be measured for payment in tons, cubic yards or square yards according to Article 311.08, except payment will not be made for aggregate outside the plan width.

481.10 Basis of Payment. This work will be paid for at the contract unit price per ton or per cubic yard for AGGREGATE SHOULDERS, TYPE A, AGGREGATE SHOULDERS, TYPE B, AGGREGATE SHOULDERS WITH FILTER FABRIC, TYPE A, or AGGREGATE SHOULDERS WITH FILTER FABRIC, TYPE B; at the contract unit price per ton for AGGREGATE WEDGE SHOULDER, TYPE B, or AGGREGATE SHOULDERS SPECIAL, TYPE C; or at the contract unit price per square yard for AGGREGATE SHOULDERS, TYPE A, AGGREGATE SHOULDERS, TYPE B, AGGREGATE SHOULDERS WITH FILTER FABRIC, TYPE A, or AGGREGATE SHOULDERS WITH FILTER FABRIC, TYPE B of the thickness specified.”

ASPHALT SHOULDERS (TOLLWAY)

Effective: March 26, 2010

Revised: September 21, 2011

Description. This work shall consist of constructing Asphalt Shoulders using hot mix asphalt (HMA) or warm mix asphalt (WMA) according to Section 482, of the Standard Specifications except as modified herein. When WMA mixtures required by design, an HMA mixture may be utilized for special or low tonnage applications in lieu of WMA mixtures upon approval by the Engineer at no additional cost to the Tollway. When HMA mixtures are required by design, a WMA mix may be utilized for special or low tonnage application in lieu of HMA mixtures upon approval by the Engineer at no additional cost to the Tollway.

Revise Article 482.02 of the Standard Specifications to read:

482.02 Materials. Materials shall be according to Section 406 and Section 1030 of the standard specifications except at modified herein.

“For construction or resurfacing projects when the HMA or WMA binder and surface course mixtures option is used, the asphalt cement used in the top lift shall not be increased above the amount required in the mix design.

Reclaimed Asphalt Shingles (RAS) used in any mixture shall be according to the Tollway special provision for RECLAIMED ASPHALT SHINGLES.

For construction or resurfacing projects when the WMA binder and surface course mixtures are used, the WMA mix designs, production and placement shall be in accordance with the special provision for ASPHALT BINDER AND SURFACE COURSE.”

Revise Note 2 of Article 1030.02 of the Standard Specifications to read as follows:

“Note 2. The Contractor shall use the asphalt binder as shown on the plans“

Revise Article 1030.04(a)(3) of the Standard Specifications to read as follows:

“(3) All Other Mixtures. The Job Mix Formula (JMF) shall fall within the following limits.

All Other, MIXTURE COMPOSITION, % by Dry Weight			
Without RAP		With RAP	
Virgin Aggregate	93.0 to 96.0	Virgin Aggregate	46.0 to 96.0
		RAP Materials	0 to 50
		Mineral Filler (If required)	0 to 5.0
Asphalt Binder	4.0 to 7.0	Asphalt Binder	4.0 to 7.0
Ratio Dust/Asphalt Binder	1.2 (max)	Ratio Dust/Asphalt Binder	1.2 (max)

Revise Article 1030.04(b)(3) of the Standard Specifications to read as follows:

“(3) All Other Mixtures.

VOLUMETRIC REQUIREMENTS			
All Other			
Mixture Composition	Design Compactive Effort	Design Air Voids Target%	Design VMA, %, minimum
All Other	N _{DES} = 50	2.0	11.0

Add the following to Article 1030.04 (b) of the Standard Specifications:

“(4) HMA N50 Binder

VOLUMETRIC REQUIREMENTS HMA N50 Binder with more than 25% RAP			
Ndesign	Design Air Voids Target%	Design Voids in the Mineral Aggregate (VMA), % minimum	Design Voids Filled with Asphalt Binder (VFA), %
50	3.0	12.0	65-78

Revise Article 1030.05(d)(2)b. of the Standard Specifications to read as follows:

“b. Dust-to-Asphalt and Moisture Content. During production, the dust-to-asphalt binder ratio and the moisture content of the mixture at discharge from the mixer shall meet the following.

Parameter	High ESAL Mixture Low ESAL Mixture	All Other Mixtures
Ratio Dust/Asphalt Binder	0.6 to 1.2	0.6 to 1.4
Moisture	0.3 %	0.3 %

If at any time the dust-to-asphalt binder ratio or moisture content of the mixture falls outside the stated limits, production of the HMA shall cease. The cause shall be determined and corrective action satisfactory to the Engineer shall be initiated prior to resuming production.”

Revise Article 1030.05(d)(4) of the Standard Specifications to read as follows:

“(4) Control Limits. Target values shall be determined by applying adjustment factors to the AJMF where applicable. The target values shall be plotted on the control charts within the following control limits.

CONTROL LIMITS			
Parameter	High ESAL Low ESAL	High ESAL Low ESAL	All Other
	Individual Test	Moving Avg. of 4	Individual Test
% Passing: ^{1/}			
1/2 in. (12.5 mm)	± 6 %	± 4 %	± 15 %
No. 4 (4.75 mm)	± 5 %	± 4 %	± 10 %
No. 8 (2.36 mm)	± 5 %	± 3 %	
No. 30 (600 µm)	± 4 %	± 2.5 %	
Total Dust Content No. 200 (75 µm)	± 1.5 %	± 1.0 %	± 2.5 %
Asphalt Binder Content	± 0.3 %	± 0.2 %	± 0.5 %
Voids	± 1.2 %	± 1.0 %	± 1.2 %

1/ Based on washed ignition oven

DENSITY CONTROL LIMITS		
Mixture Composition	Parameter	Individual Test
IL-9.5, IL-12.5	N _{design} ≥ 90	92.0 – 96.0 %
IL-9.5, IL-9.5L, IL-12.5	N _{design} < 90	92.5 – 97.4 %
IL-19.0, IL-25.0	N _{design} ≥ 90	93.0 – 96.0 %
IL-19.0, IL-19.0L, IL-25.0	N _{design} ≥ 70 & < 90	93.0 – 97.4 %
IL-19.0, IL-19.0L, IL-25.0	N _{design} = 50	94.0 – 98.4%
All Other	N _{design} = 50	Minimum 95.0 % ^{1/}

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

Method of Measurement. This work will be measured for payment in accordance with Article 482.07 of the Standard Specifications.

Basis of Payment. This work will be paid for in accordance with Article 482.08 of the Standard Specifications except as modified herein.

Add the following to Article 482.08 of the Standard Specifications:

HOT-MIX ASPHALT SHOULDERS or WARM-MIX ASPHALT SHOULDERS of the specified thickness will be paid for under its respective item. If permissive use of an HMA mixture in place of a specified WMA mixture is granted by the Engineer, a new pay item will be established for the HMA with the same unit price. If permissive use of a WMA mixture in place of a specified HMA mixture is granted by the Engineer, a new pay item will be established for the WMA with the same unit price.”

POLYUREA PAVEMENT MARKING TYPE I – LINE 10” (TOLLWAY)

Description. This work shall consist of furnishing and applying pavement markings as shown on the plans or as described by the Engineer.

Construction Requirements. Work shall follow all applicable portions of Section 780 of the Standard Specifications for Road and Bridge Construction.

Method of Measurement. The method of measurement will follow procedures dictated in Section 780 of the Standard Specification for Road and Bridge Construction.

Basis of Payment. Payment for POLYUREA PAVEMENT MARKING TYPE I – LINE 10” will be paid for at the contract unit price per foot which shall include all labor, materials, and equipment necessary to perform the work as specified.

OVERHEAD SIGN STRUCTURES (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 733. OVERHEAD SIGN STRUCTURES
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Replace this section of the IDOT Standard Specifications for Road and Bridge Construction adopted January 1, 2012 in its entirety with the following.

733.01 Description. This work shall consist of fabricating, furnishing, and erecting span, cantilever or bridge mounted type overhead sign structures, including supports, on previously prepared foundations conforming to the details and locations shown in the Plans.

733.02 Materials. Materials used in the fabrication of the overhead sign structures shall conform to the requirements shown in the Plans and to the following:

(a) Structural Steel Pipe: All structural steel pipe shall conform to the ASTM A53, Type E or S, Grade B.

(b) Steel Plates: Steel plates shall conform to the requirements of ASTM A36 (AASHTO M183).

- (c) Stainless Steel Bolts: All stainless steel bolts shall conform to the ASTM A193, Class I, Grade B8 (AISI Type 304).
- (d) Stainless Steel Nuts: All stainless steel nuts shall conform to ASTM A194 (AASHTO M292), Grade 8F (AISI Type 303). The nuts shall be "locknuts" and shall be equivalent to the finished hex series of the American Heavy Standard Series.
- (e) Stainless Steel Washer: All stainless steel washers (including contoured washers) shall conform to ASTM A240, Type 302.
- (f) Structural Steel Tube: All structural steel tube shall conform to ASTM A500, Grade B.
- (g) Aluminum Tubes for chords and diagonals shall conform to ASTM B221, Alloy 6061-T6.
- (h) Aluminum Flange Plates for splices shall conform to ASTM B209, Alloy 6061T651 or ASTM B221, Alloy 6061-T6.
- (i) Aluminum Alloy castings shall conform to ASTM B26, Alloy 356 and forgings shall conform to ASTM B247, Alloy 6061-T6.
- (j) Aluminum plates shall conform to ASTM B209, Alloy 6061-T651 or Alloy 6061T6.
- (k) Neoprene Pads: Neoprene pads shall be of the size shown in the Plans and shall have a Shore Durometer surface hardness of 65.

733.03 Drawings. Article 505.03 shall govern.

733.04 Fabrication.

- (a) Structural Steel: Article 505.04 shall govern.
- (b) Structural Aluminum: Article 505.04 shall govern, except as modified by the following:
 - (1) General: Aluminum materials shall be sawed or milled. Flame cutting will not be permitted. Holes in extruded material shall be drilled. Holes in forgings shall be drilled, or formed and reamed for final fit. In handling aluminum materials in the shop and in the field, every precaution shall be taken to avoid scoring or marring of the surfaces, sufficient in the opinion of the Engineer, to cause an objectionable appearance. Such scoring or marring shall be cause for rejection of the material. Cast or forged parts shall have all fins or other irregularities removed. Tubing shall be seamless and uniform in quality and temper. Exterior and interior surfaces shall be clean, smooth and free from seams, slivers, laminations, grooves, cracks, or other defects.
 - (2) Welding: Welding shall be done by the inert gas shielded arc method and no flux shall be used. Welders shall qualify by passing the requirements of Procedure and Performance Test of Qualification Standard for Welding Procedure for Welders and Welding Operators, current edition, formulated by the Boiler and Pressure Vessel Committee of ASME.

Qualifications shall be based on welding of aluminum alloy 6061-T6 with consumable electrode type welding, using the same aluminum alloy filler material specified herein. Welding shall comply with the Specifications mentioned in Section I, Fabrication, of ASCE Paper 970, Specifications for Structures of Aluminum Alloy 6061-T6. Welding shall be carefully checked by the fabricator by visual inspection of all welds, by proof testing of welds, and by the destructive testing of weld samples fabricated during the production welding. Poor welding workmanship as noted by visual inspection shall be sufficient cause for rejection.

All welds shall be made in accordance with current AWS Specifications. Aluminum alloy filler metal for welding aluminum shall conform to Specification for Aluminum and Aluminum Alloy Welding Rods and Electrodes, AWS A5.10-88 or latest edition.

Fillet sizes for welding on aluminum members shall be at least as thick as the thinnest member being welded.

733.05 Erection

- (a) General: Erection of all structural steel and structural aluminum sign trusses shall conform to the applicable provisions of Article 505.08 and the following requirements:
- (1) Prior to the erection of the truss, the end supports with their welded base plates shall be mounted over the anchor bolts on the concrete foundations, partially plumbed, and temporarily secured. After the erection of the truss and while the truss is supported by the crane, the uprights shall be fully plumbed and brought to final alignment by means of leveling nuts on the anchor bolts. The top nuts shall then be tightened.
 - (2) All bolts used for assembling truss sections shall be tightened to the tension specified in the Plan erection details and/or indicated in the approved shop drawings. Bolt tension shall be measured in foot-pounds of applied torque.
 - (3) When air-driven impact wrenches are used to provide the specified bolt tension, they shall be set to provide tension in excess of that specified by not more than 5%. Such wrenches shall be calibrated for each size of bolt to be installed. Calibration shall be accomplished by use of a device providing a direct read-out in foot-pounds of torque on three typical bolts of each size from the bolts to be installed.

The average of the three calibration torque readings shall be used to adjust the impact wrenches for tightening all the bolts of each size.

Wrenches to be used for inspection shall be likewise calibrated. Typical bolts used for testing the calibrations shall be of the same grade, size and condition as those under inspection. Bolts which have been tightened in the truss shall be inspected by applying a calibrated and approved inspection torque wrench to 15% of the bolts, but not less than one bolt selected at random in each connection. If any nut or bolt head is turned by the application of the inspection wrench, all bolts in that connection shall be inspected for proper tightening.

- (4) After erection is completed the truss shall be in a true horizontal position, and normal to the pavement centerline.
- (b) Full Span Trusses. The erection and maintenance of traffic procedure for overhead sign trusses shall be as follows, and shall be in accordance with the Special Provisions and applicable provisions of Section 701, unless otherwise authorized by the Tollway.
- (1) The Contractor shall erect the trusses only between the hours of 12:01 A.M. and 5:00 A.M., Monday through Sunday. Forty-eight (48) hours advance written notice to the Tollway, together with the Engineer's written approval, will be required prior to erection of any truss.
 - (2) All signs, lighting conduit, and other appurtenances shall be attached to each truss prior to erection.
 - (3) The appropriate lane closure shall be in place, restricting traffic to a single lane of travel, prior to any erection activity.
 - (4) Closed lanes and shoulders may be used by the Contractor to attach the truss to the lines of the erecting crane.
 - (5) When the truss is properly balanced for erection, a complete closure to traffic will be required. Traffic shall not be stopped more than ten (10) minutes at any one time.
 - (6) The lifting crane shall then swing the truss to the end supports. The end supports shall be plumbed and the nuts on the anchor bolts tightened.
 - (7) One U-Bolt on each end of the truss shall be installed to attach the truss to the end supports.
 - (8) The erecting lines shall then be detached from the truss and traffic allowed to travel in the single lane until the crane is removed from the pavement.
 - (9) Traffic may be allowed to drive under the truss in the open lane while the remaining U-Bolts are installed.
 - (10) The lane closure signs and barricades shall be removed prior to expiration of the allowable lane closure period.
- (c) Cantilever Trusses. The provisions of Article 733.05 (b) shall apply, except as modified by the following:
- (1) The Contractor may erect cantilever trusses during those hours that one lane traffic closures are permitted under the Special Provisions and/or Section 701.
 - (2) Item 2 of Article 733.05 (b) shall apply.
 - (3) No more than one traffic lane and one shoulder shall be closed for the erection of cantilever trusses.

- (4) Item 4 of Article 733.05 (b) shall apply.
 - (5) Traffic shall not be stopped for the erection of cantilever trusses in any lanes other than the one lane authorized for closure.
 - (6) Item 6 of Article 733.05 (b) shall apply.
 - (7) Items 7, 8, 9 of Article 733.05 (b) shall not apply. The installation of bolts and other attachment devices shall be as required in the Plan details for each particular design and type of cantilever to be erected.
 - (8) Item 10 of Article 733.05 (b) shall apply.
- (d) Bridge Mounted Sign Support
- (1) The applicable provisions of Article 733.05 (b) shall govern.

733.06 Counting of Bridge Mounted Sign Support

- (a) Concrete Girder Structure. Holes to be drilled in structural concrete for mounting sign supports shall be made in a manner which will not damage the concrete and which meets the approval of the Engineer. The positions of the brackets as shown in the Plans are based on the positions of the prestressing strands and the reinforcing steel in the girders as shown in record Plans. Copies of the as-built Plans and shop drawings are available to the Contractor from the Tollway upon request. Care shall be taken in drilling to avoid drilling through reinforcing steel or prestressing strands. At the first sign of steel cuttings in any drill hole, the drilling shall be stopped and an evaluation made of the conditions relative to the record Plans. Adjustments to the location of the drill holes shall be made to allow drilling to miss the steel. Any such adjustments in hole locations must be approved by the Engineer.
- (b) Steel Structure. Holes to be drilled in the steel fascia beam shall be as shown on the Plans and in accordance with the applicable portions of Article 505.04 (b).

733.07 Galvanizing Steel Structures. After fabrication and drilling of all holes in the horizontal steel truss units, vertical end supports, and bridge mount supports they shall be hot dipped galvanized in accordance with ASTM A123 (AASHTO M111) and ASTM A 385.

The fabricator shall provide relief holes for galvanizing as required by the galvanizer. The location of the holes shall have the approval of the Engineer.

Poor appearance or damage to the galvanized surfaces shall be sufficient cause for rejection.

If, in the judgment of the Engineer, damage or defacement is minor, it shall be repaired with zinc in accordance with American Welding Society "Recommended Practice for Metalizing", para. C2.2-52T, Part IB.

The cost of galvanizing shall be considered as included in the Contract unit price per foot for OVERHEAD SIGN STRUCTURE - SPAN TYPE (STEEL), OVERHEAD SIGN STRUCTURE - CANTILEVER TYPE (STEEL), or BRIDGE MOUNTED SIGN SUPPORT.

733.08 Method of Measurement.

- (a) OVERHEAD SIGN STRUCTURE for each of the various types will be measured for payment in feet from center to center of the end supports or from the end of the unsupported end to center of the support as shown in the Plans.
- (b) BRIDGE MOUNTED SIGN SUPPORT of each type will be measured in feet, complete, in place and accepted. Such measurement shall be the overall length end to end of the sign panels.

733.09 Basis of Payment. Payment for OVERHEAD SIGN STRUCTURE, SPAN TYPE (STEEL), OVERHEAD SIGN STRUCTURE, CANTILEVER TYPE (STEEL) and OVERHEAD SIGN STRUCTURE, SPAN TYPE (ALUMINUM), of the depth and width shown in the Plans, will be made at the Contract unit price per foot, complete and accepted, and measured as specified, which payment shall constitute full compensation for furnishing all materials; fabricating and erecting the structures; including the end supports; galvanizing; and for all labor, equipment, tools and incidentals necessary to complete the work as specified, exclusive of foundations and anchor bolts.

Payment for BRIDGE (CONCRETE) MOUNTED SIGN SUPPORT, BRIDGE (STEEL) MOUNTED SIGN SUPPORT will be made at the Contract unit price per foot, measured as specified, which payment shall constitute full compensation for furnishing all materials; fabricating, erecting and mounting sign supports, including all brackets and hardware; drilling as required; maintenance of traffic; and for furnishing all labor, equipment, tools and incidentals necessary to complete the work as specified.

SIGN INSTALLATION (TOLLWAY RECURRING)

Effective: April 2, 2007

DESCRIPTION

This work shall consist of loading signs fabricated by the Tollway at the Tollway's Sign Shop in Naperville, Illinois, transporting them to the job site and mounting them on overhead structures, bridge mount or ground mount supports, wood posts, telescoping steel posts and/or overhead canopy structures at toll plazas as shown in the Plans and herein specified. Also included is the transportation, storage, and reinstallation of existing sign panels.

The three types of sign installations are defined by surface area in accordance with the following descriptions:

TYPE 1	9 square feet or less
TYPE 2	Greater than 9 square feet and less than 24 square feet
TYPE 3	24 square feet or greater

MATERIALS

Post clip bolts shall be stainless steel conforming to ASTM A193, Class I Type 304, Grade 33. Aluminum flat washers shall conform to ASTM B209, Alloy 2024-T4 and shall be used under each nut to prevent gouging of the clip. Elastic stop nuts, shall be stainless steel conforming to ASTM A194 (AASHTO M292), Grade B8. Aluminum hardware for sign mounting panels shall conform to ASTM B211, Alloy 2024-T4.

CONSTRUCTION METHODS

New signs included with this provision will be fabricated in the Tollway's sign shop in Naperville, Illinois. The Contractor shall obtain and load the signs on his hauling units at the sign shop and transport them to the various erection sites.

For signs to be re-used, the Contractor shall load, transport, and re-erect the signs in the new locations as shown in the Plans and directed by the Engineer. If interim storage of such signs is necessary for any reason the Contractor shall store the signs and be solely responsible for them until they are acceptably re-erected.

The Contractor shall assemble sign sections in the field as needed, erect and attach the signs to the supports. The Contractor shall supply hardware for attaching the signs to the supports. Extreme care shall be used in tightening elastic stop nuts to avoid excessive torque and cracking. Any nuts so damaged during installation shall be replaced.

The Contractor shall exercise due care in handling the signs during all phases of this operation. Any sign that is damaged due to the Contractor's handling or operations shall be repaired by the Contractor to the satisfaction of the Tollway, at no additional cost to the Tollway, and without cause for the Contractor claiming delay.

Any sign that is lost or damaged beyond use shall be replaced by the Contractor at no additional cost to the Tollway and without cause for the Contractor claiming delay.

METHOD of MEASUREMENT

This work will be measured for payment in square feet of the actual total surface area of sign faces, including the edge molding, of all signs erected and accepted.

BASIS of PAYMENT

This work will be paid at the contract unit price per square foot for SIGN INSTALLATION, of the type specified, complete in place, accepted, and measured as specified, which payment shall constitute full compensation for loading signs fabricated by the Tollway at the Tollway's Sign Shop in Naperville, Illinois, transporting signs to the job site, assembling signs in the field and mounting them on overhead structures, bridge mount or ground mount supports; wood posts, telescoping steel posts and/or overhead canopy structures at toll plazas; transporting certain existing signs to new locations designated in the Plans and mounting them on ground mount supports; and furnishing all hardware needed to erect signs and install edge moldings, and for all labor, equipment, tools and incidentals necessary to complete the work as specified.

In addition add the following "Tollway Supplemental Specifications" to the Illinois Department of Transportation "Standard Specifications for Road and Bridge Construction" adopted January 1, 2012.

ELECTRICAL REQUIREMENTS (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 801. ELECTRICAL REQUIREMENTS
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

DESCRIPTION OF ROADWAY LIGHTING AND ELECTRICAL WORK

Roadway lighting and electrical work for the Tollway, including plaza areas, interchanges, maintenance areas, service areas, and incidental construction shall consist of installing, modifying, connecting and/or removing, either permanently or temporarily, materials and apparatus required for the illumination of roadways, parking lots, signs and signals, and other electrical work as shown in the plans, and set forth in the Special Provisions, or as directed by the Engineer.

Electrical work shall comply with all requirements of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction except as modified in these Supplemental Specifications.

Electrical Work on the Illinois Department of Transportation system roadways or roadway systems of other Agencies is not governed by the Supplemental Specifications but shall continue to be governed by the Standards of the Illinois Department of Transportation or other Agency having jurisdiction for the roadway.

Section 801 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows:

Delete the 3rd paragraph of Article 801.15 and replace with the following:

Upon completion of all roadway lighting and electrical work, and testing, the Contractor shall submit to the Engineer 10 days before the scheduled date for final inspection, 6 copies of all revised and current Record Drawings, and 6 copies of all test readings taken by the Contractor in accordance with Article 801.13. Record Drawings and test data shall be dated and certified by the Contractor as representing the final condition of the work. During the ensuing ten calendar day period, the Contractor shall record each and every fault that occurs, with the method and date of correction of each, and submit such record to the Engineer at the time of final inspection. The final inspection shall be made according to Article 105.13. No roadway lighting and electrical work will be accepted by the Engineer until components have been in satisfactory operation for ten consecutive days without interruption or failure after final inspection.

Add the following Articles to Section 801:

801.17 Lighting Cables.

- a. Identification. Each wire installed shall be identified with its complete circuit number at each termination, splice, junction box or other location where the wire is accessible.

- b. Fuse Installation. Quick-disconnect fuse holders shall be used on all light pole installations. Wires shall be carefully stripped only as far as needed for connection to the device. Over-stripping shall be avoided. An oxide inhibiting lubricant shall be applied to the wire for minimum connection resistance before the terminals are crimped-on. Crimping shall be performed in accordance with the fuse holder manufacturer's recommendations. The exposed metal connecting portion of the assembly shall be taped with two half-lapped wraps of electrical tape and then covered by the specified insulating boot. The fuse holder shall be installed such that the fuse side is connected to the pole wire (load side) and the receptacle side of the holder is connected to the line side.

801.18 Grounding of Lighting Systems. All electrical systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC, even though every detail of the requirements is not specified or shown. Good ground continuity throughout the electrical system shall be assured. All electrical circuit runs shall have a continuous equipment grounding conductor. IN NO CASE SHALL THE EARTH BE CONSIDERED AS AN ADEQUATE EQUIPMENT GROUNDING PATH. Where connections are made to painted surfaces, the paint shall be scraped to fully expose metal at the connection point and serrated connectors or washers shall be used. Where metallic conduit is utilized as the equipment grounding conductor, extreme care shall be exercised to assure continuity at joints and termination points. No wiring run shall be installed without a suitable equipment ground conductor. Where no equipment ground conductor is provided for in the plans and associated specified pay item, the Contractor is obligated to bring the case to the attention of the Engineer who will direct the Contractor accordingly. All connections to ground rods, structural steel, reinforcing steel or fencing shall be made with exothermic welds. Where such connections are made to insulated conductors, the connection shall be wrapped with at least 4 layers of electrical tape extended 6 inches onto the conductor insulation. Where a ground field of "made" electrodes is provided, the exact locations of the rods shall be documented by dimensioned drawings as part of the Record Drawings. Equipment ground wires shall be bonded, using a splice and pigtail connection, to all boxes and other metallic enclosures throughout the wiring system.

801.19 Raceway Installation. The following requirements shall apply to all raceways installed regardless of type, size, installation method, or system (lighting, surveillance, communication, etc.) for which the raceway will be used. These requirements are minimal installation criteria and shall be required even if lesser requirements are detailed within the installation section for individual raceway types.

Raceways shall be protected from mechanical and physical damage during construction. Open raceway ends shall be capped in accordance with manufacturer's recommendations. Raceways shall be cleared of all dirt, water, excess concrete, and other foreign materials with a dry swab and mandrel. Internal obstructions shall be repaired to the satisfaction of the Engineer. The raceway shall be continuous as shown on the plans, with no break or obstruction between junction boxes and through the entire raceway system.

A pull rope shall be installed in each raceway that does not have cables installed in it under the contract. A 3/8 inch nylon rope shall be blown through following a mandrel being pulled through the conduit to demonstrate continuity through the entire raceway system. The size(s) of the mandrel shall be in accordance with the size(s) of the conduit as shown on the plans. The rope shall be left in the conduit, and shall be continuous between all conduit terminal points. Each rope end shall be securely fitted with a washer or other approved device, of a diameter larger than the conduit diameter, to prevent the rope from coiling back inside the conduit and to insure accessibility for the installation of cables.

Continuity of the raceway system shall be demonstrated in the presence of the Engineer.

ELECTRIC SERVICE INSTALLATION – LIGHTING (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 804. ELECTRIC SERVICE
INSTALLATION - LIGHTING
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 804 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows:

Replace Article 804.01 with the following:

804.01 Description. This work shall consist of furnishing a completely installed and functioning 480 volt, single phase, 3-wire, grounded electric utility service for the supply of electric power to outdoor roadway lighting control consoles in the locations shown in the plans and where directed by the Engineer.

The service shall include all work, materials, equipment and labor required to extend, connect or modify the electric service as indicated on the plans or specified which is over and above the work performed by the utility.

Replace Article 804.03 with the following:

804.03 Utility Coordination. It shall be the Contractor's responsibility to contact the utility. The Contractor shall coordinate his work fully with the electric utility 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.

The Contractor should make particular note of the need for the earliest attention to arrangements with the utility for service. In the event of delay by the utility, 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 contract execution.

Add the following paragraph to Article 804.04 (a)

A service pedestal shall be provided at the Tollway Right of Way in accordance with the Standard Drawings and contract plans. The service pedestal shall include a cabinet, circuit breaker, and meter socket in accordance with the Standard Drawings.

Replace the second paragraph of Article 804.05 with the following:

All excess facility charges which may be levied by the Electric Utility in connection with the service facilities requested by the Tollway will be paid for according to Article 109.05.

GROUNDING (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 806.
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Replace this section of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 in its entirety with the following.

806.01 Description. This item shall consist of furnishing, installing and connecting ground rods for the grounding of service neutral conductors and for supplementing the equipment grounding system via connection at poles or other equipment throughout the system. All materials and work shall be in accordance with Article 250 of the NEC.

806.02 Materials. Materials shall be according to the following Articles of Division 1000 - Materials

Item	Article/Section
(a) Ground Rod	1087.01(b)
(b) Copper Ground Wire	1087.01(a)
(c) Access Well	1087.01(c)

CONSTRUCTION REQUIREMENTS

806.03 General. All ground rods shall be not less than 5/8 inch in diameter and not less than 10 feet in length.

806.04 Installation. All connections to ground rods, structural steel or fencing shall be made with exothermic welds. Where such connections are made to insulated conductors, the connection shall be wrapped with at least 4 layers of electrical tape extended 6 inches onto the conductor insulation.

Ground rods shall be driven so that the tops of the rod are 12 inches below finished grade. Where indicated, ground wells shall be included to permit access to the rod connections. With the approval of the Engineer where ground conditions, such as rock, preclude the installation of the ground rod, the ground rod may be deleted.

Ground rod connection shall be made by exothermic welds. Ground wire for connection to foundation steel or as otherwise indicated shall be stranded uncoated bare copper in accordance the applicable requirements of ASTM Designation B-3 and ASTM Designation B-8 and shall be included in this item. Unless otherwise indicated, the wire shall not be less than No. 2 AWG.

Where connections are made to epoxy coated reinforcing steel, the epoxy coating shall be sufficiently removed to facilitate the exothermic weld.152

806.05 Testing. Testing resistance to ground shall be according to Article 801.13(a)(5). If the measured resistance to ground exceeds 10 ohms, additional rods shall be added to the grounding electrode. A maximum of three rods shall be coupled together. If coupling three rods together does not lower the resistance to 10 ohms, then additional grounding electrodes shall be installed, a minimum of 24 inches from the initial installation and be connected by a grounding electrode conductor to form a ground field. If the resistance to ground still exceeds 10 ohms after three sets of three coupled electrodes have been installed in a ground field or where sub-surface conditions limit the depth to which the grounding electrode(s) can be installed, the Contractor shall contact the Engineer for further instructions.

806.06 Method of Measurement and Basis of Payment. No separate measurement or payment will be made for Ground Rods. The cost for furnishing and installing ground rods, ground wire, connections and access wells in accordance with these Specifications shall be considered as included in the contract unit prices for the various pay items under which their installation is required by the Specifications, the Special Provisions the Plan details or the controlling codes.

UNDERGROUND RACEWAYS (TOLLWAY SUPPLEMENTAL)
SUPPLEMENTAL SPECIFICATION FOR SECTION 810. UNDERGROUND RACEWAYS
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 810 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows:

The first paragraph of Article 810.04 shall be replaced with the following:

810.04 Installation. All underground raceways shall have a minimum depth of 33 inches below the finished grade unless otherwise indicated on the plans. Raceways under pavement shall be installed at a minimum depth of 45 inches below the top of pavement to avoid conflicts with the underdrain unless otherwise indicated on the plans or directed by the Engineer. All metal conduit installed underground shall be PVC coated Rigid Metal Conduit unless otherwise indicated on the plans.

Rigid nonmetallic conduit and fittings installed underground or in concrete foundations shall be Schedule 40 PVC.

Conduit shall be cleaned by rodding and swabbing to remove all dirt and other foreign materials and capped until conductors are installed.

Add the following paragraph to Article 810.04(b):

Plowing shall be done with equipment capable of feeding the conduit through the plow. Equipment which pulls the conduit behind a bullet-nose plow will not be allowed except by written approval of the Engineer.

Add the following paragraphs to Article 810.05(c):

Coilable nonmetallic conduit larger than 2 inch shall be machine straightened to remove the longitudinal curvature and ovality caused by coiling the conduit onto reels prior to installing in trench, encasing in concrete or embedding in structure. The straightening shall not deform the cross-section of the conduit such that any two measured outside diameters, each from any location and at any orientation around the longitudinal axis along the conduit differ by more than 1/4 inch. The longitudinal axis of the straightened conduit shall not deviate by more than 1/4 inch per foot from a straight line. The recommendations of the straightening machine manufacturer regarding ambient temperature shall be followed.

EXPOSED RACEWAYS (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 811. EXPOSED RACEWAYS Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 811 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows:

Add the following paragraphs to Article 811.03(b):

The personnel installing the PVC coated conduit must be trained and certified by the PVC coated conduit Manufacturer or Manufacturer's representative to install PVC coated conduit. Documentation demonstrating this requirement must be submitted for review and approval. All conduit fittings, couplings, channel supports, and clamps shall be PVC coated. All other mounting hardware and appurtenances shall be stainless steel.

RACEWAYS EMBEDDED IN STRUCTURE (TOLLWAY SUPPLEMENTAL)
SUPPLEMENTAL SPECIFICATION FOR SECTION 812. RACEWAYS EMBEDDED IN
STRUCTURE

Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 812 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows:

Add the following paragraph to Article 812.01:

Rigid nonmetallic conduit and fittings installed in structure including median barrier wall, median barrier wall foundations, bridge parapets, and bridge parapet foundations shall be Schedule 40 PVC in accordance with the requirements of Article 1088.01(b) unless specifically indicated and provided otherwise in the plans or Special Provisions.

Add the following paragraph to Article 812.03:

All conduits which extend outside of the structure but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum of 12 inches or the length shown on the plans beyond the structure. 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 shall be capped with a rigid PVC cap of not less than 1/8 inch thickness. 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.

JUNCTION BOXES (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 813. JUNCTION BOXES

Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 813 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows:

Add the following paragraph to Article 813.03:

Junction boxes embedded in concrete median walls and concrete parapet walls shall be stainless steel and shall be installed flush with the exterior surface of the concrete as shown in the contract documents. Conduit openings shall be provided as required in the contract documents. Junction boxes embedded in concrete median walls shall be 20"x12"x8". Junction boxes embedded in concrete parapet walls shall be 20"x12"x7".

HANDHOLE (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 814. HANDHOLE

Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 814 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows.

Replace Article 814.01 with the following:

814.01 Description. This work shall consist of furnishing and installing a handhole, heavy-duty handhole or a double handhole. Handholes may be cast-in-place or pre-cast concrete. The handhole shall be constructed in accordance with the following requirements and conforming in all respects to the lines, grades, and dimensions shown on the Standard Drawings, the contract plans or as directed by the Engineer.

Add the following items to Article 814.02:

- (e) Copper Ground Wire 1087.01(a)
- (f) Ground Rod 1087.01(b)

Replace Articles 814.03 (a) and (b) with the following:

(a) Forming. Forms will be required for the inside face of the handhole wall, and across all trenches leading into the handholes excavation. Coated steel conduit sleeves shall be installed at the specific locations shown in the construction Plans and/or as directed by the Engineer to be in keeping with the buried wiring requirements. Conduit stubs in pre-cast handholes may be cast in place during fabrication of the handhole, or installed at the work site at the Contractor's option. If conduit sleeves are installed at the work site, the appropriately sized holes shall be made through the concrete handhole walls with a core drill and the sleeves grouted in place with an epoxy adhesive.

(b) Steel Hooks. Each handhole shall be provided with galvanized steel hooks, one on each wall of the handhole.

(c) Frame and Cover. Handholes and double handholes shall be constructed only in non-paved areas. The frame and cover shall be for non-traffic application. Heavy-duty handholes shall be constructed in all paved areas. The frame and cover shall be for highway traffic application.

(d) Grounding: A 5/8" x 10' ground rod shall be installed in each handhole. Ground rod connections shall be made by exothermic welds. Ground wire for connection to handhole cover frame shall be stranded uncoated bare copper in accordance with the applicable requirements of ASTM Designation B-3 and ASTM Designation B-8 and shall be included in this item. Unless otherwise indicated, the wire shall not be less than No. 2 AWG.

UNIT DUCT (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 816. UNIT DUCT

Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 816 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows:

Add the following paragraphs to Article 816.03:

Unit duct shall be installed at a minimum depth of 33 inches below the finished grade unless otherwise indicated on the plans.

Delete the 3rd and 4th sentences of Article 816.04 and replace with the following:

3 ft. of extra unit duct will be allowed when terminating at light poles, pull boxes and similar locations. 10 ft. of extra unit duct will be allowed when terminating at controllers and handholes.

CABLE IN RACEWAY (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 817. CABLE IN RACEWAY

Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 817 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows:

Add the following paragraphs to Article 817.03:

Circuit conductors shall be individually identified with factory printed adhesive, wrap-around cloth marking tape indicating the circuit number or other identification as shown in the plans. They shall be identified wherever they are exposed in light pole bases, handholes, junction boxes, pull boxes, panels and control consoles.

Wire splices and taps shall only be made in junction and outlet boxes, handholes, wireways, equipment terminal boxes, and pole bases where they will be readily accessible. Wire splices and tap connections will not be allowed in control consoles, conduit fittings, pull boxes and handholes required only for pulling conductors.

Finished splices and taps shall be arranged in underground handholes and pole bases so as to position them near the top of the underground handholes and opposite the handholes at the pole bases.

Wire and cable in conduit and duct shall be made continuous from terminal to terminal without intermediate splices. Sufficient conductor slack shall be provided in junction boxes, pull boxes, handholes, light pole bases, and terminal locations to allow for thermal movement of the conductors and the making-up of any required branch circuit tap connection as indicated in the plans.

Delete the 3rd and 4th sentences of Article 817.04 and replace with the following:

3 ft. of extra cable will be allowed when terminating at light poles, pull boxes and similar locations. 10 ft. of extra unit duct will be allowed when terminating at controllers and handholes.

ROADWAY LUMINAIRES (TOLLWAY SUPPLEMENTAL)
SUPPLEMENTAL SPECIFICATION FOR SECTION 821 ROADWAY LUMINAIRES
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 821 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows:

Replace Article 821.04 with the following:

821.04 Conventional Pole Installation

- (a) Luminaire. Luminaires have been specified based on published photometric data of General Electric, Hubbell, and American Electric. The manufacturer's published photometric data is on file with the Tollway.

Where luminaires manufactured by General Electric are supplied, luminaires labeled Type M-C-II on the plans shall have optics as defined by General Electric Photometric File No. 35-177620, luminaires labeled Type M-C-III shall have optics as defined by General Electric Photometric File No. 35-177323, and luminaires labeled Type S-C-II shall have optics as defined by General Electric Photometric File No. 35-177324.

Where luminaires manufactured by Hubbell are supplied, luminaires labeled Type M-C-II on the plans shall have optics as defined by Hubbell Photometric File No. HP-03062 and luminaires labeled Type M-C-III shall have optics as defined by Hubbell Photometric File No. HP-03065.

Where luminaires manufactured by American Electric are supplied, luminaires labeled Type M-C-II on the plans shall have optics as defined by American Electric Photometric File No. 325-40S-R2-FG-HP and luminaires labeled Type M-C-III shall have optics as defined by American Electric Photometric File No. 325-40S-R3-FG-HP.

All luminaires supplied by the Contractor shall meet or exceed the manufacturer's published photometric data on file with the Tollway.

- (b) Horizontal mount luminaires shall be installed in a level, horizontal plane, with adjustments as needed to insure that the optics are set perpendicular to the traveled roadway.
- (c) When installed on a bridge mounted pole, a minimum size stainless steel 1/4-20NC set screw shall be provided to secure the luminaire to the mast arm tenon. A hole shall be drilled and tapped thru the tenon and luminaire mounting bracket and then fitted with the screw.

Replace Article 821.06 with the following:

821.06 Underpass Installation

- (a) Luminaire. Underpass luminaires shall be 150 watt high pressure sodium. Luminaires have been specified based on published photometric data of Holophane. The manufacturer's published photometric data is on file with the Tollway.

All underpass luminaires shall have optics as defined by Holophane Photometric Test No. 33429.

All luminaires supplied by the Contractor shall meet or exceed the manufacturer's published photometric data on file with the Tollway.

- (b) In addition to the general installation requirements each underpass luminaire shall be installed in strict accordance with the plans and the manufacturer's recommendations.
- (c) When attached directly to a structure, the underpass luminaire shall be installed on stainless steel c-channels to provide space between the luminaire and the structure.
- (d) When suspended the underpass luminaires shall be installed 1 inch above the lowest underpass beam and shall be mounted parallel to the plan of the roadway, taking into consideration the grade and superelevation of the traveled lanes. Vibration dampening hanger devices shall be used and be sized to the weight and shape of the underpass luminaire. The vibration dampening hangers shall be the double deflection, neoprene and spring type, allow for a 1 inch minimum deflection and a 30 degree rod swing. The body of the hanger shall be hot-dipped galvanized steel or stainless steel. The hanger spring shall be powder coated or stainless steel. The hangers shall be manufactured with the provision for attaching to a bridge structure using threaded rods and be fail safe. The hangers shall be as manufactured by Mason Industries, 30N Series or approved equal. All mounting hardware such as threaded rods, nuts, washers, etc. shall be stainless steel.
- (e) The underpass luminaire shall include all conduit, fittings and cable from the closest junction box to the luminaire and all mounting and attachment hardware.

Replace Article 821.07 with the following:

821.07 Sign Lighting Installation

- (a) Sign Luminaire
 - (1) Luminaire. Sign luminaires shall utilize 85 watt QL induction lamps. Luminaires have been specified based on published photometric data of Holophane. The manufacturer's published photometric is on file with the Tollway.

All luminaires shall be Holophane Catalog No. PANL-085QL-48-D-B-QD-F2.

All luminaires supplied by the Contractor shall meet or exceed the manufacturer's published photometric data on file with the Tollway.

- (2) Each sign luminaire shall be installed in accordance with the Standard Drawings.
- (3) Each luminaire shall be aimed and adjusted at night when fully illuminated to provide the optimum field of lighting flux on the sign panel.
- (4) Each luminaire shall be furnished with an integral transformer for operation on a 480 volt, 60 hertz system.

(b) Sign Beacon

- (1) Sign beacons shall be 116 Watt, Incandescent.
- (2) Each sign beacon shall be installed in accordance with the Standard Drawings and shall include the installation of sign beacon supports as indicated in the Standard Drawings or as directed by the Engineer.
- (3) Each sign beacon shall be aimed and adjusted at night. The cost for furnishing and installing sign beacon supports, furnishing and installing the lamp specified, and for beacon aiming, adjusting, and testing shall be considered as included in the contract unit price for Sign Beacon.

Replace Article 821.08 with the following:

821.08 Basis of Payment. This work will be paid at the contract unit price per each for LUMINAIRE or TEMPORARY LUMINAIRE, of the lamp type, mount type and wattage specified; PARKING LOT LUMINAIRE, UNDERPASS LUMINAIRE, or SIGN LUMINAIRE, of the lamp type and wattage specified; or SIGN BEACON of the wattage specified.

LIGHTING CONTROLLER (TOLLWAY SUPPLEMENTAL)
SUPPLEMENTAL SPECIFICATION FOR SECTION 825. LIGHTING CONTROLLER
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Replace this section of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 in its entirety with the following.

825.01 Description. This work shall consist of furnishing and installing an electrical control cabinet with control devices, distribution equipment, and wiring for control of roadway lighting in accordance with the Standard Drawings and installing them on prepared foundations at locations indicated in the plans or as directed by the Engineer.

825.02 Materials. Materials shall be according to the following Articles of Division 1000 - Materials

Item	Article/Section
(a) Lighting Controller	1068.01
(b) Grounding for Lighting	1087
(c) Transformers, General Purpose	1068.02
(d) Lightning Protection – Lighting	1065.02

Construction Requirements

825.03 Installation.

- (a) General. The lighting controller shall be located as shown on the plans. The Contractor shall confirm the location and orientation of the door side with the Engineer, prior to installing the foundation. Each controller shall be set on a prepared concrete foundation with anchor bolts as detailed on the Standard Drawings. A ground rod and connecting wire shall be installed for each controller in accordance with the Standard Drawings.
- (b) All conduit entrances into each controller shall be field drilled and attachment made with waterproof hubs. The removable metal bottom plate shall be sealed with a rodent and dust/moisture barrier.
- (c) Roadway lighting branch circuit conductors shall be brought into the controller panelboard and be terminated at their respective circuit breakers as indicated in the plans. The conductors shall be neatly arranged in the gutters for ease in tracing.
- (d) Electric utility service conductors shall be brought into the meter socket or disconnect switch as indicated in the plans or as directed by the Engineer.

825.04 Grounding. A ground rod and connecting wire shall be installed for each controller in accordance with the Standard Drawings and Section 806.

825.05 Basis of Payment. This work will be paid at the contract unit price each for LIGHTING CONTROLLER, of the amperes specified.

LIGHTING CONTROLLER FOUNDATION (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 828. LIGHTING CONTROLLER FOUNDATION

Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Add the following new articles:

828.01 Description. This item shall consist of constructing reinforced concrete foundations for lighting controllers. Each such foundation shall be of the type indicated in the plans and shall be constructed in accordance with the Standard Drawings.

828.02 Materials. Materials shall be according to the following Articles of Division 1000 - Materials

Item	Article/Section	
(a)	Portland Cement Concrete (Class SI)	1020
(b)	Reinforcement Bars	1006.10
(c)	Conduit	1088.01
(d)	Anchor Rods	1006.09
(e)	Structural Steel	1006.04

Construction Requirements

828.03 Installation

- (a) General. Each foundation for a lighting controller shall be constructed in accordance with the Standard Drawings for the type specified in the plans.

PVC coated rigid steel conduits shall be provided in each foundation for service cable and roadway lighting conductors and cable ducts in accordance with the plan details. A minimum of two spare 3 inch conduits shall be provided at each controller. PVC conduit shall be provided in each foundation for ground wire in accordance with the Standard Drawings.

All applicable provisions of Section 503 shall govern.

Excavation and backfill required will not be measured separately for payment, but will be considered as included in the contract unit price for Lighting Controller Foundation, Type A or Type B.

Anchor bolts and all required conduits and cable duct sleeves shall be firmly secured in place in the forms prior to placement of concrete. Conduits and cable duct sleeves shall be capped to prevent the entry of concrete or other foreign material during placement and finishing operations.

- (b) Type B Lighting Controller Foundation. The structural steel handrail shall be hot-dip galvanized after fabrication. The handrail shall be attached to the working platform with galvanized studs anchored in drilled holes with epoxy grout; or with galvanized bolts in threaded steel sockets which are anchored in drilled holes with epoxy grout. The epoxy grout shall be a pre-packaged self-contained system having the two epoxy components and a filler, pre-measured and contained in a glass vial to be shattered by impact to mix the components. In use of such a system, the drilled hole for the glass vial shall be specifically sized by the manufacturer for the size of anchor bolt or dowel to be installed.

828.04 Basis of Payment. This work will be paid at the contract unit price each for LIGHTING CONTROLLER FOUNDATION of the type specified.

LIGHT POLES (TOLLWAY SUPPLEMENTAL)
SUPPLEMENTAL SPECIFICATION FOR SECTION 830. LIGHT POLES
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 830 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows:

Replace the first paragraph of Article 830.03 with the following paragraphs:

830.03 Installation. The light poles shall be erected and placed on their foundations in accordance with manufacturer's recommendations. Care shall be exercised in handling and erecting the poles so as not to damage the finish. Rope or canvas slings shall be used in moving light poles. Each light pole shall be erected plumb with arm and luminaire in place.

The use of galvanized steel U-shaped shims under the pole base will be permitted for plumbing poles, provided the shims are supplied in increments of nominal thickness not exceeding 1/8 inch, and further provided that not more than 1/8 inch of shimming is required at any individual anchor bolt. When more than 1/4 inch of shimming is required, the necessary corrections shall be made to the foundation surface. Bending of anchor bolts will not be permitted.

Replace the fifth paragraph of Article 830.03 with the following paragraph:

Lighting unit identification numbers shall be furnished when specified in the contract plans. Lighting unit identification numbers shall be installed before the lighting unit is energized.

Add the following paragraphs to Article 830.03:

- (a) Ground Mounted Poles. All ground mounted light poles shall be provided with an approved FHWA breakaway device. The Contractor has the option of supplying an unwelded shaft and breakaway base with insert sleeve, or a transformer base. Breakaway devices shall not be measured for payment but shall be included in the cost of the Light Pole.
- (b) Bridge Mounted Light Pole. Bridge mounted poles shall have standard pole bases. Breakaway poles or devices shall not be used on bridges. Installation shall include a vibration pad and leveling plate as shown on the Standard Drawings and as follows:
 - (1) Vibration pads and washers including all incidental hardware shall be as manufactured by Fabreeka or Voss Engineering Co.
 - (2) Each vibration pad shall be preformed in a shape conforming to the outline of the base plate. The pad shall be made with new unvulcanized rubber and unused fabric fibers in proper proportion to maintain strength and stability.
 - (3) The surface hardness shall be 80±, as measured on a Shore A Durometer.
 - (4) The ultimate breakdown of the pad under compressive loading shall be no less than 10,000 lbs/square inch for the specified thickness without extrusion or detrimental reduction in thickness. The pads shall be furnished to specified dimensions with all bolt holes accurately located.
 - (5) A set of 4 vibration washers shall be provided, 1/2 inch thick and constructed of the same material as provided for the vibration pads.
 - (6) A set of 4 leveling nuts shall be provided for each pole.
 - (7) A 3/4" steel base plate ASTM A-36 (AASHTO M183) shall be furnished to rest atop the leveling nuts. The base plate shall have matching outline dimensions to conform with the light pole base plate.
- (c) Wall Mounted Light Pole. Wall mounted poles shall have standard pole bases. Breakaway poles or devices shall not be used on barrier walls or retaining walls. Replace Article 830.05(b) with the following:
 - (b) All other light poles will be paid for at the contract unit price per each for LIGHT POLE, of the material type, mounting type, mounting height, and arm (quantity and length) type specified.

In Article 830.05 delete the last line. ("When breakaway devices are specified, the devices will be paid for separately according to Articles 838.04 and 838.05.")

POLE FOUNDATION (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 836. POLE FOUNDATION

Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 836 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows.

Add the following paragraphs to Article 836.02:

- (f) Curing compound shall comply with ASTM Class B. Type 1 compound shall be shall be ASTM (AASHTO) Type 1.C 309 and ASTM C 156 for liquid membrane forming curing compound, and shall be a linseed oil emulsion. The Contractor shall furnish a certification to the Engineer attesting that the compound to be used meets the requirements of the cited ASTM Standards and is in fact a linseed oil emulsion. The engineer reserves the right to have the material certification verified in a laboratory.
- (g) Preformed joint filler shall comply with ASTM D 1752, Type III self-expanding cork joint filler.

Replace the first paragraph of Article 836.03(a) with the following paragraphs:

- (a) Drilled Shaft Foundations. Drilled shaft foundations shall be to the depth shown on the Standard Drawings unless shown otherwise on the contract plans or directed by the Engineer. Each foundation shall be constructed in accordance with the details shown in the Standard Drawings unless directed otherwise by the Engineer.

Parking lot foundations shall be constructed in accordance with the details shown in the Contract Plans. When details for parking lot foundations are not included in the Contract Plans they shall be constructed in accordance with the Standard Drawings for concrete Light Standard Foundations, located as directed by the Engineer.

Drilled shaft foundations shall be constructed according to Section 516 and the following.

Replace Article 836.03(b) with the following:

- (b) Metal Foundations. Steel helix foundations shall be fabricated as shown on the Standard Drawings and shall be either 7 feet or 10 feet in length. Ten-foot helix foundations are required when the ground slope is steeper than 3:1. Steel helix foundations shall be used only for roadway lighting applications and shall be installed in a manner acceptable to the Engineer and to the depths indicated in the Plan and/or Standard Drawings.

The steel helix foundation shall be installed in accordance with the manufacturer's recommended procedures. The installation shall be accomplished by either a boom type or a bed mounted type digger truck. The maximum torque limit of 13,000 ft.-lb. should not be exceeded since the possible damage to the foundation could occur. In the case of extremely difficult soils that cause the mechanical limit of the foundation to be exceeded, the foundation may be installed at the discretion of the Engineer in one of two methods. Predrilling a hole that is less than the shaft diameter of the foundation or using water as a lubricant. When foundation is installed by either method, minimum torque requirements of 5000 ft.-lb. are to be followed. The installation torque may be measured by torque measuring devices currently available or by calibrating the hydraulic system of the installing equipment.

Any voids within the metal screw-in foundation shall be filled with fine aggregate.

A ground rod and connecting wire shall be installed in conjunction with each foundation as shown on the Standard Drawings.

Add the following paragraphs to Article 836.03:

- (c) Median Barrier Wall Foundations. The top portion of the foundation shall be integrated with a portion of the median barrier wall, as one monolithic structure, as shown on the Standard Drawings and as directed by the Engineer. This portion of the foundation shall be of the same shape as the wall and shall be constructed according to the applicable portions of Articles 503.06 and 503.07. Any required sheeting, cribbing or other associated work required to complete the foundation work shall be included. The length of the wall included shall be as shown on the Standard Drawings or contract plans.

The drilled shaft portion of the foundation shall be constructed in accordance of the requirements of Article 836.03(a).

A ground rod and connecting wire shall be installed in conjunction with each foundation as shown on the Standard Drawings.

If detailed in the plans expansion couplings shall be used at the expansion joints at either end of the foundation. If no specific details are included in the contract plans a PVC coupling shall be installed at each preformed expansion joint as shown on the Standard Drawings.

- (1) Finishing. The surface of the concrete barrier shall be finished according to Article 503.15, except all holes and honeycombs shall be patched immediately.

- (2) Curing. The Concrete barrier shall be cured by application of a linseed emulsion applied under pressure, by means of an atomizing type spray nozzle, in such a manner as to cover the entire exposed surface uniformly at a rate of not less than one gallon per 175 square feet. Sufficient pressure shall be applied by the spray machine to force the compound to leave the nozzle as a fine mist. Application shall be by means of an airless spray gun or other type of spraying equipment approved by the Engineer. Orchard-type hand spray equipment is not acceptable.

The estimated wind velocity, at the time of application shall be noted and the rate of application adjusted to assure the specified yield of one gallon of emulsion in place for each 175 square feet.

The linseed oil emulsion shall be applied to fresh concrete immediately after finishing and after any superficial free water has subsided. All surfaces shall be protected from damage for 72 hours after the application of the linseed oil emulsion.

Replace Article 836.04 with the following:

836.04 Method of Measurement. Pole foundations will be measured per each complete and in place.

Relocation of a foundation due to an obstruction and any shaft excavation to that point will not be measured for payment.

Excavation in rock will be measured for payment according to Article 502.12.

Replace Article 836.05 with the following:

836.05 Basis of Payment. This work will be paid at the contract unit price each for LIGHT POLE FOUNDATION (ROADWAY) STEEL HELIX (7 FT) OR CONCRETE; LIGHT POLE FOUNDATION (ROADWAY) STEEL HELIX (10 FT); LIGHT POLE FOUNDATION (ROADWAY) CONCRETE; LIGHT POLE FOUNDATION (PARKING LOT) CONCRETE; or LIGHT POLE FOUNDATION (ROADWAY) MEDIAN, of the type specified.

Excavation in rock will be paid for according to Article 502.13.

BREAKAWAY DEVICES (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 838. BREAKAWAY DEVICES

Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Delete Section 838.

Breakaway devices or pole shafts shall be included with Ground Mounted Light Poles as specified in Supplemental Specification Section 830.

TEMPORARY LIGHTING REMOVAL (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 841. TEMPORARY LIGHTING REMOVAL
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 841 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows.

Replace Article 841.03 with the following:

841.03 Method of Measurement and Basis of Payment. No separate measurement or payment will be made for temporary lighting removal. The cost for this work in accordance with these Specifications shall be considered as included in the cost for MAINTAIN LIGHTING SYSTEM.

Delete Article 841.04.

REMOVAL OF LIGHTING UNITS (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 842. REMOVAL OF LIGHTING UNITS
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 842 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows.

Revise Article 842.03(b) to read:

- (b) Removal of Lighting Unit, Salvage. Aluminum poles, mast arms, luminaires and all associated hardware and appurtenances shall remain the property of the Tollway and shall be delivered to a Tollway facility, as designated by the Engineer. All materials shall be unloaded and stacked there as directed by the Engineer. Luminaires shall be removed and be boxed in new containers, approved by the Engineer. Wood blocking, banding and other appurtenant items required for the proper stacking and protection shall be included.

Add the following paragraphs to Article 842.03:

- (c) When any light pole is found to have a sign or signs attached, the Contractor shall notify the Tollway's Sign Shop not less than 5 working days prior to the removal of such pole. This 5 day advance notice notwithstanding, the removal of any such pole shall not be undertaken until the sign or signs have been removed. The Contractor is not authorized to remove such signs unless specifically so directed by the Engineer.
- (d) Removal of Underpass and Sign Luminaires. Underpass and sign luminaires which are removed shall become the property of the Contractor and shall be disposed of according to Article 202.03.

Revise the last sentence of the third paragraph of Article 842.04 to read:

Those foundations deemed reusable by the Engineer shall be thoroughly cleaned (inside and outside) and be delivered to a Tollway facility, as designated by the Engineer. All materials shall be unloaded and stacked there as directed by the Engineer. Wood blocking, banding and other appurtenant items required for the proper stacking and protection shall be included.

Replace Article 842.06 with the following:

842.06 Basis of Payment. Removal of lighting units will be paid for at the contract unit price per each for REMOVAL OF EXISTING LIGHTING UNIT, SALVAGE; REMOVAL OF EXISTING LIGHTING UNIT, NO SALVAGE; REMOVAL OF SIGN LUMINAIRE; or REMOVAL OF UNDERPASS LUMINAIRE.

Foundation removal will be paid for at the contract unit price per each for POLE FOUNDATION, REMOVED or POLE FOUNDATION REMOVED, METAL.

REMOVAL OF LIGHTING CONTROLLER (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 845. REMOVAL OF LIGHTING CONTROLLER

Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Section 845 of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 shall be modified as follows.

Revise Article 845.04 to read:

845.04 Removal of Lighting Controller. This work shall consist of the removal of the lighting controller cabinet, enclosed electrical equipment, and all other miscellaneous items associated with the lighting controller.

Lighting controllers shall remain the property of the Tollway and shall be delivered to a Tollway facility, as designated by the Engineer. Lighting Controllers shall be unloaded and stacked as directed by the Engineer. Wood blocking, banding and other appurtenant items required for the proper stacking and protection shall be included.

Any lighting controller or component that is lost or sustains sufficient damage to make it unfit for reuse, shall be replaced by the Contractor at no additional cost to the Tollway.

MAINTAIN LIGHTING SYSTEM (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 846. MAINTAIN LIGHTING SYSTEM
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Add the following new articles:

846.01 Description. This work shall consist of furnishing all labor, equipment, and incidental materials for maintaining roadway lighting systems, parking lot lighting system, and sign lighting systems until the proposed new systems are installed, energized, tested, and accepted for operation by the Tollway.

The work shall include temporary light poles, mast arms, luminaires, aerial cable, and any necessary ancillary temporary devices required to maintain existing roadway illumination. The location and protection of temporary devices necessary to comply with these requirements shall be subject to the approval of the Engineer.

All temporary lighting materials shall be furnished, installed, terminated, and maintained in service until the proposed lighting systems are installed, tested, and accepted for operation by the Tollway.

Where removal of existing sign lighting equipment is required before new sign lighting equipment can be installed, the new sign lighting system shall be put in operation within 3 calendar days from the time the existing system is de-energized for removal.

Where existing signs that require lighting are being replaced with new sign panels that do not require sign lighting, the existing sign lighting must remain in service until the new sign panels are installed. When the new sign panels are installed, the existing sign lighting system, including all conduit, wire, ballasts, circuit breakers, wireways, and luminaire support brackets shall be removed. Supply cables shall be disconnected and removed to their source,

All materials shall be furnished and delivered by the Contractor to the jobsite at no additional cost to the Tollway.

Effective the date the Contractor's activities (electrical or otherwise) at the job site begin, the Contractor shall be responsible for the proper operation and maintenance of all existing and proposed lighting systems which are part of, or which may be affected by the work until final acceptance or as otherwise determined by the Engineer.

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

Existing lighting systems, when depicted on the plans, are intended only to indicate the general equipment installation of the systems involved and shall not be construed as an exact representation of the field conditions. It remains the Contractor's responsibility to visit the site to confirm the exact condition of the electrical equipment and systems to be maintained.

846.02 Maintenance of Existing Lighting Systems. Existing lighting systems shall be defined as any permanent or temporary lighting system or part of a permanent or temporary lighting system in service prior to the contract that may be affected by the work of the contract. It remains the Contractor's responsibility to visit the site and 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.

846.03 Maintenance of Proposed Lighting Systems. Proposed lighting systems shall be defined as any lighting system or part of a lighting system which is to be constructed under the contract.

846.04 Extent of Maintenance. The Contractor shall maintain all controllers and all circuits connected to the controllers that are affected by the contract. This may include controllers and circuits that extend outside the nominal contract limits identified in the contract documents. There is no "Partial Maintenance" of a Tollway Lighting Controller.

846.05 Maintenance Responsibility. The Contractor shall be fully responsible for maintenance of all existing and proposed lighting systems 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, or other means. The potential cost of replacing or repairing any malfunctioning or damaged equipment shall be included in the bid price of this item and will not be paid for separately.

The Contractor's responsibility shall include the maintenance of lighting units (including sign lighting), cable runs and lighting controls. In the case of a pole knockdown or sign light damage caused by normal vehicular traffic, the Contractor shall promptly clear the lighting unit and circuit discontinuity and restore the system to service.

Responsibilities shall also include weekly night-time patrol of the lighting system, with patrol reports filed immediately with the Engineer and with deficiencies corrected within 24 hours of the patrol. Patrol reports shall be presented on standard forms as designated by the Engineer. Uncorrected deficiencies may be designated by the Engineer as necessitating emergency repairs as described elsewhere herein.

The following chart lists the maximum response, service restoration, and permanent repair time the Contractor will be allowed to perform corrective action on specific lighting system equipment.

INCIDENT OR PROBLEM	SERVICE RESPONSE TIME	SERVICE RESTORATION TIME	PERMANENT REPAIR TIME
Control cabinet out	1 hour	4 hours	7 Calendar days
Hanging mast arm	1 hour to clear	na	7 Calendar days
Motorist caused knockdown, damaged or leaning light pole 10 degrees or more	1 hour to clear	4 hours	7 Calendar days
Circuit out – Needs to reset breaker	1 hour	4 hours	na
Circuit out – Cable trouble	1 hour	24 hours	21Calendar days
Outage of 3 or more successive lights	1 hour	4 hours	na
Outage of light nearest Plazas and gores	1 hour	4 hours	na
Outage (single or multiple) found on night outage survey or reported to Tollway	na	na	7Calendar days
Navigation light outage	na	na	24 hours

Service Response Time – amount of time from the initial notification to the Contractor until a patrolman physically arrives at the location.

Service Restoration Time – amount of time from the initial notification to the Contractor until the time the system is fully operational again (In cases of motorist caused damage the undamaged portions of the system are operational).

Permanent Repair Time – amount of time from the initial notification to the Contractor until the time the permanent repairs are made if the Contractor was required to make temporary repairs to meet the service restoration deadline.

846.06 Liquidated Damages

- (a) Non-Compliance. The Contractor will be subject to liquidated damages of \$1,000.00 per incident, per day, to be deducted from next pay estimate due Contractor, for each occurrence when Engineer determines that Contractor or his Subcontractor is not in full compliance with this Article.
- (b) Failure to Respond. The Contractor is required to respond in accordance with the requirements of Article 846.05. Failure by Contractor to so respond shall be grounds for liquidated damages of \$1,000.00 for each and every occurrence, to be deducted from next pay estimate due Contractor.

In addition, the Tollway reserves the right to assign any work not completed within this timeframe to the Tollway Electrical Maintenance Department. All costs associated to repair this uncompleted work shall be the responsibility of the Contractor. These costs will be deducted from next pay estimate due Contractor.

Repeated failures and/or a gross failure of maintenance shall result in the Tollway's Electrical Maintenance Department being directed to correct all deficiencies and the resulting costs will be deducted from any monies owed the Contractor.

Damage caused by the Contractor's operations shall be repaired at no additional cost to the contract.

846.07 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. 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.

846.08 Maintenance Transfer and Preconstruction Inspection. 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:

- (a) Establish the procedures for formal transfer of maintenance responsibility required for the construction period.
- (b) Establish the approximate location and operating condition of lighting and/or traffic control systems which may be affected by the work.
- (c) Establish the condition of lighting and/or traffic control systems which may be affected by the work.

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.

846.09 Temporary Wiring. Temporary wiring suspended between poles shall be installed a minimum of 20' above grade to limit access to people on site. At existing light poles the pole cap shall be removed and temporary wiring shall enter the pole at the top. The wiring shall extend down the inside of the pole and be connected to the existing wiring in the base of the pole. A temporary pole cap shall be provided to limit rain from entering the pole. The original pole cap shall be reinstalled after the temporary wiring has been removed. Temporary wiring shall not be wrapped around the pole or connected through the pole handhole. Temporary wiring shall not be routed under the base of the pole. All handhole covers must be installed and in place at all times.

Temporary wiring shall be limited to one four conductor aerial cable assembly (#2 AWG maximum) between adjacent poles to replace an underground feeder or a single assembly running perpendicular to the roadway to provide power to median lighting during roadway widening. In no case shall more than one aerial cable assembly be attached to an existing light pole without prior approval of the Tollway.

846.10 Marking of Existing Cable Systems. The party responsible for maintenance of any existing lighting, communication, 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 respective party. A project may involve multiple "locations" where separated electrical systems are involved.

The markings shall be taken to have a horizontal tolerance of at least one foot to either side. The request for the cable locations and marking shall be made in sufficient time in advance of the request for the maintenance transfer and preconstruction inspection to allow the markings to be completed before the preconstruction site inspection date.

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.

846.11 Removal of Temporary Lighting. Disconnection and removal of all temporary lighting systems shall be in accordance with the requirements of Section 841. The cost for the removal of all temporary lighting equipment shall be considered as included in the cost for MAINTAIN LIGHTING SYSTEM.

846.12 Basis of Payment. Maintenance of lighting systems will be paid for at the Contract lump sum price for MAINTAIN LIGHTING SYSTEM, which shall include all work as described herein.

TRAILER MOUNTED FULL MATRIX PORTABLE CHANGEABLE MESSAGE SIGN

SUPPLEMENTAL SPECIFICATION FOR SECTION 1201
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Add the following new articles:

1201.01 Description. This work shall consist of furnishing, installing, maintaining, relocating and removing a TRAILER MOUNTED FULL MATRIX PORTABLE CHANGEABLE MESSAGE SIGN(s) at locations shown on the Maintenance of Traffic plans and at locations as directed by the Engineer.

Acceptable Manufacturers of the Trailer Mounted Full Matrix Portable Changeable Message Signs at the time of this bid are:

Vermac - Model: 1500-30IL

Wanco - Model: WTMMB-SLL(A)IT

Addco – Model FM 7x5 IT

Solar Technology – Model MB-3048-ITA

Note: Other manufactures may be available after the bid award. Contact the Tollway's Fleet Manager for more information.

The system supplied shall satisfy all the requirements of this Special Provision.

All other sign models or manufacturers must have the sign pre-qualified and tested before signs can be put into service. Testing must be completed BEFORE the contractor is required to have sign in operation. Contractors are to contact the Tollway's Fleet Manager to schedule message sign pre-qualification testing. Only signs that have passed the pre-qualification testing will be allowed to be used on Tollway construction projects.

1201.02 General Requirements. The signs specifications shall fully meet the Tollway's standard Trailer Mounted Full Matrix specifications as established by the Tollway's Fleet Unit. The trailer mounted portable message sign shall be solar powered, 12 volt, full matrix LED. The sign shall be of a modular design allowing sections of the sign to be replaced individually. The sign shall withstand 70 MPH winds when in normal operating configuration and be all weather capable/non-condensing.

Prior to deploying any message sign, the contractor must have each sign inspected by the Tollway at the Central Shop location 3460 S. Finley Road, Downers Grove. The Tollway may at its discretion install various equipment on each sign. This equipment will remain the property of the Tollway and cannot be removed or altered. All signs will be marked by the Tollway with a unique identification number. At the end of the contract period the contractor is required to deliver any and all message signs to the Central Shop location to have the equipment and decals removed.

1201.03 Message Panel Requirements. The sign lift cylinder shall have all safety devices required for safe operation and holding of sign in the event of a hydraulic hose failure. The message panel shall be at least 130 inches (not to exceed 136" width) by 70 inches, have a minimum 156 inch fully raised sign height, and present a level appearance. The message panel shall be flat black for non-reflectivity, with an easily removable UV and impact resistant front sign panel/cover. The sign panel shall have full graphics capability, and shall be three lines, 18 inch font capable. The sign shall have a display matrix of 25/48 minimum, with a 30 degree viewing angle/cone minimum. Individual messages shall be capable of containing words and graphics, with multiple line or character appearance/timing, sequencing, on/off duration, controlled by row, character or word. The LED's shall be visible from 1000 feet minimum on a clear day (100,000 hour rated). The sign shall have a lockable main power switch, 12 volt system meter, and battery charge ammeter.

1201.04 Message Programming & Software. On site programming shall be via a backlit onboard controller to be stored in a lockable storage compartment. The onboard controller shall maintain 200 minimum preprogrammed commonly used messages as well as 100 minimum custom messages (including sequences) and retain downloaded graphics. The onboard controller shall perform custom calendar settings to allow the sign to change messages by date and time, and shall allow the operator to view messages, sequencing and timing without having to view it on the sign (WYSIWYG). The message sign operating software shall be NTCIP compliant, and must be compatible and functional with Illinois Tollway Traffic Management Center (TIMS) Sign Control Software. The sign software shall allow the TIMS Center Software to "ping" the sign and gain the sign information including the message running on the sign at the time it is "pinged". All controlling functions of sign messaging shall be password protected. Sign shall display a low battery signal and switch to low power consumption automatically. Typical transportation industry graphics shall be included with controller/software. Communications to the TIMS center shall be through a CDMA/1XRTT modem that is IP addressable. The sign software shall have the capability of working with encrypted IP addresses as required by the Tollway's TIMS operating software. The modem shall be approved by Verizon Wireless for use on their network.

Wireless antenna(s) shall be mounted on the highest available location and properly grounded to the trailer. Antenna location shall be installed to maximize reception and transmission properties.

The unit shall be equipped with a Grey Island Systems GPS/AVL WAAS transponder.
Grey Island Systems contact:

Chris Jackson
76 Stafford Street Suite 100
Toronto, Ontario M6J 2S1
Phone: (416) 248-9991 ext 312
Email: chrisj@interfleet.com

The transponder and message sign data line service shall be provided by Verizon Wireless.

The Bidder shall contact Verizon to establish data line service for each sign and GPS transponder.

The contractor is responsible for establishing and maintaining data communication lines for the message signs for the duration of this contract.

The Tollway reserves the right to operate the sign via the Tollway's TIMS Center which may take over control the sign(s) remotely. The TIMS Center's control over what messages are being posted on the sign shall override any other entities or persons. The contractor may be required to notify the TIMS center of all messages being placed on the signs by them or their agent. The Contractor must notify the TIMS Center if a sign(s) is inoperable for any reason. The contractor may be required to regularly update the TIMS Center on the sign(s) location. The Tollway may move or alter the location of the sign at its discretion.

1201.05 Electrical Requirements. The message sign shall include automatic dimming to optimally match ambient light conditions. Solar recharging of 12 volt batteries shall be via a moveable solar panel to maximize sun exposure. Batteries shall be capable of running the sign from full charge without recharging for 15 days minimum. Solar recharging of batteries shall allow continuous sign use during all weather conditions, year-round in northern Illinois regardless of the message size, shape, configuration or on time duration. The battery shall have a 1350 amp hour minimum storage capacity, and shall be 120 volt capable for full sign operation (in lieu of batteries). The message sign shall have onboard 120 volt to 12 volt self-regulating battery charger and a power supply capable of providing continuous uninterrupted service.

1201.06 Trailer Requirements. The trailer shall have four 2,000 lb rated leveling jacks/stabilizers and have a 3,500 lb capacity trailer axle with 15" radial tires with fenders. All external metal surfaces shall be powder coated in safety orange. All four sides of the trailer must have 100 inches minimum of DOT rated reflective red and white safety tape. The trailer lights and reflectors shall meet DOT standards. The trailer shall have a seven pole pin type trailer light plug wired to DOT standards. The trailer shall have a lockable battery and compartment storage cover, an adjustable height pintle hitch with 3" eye opening, 3/8" safety chains and hooks, and a removable trailer tongue or hitch.

1201.07 Radar Display. The message sign shall be radar capable, drone type for traffic slow down and reading style that will display actual traffic speed to approaching vehicles. Actual traffic speeds shall be viewable from TIM's with an accuracy of plus or minus one MPH. Supply calibrating instruments on each trailer if required to calibrate radar.

1201.08 Maintenance. Whenever signs are displaying messages they shall be considered a traffic control device. At times when no messages are displayed, then they shall be considered equipment, and shall comply with Article 701.13.

1201.09 Interruption of Service. The Contractor shall provide all preventive efforts necessary to achieve uninterrupted service. Upon notification by the Engineer, the Contractor shall respond by arriving at the sign location and commencing maintenance - failure to respond within 1/2 hour of said notification will result in the appropriate penalty, per Article 701.01(b)(2). If service is interrupted for any cause and not restored to full operational service within twelve (12) hours, the defective sign shall be removed and a replacement sign shall be provided. If after 24 hours the defective sign has not been repaired or replaced, the Contractor shall be assessed a Non-Compliance with Specifications penalty, per Article 701.01(b)(1).

1201.10 Documentation & Training. One service, parts and operators manual shall be provided with the message sign. The operator's manuals shall include laminated abbreviated reminder sheet to assist operators in sign display. There shall be 4 hours of training per sign with a total not to exceed 16 hours for Tollway personnel.

1201.11 Method of Measurement. TRAILER MOUNTED FULL MATRIX PORTABLE CHANGEABLE MESSAGE SIGNS will be measured for payment per each for each sign ordered, placed and accepted.

1201.12 Basis of Payment. Payment for TRAILER MOUNTED FULL MATRIX PORTABLE CHANGEABLE MESSAGE SIGNS will be made at the Contract unit price per each for trailer mounted full matrix changeable message sign ordered, placed, and accepted required for the duration of the Contract.

RIGHT OF WAY FENCE, TYPE 1 (TOLLWAY)

Description: This work shall consist of furnishing and erecting right-of-way fencing, including pedestrian and vehicular gates, stream (flood) gates, and other appurtenances, in conformance with the Plans, or as directed by the Engineer.

Materials. Materials shall be according to Article 664.02 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

General. The Contractor's activities and operations shall be confined to the area immediately adjacent to the right-of-way lines and within the Tollway right-of-way, except that where permitted by the Tollway, the Contractor may expand his operations to adjacent areas owned by, or under the control of, the Tollway.

The Contractor shall be fully responsible for arranging with and obtaining from adjacent property owners all permits or permissions required for the erection of the right-of-way fencing shown in the Plans. Erection of fencing at any location shall not commence until the Contractor has shown conclusively and to the Tollway's satisfaction that all necessary permits or permissions have been obtained from the property owners involved. The Contractor shall be fully liable for and shall indemnify the Tollway against all damages to or on adjacent properties resulting from his operations.

The erection of certain portions or lengths of right-of-way fence may be more essential to the needs of the Tollway than other portions or lengths. The Engineer will designate these segments of priority installations and the Contractor shall conduct his operations as to give priority to the erection of such segments or lengths.

Clearing. Prior to constructing the right of way fence, the Contractor shall clear the area, from the line of fence to a line approximately 4 feet within the line of fence, according to Section 201, and as directed by the Engineer. Such clearing shall be conducted in a manner to leave intact valuable trees and selected native growth. Only such trees as are directly on the line of the fence, or that would otherwise, in the opinion of the Engineer, interfere with the construction of the fence, shall be cut flush with the ground. No separate payment will be made for such clearing, but the costs thereof shall be considered as included in the Contract unit prices for the various fence items.

Materials removed during clearing operations shall be promptly disposed of by the Contractor as directed by the Engineer. Disposal of clearing materials within the right-of-way will be permitted only when specifically approved in writing by the Engineer. All such disposal shall be at no additional cost to the Tollway.

Trench Excavation. Whenever irregular terrain exists along proposed fence lines, it may be necessary to excavate trenches to secure the specified clearances between the ground line and the bottom of the fence fabric to be installed. The trenches shall be excavated to a line and grade established by the Engineer ensuring adequate drainage and shall be of the cross sections indicated in the Plans. No separate payment will be made for such trench excavation, but the cost therefore shall be considered as included in the Contract unit price for fence to be installed. All materials excavated to form trenches shall be spread evenly over the adjacent area within the Toll Highway right-of-way or otherwise disposed of by the Contractor as directed by the Engineer.

Installing Posts. All terminal corner, end, pull and/or gate posts shall be properly spaced and set in concrete. All line posts shall be properly spaced and set into the ground as in the Tollway's Standard Drawing D1.

Concrete footings shall be of Class SI concrete meeting the requirements of Section 1020. The footings shall be constructed to the depths shown in the Plans. The top of all footings shall extend slightly above the ground line and shall be troweled to a smooth finish with a slope to drain away from the posts. Post, braces, and other units shall be centered in the footings. Fence shall not be erected until the concrete encasement around the posts has cured for at least seven days.

All excess excavation from the footings shall be disposed of in a manner satisfactory to the Engineer. All such disposal shall be at no additional cost to the Tollway.

Wherever right-of-way markers are omitted, the posts shall be set with back of post flush with the right-of-way line.

Post Set in existing Solid Surface. The Contractor's attention is directed to the fact that some posts may have to be placed in existing boulder beds, in old concrete foundations or other similarly solid materials. No separate payment will be made for breaking up of such material or for any material and work required to set the posts, but the cost thereof shall be considered as included in the Contract unit prices for the various fence items.

Right-of-Way Fence, Type 1. The fence shall be erected to line and gradient established by the Engineer. The fence shall be true to line, taut, and shall comply with the best practice of fence construction.

Posts shall be spaced in line at 10 foot centers with a tolerance of minus 2 feet. Spacing of posts shall be as uniform as conditions of terrain will permit.

Additional posts shall be placed at each abrupt change in the ground line profile when required. All line posts shall be driven to the depth indicated in the Plan details in vertical plumb position, and in line, with no perceptible horizontal misalignment when sighted by eye from corner to corner.

Pull posts shall be placed at intervals of no more than 500 feet in straight runs and at each predetermined vertical angle point.

Corner posts shall be placed at each horizontal angle point. When the distance between corner posts exceeds 500 feet, pull posts shall be installed to maintain the maximum 500 foot interval.

Post Tops. Post tops shall be according to Article 664.05 of the Standard Specifications.

Tension Wire. Tension wire shall be according to Article 664.06 of the Standard Specifications.

Braces. Braces shall be according to Article 664.07 of the Standard Specifications.

Fabric. Fabric shall be according to Article 664.08 of the Standard Specifications. The fence fabric shall be placed normally at 1 1/2 inches above the ground line. However, over irregular terrain, a minimum clearance of one inch and a maximum clearance of 6 inches will be permitted for a distance not to exceed 8 feet. Any excavation required in order to comply with these provisions shall be made as specified in Trench Excavation of this specification.

Gates. Gates shall be according to Article 664.09 of the Standard Specifications with the addition of the following:

Right-of-Way Fence, Type 1 gates shall consist of pedestrian gates and single and/or double vehicular gates of the types and sizes shown in the Plans.

Fabric for gates shall be of the same type as used in the adjoining fence.

Gates shall be equipped with approved latches, stops, hinges, and locking devices.

Hinges shall be heavy-duty malleable iron, pivot type, with large bearing surfaces for clamping onto the posts. Hinges shall not twist or turn under the action of the gate, and shall be so arranged that a closed gate cannot be lifted off its hinges to obtain entry.

Vehicular gates shall have a 180 degree opening swing. Pedestrian gates shall be equipped with a positive stop which will not permit the gate to swing toward the Toll Highway and shall provide a satisfactory spring or other positive means to maintain the gate in a closed position.

The pedestrian and vehicular gate installation shall include gate frames, tie rods, stretcher bars, filler fabric, latches, stops, locking device, padlock, hinges, gate posts with braces, tie rods, turnbuckles, stretcher bars and caps, and all fittings and details for gates and gate posts, all as specified and as shown in the Plans, and as required to make a complete installation.

The Contractor shall furnish an approved-type padlock for each gate. Each padlock shall be master keyed to the Tollway's lock system as directed.

Stream Gates (Flood Gates). The Contractor shall furnish and erect stream gates (flood gates) for stream and culvert crossings in conformance with, and at the locations shown in the Plans and as specified herein. Prior to fabricating any gates, the Contractor shall investigate the conditions at the site and shall prepare shop drawings in accordance with Article 105.04 (d) of the Tollway Supplemental Specifications showing the details of the proposed installation. Four complete sets of the shop drawings shall be submitted to the Engineer for approval. Fabrication of gates shall not be started until the shop drawings have been approved by the Engineer.

Stream Crossing. Where RIGHT-OF-WAY FENCE, TYPE 1, 6' crosses streams, drainage channels, or sharp depressions in the terrain, Stream Crossing will be required at the locations shown in the Plans and/or directed by the Engineer.

Stream crossings shall be constructed in accordance with the Plan details for TYPE 1 as indicated in the Plans or directed by the Engineer. In the usual circumstances, TYPE 1 STREAM CROSSING will be required for locations where there normally is no flow of water.

Extra-length posts will be required at stream crossings. Posts at stream crossings may be driven, except that posts more than 9 feet in length shall be set in concrete. The openings below the fence fabric or gate at stream crossings shall be closed with No. 12-1/2 gage barbed wire stretched between the posts as shown in the Plans.

The finished fence shall be plumb, taut, true to line and ground contour, and complete in every detail. Where directed, the Contractor will be required to stake down the chain link fence at several points between posts.

Existing Fence Connections. Existing fence connections shall be according to Article 664.10 of the Standard Specifications.

Connection to Bridge Abutment. Fence post connections adjacent to the concrete abutments at bridge structures shall be connected to the abutments in accordance with the details shown in the Plans. The bands around the posts may be of rolled, pressed, or forged steel or of malleable iron, and shall have a tight fit around posts. Bands and connection angles shall be hot-dip galvanized in conformity with ASTM A123. Bolts shall be unfinished and shall have hexagonal head and nut and standard thread. Bolts shall be drawn up tight and the threads burred with a pointed tool.

Protective Electrical Ground. Protective electric ground shall be according to Article 664.11 of the Standard Specifications.

Painting. Metal parts which are protected by galvanizing shall not be painted. After erection is completed, all fencing under the Contract will be inspected by the Engineer, and all parts of fences, gates, stream gates, etc. (including bolts and nuts), from which the galvanizing has been abraded so that the base metal is exposed, shall be spot painted with an approved aluminum paint.

Method of Measurement. The fencing work will be measured for payment, complete in place, in units as specified herein:

RIGHT-OF-WAY FENCE, TYPE 1, 6' will be measured for payment in feet for fence erected, from center to center of end or terminal posts and will exclude the lengths occupied by pedestrian and vehicular gates, stream crossings and stream gates. The measured length of fencing will be basis for payment of fabric, barb and tension wire, line posts, and all connections required to erect the fencing.

CORNER POSTS, PULL POSTS, END POSTS, and END POSTS CONNECTED TO STRUCTURES will be measured for payment on a unit basis for each type of post erected and will include all bracing, tension rods, concrete, and necessary connections.

PEDESTRIAN GATE, SINGLE VEHICULAR GATE, and DOUBLE VEHICULAR GATE will be measured for payment on a unit basis for each type and size of gate erected and will include the gate posts, bracing, tension rods, concrete, and other necessary fastenings and connections.

STREAM or FLOOD GATES will be measured for payment per square foot for the size and type specified.

STREAM CROSSINGS will be measured for payment in feet for each type of stream crossing erected, and will include Right-of-Way Fence, Type 1 and the barb wire below the right-of-way fencing. Measurement will be from end to end of the crossing section as determined by the Engineer.

Basis of Payment. The fencing work will be paid for at the contract unit price as specified herein:

Payment for RIGHT-OF-WAY FENCE, TYPE 1, 6' will be made at the Contract unit price per foot, complete in place and accepted.

Payment for CORNER POST, PULL POST and END POST will be made at the Contract unit price per each, complete in place and accepted, for posts of the lengths shown in the Plans for RIGHT-OF-WAY FENCE, TYPE 1.

Payment for PEDESTRIAN GATE, SINGLE VEHICULAR GATE and DOUBLE VEHICULAR GATE will be made at the Contract unit price per each, complete in place and accepted, for gates of the description shown in the Plans for RIGHT-OF-WAY FENCE, TYPE 1.

Payment for STREAM OR FLOOD GATE will be made at the Contract unit price per square foot, complete in place and accepted.

Payment for STREAM CROSSING will be made at the Contract unit price per foot for the type specified, complete in place and accepted, as shown in the Plans for one or both of the following:

STREAM CROSSING, TYPE 1 and/or STREAM CROSSING, TYPE 2

All payments shall constitute full compensation for furnishing all materials as specified, and for all transportation costs, labor, equipment, tools and incidentals necessary to complete the work as specified.

SEEDING (TOLLWAY SUPPLEMENTAL)

SUPPLEMENTAL SPECIFICATION FOR SECTION 250. SEEDING
Issued February 7, 2012

This Supplemental Specification amends and supersedes the provisions of the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, adopted January 1, 2012 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Modify the following Articles:

250.04 Fertilizer and Agricultural Ground Limestone Application.

Revise the fourth paragraph and the table to read.

When fertilizer is specified, 130 lb of fertilizer nutrients per acre shall be applied as follows.

Nitrogen Fertilizer Nutrients	30 lb/acre
Phosphorus Fertilizer Nutrients	10 lb/acre
Potassium Fertilizer Nutrients	90 lb/acre

250.05 Seed Bed Preparation.

Add the following to end of the Article.

For areas in which temporary stabilization exists, as a result of erosion control seeding, disking will be required in addition any treatment needed to remove temporary vegetation and to prepare the area for permanent vegetation.

250.06 (a) Bare Earth Seeding Add the following

- (a) Seeding class 2E shall be sown with a machine that mechanically places the seed in direct contact with the soil, packs, and covers the seed in one continuous operation or a hydraulic seeder.
- (b) Seeding class 3E, 4E, 4F, shall be sown with a hydraulic seeder or rangeland type grass drill.

250.07 Seeding Mixture

Add the following seed classes to TABLE 1

Add the following to TABLE 1 after Class 2A:

Table 1		
CLASS-TYPE	SEEDS	LBS/ACRE
2E IT Salt Tolerant Roadside Mixture 7/	Tall Fescue (Inferno, Tarheel II, Quest, Blade Runner, or Falcon IV)	80
	Ky. Bluegrass	20
	Perennial Ryegrass	50
	Red Fescue (Audubon, Sea Link, or Epic)	30
	Hard Fescue (Rescue 911, Spartan II, or Reliant IV)	40
	Fulfs Salt Grass 1/	60
	Dawson Red Fescue	20
2F IT Roadside Mixture 7/	Tall Fescue (Inferno, Tarheel II, Quest, Blade Runner, or Falcon IV)	110
	Ky. Blue Grass	50
	Perennial Ryegrass	50
	Creeping Red Fescue	50
	Red Top	10
	Dawson Red Fescue	20

Add the following to TABLE 1 after Class 3A:

Table 1		
CLASS-TYPE	SEEDS	LBS/ACRE
3E IT Slope Mixture 7/	Elymus Canadensis (Canada Wild Rye)	10
	Perennial Ryegrass	40
	Alsike Clover 2/	2
	Desmanthus Illinoensis (Illinois Bundleflower) 2/, 5/	1
	Andropogon Scoparius (Little Blue Stem) 5/	25
	Bouteloua Curtipendula (Side Oats Grama)	20
	Fulfs Salt Grass 1/	30
	Oats, Spring	50
	Slender Wheat Grass 5/	15
	Buffalo Grass (Cody or Bowie) 4/, 5/, 9/	5
	Alta Fescue or K31	50
	KY. Bluegrass	10
	Annual Ryegrass	30
	Creeping Red Fescue	15

Add the following to TABLE 1 after Class 4B:

Table 1		
CLASS-TYPE	SEEDS	LBS/ACRE
4E IT Native Grass 6/, 8/	Andropogon Scoparius (Little Blue Stem)	15
	Bouteloua Curtipendula (Side Oats Grama) 5/	10
	Elymus Canadensis (Canada Wild Rye) 5/	2
	Panicum Virgatum (Switch Grass) 5/	2
	Sorghastrum Nutans (Indian Grass) 5/	2
	Annual Ryegrass	30
	Oats, Spring	40
	Perennial Ryegrass	25
	Alta Fescue	20
4F IT Low Profile Native Grass 6/, 8/	Andropogon Scoparius (Little Blue Stem) 5/	20
	Bouteloua Curtipendula (Side Oats Grama) 5/	15
	Elymus Canadensis (Canada Wild Rye) 5/	3
	Sporobolus Heterolepsis (Prairie Dropseed) 5/	1
	Annual Ryegrass	50
	Oats, Spring	40
	Perennial Ryegrass	40
	Alta Fescue	45
	Ky. Bluegrass	20
	Creeping Red fescue	10
	Slender Wheat Grass	5

Revise the following mixtures:

Revise lb/Acre seeding rate for the following line item only:

4B Wetland Grass and Sedg
 Sedg Mixture 6, 8/ Wetland Grasses (species below) 12

Revise lb/Acre seeding rate for the following line item only:

5 Forb with Annuals Mixture (Below) 6/, 8/ 2
 Annuals Mixture Forb Mixture (Below) 6/, 8/ 18

Revise lb/Acre seeding rate for the following line item only:

5A Large Flower Native Forb Mixture (see below) 12
 Forb Mixture 6/, 8/

Revise lb/Acre seeding rate for the following line item only:

5B Wetland Forb Forb Mixture (see below) 5

Add the following seed and rate to the seeding mixture:

7 Temporary Turf Cover Mixture Annual Ryegrass 30

Revise note 7 as follows:

On Tollways the planting times shall be April 1 to June 15 and August 1 to November 1.

Add the following to end of the Article:

The Contractor shall be responsible for the satisfactory growth of grass and stabilization of soils on all areas seeded under the Contract until final acceptance of the work. In the event that the length of time between the seeding and final acceptance is insufficient for the Engineer to ascertain that acceptable growth is established, final acceptance of the work will not be made until the following growing season, or until such time that the grass cover and soil stabilization can be appraised as satisfactory. The responsibility of the Contractor for satisfactory grass growth and soil stabilization shall thereafter be as provided in Article 109.08 (b).

If the Contractor believes that the specified treatment will not produce substantial growth in any particular portion of the work, He/she shall arrange to test the soil. Based on the results of his soil tests, the Contractor shall then do whatever additional preparatory work he deems necessary to produce satisfactory growth before proceeding with seeding. Any such work not described in the Contract, but deemed by the Contractor to be necessary, shall be done by the Contractor at no additional cost to the Tollway, with the understanding that the Contractor is obligated under the Contract to produce satisfactory growth throughout the entire project.

Washouts or gullies in seeded areas shall be repaired by spreading additional topsoil and the areas reseeded, fertilized, mulched, and covered with erosion control blanket by the Contractor at no additional cost to the Tollway at such time and in such manner as directed and approved by the Engineer. Reseeding of areas that have failed or have not produce satisfactory growth, shall, in such case, once again be accomplished in the same manner specified herein. The Contractor shall also remove any material dislocated by slides and restore any eroded areas to the original lines and slopes. Such preliminary restoration shall be subject to the Engineer's approval before any reseeded or reapplication of erosion control material takes place. All such restoration shall be accomplished at no additional cost to the Tollway.

AGGREGATE SURFACE COURSE FOR TEMPORARY ACCESS

Effective: April 1, 2001

Revised: January 2, 2007

Revise Article 402.10 of the Standard Specifications to read:

“402.10 For Temporary Access. The contractor shall construct and maintain aggregate surface course for temporary access to private entrances, commercial entrances and roads according to Article 402.07 and as directed by the Engineer.

The aggregate surface course shall be constructed to the dimensions and grades specified below, except as modified by the plans or as directed by the Engineer.

- (a) Private Entrance. The minimum width shall be 12 ft (3.6 m). The minimum compacted thickness shall be 6 in. (150 mm). The maximum grade shall be eight percent, except as required to match the existing grade.
- (b) Commercial Entrance. The minimum width shall be 24 ft (7.2 m). The minimum compacted thickness shall be 9 in. (230 mm). The maximum grade shall be six percent, except as required to match the existing grade.

- (c) Road. The minimum width shall be 24 ft (7.2 m). The minimum compacted thickness shall be 9 in. (230 mm). The grade and elevation shall be the same as the removed pavement, except as required to meet the grade of any new pavement constructed.

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

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

Add the following to Article 402.12 of the Standard Specifications:

“Aggregate surface course for temporary access will be measured for payment as each for every private entrance, commercial entrance or road constructed for the purpose of temporary access. If a residential drive, commercial entrance, or road is to be constructed under multiple stages, the aggregate needed to construct the second or subsequent stages will not be measured for payment but shall be included in the cost per each of the type specified.”

Revise the second paragraph of Article 402.13 of the Standard Specifications to read:

“Aggregate surface course for temporary access will be paid for at the contract unit price per each for TEMPORARY ACCESS (PRIVATE ENTRANCE), TEMPORARY ACCESS (COMMERCIAL ENTRANCE) or TEMPORARY ACCESS (ROAD).

Partial payment of the each amount bid for temporary access, of the type specified, will be paid according to the following schedule:

- (a) Upon construction of the temporary access, sixty percent of the contract unit price per each, of the type constructed, will be paid.
- (b) Subject to the approval of the Engineer for the adequate maintenance and removal of the temporary access, the remaining forty percent of the pay item will be paid upon the permanent removal of the temporary access.”

AGGREGATE FOR CONCRETE BARRIER (DISTRICT ONE)

Effective: February 11, 2004

Revised: January 1, 2007

Add the following paragraph to Article 637.02 of the Standard Specifications:

“The coarse aggregate to be used in the concrete barrier walls shall conform to the requirement for coarse aggregate used in Class BS concrete according to Article 1004.01(b), paragraph 2.”

ADJUSTMENTS AND RECONSTRUCTIONS

Effective: March 15, 2011

Revise the first paragraph of Article 602.04 to read:

“602.04 Concrete. Cast-in-place concrete for structures shall be constructed of Class SI concrete according to the applicable portions of Section 503. Cast-in-place concrete for pavement patching around adjustments and reconstructions shall be constructed of Class PP-1 concrete, unless otherwise noted in the plans, according to the applicable portions of Section 1020.”

Revise the third, fourth and fifth sentences of the second paragraph of Article 602.11(c) to read:

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

Revise Article 603.05 to read:

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

Revise Article 603.06 to read:

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

The surface of the Class PP concrete shall be constructed flush with the adjacent surface.”

Revise the first sentence of Article 603.07 to read:

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

AGGREGATE SUBGRADE IMPROVEMENT (D-1)

Effective: February 22, 2012

Revised: January 1, 2013

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	1004.06
(b) Reclaimed Asphalt Pavement (RAP) (Notes 1, 2)	1031

Note 1. Crushed RAP, from either full depth or single lift removal, may be mechanically blended with aggregate gradations CS 01 or CS 02 but shall not exceed 40 percent 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 gradations CS 01 or CS 02 are used in lower lifts. When RAP is blended with any of the coarse aggregates, the blending shall be done with mechanically calibrated feeders.

303.03 Equipment. The vibratory machine shall be according to Article 1101.01, or as approved by the Engineer.

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

303.05 Placing Aggregate. The maximum nominal lift thickness of aggregate gradations CS 01 or CS 02 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:

“1004.06 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.
- (b) Quality. The coarse aggregate shall consist of sound durable particles reasonably free of deleterious materials.
- (c) Gradation.
 - (1) The coarse aggregate gradation for total subgrade thickness less than or equal to 12 in. (300 mm) shall be CS 01.

The coarse aggregate gradation for total subgrade thickness more than 12 in. (300 mm) shall be CS 01 or CS 02.

COARSE AGGREGATE SUBGRADE GRADATIONS					
Grad No.	Sieve Size and Percent Passing				
	8"	6"	4"	2"	#4
CS 01	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20
CS 02		100	80 ± 10	25 ± 15	

COARSE AGGREGATE SUBGRADE GRADATIONS (Metric)					
Grad No.	Sieve Size and Percent Passing				
	200 mm	150 mm	100 mm	50 mm	4.75 mm
CS 01	100	97 ± 3	90 ± 10	45 ± 25	20 ± 20
CS 02		100	80 ± 10	25 ± 15	

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

DRAINAGE AND INLET PROTECTION UNDER TRAFFIC (DISTRICT 1)

Effective: April 1, 2011

Revised: April 2, 2011

Add the following to Article 603.02 of the Standard Specifications:

- “(i) Temporary Hot-Mix Asphalt (HMA) Ramp (Note 1) 1030
- “(j) Temporary Rubber Ramps (Note 2)

Note 1. The HMA shall have maximum aggregate size of 3/8 in. (95 mm).

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

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

Revise Article 603.07 of the Standard Specifications to read:

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

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

- (a) Temporary Asphalt Ramps. Temporary hot-mix asphalt ramps shall be placed around the casting, flush with its surface and decreasing to a featheredge in a distance of 2 ft (600 mm) around the entire surface of the casting.
- (b) Temporary Rubber Ramps. Temporary rubber ramps shall only be used on roadways with permanent posted speeds of 40 mph or less and when the height of the casting to be protected meets the proper sizing requirements for the rubber ramps as shown below.

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

Placement shall be according to the manufacturer's specifications.

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

EMBANKMENT I

Effective: March 1, 2011

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

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

- a) The laboratory Standard Dry Density shall be a minimum of 90 lb/cu ft (1450 kg/cu m) when determined according to AASHTO T 99 (Method C).
- b) The organic content shall be less than ten percent determined according to AASHTO T 194 (Wet Combustion).
- c) Soils which demonstrate the following properties shall be restricted to the interior of the embankment and shall be covered on both the sides and top of the embankment by a minimum of 3 ft (900 mm) of soil not considered detrimental in terms of erosion potential or excess volume change.
 - 1) A grain size distribution with less than 35 percent passing the number 75 um (#200) sieve.
 - 2) A plasticity index (PI) of less than 12.
 - 3) A liquid limit (LL) in excess of 50.
- d) Reclaimed asphalt shall not be used within the ground water table or as a fill if ground water is present.

CONSTRUCTION REQUIREMENTS

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

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

EXTENDED LIFE CONCRETE PAVEMENT (DISTRICT ONE)

Effective: January 3, 2005

Revised: September 1, 2012

Description. This work shall consist of constructing concrete pavement, shoulders and areas striped as medians using extended life concrete. Work shall be performed according to the Standard Specifications except as modified herein:

Definitions.

- a) Granular Subbase. The aggregate above the subgrade and below the granular subbase cap.
- b) Granular Subbase Cap. The aggregate above the granular subbase and below the Hot-Mix Asphalt base.
- c) Aggregate Subgrade. The Aggregate Subgrade layer shall contain the Granular Subbase and the Granular Subbase Cap.
- d) Hot-Mix Asphalt Stabilized Subbase. The Hot-Mix Asphalt Stabilized Subbase layer is above the granular subbase cap and below the pavement.

Embankment. Add the following to Section 205:

“Embankment material shall be approved by the Engineer and shall have a standard laboratory density of not less than 90 lb/cu ft. It shall not have an organic content greater than ten percent when tested according to AASHTO T 194. Reclaimed Asphalt Pavement shall not be used within the ground water table or as a fill if ground water is present. Soils that demonstrate the following properties shall be restricted to the interior of the embankment:

- a) A grain size distribution with less than 35 percent passing the #200 sieve.
- b) A plasticity index (PI) of less than 12.
- c) A liquid limit (LL) in excess of 50.
- d) Potential for erosion.
- e) Potential for excess volume change.

Such soils shall be covered on the side and top with a minimum of 3 ft. of soil not characterized by any of the five items above.”

Revised the second paragraph of Article 205.06 to read:

“All lifts shall be compacted to not less than 95 percent of the standard laboratory density.”

Revise the first sentence of the third paragraph of Article 205.06 to read:

“The embankment shall not contain more than 110 percent of the optimum moisture content for all forms of clay soils and not more than 105 percent of the optimum moisture content for all forms of clay loam soils determined according to AASHTO T 99 (Method C).”

Add the following paragraph to the end of Section 205.06:

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

Aggregate Subgrade. Work shall be done according to the Special Provision for “AGGREGATE SUBGRADE IMPROVEMENT (D1)”.

Placement. Prior to starting the work, all granular subbase and granular subbase cap shall be placed and compacted in a manner meeting the approval of the Engineer.

The Granular subbase may be constructed in layers not more than 2 ft. thick when compacted. The finished granular subbase shall be covered with a granular subbase cap. All layers shall be compacted with a vibratory roller.

If the moisture content of the material is insufficient to obtain satisfactory compaction, sufficient water shall be added, at the Contractors expense, so that satisfactory compaction can be obtained.

Hot-Mix Asphalt Stabilized Sub Base. This work shall be performed according to Sections 312 and 1030. The mixture used shall be Stabilized Sub Base Hot-Mix Asphalt IL-19.0, N50, 3.0 percent voids.

Pavement and Shoulders. Add the following to Articles 420.03, 421.03, and 483.03:

“The Contractor shall submit to the Engineer, for approval before paving, the proposed internal type vibrator spacing for the paver. The Contractor shall also provide the proposed vibrator operating frequencies for a paving speed greater than or equal to 3 ft/min and a paving speed less than 3 ft/min.”

Add the following to Article 420.07 and 421.04(a):

“When the surface temperature, as measured on the surface with a device as approved by the Engineer, of the Stabilized Sub-base is 115 °F or greater the Contractor shall spray the Stabilized Sub-base with a water mist with equipment that meets the approval of the Engineer. The Stabilized Sub-base shall be cooled below 115 °F prior to paving on top. The water spray shall not produce excessive water runoff or leave puddles on the Stabilized Sub-base at the time of paving. All cooling shall be completed a minimum of 10 minutes prior to paving. The surface temperature shall be monitored during the paving operation to determine if the Stabilized Sub-base requires re-spraying. The water used shall meet the requirements of Section 1002.”

Add the following to Article 701.17(c)(5):

“Construction vehicles, except light weight saws, will not be permitted on the pavement during the cure period even if the concrete has obtained the minimum required strength.”

Add the following to Article 1020.02(d):

“Note 1. For pavement, shoulders, and striped median, the freeze-thaw rating expansion limit for the coarse aggregate shall be a maximum of 0.040 percent according to Illinois Modified AASHTO T 161, Procedure B.”

Revise the curing table of Article 1020.13 as follows:

“The curing period for all pavement, shoulder, and striped median shall be a minimum of 7 days.”

Revise the first sentence of the second paragraph of Article 1020.13(a)(4) to read:

“Membrane curing shall be completed within ten minutes after tining.”

Add the following to Article 1020.14(a):

“Prior to placing concrete, the Contractor shall indicate to the Engineer how the temperature of the concrete mixture will be controlled. If the temperature requirements are not being met, production of concrete shall stop until corrective action is taken. The Contractor will be allowed to deliver concrete already in route to the paving site.”

Method of Measurement. This work shall be measured for payment per Sections 200, 300, and 400.

Basis of Payment. The plans indicate which roadways will be constructed to the extended life requirements. The cost to construct the roadways to the extended life requirements will not be paid for separately, but are included in the cost of the various items of work.

The additional costs to meet the various Material, Samples, Compaction, Stability, Placing and Trimming requirements for embankment beneath and adjacent to the extended life items will not be measured for payment, but are included in the cost of the various items of excavation.

The additional cost to meet the various Material, Equipment, Placing, Stability, Compaction, Trimming, and Finishing requirements for Granular Subbase beneath and areas adjacent to the extended life items will not be paid for separately, but are included in the cost of the Aggregate Subgrade Improvement. Capping Aggregate shall be included in the cost of the Aggregate Subgrade Improvement.

The additional costs to meet the various Material, Placing, Stability, Compaction, Trimming, and Finishing requirements for the bituminous stabilized subbase beneath and areas adjacent to the extended life items will not be paid for separately, but are included in the cost per square yard for STABILIZED SUBBASE - HMA, of the thickness specified. At the option of the contractor, the trimming of the stabilized subbase will not be required as per Article 311.06 except the subbase shall be brought to true shape by either placing the material in two lifts or by using a grade controlled mechanical paver as approved by the Engineer.

The additional costs to meet the various Material, Equipment, Placement, Finishing, Curing, and Sealing requirements for extended life items will not be paid for separately but are included in the cost per square yard for PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED) or CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT, of the thickness specified; and per square yard for PORTLAND CEMENT CONCRETE SHOULDER, of the thickness specified.

BITUMINOUS PRIME COAT FOR HOT-MIX ASPHALT PAVEMENT (FULL DEPTH) (D-1)

Effective: May 1, 2007

Revise Article 407.06(b) of the Standard Specifications to read:

“A bituminous prime coat shall be applied between each lift of HMA according to Article 406.05(b) at a rate of 0.02 to 0.05 gal/sq yd (0.1 to 0.2 L/sq m), the exact rate to be determined by the Engineer.”

Revise the second paragraph of Article 407.12 of the Standard Specifications to read:

“Prime Coat will be paid for at the contract unit price per gallon (liter) or per ton (metric ton) for BITUMINOUS MATERIALS (PRIME COAT).”

FINE AGGREGATE FOR HOT- MIX ASPHALT (HMA) (D-1)

Effective: May 1, 2007

Revised: January 1, 2012

“(a) Description. Fine aggregate for HMA shall consist of sand, stone sand, chats, slag sand, or steel slag sand. For gradation FA 22, uncrushed material will not be permitted.”

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

“(c) Gradation. The fine aggregate gradation for all HMA shall be FA1, FA 2, FA 20, FA 21 or FA 22. When Reclaimed Asphalt Pavement (RAP) is incorporated in the HMA design, the use of FA 21 Gradation will not be permitted.

FRICITION SURFACE AGGREGATE (D1)

Effective: January 1, 2011

Revised: February 26, 2013

Revise Article 1004.01(a)(4) of the Standard Specifications to read:

“ (4) Crushed Stone. Crushed stone shall be the angular fragments resulting from crushing undisturbed, consolidated deposits of rock by mechanical means. Crushed stone shall be divided into the following, when specified.

a. Carbonate Crushed Stone. Carbonate crushed stone shall be either dolomite or limestone. Dolomite shall contain 11.0 percent or more magnesium oxide (MgO). Limestone shall contain less than 11.0 percent magnesium oxide (MgO).

b. Crystalline Crushed Stone. Crystalline crushed stone shall be either metamorphic or igneous stone, including but is not limited to, quartzite, granite, rhyolite and diabase.”

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 revisions.

(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> Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) Crushed Steel Slag Crushed Concrete
HMA All Other	Shoulders	<u>Allowed Alone or in Combination:</u> Gravel Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) ^{1/} Crushed Steel Slag ^{1/} Crushed Concrete

Use	Mixture	Aggregates Allowed	
HMA High ESAL Low ESAL	C Surface IL-12.5,IL-9.5, or IL-9.5L	<u>Allowed Alone or in Combination:</u> Crushed Gravel Carbonate Crushed Stone Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) ^{1/} Crushed Steel Slag ^{1/} Crushed Concrete	
HMA High ESAL	D Surface IL-12.5 or IL-9.5	<u>Allowed Alone or in Combination:</u> Crushed Gravel Carbonate Crushed Stone (other than Limestone) Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) ^{1/} Crushed Steel Slag ^{1/} Crushed Concrete	
		<u>Other Combinations Allowed:</u>	
		<i>Up to...</i>	<i>With...</i>
		25% Limestone	Dolomite
		50% Limestone	Any Mixture D aggregate other than Dolomite
75% Limestone	Crushed Slag (ACBF) ^{1/} or Crushed Sandstone		

HMA High ESAL	F Surface IL-12.5 or IL-9.5	<u>Allowed Alone or in Combination:</u>	
		Crystalline Crushed Stone Crushed Sandstone Crushed Slag (ACBF) ^{1/} Crushed Steel Slag ^{1/}	
		No Limestone or no Crushed Gravel alone.	
		<u>Other Combinations Allowed:</u>	
		<i>Up to...</i>	<i>With...</i>
		50% Crushed Gravel, or Dolomite	Crushed Sandstone, Crushed Slag (ACBF) ^{1/} , Crushed Steel Slag ^{1/} , or Crystalline Crushed Stone
HMA High ESAL	SMA Ndesign 80 Surface	Crystalline Crushed Stone Crushed Sandstone Crushed Steel Slag	

1/ When either slag is used, the blend percentages listed shall be by volume.

Add to Article 1004.03 (b) of the Standard Specifications to read:

“ When using Crushed Concrete, the quality shall be determined as follows. The Contractor shall obtain a representative sample from the stockpile, witnessed by the Engineer, at a frequency of 2500 tons (2300 metric tons). The sample shall be a minimum of 50 lb (25 kg). The Contractor shall submit the sample to the District Office. The District will forward the sample to the BMPR Aggregate Lab for MicroDeval Testing, according to Illinois Modified AASHTO T 327. A maximum loss of 15.0 percent by weight will be applied for acceptance. The stockpile shall be sealed until test results are complete and found to meet the specifications above.”

HOT MIX ASPHALT MIXTURES, EGA MODIFIED PERFORMANCE GRADED (PG) ASPHALT BINDER

Effective: March 16, 2009

Description. This work shall consist of constructing Hot Mix Asphalt (HMA) mixtures containing ethylene-glycidyl-acrylate (EGA) Modified Performance Graded (PG) Asphalt Binder. Work shall be according to Sections 406, 1030, and 1032 of the Standard Specifications, except as modified herein.

The asphalt binder shall meet the following requirements:

EGA Modified Performance Graded (PG) Asphalt Binder. The asphalt binder shall meet the requirements of AASHTO M 320, Table 1 "Standard Specification for Performance Graded Asphalt Binder" for the grade shown on the plans. An ethylene-glycidyl-acrylate (EGA) terpolymer with a maximum of 0.3 percent polyphosphoric acid by weight of asphalt binder, shall be added to the base asphalt binder to achieve the specified performance grade. Asphalt modification at hot-mix asphalt plants will not be allowed. The modified asphalt binder shall be smooth, homogeneous, and be according to the requirements shown in the following table for the grade shown on the plans.

Ethylene-Glycidyl-Acrylate (EGA) Modified Asphalt Binders		
Test	Asphalt Grade EGA PG 70-22 EGA PG 70-28	Asphalt Grade EGA PG 76-22 EGA PG 76-28
Separation of Polymer Illinois Test Procedure, "Separation of Polymer from Asphalt Binder" Difference in °F (°C) of the softening point between top and bottom portions.	4 (2) max.	4 (2) max.
TEST ON RESIDUE FROM ROLLING THIN FILM OVEN TEST (AASHTO T 240)		
Elastic Recovery ASTM D 6084, Procedure A, 77 °F (25 °C), 100 mm elongation, %	60 min.	70 min.

RECLAIMED ASPHALT PAVEMENT AND SHINGLES (D-1)

Effective: November 1, 2012

Revise: January 1, 2013

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 by 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 Bureau of Materials and Physical Research Policy Memorandum “Reclaimed Asphalt Shingle (RAS) Sources”, by weight of RAS. All RAS used shall come from a Bureau of Materials and Physical Research approved processing facility where it shall be ground and processed to 100 percent passing the 3/8 in. (9.5 mm) sieve and 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. No additional RAP shall be added to the pile after the pile has been sealed. Stockpiles shall be sufficiently separated to prevent intermingling at the base. All stockpiles (including unprocessed RAP and Processed 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, Superpave 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 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 RAP will be used in.
 - (2) Restricted FRAP (B quality) stockpiles shall consist of RAP from Class I, Superpave (High ESAL), or HMA (High ESAL). If approved by the Engineer, the aggregate from a maximum 3.0 inch 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, Superpave 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.
- Conglomerate "D" Quality (DQ). Conglomerate DQ RAP stockpiles shall consist of RAP from from HMA shoulders, bituminous stabilized subbases or Superpave (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/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. The Contractor shall construct individual, sealed RAS stockpiles meeting one of the following definitions. No additional RAS shall be added to the pile after the pile has been sealed. 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. Unless otherwise approved by the Engineer, mechanically blending manufactured sand (FM 20 or FM 22) up to an equal weight of RAS with the processed RAS will be permitted to improve workability. The 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. RAP/FRAP and RAS testing shall be according to the following.

- (a) RAP/FRAP Testing. When used in HMA, the RAP/FRAP shall be sampled and tested either during processing or after stockpiling.
- (1) During Stockpiling. For testing during stockpiling, washed extraction samples shall be run at the minimum frequency of one sample per 500 tons (450 metric tons) for the first 2000 tons (1800 metric tons) and one sample per 2000 tons (1800 metric tons) thereafter. A minimum of five tests shall be required for stockpiles less than 4000 tons (3600 metric tons).
- (2) After Stockpiling. For testing after stockpiling, the Contractor shall submit a plan for approval to the District proposing a satisfactory method of sampling and testing the RAP/FRAP pile either in-situ or by restocking. 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 whether RAP or 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 either during or after stockpiling.

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 stockpiled in a separate working pile as designated in the Quality Control plan and only added to the sealed stockpile when the test results of the working pile are complete and are found to meet the tolerances specified herein for the original sealed RAS stockpile.

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 tests results shall be according to the following.

- (a) Evaluation of RAP/FRAP Test Results. All of the extraction results shall be compiled and averaged for asphalt binder content and gradation and, when applicable (for slag) G_{mm} . Individual extraction test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	FRAP/RAP or FRAP	Conglomerate "D" Quality RAP
1 in. (25 mm)		$\pm 5 \%$
1/2 in. (12.5 mm)	$\pm 8 \%$	$\pm 15 \%$
No. 4 (4.75 mm)	$\pm 6 \%$	$\pm 13 \%$
No. 8 (2.36 mm)	$\pm 5 \%$	
No. 16 (1.18 mm)		$\pm 15 \%$
No. 30 (600 μm)	$\pm 5 \%$	
No. 200 (75 μm)	$\pm 2.0 \%$	$\pm 4.0 \%$
Asphalt Binder	$\pm 0.4 \%$ ^{1/}	$\pm 0.5 \%$
G_{mm}	± 0.03 ^{2/}	

1/ The tolerance for FRAP shall be $\pm 0.3 \%$.

2/ For slag and steel slag

If more than 20 percent of the individual sieves and/or asphalt binder content tests are out of the above tolerances, the RAP/FRAP shall not be used in HMA unless the RAP/FRAP representing the failing tests is removed from the stockpile. All test data and acceptance ranges shall be sent to the District for evaluation.

With the approval of the Engineer, the ignition oven may be substituted for extractions according to the Illinois Test Procedure, "Calibration of the Ignition Oven for the Purpose of Characterizing Reclaimed Asphalt Pavement (RAP)".

- (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. Individual test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	RAS
No. 8 (2.36 mm)	± 5 %
No. 16 (1.18 mm)	± 5 %
No. 30 (600 µm)	± 4 %
No. 200 (75 µm)	± 2.0 %
Asphalt Binder Content	± 1.5 %

and/or asphalt binder content tests are out of the above tolerances, the RAS shall not be used in Department projects unless the RAS, RAP or FRAP representing the failing tests is removed from the stockpile. All test data and acceptance ranges shall be sent to the District for evaluation.

1031.05 Quality Designation of Aggregate in RAP/FRAP.

- (a) RAP. The aggregate quality of the RAP for homogenous, 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, Superpave (High ESAL)/HMA (High ESAL), or (Low ESAL) IL-9.5L surface mixtures are designated as containing Class B quality coarse aggregate.
 - (2) RAP from Superpave (High ESAL)/HMA (Low ESAL) IL-19.0L binder mixture is designated as Class D quality coarse aggregate.
 - (3) RAP from Class I, Superpave (High ESAL)/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 prequalified by the Department for the specified testing. The consultant 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 BMPR Aggregate Lab for MicroDeval Testing, according to Illinois Modified AASHTO T 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 RAS, RAP or FRAP in HMA. The use of RAS, RAP or FRAP shall be a Contractor's option when constructing HMA in all contracts.

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

- (1) Coarse Aggregate Size (after extraction). The coarse aggregate in all RAP shall be equal to or less than the nominal maximum size requirement for the HMA mixture to be produced.
- (2) Steel Slag Stockpiles. RAP/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). RAP/FRAP stockpiles for use in HMA surface mixtures (High and Low ESAL) shall have coarse aggregate that is Class B quality or better. RAP/FRAP shall be considered equivalent to limestone for frictional considerations unless produced/screened to minus 3/8 inch.

in which the coarse aggregate is Class C quality or better.

- (5) Use in Shoulders and Subbase. RAP/FRAP stockpiles for use in HMA shoulders and stabilized subbase (HMA) shall be RAP, 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) RAP/FRAP and/or RAS Usage Limits. Type 1 or Type 2 RAS may be used alone or in conjunction with RAP or FRAP in HMA mixtures up to a maximum of 5.0% by weight of the total mix.

- (6) When the Contractor chooses the RAP option, the percentage of the percentage of virgin asphalt binder replaced by the asphalt binder from the RAP shall not exceed the percentages indicated in the table below for a given N Design:

Max Asphalt Binder Replacement RAP Only
 Table 1

HMA Mixtures ^{1/, 2/}	Maximum % Asphalt Binder replacement (ABR)		
	Ndesign	Binder/Leveling Binder	Surface
30L	25	15	10
50	25	15	10
70	15	10	10
90	10	10	10
105	10	10	10
4.75 mm N-50			15
SMA N-80			10

1/ For HMA “All Other” (shoulder and stabilized subbase) N-30, the percent asphalt binder replacement shall not exceed 50% of the total asphalt binder in the mixture.

2/ When the asphalt binder replacement exceeds 15 percent, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent binder replacement would require a virgin asphalt binder grade of PG64-22 to be reduced to a PG58-28). When constructing full depth HMA and the ABR is less than 15 percent, the required virgin asphalt binder grade shall be PG64-28.

RAP shall not exceed the amounts indicated in

When the Contractor chooses either the RAS or FRAP option, the percent binder replacement shall not exceed the amounts indicated in the tables below for a given N Design.

Max Asphalt Binder Replacement RAS or FRAP
 Table 2

HMA Mixtures ^{1/, 2/}	Level 1 - Maximum % ABR		
	Ndesign	Binder/Leveling Binder	Surface
30L	35	30	15
50	30	25	15
70	30	20	15
90	20	15	15
105	20	15	15
4.75 mm N-50			25
SMA N-80			15

1/ For HMA “All Other” (shoulder and stabilized subbase) N-30, the percent asphalt binder replacement shall not exceed 50% of the total asphalt binder in the mixture.

2/ When the asphalt binder replacement exceeds 15 percent 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 percent binder replacement will require a virgin asphalt binder grade of PG64-22 to be reduced to a PG58-28). When constructing full depth HMA and the ABR is less than 15 percent, the required virgin asphalt binder grade shall be PG64-28.

3/ When the ABR for SMA is 15 percent or less, the required virgin asphalt binder grade shall be SBS PG76-22.

4/ When the ABR for IL-4.75 mix is 15 percent or less, the required virgin asphalt binder grade shall be SBS PG76-22. When the ABR for the IL-4.75 mix exceeds 15 percent, the virgin asphalt binder grade shall be SBS PG70-28.

When the Contractor chooses the RAS with FRAP combination, the percent asphalt binder replacement shall split equally between the RAS and the FRAP, and the total replacement shall not exceed the amounts indicated in the tables below for a given N Design.

Max Asphalt Binder Replacement RAS and FRAP Combination
 Table 3

HMA Mixtures ^{1/, 2/}	Level 2 - Maximum % ABR		
Ndesign	Binder/Leveling Binder	Surface	Polymer Modified ^{3/, 4/}
30L	50	40	30
50	40	35	30
70	40	30	30
90	40	30	30
105	40	30	30
4.75 mm N-50			40
SMA N-80			30

1/ For HMA "All Other" (shoulder and stabilized subbase) N-30, the percent asphalt binder replacement shall not exceed 50% of the total asphalt binder in the mixture.

2/ When the binder replacement exceeds 15 percent 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 percent binder replacement will require a virgin asphalt binder grade of PG64-22 to be reduced to a PG58-28).

3/ When the ABR for SMA is 15 percent or less, the required virgin asphalt binder shall be SBS PG76-22. When the ABR for SMA exceeds 15%, the virgin asphalt binder grade shall be SBS PG70-28.

4/ When the ABR for IL-4.75 mix is 15 percent or less, the required virgin asphalt binder grade shall be SBS PG76-22. When the ABR for the IL-4.75 mix exceeds 15 percent, the virgin asphalt binder grade shall be SBS PG70-28 For IL-4.75 mix the FRAP/RAS ABR shall not exceed 30 percent.

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

All HMA mixtures will be required to be tested, prior to submittal for Department verification, according to Illinois Modified AASHTO T324 (Hamburg Wheel) and shall meet the following requirements:

Asphalt Binder Grade	# Repetitions	Max Rut Depth (mm)
PG76-XX	20,000	12.5
PG70-XX	20,000	12.5
PG64-XX	10,000	12.5
PG58-XX	10,000	12.5
PG52-XX	10,000	12.5
PG46-XX	10,000	12.5

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

1031.08 HMA Production. All HMA mixtures shall be sampled 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.

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, RAP and FRAP feed system to remove or reduce oversized material. If material passing the sizing device adversely affects the mix production or quality of the mix, the sizing device shall be set at a size specified by the Engineer.

If the RAS, RAP and FRAP control tolerances or QC/QA test results require corrective action, the Contractor shall cease production of the mixture containing RAs, RAP or FRAP and either switch to the virgin aggregate design or submit a new RAS, RAP or FRAP design.

RAP/FRAP. The coarse aggregate in all RAP/FRAP used shall be equal to or less than the maximum size requirement for the HMA mixture being produced.

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.

RAS, RAP and FRAP. HMA plants utilizing RAS, RAP and FRAP 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, RAP 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, RAP and FRAP material as a percent of the total mix to the nearest 0.1 percent.
- h. Aggregate RAS, RAP and FRAP moisture compensators in percent as set on the control panel. (Required when accumulated or individual aggregate and RAS, RAP 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)

(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, RAP 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, RAP 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 Shoulders. 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.
- (c) Gradation. One hundred percent of the RAP material shall pass the 1 1/2 in. (37.5mm) sieve. The RAP material shall be reasonably well graded from coarse to fine. RAP material that is gap-graded, FRAP, or single sized will not be accepted for use as Aggregate Surface Course and Aggregate Shoulders."

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

Effective: June 26, 2006

Revised: January 1, 2013

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

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

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

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

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

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

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

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

“(c) RAP Materials (Note 3)1031”

Add the following note to 1030.02 of the Standard Specifications:

Note 3. 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.

1) Design Composition and Volumetric Requirements

Revise Article 1030.04(a)(1) of the Standard 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-25.0 mm		IL-19.0 mm		IL-12.5 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)		100								
1 in. (25 mm)	90	100		100						
3/4 in. (19 mm)		90	82	100		100				
1/2 in. (12.5 mm)	45	75	50	85	90	100		100		100
3/8 in. (9.5 mm)						89	90	100		100
#4 (4.75 mm)	24	42 ^{2/}	24	50 ^{2/}	28	65	28	65	90	100
#8 (2.36 mm)	16	31	20	36	28	48 ^{3/}	28 32	48 52 ^{3/}	70	90
#16 (1.18 mm)	10	22	10	25	10	32	10	32	50	65
#50 (300 μm)	4	12	4	12	4	15	4	15	15	30
#100 (150 μm)	3	9	3	9	3	10	3	10	10	18
#200 (75 μm)	3	6	3	6	4	6	4	6	7	9
Ratio Dust/Asphalt Binder		1.0		1.0		1.0		1.0		1.0 ^{4/}

1/ Based on percent of total aggregate weight.

2/ The mixture composition shall not exceed 40 percent passing the #4 (4.75 mm) sieve for binder courses with Ndesign ≥ 90.

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

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

Delete Article 1030.04(a)(4) of the Standard Specifications.

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						
Ndesign	Voids in the Mineral Aggregate (VMA), % minimum					Voids Filled with Asphalt Binder (VFA), %
	IL-25.0	IL-19.0	IL-12.5	IL-9.5	IL-4.75 ^{1/}	
50	12.0	13.0	14.0	15	18.5	65 – 78 ^{2/}
70					65 - 75	
90						
105						

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

2/ VFA for IL-4.75 shall be 72-85%”

Delete Article 1030.04(b)(4) of the Standard Specifications.

Revise the Control Limits Table in Article 1030.05(d)(4) of the Standard Specifications to read.

“CONTROL LIMITS					
Parameter	High ESAL Low ESAL	High ESAL Low ESAL	All Other	IL-4.75	IL-4.75
	Individual Test	Moving Avg. of 4	Individual Test	Individual Test	Moving Avg. of 4
% Passing: ^{1/}					
1/2 in. (12.5 mm)	± 6 %	± 4 %	± 15 %		
No. 4 (4.75 mm)	± 5 %	± 4 %	± 10 %		
No. 8 (2.36 mm)	± 5 %	± 3 %			
No. 16 (1.18 mm)				± 4 %	± 3 %
No. 30 (600 μm)	± 4 %	± 2.5 %			
Total Dust Content No. 200 (75 μm)	± 1.5 %	± 1.0 %	± 2.5 %	± 1.5 %	± 1.0 %
Asphalt Binder Content	± 0.3 %	± 0.2 %	± 0.5 %	± 0.3 %	± 0.2 %
Voids	± 1.2 %	± 1.0 %	± 1.2 %	± 1.2 %	± 1.0 %
VMA	-0.7 % ^{2/}	-0.5 % ^{2/}		-0.7 % ^{2/}	-0.5 % ^{2/}

1/ Based on washed ignition oven

2/ Allowable limit below minimum design VMA requirement”

2) Design Verification and Production

Description. The following states the requirements for Hamburg Wheel and Tensile Strength testing for High ESAL, IL-4.75, and SMA hot mix asphalt (HMA) mixes during mix design verification and production.

When the options of Warm Mix Asphalt, Reclaimed Asphalt Shingles, or Reclaimed Asphalt Pavement are used by the Contractor, the Hamburg Wheel and tensile strength requirements in this special provision will be superseded by the special provisions for Warm Mix Asphalt, Reclaimed Asphalt Shingles, or Reclaimed Asphalt Pavement as applicable.

Mix Design Testing. Add the following to Article 1030.04 of the Standard Specifications:

“(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 meeting the following requirements:

(1)Hamburg Wheel Test criteria.

Asphalt Binder Grade	# Repetitions	Max Rut Depth (mm)
PG 76 -XX (or higher)	20,000	12.5
PG 64 -XX (or lower)	10,000	12.5

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

Production Testing. Add the following to Article 1030.06 of the Standard Specifications:

“(c) Hamburg Wheel Test. All HMA mixtures shall be sampled 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.

During start-up, for asphalt mix designs verified with the Hamburg Wheel, The Department may conduct additional Hamburg Wheel Tests on production material as determined by the Engineer. 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”

Basis of Payment. Revise the seventh paragraph of Article 406.14 of the Standard Specifications to read:

“For all mixes designed and verified under the Hamburg Wheel criteria, the cost of furnishing and introducing anti-stripping additives in the HMA will not be paid for separately, but shall be considered as included in the contract unit price of the HMA item involved.

No additional compensation will be awarded to the Contractor because of reduced production rates associated with the addition of the anti-stripping additive.”

TEMPORARY PAVEMENT

Effective: March 1, 2003

Revised: April 10, 2008

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

The contractor shall use either Portland cement concrete according to Sections 353 and 354 of the Standard Specifications or HMA according to Sections 355, 356, 406 of the Standard Specifications, and other applicable HMA special provisions as contained herein. The HMA mixtures to be used shall be specified in the plans. The thickness of the Temporary Pavement shall be as described in the plans. The contractor shall have the option of constructing either material type if both Portland cement concrete and HMA are shown in the plans.

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

The removal of the Temporary Pavement, if required, shall conform to Section 440 of the Standard Specification.

Method of Measurement. Temporary pavement will be measured in place and the area computed in square yards (square meters).

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

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

SPECIAL PROVISION FOR DOWEL BAR INSERTER (BMPR)

Effective: April 1, 2012

Revise Article 420.05(c) to read:

(c) Transverse Contraction Joints. Transverse contraction joints shall consist of planes of weakness created by sawing grooves in the surface of the pavement and shall include load transfer devices consisting of dowel bars. Transverse contraction joints shall be according to the following.

Revise Article 420.05(c)(2) to read:

(2) Dowel Bars. Dowel bars shall be installed parallel to the centerline of the pavement and parallel to the proposed pavement surface. Installation shall be according to one of the following methods.

a. Dowel Bar Assemblies. The assembly shall act as a rigid unit with each component securely held in position relative to the other members of the assembly. The entire assembly shall be held securely in place by means of nails which shall penetrate the stabilized subbase. At least ten nails shall be used for each 10, 11, or 12 ft (3, 3.3, or 3.6 m) section of assembly. Bearing plates shall be punched to receive the nails. When bearing plates are omitted on stabilized subbase, other methods for securing the assembly with nails shall be provided.

Metal stakes shall be used instead of nails, with soil or granular subbase. The stakes shall loop over or attach to the top parallel spacer bar of the assembly and penetrate the subgrade or subbase at least 12 in. (300 mm).

At the location of each dowel bar assembly, the subgrade or subbase shall be reshaped and re-tamped when necessary.

Prior to placing concrete, any deviation of the dowel bars from the correct horizontal or vertical alignment (horizontal skew or vertical tilt) greater than 3/8 in. in 12 in. (9 mm in 300 mm) shall be corrected and a light coating of oil shall be uniformly applied to the dowel bars.

Care shall be exercised in depositing the concrete at the dowel bar assemblies so that the horizontal and vertical alignment will be retained.

b. Inserted Dowel Bars. The dowel bars shall be placed in the pavement slab with a mechanical dowel bar inserter (DBI) attached to a formless paver.

The DBI shall be self-contained and supported on the formless paver with the ability to move separately from the paver. The DBI shall be equipped with insertion forks along with a tamping bar, finishing pan, and any other devices necessary for finishing the concrete the full width of the pavement. The insertion forks shall have the ability to vibrate at a minimum frequency of 3000 vpm.

The DBI shall insert the bars with vibration into the plastic concrete after the concrete has been struck off and consolidated without deformation of the slab. After the bars have been inserted, the concrete shall be finished and no voids shall exist around the dowel bars. The forward movement of the finishing screed shall not be interrupted by the inserting of the dowel bars.

The exact location of each row of dowels shall be marked on the subbase as indicated by the plans. The location of each row of dowels inserted by the DBI shall be prominently marked on both sides of the pavement to facilitate sawing of the transverse joint.

1. Placement Tolerances. The mechanical dowel bar inserter shall place the dowel bars in the concrete pavement within the following tolerances:
 - (a.) Longitudinal translation (side shift) is defined as the position of the center of the dowel bar along the longitudinal axis, in relation to the sawed joint. The maximum allowable longitudinal translation is 2 in. (50 mm).
 - (b.) Horizontal translation is defined as difference in the actual dowel bar location parallel to the transverse axis of the joint from its theoretical position as detailed in the standard details. The maximum allowable horizontal translation is 2 in. (50 mm).
 - (c.) Vertical translation (depth) is the difference in the actual dowel bar location from the theoretical midpoint of the slab. The maximum allowable vertical translation is 1/2 in. (12.5 mm) above the theoretical midpoint and 1 in. (25 mm) below the theoretical midpoint.
 - (d.) Dowel bar misalignment, either vertical tilt or horizontal skew is defined as the difference in position of the dowel bar ends with respect to each other. Vertical tilt is measured in the vertical axis whereas horizontal skew is measured in the horizontal axis. The maximum allowable misalignment shall be 3/8 in. in 12 in. (9 mm in 300 mm).
2. Evaluation of Dowel Bar Placement by Magnetic Tomography. The location and alignment of the dowel bars shall be tested with a calibrated magnetic imaging device. The testing device shall be approved by the Engineer prior to the start of testing and shall include the following items:
 - (a.) the sensor unit;
 - (b.) an onboard computer that runs the test, collects and stores the data and performs preliminary evaluation;

- (c.) a rail system to guide the sensor unit parallel to the joint and the pavement surface at a constant elevation for the full width of the pavement that is placed; and
- (d.) associated PC software recommended by the manufacturer of the device for installation on a Department laptop computer. The program shall be compatible with Windows NT.

A trained operator shall perform the scans with the device and provide the printed results. All testing shall be performed in the presence of the Engineer. The test results for each joint shall be printed directly from the onboard computer immediately after the scan is performed and given to the Engineer. The results shall also be stored on a flash memory card used in the onboard computer that shall be given to the Engineer at the end of each day.

The device shall be calibrated to the type and size dowel bar used in the work according to the manufacturer's instructions. The Contractor may utilize this device as a process control and make necessary adjustments to ensure the dowels are placed in the correct location.

Test sections consisting of the first 20 joints of concrete pavement on the first day of paving shall be tested for dowel location and alignment as soon as the concrete has hardened sufficiently to prevent damage to the surface of the pavement. Additional trial sections will be established when the slipform paving equipment is modified to accommodate a change in paving width or when the slipform paving equipment has been disassembled and/or replaced by another slip form paver.

For all remaining joints, a minimum of 1 out of every 10 shall be tested as soon as the concrete has hardened sufficiently to prevent damage to the surface of the pavement. If the position and alignment of any dowel bar(s) is found to be rejectable, then scanning of adjacent joints on both sides of the joint containing the rejectable dowel bar(s) shall be performed until joints on each side are found with no rejectable dowel bars.

If consistency of the proper dowel bar alignment cannot be established within the first 300 ft (90 m), the Engineer will suspend the paving operation. The Contractor shall determine a course of action approved by the Engineer to correct dowel bars found out of tolerance. Use of the DBI shall cease if satisfactory results, as determined by the Engineer, are not being achieved.

WINTERIZED TEMPORARY ACCESS

Effective: January 1, 2012

Revised: March 5, 2012

Description. This work shall consist of constructing, maintaining and removing winterized temporary access for private and commercial entrances and side roads designed for use throughout the winter months.

Materials. Materials shall be according to the following.

ITEM	ARTICLE/SECTION
Hot-Mix Asphalt	1030

CONSTRUCTION REQUIREMENTS

For projects lasting longer than one construction season, the contractor shall construct and maintain temporary access composed of an HMA surface course over an existing aggregate temporary access. The contractor shall install the winterized temporary access prior to winter shut down at the direction of the engineer. The top 2” of the existing aggregate temporary access should be removed and replaced with 2” of Hot-Mix Asphalt. Compensation will be given for the winterized temporary access at the time of the installation of the Hot-Mix Asphalt surface course.

HMA Surface Course. The Hot-Mix Asphalt surface course shall be 2 in. thick when compacted. HMA Surface Course, Mix “D”, N50 shall be used except as modified by the plans or as directed by the Engineer. This work shall be constructed in accordance with the applicable portions of Section 406 of the Standard Specifications and as directed by the Engineer. The material shall conform to the applicable portions of Section 1030 of the Standard Specifications.

The winterized temporary access shall be constructed to the dimensions and grades of the existing aggregate temporary access.

Maintaining the winterized temporary access shall include repairing the HMA surface course after any operation that may disturb or remove the winterized temporary access to the satisfaction of the Engineer.

When use of the winterized temporary access is discontinued, the winterized temporary access shall be removed according to Article 440.03 of the Standard Specifications. The material shall be disposed of according to Article 202.03 of the Standard Specifications or may be utilized in the permanent construction with the approval of the Engineer.

Method of Measurement. Winterized temporary access for private and commercial entrances and roads will be measured for payment at the contract unit price per square yard for every private entrance, commercial entrance or road constructed for the purpose of winterized temporary access.

Basis of Payment. Winterized temporary access for private and commercial entrances and roads will be paid for at the contract unit price per square yard for TEMPORARY ACCESS (WINTERIZE) as specified in the plans.

Partial payment of the square yard amount bid for each winterized temporary access will be paid according to the following schedule:

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

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

GENERAL ELECTRICAL REQUIREMENTS

Effective: January 1, 2012

Add the following to Article 801 of the Standard Specifications:

“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."

Add the following to the 1st paragraph of Article 801.05(a) of the Standard Specifications:

"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."

Revise the second sentence of the 5th paragraph of Article 801.05(a) of the Standard Specifications to read:

"The Engineer will stamp the submittals indicating their status as 'Approved', 'Approved as Noted', 'Disapproved', or 'Information Only'.

Revise the 6th paragraph of Article 801.05(a) of the Standard Specifications to read:

Resubmittals. All submitted items reviewed and marked 'Approved as Noted', or 'Disapproved' are to be resubmitted in their entirety with a disposition of previous comments to verify contract compliance at no additional cost to the state unless otherwise indicated within the submittal comments."

Revise Article 801.11(a) of the Standard Specifications to read:

“Lighting Operation and Maintenance Responsibility. The scope of work shall include the assumption of responsibility for the continuing operation and maintenance the of 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

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.”

Add the following to Section 801 of the Standard Specifications:

“Lighting Cable Identification. Each wire installed shall be identified with its complete circuit number at each termination, splice, junction box or other location where the wire is accessible.”

“Lighting Cable Fuse Installation. Standard fuse holders shall be used on non-frangible (non-breakaway) light pole installations and quick-disconnect fuse holders shall be used on frangible (breakaway) light pole installations. Wires shall be carefully stripped only as far as needed for connection to the device. Over-stripping shall be avoided. An oxide inhibiting lubricant shall be applied to the wire for minimum connection resistance before the terminals are crimped-on. Crimping shall be performed in accordance with the fuse holder manufacturer's recommendations. The exposed metal connecting portion of the assembly shall be taped with two half-lapped wraps of electrical tape and then covered by the specified insulating boot. The fuse holder shall be installed such that the fuse side is connected to the pole wire (load side) and the receptacle side of the holder is connected to the line side.”

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 full-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. 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 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.”

Add the following to Article 801.16 of the Standard Specifications:

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

- Last light pole on each circuit
- Handholes
- Conduit roadway crossings
- Controllers
- Control Buildings
- Structures with electrical connections, i.e. DMS, lighted signs.
- Electric Service locations
- CCTV Camera installations
- Fiber Optic Splice Locations

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. Description of item
2. Designation or approximate station if the item is undesignated
3. Latitude
4. Longitude

Examples:

Equipment Description	Equipment Designation	Latitude	Longitude
CCTV Camera pole	ST42	41.580493	-87.793378
FO mainline splice handhole	HHL-ST31	41.558532	-87.792571
Handhole	HH at STA 234+35	41.765532	-87.543571
Electric Service	Elec Srv	41.602248	-87.794053
Conduit crossing	SB IL83 to EB I290 ramp SIDE A	41.584593	-87.793378
Conduit crossing	SB IL83 to EB I290 ramp SIDE B	41.584600	-87.793432
Light Pole	DA03	41.558532	-87.792571
Lighting Controller	X	41.651848	-87.762053
Sign Structure	FGD	41.580493	-87.793378
Video Collection Point	VCP-IK	41.558532	-87.789771
Fiber splice connection	Toll Plaza34	41.606928	-87.794053

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 100 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.

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 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.”

EXPOSED RACEWAYS

Effective: January 1, 2012

Revise the first paragraph of Article 811.03(a) of the Standard Specifications to read:

“General. Rigid metal conduit installation shall be according to Article 810.05(a). Conduits terminating in junction and pull boxes shall be terminated with insulated and gasketed watertight threaded NEMA 4X conduit hubs. The hubs shall be Listed under UL 514B. The insulated throat shall be rated up to 105° C. When PVC coated conduit is utilized, the aforementioned hubs shall also be PVC coated.”

Add the following to Article 811.03(b) of the Standard Specifications:

“Where PVC coated conduit is utilized, all conduit fittings, couplings and clamps shall be PVC coated. All other mounting hardware and appurtenances shall be stainless steel.”

“The personnel installing the PVC coated conduit must be trained and certified by the PVC coated conduit Manufacturer or Manufacturer’s representative to install PVC coated conduit. Documentation demonstrating this requirement must be submitted for review and approval.”

Add the following to Article 1088.01(a) of the Standard Specifications:

All iron and steel products, which are to be incorporated into the work, including conduit and all conduit fittings, shall be domestically manufactured or produced and fabricated as specified in Article 106.”

Revise Article 1088.01(a) (3) of the Standard Specifications to read:

- a. PVC Coated Steel Conduit. The PVC coated rigid metal conduit shall be UL Listed (UL 6). The PVC coating must have been investigated by UL as providing the primary corrosion protection for the rigid metal conduit. Ferrous fittings for general service locations shall be UL Listed with PVC as the primary corrosion protection. Hazardous location fittings, prior to plastic coating shall be UL listed.
- b. The PVC coating shall have the following characteristics:

Hardness:	85+ Shore A Durometer
Dielectric Strength:	400V/mil @ 60 Hz
Aging:	1,000 Hours Atlas Weatherometer
Temperature	The PVC compound shall conform at 0° F. to Federal Specifications PL-406b, Method 2051, Amendment 1 of 25 September 1952 (ASTM D 746)
Elongation:	200%

- c. The exterior and interior galvanized conduit surface shall be chemically treated to enhance PVC coating adhesion and shall also be coated with a primer before the PVC coating to ensure a bond between the zinc substrate and the PVC coating. The bond strength created shall be greater than the tensile strength of the plastic coating.
- d. The nominal thickness of the PVC coating shall be 1 mm (40 mils). The PVC exterior and urethane interior coatings applied to the conduit shall afford sufficient flexibility to permit field bending without cracking or flaking at temperatures above -1°C (30°F).

- e. An interior urethane coating shall be uniformly and consistently applied to the interior of all conduit and fittings. This internal coating shall be a nominal 2 mil thickness. The interior coating shall be applied in a manner so there are no runs, drips, or pinholes at any point. The coating shall not peel, flake, or chip off after a cut is made in the conduit or a scratch is made in the coating.
- f. Conduit bodies shall have a tongue-in-groove gasket for maximum sealing capability. The design shall incorporate a positive placement feature to assure proper installation. Certified test results confirming seal performance at 15 psig (positive) and 25 in. of mercury (vacuum) for 72 hours shall be submitted for review when requested by the Engineer.
- g. The PVC conduit shall pass the following tests:

Exterior PVC Bond test RN1:

Two parallel cuts 13 mm (1/2 inch) apart and 40 mm (1 1/2 inches) in length shall be made with a sharp knife along the longitudinal axis. A third cut shall be made perpendicular to and crossing the longitudinal cuts at one end. The knife shall then be worked under the PVC coating for 13 mm (1/2 inch) to free the coating from the metal.

Using pliers, the freed PVC tab shall be pulled with a force applied vertically and away from the conduit. The PVC tab shall tear rather than cause any additional PVC coating to separate from the substrate.

Boil Test:

Acceptable conduit coating bonds (exterior and interior) shall be confirmed if there is no disbondment after a minimum average of 200 hours in boiling water or exposure to steam vapor at one atmosphere. Certified test results from a national recognized independent testing laboratory shall be submitted for review and approval. The RN1 Bond Test and the Standard Method for Measuring Adhesion by Tape Test shall be utilized.

Exterior Adhesion. In accordance with ASTM D870, a 6" length of conduit test specimen shall be placed in boiling water. The specimen shall be periodically removed, cooled to ambient temperature and immediately tested according to the bond test (RN1). When the PVC coating separates from the substrate, the boil time to failure in hours shall be recorded.

Interior Adhesion. In accordance with ASTM D3359, a 6" conduit test specimen shall be cut in half longitudinally and placed in boiling water or directly above boiling water with the urethane surface facing down. The specimen shall be periodically removed, cooled to ambient temperature and tested in accordance with the Standard Method of Adhesion by Tape Test (ASTM D3359). When the coating disbonds, the time to failure in hours shall be recorded.

Heat/Humidity Test:

Acceptable conduit coating bonds shall be confirmed by a minimum average of 30 days in the Heat and Humidity Test. The RN1 Bond Test and the Standard Method for Measuring Adhesion by Tape Test shall be utilized.

Exterior Adhesion. In accordance with ASTM D1151, D1735, D2247 and D4585, conduit specimens shall be placed in a heat and humidity environment where the temperature is maintained at 150°F (66°C) and 95% relative humidity. The specimens shall be periodically removed and a bond test (RN1) performed. When the PVC coating separates from the substrate, the exposure time to failure in days shall be recorded.

Interior Adhesion. In accordance with ASTM D3359, conduit specimens shall be placed in a heat and humidity environment where the temperature is maintained at 150°F (66°C) and 95% relative humidity. When the coating disbonds, the time to failure in hours shall be recorded.

Add the following to Article 1088.01(a) (4) of the Standard Specifications:

"All liquid tight flexible metal conduit fittings shall have an insulated throat to prevent abrasion of the conductors and shall have a captive sealing O-ring gasket. The fittings shall be Listed under UL 514B. The insulated throat shall be rated up to 105° C."

Revise the second paragraph of Article 811.04 of the Standard Specifications to read:

"Expansion fittings and LFNC will not be measured for payment."

Revise Article 811.05 of the Standard Specifications to read:

"811.05 Basis of Payment. This work will be paid for at the contract unit price per foot for **CONDUIT ATTACHED TO STRUCTURE**, of the diameter specified, **RIGID GALVANIZED STEEL** or **CONDUIT ATTACHED TO STRUCTURE**, of the diameter specified, **RIGID GALVANIZED STEEL, PVC COATED.**"

CCTV EQUIPMENT, IP DISTRIBUTION

Effective: September 1, 2012

Description.

This item shall consist of furnishing and installing equipment for the control and distribution of CCTV video from the CCTV camera to a Video Collection Point (VCP). Transmission for the video and control signals shall be by fiber optic cable as specified elsewhere herein and as indicated in the plans.

The CODEC encoders are specified and included as a part of this item and shall be fully coordinated with the decoders.

The CODEC decoders are specified and paid for as a part of the Modification of Existing Video Distribution System pay item and shall be fully coordinated and of the same manufacturer as the video CODEC encoders specified herein.

Construction Requirements

General. The Contractor shall prepare and submit a shop drawing detailing the complete closed-circuit television cabinet equipment installation. The shop drawings shall identify the installation and specifications of all components to be supplied, for approval of the Engineer. Particular emphasis shall be given to the cabling and the interconnection of all of the components.

The Contractor shall demonstrate a prototype assembly using the proposed components. This demonstration shall take place at the D1 Headquarters in Schaumburg. These conformance tests shall be completed prior to the delivery of any completed assemblies to the project site. Any deviations from these specifications that are identified during this testing shall be corrected prior to shipment of the assembly to the project site.

Appropriate connectors shall be furnished and installed to interface the in-cabinet components to the integrated dome camera assembly. The Contractor shall mount the in-cabinet components in the equipment cabinet and connect them to AC power, communications, and video feeds.

Testing. The Contractor shall test each installed CCTV Cabinet Equipment. The test shall be conducted from the field cabinet using the standard communication protocol and a laptop computer. The Contractor shall verify that the camera can be fully exercised and moved through the entire limits of Pan, Tilt, Zoom, Focus and Iris adjustments, using both the manual control and presets. In addition, a video monitor and an oscilloscope shall verify that the video signal meets or exceeds the specified requirements.

The Contractor shall repeat the test at the communications shelter associated with the CCTV camera. This test confirms the distribution portion of the video circuit, that is, the portion of the circuit from the CCTV camera to the digital video encoder.

The Contractor shall maintain a log of all testing and the corresponding results. A representative of the Contractor and a representative of the Engineer shall sign the log as witnessing the results. Records of all tests shall be submitted to the Engineer prior to accepting the installation.

Documentation. One copy of all operations and maintenance manuals for each CCTV component shall be delivered for each assembly installed. In addition, full documentation for all software and associated protocols shall be supplied to the Department on a CD-ROM. The Department reserves the right to provide this documentation to other parties who may be contracted with in order to provide overall integration or maintenance of this item.

Warranty. The Contractor shall warranty all materials and workmanship including labor for a period of two years after the completion and acceptance of the installation, unless other warranty requirements prevail. The warranty period shall begin when the Contractor completes all construction obligations related to this item and when the components for this item have been accepted, which shall be documented as the final completion date in the construction status report. This warranty shall include repair and/or replacement of all failed components via a factory authorized depot repair service. All items sent to the depot for repair shall be returned within two weeks of the date of receipt at the facility. The depot location shall be in the United States. Repairs shall not require more than two weeks from date of receipt and the provider of the warranty shall be responsible for all return shipping costs.

The depot maintainer designated for each component shall be authorized by the original manufacturer to supply this service. A warranty certificate shall be supplied for each component from the designated depot repair site indicating the start and end dates of the warranty. The certificate shall be supplied at the conclusion of the system acceptance test and shall be for a minimum of two years after that point. The certificate shall name the Department as the recipient of the service. The Department shall have the right to transfer this service to other private parties who may be contracted to perform overall maintenance of the facility.

Materials.

Equipment Installation. The CCTV equipment shall be mounted in an enclosure provided and paid for separately. The installation and mounting of the CCTV equipment shall be fully coordinated with the enclosure or co-location.

Co-location of CCTV equipment. The CCTV equipment may be co-located within a traffic signal controller cabinet as indicated.

The equipment shall be securely mounted on a mounting back panel or on a corrosion resistant DIN rail if equipment is configured as such.

Closed Circuit Television Camera Power Supply.

Light Tower Installation. The power supply shall be as required and manufactured by the CCTV camera manufacturer. The power supply shall be mounted as described elsewhere herein and as indicated in the plans. The CCTV equipment shall include video, control, and power surge suppression as described herein.

Non-Light Tower Installation. The Closed Circuit Television Camera Power Supply shall supply power to the camera dome assembly. The requirements include:

Input voltage	120 VAC \pm 10%
Output voltage	24 VAC \pm 10%
Operating Temperature Range:	-40°C to +70°C (minimum)
Storage Temperature Range:	-40°C to +75°C (minimum)

The power supply shall include an AC power indicator with power on/off switch. All outputs shall be fused. The power supply shall be sized for the dome units being supplied, considering pan/tilt, heating, and blower requirements, and shall not be less than 100 VA.

Over-voltage Protection. Over-voltage protection shall be provided on the power conductors, camera control conductors, and the video cables. The specific protection is based on the elements being protected.

Incoming Power Protection. The incoming power shall be protected with a filtering surge protector that absorbs power line noise and switching transients. The specified performance shall be as follows:

Peak current	20 kA (8x20 μ s waveshape)
Life Test	5% change
Clamp voltage	280 V typical @ 20 kA
Response time	\leq 5 ns
Continuous service current	10 amps max. 120 VAC/60 Hz
Operating Temperature	-40°C to +75°C (minimum)
Nominal dimensions	7.15 inches by 3.13 inches by 2.3 inches

Video Cable Protection. The coaxial cable from the camera shall be protected with gas tubes and silicon avalanche devices. The units shall include re-settable fuses to protect against sneak currents. Specific requirements include:

Frequency	0 to 20 MHz
Peak surge current	20 kA (8x20 μ s waveshape)
Technology	Hybrid, solid-state
Attenuation	0.1 dB at 10 MHz
Response time	\leq 1 ns
Protection	Line-to-shield
Input/output connectors	BNC
Impedance	75 ohms
Temperature range	-40°C to +75°C (minimum)
Humidity	0% to 95% (non-condensing)
Clamping voltage	6 V
Nominal dimensions	4.5 inches by 1.5 inches by 1.25 inches

The video cable protector shall be UL listed.

Camera Control Cable Protection. The camera control cable protector shall protect the RS-422/RS-485 signal leads going to the camera dome assembly. Specific requirements include:

Technology	Hybrid, solid-state
Response time	≤5 ns
Protection	Line-to-ground
Input/output connectors	terminal block
Temperature range	-40°C to +75°C (minimum)
Humidity	0% to 95% (non-condensing)
Clamping voltage	7.25 V (maximum); ≤7.0 V (typical)
Nominal dimensions	4.5 inches by 3.3 inches by 1.8 inches

The protector shall protect a minimum of four conductors. [Transmit Data (2 wires) and Receiver Data (2 wires)]

Both Light Tower and Non-Light Tower installations shall include the appropriate equipment for the local control and video monitoring of the video without necessitating the need to disconnect and re-connect cables for servicing or camera set-up.

Video CODEC

Video Encoders and Decoders. Video encoders and decoders (codecs) shall be dedicated hardware devices, and except for differences between encoders and decoders they shall all of the same type from the same common manufacturer. The codec shall be a single video channel type to transfer “full motion” 30 frame-per-second high quality D1 color video via H.264, MPEG-4, and MPEG-2 video compression at up to 20 Megabits per second. The units shall operate to produce a robust data communications stream that shall allow for both video and audio transmission and shall be immune to timing disruptions in the existing IP multi-cast system.

The units shall be rack-mountable, or single unit chassis for single unit installation complete with power supplies as required, operating from a 120-volt single phase AC power input. Units mounted in VCPs or other control buildings shall include a standard 19” rack with dual redundant power supplies.

Encoder units shall accept NTSC video BNC input, Ethernet RJ-45 communications, and RJ45 serial data input connections.

Approvable codecs shall be compatible with and demonstrably interoperable with the standard codec product of at least one other vendor. Final approval of codec equipment shall be dependent upon a demonstration test of multi-vendor interoperability. Initial submittal information shall include documentation of this interoperability and a demonstration testing plan for approval by the Engineer.

The CODEC encoders shall be Optelecom-NKF series C-60 E-MC, or approved equal by the Engineer. The Approved equal shall be 100% interchangeable with the specified unit with respect to functionality and performance.

The encoders shall interface the serial communications port of the CCTV camera assembly through the fiber optic video link where indicated. Using the Ethernet port on the encoder and its IP address, commands shall be exchanged between the camera control computer at the Communications Center and the serial port of the CCTV camera.

Materials shall be supplied to satisfy the following:

VIDEO	Requirements
Video channels	1x PAL/NTSC (Auto/PAL/NTSC)
Input level	1 Vpp (±3 dB)
Compression algorithm	H.264 BP (ISO/IEC 14496-10) MPEG-2 (ISO/IEC 13818-2), MJPEG, MPEG-4 (ISO/IEC 14496-2, ISMA comp.)
Type of streaming	UDP/IP (multi- and/or unicast)
Number of output streams	Up to 20
Input impedance	75Ω/Hi-Z selectable
Video Motion Detection	Yes (user-defined masking)
Encoding latency	<130 ms typ.
Resolution	D1, ½D1, 2CIF, CIF, QCIF, VGA
GOP structure	I, IP (selectable/user profiles)
Frame rate	1 to 30 fps
Quad streaming	1 D1@30fps H264 + D1@30fps MPEG-2+ D1@ 30fps MPEG-4 + CIF@1fps MJPEG
Output data rate	up to 20 Mb/s (CBR or VBR selectable/user profiles)
Video settings	User profiles, contrast, brightness, color saturation, hue, sharpness
On Screen Display (OSD)	3x Text lines (configurable: position, color, border/outline color, font size), 1x image in BMP, GIF, or JPEG format (configurable: position, scaling)
Live View Encoder (MJPEG)	HTTP, FTP pull
Connector type	BNC 75Ω (gold plated center pin)

DATA	Requirements
Number of channels	2 (full-duplex)
Number of streams	2x 3 (multi- and/or unicast)
Interfaces	1x RS232
	1x RS422/485 (2- or 4-wire)
Stream	TCP/UDP/MX configurable
Data rate	300 b/s to 230.4 kb/s
Connector type	RJ45

TRANSMISSION	Requirements
Number of interfaces	1
Interface 10/100Base-TX	Fast Ethernet
	Auto Negotiation, half-duplex/full-duplex, 10/100 Mb/SFP option
	Empty SFP slot for 100 Mbps SFP device
Protocols	H. 264 BP, MPEG-4 ES, MPEG-2 TS, MPEG-2 ES, (M)JPEG, RTP, RTCP, RTSP, TCP, UDP, IP, DHCP, IGMPv2,
	(S)NTP, MX/IP, HTTP, SNMP v2, FTP, TelNet, DiffServ, SAP, UPnP
Connector type	RJ45

Management	
LED status indicators	
DC	Power-on indicator (green)
NV	No video on input (red)
SYNC	All links are operational (green); failure in RX stream(s) (yellow); failure in TX stream(s) (red)
Ethernet port	Green LED: on=100 Mb, off=10 Mb; Amber LED: on=link okay, flashes with activity
Network Management & Control	SNMP v2, MX™, HTTP API, HTML (password protected)

Power	
Power consumption	<5W
Rack-mount units	MC 10 and MC11 power supply cabinets
Stand-alone units (/SA)	11 to 19 VDC (PSA-12 DC/25 or PSR-12 DC)

ENVIRONMENTAL	Requirements
Operating temperature	-40° F to +165° F (-40 °C to +74 °C)
Relative humidity	<95%,no condensation.

The encoders and decoders shall be UL listed and be type-accepted to 47 CFR (FCC), Part 15, Type A.

The Codecs shall be the standard product of an established North American manufacturer. The manufacturer shall have been in business for a minimum of 7 years. The manufacturer shall provide a minimum of a twelve (12) month warranty from the date of installation. The manufacturer shall provide technical support via email, fax and telephone. The above forms of support shall be provided Monday through Friday, 8:00am to 5:00pm EST. The Manufacturer shall also have a repair facility within North America.

The units shall be 19-inch rack-mountable, complete with power supplies as required for the rack configurations indicated on the plans, operating from a 120-volt single phase AC power input

The codecs shall be fully capable of transmitting the PTZ commands of the CCTV camera manufacturer being furnished under this contract as well as existing Philips/Bosch, Pelco, Vicon and Cohu camera commands. Serial data will be transmitted over TCP-IP. Each serial port must support IP addressing with the ability to select the appropriate IP socket number. The codecs must provide the ability to establish an IP connection directly from a workstation to any encoder IP address and socket number to pass serial data. Transmission of serial data must be independent of the video stream. Any serial data conversion required by the codec to communicate to the camera shall be included in this pay item and shall not be paid for separately.

The Encoder/Decoder serial data port must support Multicast data to broadcast a single serial data input to multiple remote encoder serial data port recipient. Bi-directional data must be supported on the codecs.

A demonstration of this low speed serial data transfer shall be required before material submittal approval is given. See submittal requirements in this Special Provision.

Codec operation and management.

Each unit must support a local console accessible using one of the serial interfaces to provide access to all configuration menus of the product including the initial IP address configuration as well as for troubleshooting purposes. The interface must be menu driven for novice users.

All units (encoders and decoders) must support SNMPv2 management protocol to provide the ability to control and monitor all configuration parameters and diagnostics from any 3rd party SNMP management application.

The Encoders/Decoders must support firmware updates from a central site. Updates must be downloadable to a single unit or by bulk via a single command from a firmware utility application via the Ethernet network. The firmware utility application must provide confirmation of the successful and unsuccessful updates. Upon completing of the update, the units must resume to original configuration without the need to reload the unit configuration.

Still Picture Capture

The codec shall be capable of capturing a still image in JPEG format and automatically transferring this image to an FTP site. The resolution of the image shall be user selectable. The frequency of captures shall be user settable and shall as a minimum range from 1 picture every 30 seconds to 1 picture every five minutes..

Still picture logo placement capability. As a part of the still image capture, a graphic overlay image shall be added to the captured image. The graphic image shall be user selectable, in JPEG, BMP or GIF formats. The overlay shall also be user positionable.

Special Submittal Requirements and Operational Demonstration

As a part of the product catalog cut submittal, the Contractor shall provide a demonstration of the codecs at the time of the initial product submittal. The manufacturer shall demonstrate the following interoperability with at least one other codec manufacturer. Compatibility shall also include successful transmission of PTZ commands. The demonstration shall be comprised of the following parts:

- **Codec CCTV camera PTZ compatibility.** The demonstration shall include a pair of the proposed codecs, a proposed CCTV camera, and a CCTV camera of another manufacturer other than the proposed CCTV which is of a manufacturer already installed in the State system.
- **Video interoperability.** The demonstration shall demonstrate the following interoperability: The proposed encoder shall be capable of encoding a video stream that is decodable by at least one other Manufacturer compiling with this specification, or of a manufacturer which equipment is presently in use by IDOT District 1 at the time of bidding. The interoperability demonstration shall be conducted in multicast mode.
- **Software video decoding.** A software based video decoder with PTZ control shall be provided for viewing and controlling a video stream remotely over the IP network.

- **Video snapshot capability.** A fully functional copy of the proposed video snapshot program shall be provided for the demonstration and throughout the 10 day period described herein.

After a successful demonstration of the above requirements, the codec pair shall remain with the Department for 10 working days for further observation. After 10 working days, the Contractor may pick up the codec pair. All costs for this demonstration shall be included in the cost of this pay item. It is the Contractor's responsibly to provide all hardware (including dome CCTV cameras and Ethernet switches) and software to perform the demonstrations as specified.

Gigabit Ethernet switch

General Requirements. The Ethernet switch shall be an environmentally hardened Ethernet switch compliant with IEEE 802.3 (10Mbps) and IEEE 802.3u (100Mbps) as manufactured by RuggedCom, Series RS900G or approved equal.

Operating Environment. The Ethernet switch shall be capable of operating properly over an ambient temperature range of -40°C to +85°C without the use of internal or external cooling fans in accordance with IEC 60068-2-1 and 60068-2-2. The Ethernet switch shall be capable of operating properly in relative humidity conditions of 95% non-condensing at 55°C in accordance with IEC 60068-2-30. The Ethernet switch shall meet the environmental requirements of traffic control equipment in accordance with NEMA TS 2 (1998), Section 2: Environmental Requirements. Specifically NEMA TS 2 1998 (Section 2.2.8)

- a. Vibration in each of the 3 mutually perpendicular planes.
- b. Vibration frequency sweep of 5 to 30 Hz
- c. Vibration strength = 0.5g
- d. Duration = 3 hours, 1 hour at each plane

The manufacturer shall provide evidence of independent testing verifying performance. In general, the Ethernet switch shall comply with the environmental requirements outlined in Table 1. The Ethernet switch shall be capable of operating properly when exposed to radiated electric fields of up to 10V/m continuously and magnetic fields of up to 40A/m continuously. In general, the Ethernet switch shall comply with the EMI Immunity requirements given in IEC 61850-3 and IEEE1613. The Ethernet switch shall also pass the minimum EMC immunity requirements of EN61800-3. EN61800-3 A11 is the IEC standard for EMC emissions and immunity requirements for Adjustable Speed Power Drive Systems.

Port Requirements. The Ethernet switch shall have 8 10/100BaseTX ports 2 - 1000BaseX fiber optical ports. All fiber optic link ports shall be capable of Multimode or Single mode. The Ethernet switch shall have the option of both small form pluggable (SFP) optics and fixed (soldered on) optics. Single mode optics shall support distances up to 70km. The Ethernet switch shall support the following requirements and options:

10/100BaseTX ports:

- RJ45 connectors
- Cable type: Category 5, unshielded twisted pair (CAT 5 UTP)
- Segment Length: 100m
- Auto-negotiation support (10/100Mbps)
- Auto MDIX crossover capability
- TVS (Transient voltage suppression) between Line +/-, Line +/--ground, to protect the circuitry.
- Full Duplex operation (IEEE 802.3x)

1000BaseX fiber optical ports:

- SFP (small form pluggable)
- LC Connectors (multi-mode), LC or SC Connectors (single-mode)_
- Optical Characteristics: 850 nm multi-mode, 1310 nm single-mode, 1550nm single-mode
- Supports Fiber Type: 62.5/125 um multi-mode fiber, 9/125 um single-mode fiber
- Segment Length: + 2 km with multi-mode fiber, Minimum Optical Budget 14 dB @ 850 nm
- Optical Budget single-mode fiber: minimum 17 dB @ 1310 nm
- Full Duplex operation (IEEE 802.3x)
- Optical power shall be sufficient to transport the signal back to the I55 Wiegth Station video collection hut.

Networking Requirements. The Ethernet switch shall support automatic address learning of up to 8192 MAC addresses. The Ethernet switch shall support the following advanced layer 2 functions:

- IEEE 802.1Q VLAN, with support for up to 255 VLANs and 4096 VLAN ID's.
- IEEE 802.1p priority queuing
- IEEE 802.1w rapid spanning tree
- IEEE802.1Q-2005 MSTP (formerly 802.1s)
- IEEE 802.1Q-2005 standard GMRP
- IEEE 802.3x flow control
- IEEE.802.3ad-Link Aggregation
- IGMPv2 with 256 IGMP groups
- Port Rate Limiting
- Configuration via test file which can be modified through standard text editor
- Forwarding/filtering rate shall be 14,880 packets per second (PPS) for 10Mps, 148,800 for 100Mps, 1,488,000 for 1000Mps
- DHCP Option 82

Network Management Functionality Requirements. The Ethernet switch shall provide the following network management functions

- SNMPv2, SNMPv3
- RMON
- GVRP
- Port Mirroring
- 802.1x port security
- SSL – Secure Socket Layer
- SSH – Secure Shell
- TFTP
- Network Time Protocol (NTP),
- Simple Network Time Protocol (SNTP)
- Management via web or Telnet
- Built in Protocol Analyzer which enables traces to be run from within the Ethernet switch operating system. Must be able to forward traces to an IP address or UDP port. Traces for must include but not be limited to the following: STP, MAC, Link, IGMP, GVRP, PPP, Transport, DHCPRA, 802.1X, WEBS, SNMP, IP, TacPlus, Radius, FORW, IPASSIGN, TRANSPORT

Additionally, the Ethernet switch shall demonstrate to provide sub 15 ms failover per Ethernet switch hop in a ring topology.

Programmable Critical Failure Relay. The Ethernet switch shall provide a programmable critical failure out relay that may be configured to activate upon critical error detection such as loss of link or detection of critical system errors. This function shall be user enabled and programmable. The output contacts shall be available in a Form-C configuration with Max Current at 2A@250 VAC, .15A@125VDC, 2@20VDC.

Power Supply Requirements. The Ethernet switch shall be supplied with provisions for operation at the following power supply inputs, 85 to 264 Vac (50/60Hz). The power supply shall be internal to the Ethernet switch. Power supply shall have two stage isolation accomplished via two transformers which step down from primary AC/DC to VDC. A power cord of not less than 5 feet in length shall be supplied as well. The Ethernet switch shall require no more than 15W of power.

'Hipot' Testing in the Field The Ethernet switch shall allow for dielectric strength ('hipot') tests in the field, in accordance with IEC 60255-5, by trained personnel. It shall be capable of enduring a test voltage of at least 2kVrms on power supply inputs above 60V and 0.5kVrms on power supply inputs below 60V. A removable grounding wire shall be provided to allow disconnecting of any transient suppression circuitry at the power supply input to allow for 'hipot' testing without activating the transient suppression circuitry.

Mounting Requirements. The Ethernet switch shall provide options for DIN Rail mounting or panel mounting via brackets

Warranty. The Ethernet switch shall be warranted for defects in material and workmanship for five (5) years after shipment. The Warranty shall include software updates and 7x24 phone support for the 5 year warranty period.

Environmental Requirements. The Ethernet switch shall comply with the atmospheric, vibration, shock and bump requirements outlined in Table 1. This compliance shall be demonstrated by type withstands tests (i.e. 'type tests') as outlined in Table 1 and summarized in a Type Test Report per the test report requirements of each of the standards given in Table 1.

Table 1: Environmental Tests				
Test	Description		Test Level	Severity
IEC 60068-2-1	Cold Temp	Test Ad	-40 deg. C, 16 hours	N/A
IEC 60068-2-2	Dry Heat	Test Bd	+85 deg. C, 16 hours	N/A
IEC 60068-2-30	Humidity	Test Db	95% (non-condensing), 55 deg. C, 6 cycles	N/A
IEC 60255-21-1	Vibration	Test Fc		Class 1
IEC 60255-21-2	Shock	Test Ea		Class 1
IEC 60255-21-2	Bump	Test Eb		Class 1

Safety Requirements / Agency Approvals. The Ethernet switch shall comply with the following electrical safety requirements or equivalents: UL60950 or CSA C22.2 No. 60950 (safety requirements for IT equipment). The Ethernet switch shall also have CE (Europe) qualification. The Ethernet switch shall also comply with FCC Part15 Class A for EMI emissions.

Fiber Optic Cable Termination

The Contractor shall include all necessary wires and cables necessary to interconnect the components of the CCTV cabinet. The Contractor shall provide a factory terminated patch block with a 12 fiber pigtail of sufficient length to connect to the lateral splice handhole without the use of any intermediate splices. The patch block shall be a Fiber Connections, Gator Patch II or approved equal..

Method Of Measurement. CCTV equipment shall be counted, each installed.

Basis Of Payment. This item shall be paid at the contract unit each for **CLOSE CIRCUIT TELEVISION EQUIPMENT, FIBER OPTIC DISTRIBUTION.**

CCTV VIDEO CODEC
 Effective: September 1, 2012

Description.

The decoders shall be dedicated hardware devices. The codec shall be a single video channel type to transfer "full motion" 30 frame-per-second high quality D1 color video at up to 20 Megabits per second. The units shall operate to produce a robust data communications stream that shall allow for both video and audio transmission and shall be immune to timing disruptions in the existing IP multi-cast system.

The units shall be rack-mountable, or single unit chassis for single unit installation complete with power supplies as required, operating from a 120-volt single phase AC power input. Units mounted in VCPs or other control building shall be rack mountable and include standard 19” racks with dual redundant power supplies.

Decoders shall have multi-stream format detection, and decode H.2 64, MPEG-4 and MJPEG streams.

Approvable codecs shall be compatible with and demonstrably interoperable with the standard codec product of at least one other vendor. Final approval of codec equipment shall be dependent upon a demonstration test of multi-vendor interoperability. Initial submittal information shall include documentation of this interoperability and a demonstration testing plan for approval by the Engineer.

The CODEC decoders shall be Optelecom-NKF series S-60 D-MC, or approved equal by the Engineer. The Approved equal shall be 100% interchangeable with the specified unit with respect to functionality and performance.

Materials shall be supplied to satisfy the following:

Video	Requirements
Video channels	1x PAL/NTSC (Auto/PAL/NTSC)
Output level	1 Vpp (±3 dB)
Compression algorithms	H.264 BP (ISO/IEC 14496-10), MJPEG, MPEG-4 (ISO/IEC 14496-2, ISMA comp.)
Type of streaming	UDP/IP (multi- and/or unicast)
Decoding latency	TBD
Resolution	D1, ½D1, 2CIF, CIF, QCIF, VGA
GOP structure	I, IP
Frame rate	1 to 30 fps
On Screen Display (OSD)	3x Text lines (configurable: position, color, border/outline color, font size), 1x image in BMP, GIF, or JPEG format configurable: position, scaling)
Live View encoder (MJPEG)	HTTP, FTP pull
Connector type	BNC 75Ω (gold plated center pin)

Transmission interface	Requirements
Number of interfaces	1
Interface 10/100Base-TX	Fast Ethernet Auto Negotiation, half-duplex/full-duplex, 10/100 Mb
SFP option	Empty SFP slot for 100 Mbps SFP device
Protocols	H.264 BP, MPEG-4 ES, (M)JPEG, RTP, RTCP, RTSP, TCP, UDP, IP, DHCP, IGMPv2,(S)NTP, MX/IP, HTTP, SNMP v2, FTP, TelNet, SAP,

	UPnP
Connector type	RJ45

Power	Requirements
Power consumption	<5W
Rack-mount units	MC 10 and MC11 power supply cabinets
Stand-alone units (/SA)	11 to 19 VDC (PSA-12 DC/25 or PSR-12 DC)

Management	Requirements
LED status indicators	
DC	Power-on indicator (green)
SYNC	All links are operational (green); failure in RX stream(s) (yellow); failure in TX stream(s) (red)
Ethernet port	Green LED: on=100 Mb, off=10 Mb; Amber LED: on=link okay, flashes with activity
Network Management & Control	SNMP v2, MX™, HTTP API, HTML (password protected)

Environmental	Requirements
Operating temperature	+14° F to +140° F (-10 °C to +60 °C)
Relative humidity	<95% as long as there is no condensation.
MTBF	TBD
Safety & EMC	TBD

Contact Closures	Requirements
Number of channels	2x in, 2x out
Number of streams	2x 3 (multi- and/or unicast)
Output	Fail-safe, potential-free
Connector type	RJ45

Data	Requirements
Number of channels	2 (full-duplex)
Number of streams	2x 3 (multi- and/or unicast)
Interfaces	1x RS232 1x RS422/485 (2- or 4-wire)
Stream	TCP/UDP/MX configurable
Data rate	300 b/s to 230.4 kb/s
Connector type	RJ45

Audio	Requirement
Number of channels	2 (stereo, full-duplex)
Number of streams	3 (multi- and/or unicast)
Maximum bandwidth	20 Hz to 20 kHz

Sampling resolution	8/16-bits linear PCM or G.711
Input level	Adjustable, mic or line
Output level	Adjustable, 3 Vrms max.
Input impedance	>20 kΩ or 600Ω bal.
Output impedance	<100Ω bal.
Connector type	RJ45

The decoders shall be UL listed and be type-accepted to 47 CFR (FCC), Part 15, Type A.

The Codecs shall be the standard product of an established North American manufacturer. The manufacturer shall have been in business for a minimum of 7 years. The manufacturer shall provide a minimum of a twelve (12) month warranty from the date of installation. The manufacturer shall provide technical support via email, fax and telephone. The above forms of support shall be provided Monday through Friday, 8:00am to 5:00pm EST. The Manufacturer shall also have a repair facility within North America.

The units shall be 19-inch rack-mountable, complete with power supplies as required for the rack configurations indicated on the plans, operating from a 120-volt single phase AC power input

The codecs shall be fully capable of transmitting the PTZ commands of the CCTV camera manufacturer being furnished under this contract as well as existing Philips/Bosch, Pelco, Vicon and Cohu camera commands. Serial data will be transmitted over TCP-IP. Each serial port must support IP addressing with the ability to select the appropriate IP socket number. The codecs must provide the ability to establish an IP connection directly from a workstation to any encoder IP address and socket number to pass serial data. Transmission of serial data must be independent of the video stream. Any serial data conversion required by the codec to communicate to the camera shall be included in this pay item and shall not be paid for separately.

The Encoder/Decoder serial data port must support Multicast data to broadcast a single serial data input to multiple remote encoder serial data port recipient. Bi-directional data must be supported on the codecs.

A demonstration of this low speed serial data transfer shall be required before material submittal approval is given. See submittal requirements in this Special Provision.

Codec operation and management. Each unit must support a local console accessible using one of the serial interfaces to provide access to all configuration menus of the product including the initial IP address configuration as well as for troubleshooting purposes. The interface must be menu driven for novice users.

All units (encoders and decoders) must support SNMPv2 management protocol to provide the ability to control and monitor all configuration parameters and diagnostics from any 3rd party SNMP management application.

The Encoders/Decoders must support firmware updates from a central site. Updates must be downloadable to a single unit or by bulk via a single command from a firmware utility application via the Ethernet network. The firmware utility application must provide confirmation of the successful and unsuccessful updates. Upon completing of the update, the units must resume to original configuration without the need to reload the unit configuration.

Method Of Measurement. Video decoders shall be counted, each installed.

Basis Of Payment. This item shall be paid at the contract unit each for **CCTV VIDEO CODEC** as specified.

COMMUNICATIONS VAULT

Effective: March 1, 2010

Description.

Work under this item shall consist of constructing a composite concrete handhole a cover, in accordance with the details shown on the plans and as specified herein.

Materials. The composite concrete handhole and two piece vault lid shall be constructed of polymer concrete material, and shall be gray in color.

The composite concrete handhole shall be 48 inches x 48 inches and shall have an effective depth of 36 inches.

The composite concrete handhole and cover shall have a design/test loading of 22,500/33,750 lbs. respectively. The cover shall have a permanently recessed logo that reads "IDOT COMMUNICATIONS", or as otherwise designated by the Engineer. The composite concrete handhole lid shall have two ½-in x 4-in pull slots. The lid surface shall have a coefficient of friction of 0.50 in accordance with ASTM C-1028.

The Contractor shall install manufacturer-approved gasketing between the lid and the handhole to prevent water from entering the composite concrete handhole.

The composite concrete handhole lid shall be secured to the vault with two 3/8-inch NC stainless steel penta-head bolts and washers to lock the lid. In addition, a "lock tool" shall be provided for composite concrete handhole entry.

A fiber optic cable support assembly shall be recommended by the manufacturer and approved by the Engineer for fiber optic cable and splice enclosures used in the vault. Each support assembly shall consist of multiple brackets, racks, and/or rails required to suspend the required surplus cabling and any splice enclosures required.

The support assembly shall be made from or coated with weather resistant material such that there is no corrosion of the supports. The support assemblies shall be anchored to the vault using stainless steel hardware.

The fiber optic cable support assemblies shall be included in the Contract unit price for the composite concrete handhole. Void areas between openings and conduit shall be filled with self-curing caulking consisting of a permanent, flexible rubber which is unaffected by sunlight, water, oils, mild acids or alkalis. The caulking shall be mildew resistant and non-flammable. The material shall provide a permanent bond between the conduit entering the vault and the polymer concrete. The caulking shall be gray in color.

CONSTRUCTION REQUIREMENTS

Composite concrete handholes shall be installed in accordance with applicable requirements of Section 800 of the Standard Specifications and as provided herein.

A manufacturer-approved knockout punch driver shall be used to provide openings in the vaults for conduit, or the required openings may be machined at the time of stackable vault fabrication. Voids between entering conduits and punch driven or machined openings shall not exceed ½-inch.

Any void areas shall be caulked from the interior and exterior of the composite concrete handhole. The caulk shall be allowed to fully cure per the manufacturer's specifications, prior to backfilling.

The composite concrete handhole shall be placed on 12 inches of coarse aggregate, CA-5 or CA 7 Class A, as specified in Section 1004 of the Standard Specifications. Seal and flash test the vault per the manufacturer's recommendations.

A minimum of 150 feet of excess cable per cable run shall be coiled in each composite concrete handhole containing splices to allow moving the splice enclosure to the splicing vehicle unless otherwise indicated in the plans.

Basis of Payment. This item will be paid for at the contract unit price each for **COMMUNICATIONS VAULT**, of the size indicated, which shall be payment in full for all material and work as specified herein.

FIBER OPTIC CABLE, SINGLE MODE

Effective: September 1, 2012

Description. The Contractor shall furnish and install loose-tube, single-mode, fiber optic cable of the number of fibers specified as shown in the plans and as directed by the Engineer.

Other ancillary components, required to complete the fiber optic cable plant, including but not limited to, moisture and water sealants, cable caps, fan-out kits, etc., shall be included in the cost of fiber optic cable and will not be paid for separately.

Materials The single-mode, fiber optic cable shall incorporate a loose, buffer-tube design. The cable shall be an accepted product of the United States Department of Agriculture Rural Utilities Service (RUS) 7 CFR 1755.900 and meet the requirements of ANSI/ICEA Standard for Fiber Optic Outside Plant Communications Cable, ANSI/ICEA S-87-640-1999 for a single sheathed, non-armored cable, and shall be new, unused and of current design and manufacture.

Fibers.

The cables shall use dispersion unshifted fibers. The optical and physical characteristics of the un-cabled fibers shall include:

The single-mode fiber shall meet EIA/TIA-492CAAA, "Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers," and ITU recommendation G.652.D, "Characteristics of a single-mode optical fiber cable."

Physical Construction			
Requirement		Units	Value
Cladding Diameter		(μm)	125.0 ± 0.7
Core-to-Cladding Concentricity		(μm)	≤ 0.5
Cladding Non-Circularity			$\leq 0.7 \%$
Mode Field Diameter	1310 nm	(μm)	9.2 ± 0.4
	1550 nm		10.4 ± 0.5
Coating Diameter		(μm)	245 ± 5
Colored Fiber Nominal Diameter		(μm)	253 - 259
Fiber Curl radius of curvature		(m)	$> 4.0 \text{ m}$
Optical Characteristics			
Requirement		Units	Value
Cabled Fiber Attenuation	1310 nm	(dB/km)	≤ 0.4
	1550 nm		≤ 0.3
Point discontinuity	1310 nm	(dB)	≤ 0.1
	1550 nm		≤ 0.1
Macrobend Attenuation	Turns	Mandrel OD	
	1	$32 \pm 2 \text{ mm}$	< 0.05 at 1550 nm
	100	$50 \pm 2 \text{ mm}$	< 0.05 at 1310 nm
	100	$50 \pm 2 \text{ mm}$	< 0.10 at 1550 nm
	100	$60 \pm 2 \text{ mm}$	< 0.05 at 1550 nm
	100	$60 \pm 2 \text{ mm}$	< 0.05 at 1625 nm
Cable Cutoff Wavelength (λ_{ccf})		(nm)	< 1260
Zero Dispersion Wavelength (λ_0)		(nm)	$1302 \leq \lambda_0 \leq 1322$
Zero Dispersion Slope (S_0)		(ps/(nm ² •km))	≤ 0.089
Total Dispersion	1550 nm	(ps/(nm•km))	≤ 3.5
	1285-1330 nm		≤ 17.5
	1625 nm		≤ 21.5
Cabled Polarization Mode Dispersion		(ps/km ²)	≤ 0.2
IEEE 802.3 GbE - 1300 nm Laser Distance		(m)	up to 5000
Water Peak Attenuation: 1383 \pm 3 nm		(dB/km)	≤ 0.4

Cable Construction.

The number of fibers in each cable shall be as specified on the plans.

Optical fibers shall be placed inside a loose buffer tube. The nominal outer diameter of the buffer tube shall be 3.0 mm. Each buffer tube shall contain up to 12 fibers. The fibers shall not adhere to the inside of the buffer tube.

Each fiber shall be distinguishable by means of color coding in accordance with TIA/EIA-598-B, "Optical Fiber Cable Color Coding." The fibers shall be colored with ultraviolet (UV) curable inks.

Buffer tubes containing fibers shall be color coded with distinct and recognizable colors in accordance with TIA/EIA-598-B, "Optical Fiber Cable Color Coding." Buffer tube colored stripes shall be inlaid in the tube by means of co-extrusion when required. The nominal stripe width shall be 1 mm.

For cables containing more than 12 buffer tubes, standard colors are used for tubes 1 through 12 and stripes are used to denote tubes 13 through 24. The color sequence applies to tubes containing fibers only, and shall begin with the first tube. If fillers are required, they shall be placed in the inner layer of the cable. The tube color sequence shall start from the inside layer and progress outward.

In buffer tubes containing multiple fibers, the colors shall be stable across the specified storage and operating temperature range and shall not be subject to fading or smearing onto each other. Colors shall not cause fibers to stick together.

The buffer tubes shall be resistant to external forces and shall meet the buffer tube cold bend and shrinkback requirements of 7 CFR 1755.900.

Fillers may be included in the cable core to lend symmetry to the cable cross-section where needed. Fillers shall be placed so that they do not interrupt the consecutive positioning of the buffer tubes. In dual layer cables, any fillers shall be placed in the inner layer. Fillers shall be nominally 2.5 mm or 3.0 mm in outer diameter.

The central member shall consist of a dielectric, glass reinforced plastic (GRP) rod (optional steel central member). The purpose of the central member is to provide tensile strength and prevent buckling. The central member shall be overcoated with a thermoplastic when required to achieve dimensional sizing to accommodate buffer tubes/fillers.

Each buffer tube shall contain a water-swellaable yarn for water-blocking protection. The water-swellaable yarn shall be non-nutritive to fungus, electrically non-conductive, and homogeneous. It shall also be free from dirt or foreign matter. This yarn will preclude the need for other water-blocking material; the buffer-tube shall be gel-free. The optical fibers shall not require cleaning before placement into a splice tray or fan-out kit.

Buffer tubes shall be stranded around the dielectric central member using the reverse oscillation, or "S-Z", stranding process.

Water swellable yarn(s) shall be applied longitudinally along the central member during stranding.

Two polyester yarn binders shall be applied contrahelicly with sufficient tension to secure each buffer tube layer to the dielectric central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking, and dielectric with low shrinkage.

For single layer cables, a water swellable tape shall be applied longitudinally around the outside of the stranded tubes/fillers. The water swellable tape shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free from dirt and foreign matter.

For dual layer cables, a second (outer) layer of buffer tubes shall be stranded over the original core to form a two layer core. A water swellable tape shall be applied longitudinally over both the inner and outer layer. The water swellable tape shall be non-nutritive to fungus, electrically non-conductive, and homogenous. It shall also be free from dirt and foreign matter.

The cables shall contain one ripcord under the sheath for easy sheath removal.

Tensile strength shall be provided by the central member, and additional dielectric yarns as required.

The dielectric yarns shall be helically stranded evenly around the cable core.

The cables shall be sheathed with medium density polyethylene (MDPE). The minimum nominal jacket thickness shall be 1.4 mm. Jacketing material shall be applied directly over the tensile strength members (as required) and water swellable tape. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus.

The MDPE jacket material shall be as defined by ASTM D1248, Type II, Class C, Category 4 and Grades J4, E7 and E8.

The jacket or sheath shall be free of holes, splits, and blisters.

The cable jacket shall contain no metal elements and shall be of a consistent thickness.

Cable jackets shall be marked with the manufacturer's name, month and year of manufacture, sequential meter or foot markings, a telecommunication handset symbol as required by Section 350G of the National Electrical Safety Code (NESC), fiber count, and fiber type. The actual length of the cable shall be within -0/+1% of the length markings. The print color shall be white, with the exception that cable jackets containing one or more co-extruded white stripes, which shall be printed in light blue. The height of the marking shall be approximately 2.5 mm.

The maximum pulling tension shall be 2700 N (608 lbf) during installation (short term) and 890 N (200 lbf) long term installed.

The shipping, storage, and operating temperature range of the cable shall be -40°C to +70°C. The installation temperature range of the cable shall be -30°C to +70°C.

General Cable Performance Specifications

The fiber optic cable manufacturer shall provide documentation and certify that the fiber optic cable complies with the following EIA-455-xxx Fiber Optic Test Procedures (FOTP):

When tested in accordance with FOTP-3, "*Procedure to Measure Temperature Cycling Effects on Optical Fibers, Optical Cable, and Other Passive Fiber Optic Components*," the change in attenuation at extreme operational temperatures (-40°C and +70°C) shall not exceed 0.15 dB/km at 1550 nm for single-mode fiber and 0.3 dB/km at 1300 nm for multimode fiber.

When tested in accordance with FOTP-82, "*Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable*," a one meter length of unaged cable shall withstand a one meter static head or equivalent continuous pressure of water for one hour without leakage through the open cable end.

When tested in accordance with FOTP-81, "*Compound Flow (Drip) Test for Filled Fiber Optic Cable*," the cable shall exhibit no flow (drip or leak) of filling and/or flooding material at 70°C.

When tested in accordance with FOTP-41, "*Compressive Loading Resistance of Fiber Optic Cables*," the cable shall withstand a minimum compressive load of 220 N/cm (125 lbf/in) applied uniformly over the length of the sample. The 220 N/cm (125 lbf/in) load shall be applied at a rate of 2.5 mm (0.1 in) per minute. The load shall be maintained for a period of 1 minute. The load shall then be decreased to 110 N/cm (63 lbf/in). Alternatively, it is acceptable to remove the 220 N/cm (125 lbf/in) load entirely and apply the 110 N/cm (63 lbf/in) load within five minutes at a rate of 2.5 mm (0.1 in) per minute. The 110 N/cm (63 lbf/in) load shall be maintained for a period of 10 minutes. Attenuation measurements shall be performed before release of the 110 N/cm (63 lbf/in) load. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fibers and 0.30 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-104, "*Fiber Optic Cable Cyclic Flexing Test*," the cable shall withstand 25 mechanical flexing cycles around a sheave diameter not greater than 20 times the cable diameter. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber and 0.30 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-25, "*Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies*," except that the number of cycles shall be two at three locations along a one meter cable length and the impact energy shall be at least 4.4 Nm (in accordance with ICEA S-87-640)", the change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber and 0.30 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-33, "*Fiber Optic Cable Tensile Loading and Bending Test*," using a maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a rated tensile load of 2670N (601 lbf) and residual load of 30% of the rated installation load. The axial fiber strain shall be $\leq 60\%$ of the fiber proof level after completion of 60 minute conditioning and while the cable is under the rated installation load. The axial fiber strain shall be $\leq 20\%$ of the fiber proof level after completion of 10 minute conditioning and while the cable is under the residual load. The change in attenuation at residual load and after load removal shall not exceed 0.15 dB at 1550 nm for single mode fiber and 0.30 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-85, "*Fiber Optic Cable Twist Test*," a length of cable no greater than 2 meters shall withstand 10 cycles of mechanical twisting. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber and 0.30 dB at 1300 nm for multimode fiber.

When tested in accordance with FOTP-37, "*Low or High Temperature Bend Test for Fiber Optic Cable*," the cable shall withstand four full turns around a mandrel of ≤ 20 times the cable diameter after conditioning for four hours at test temperatures of -30°C and $+60^{\circ}\text{C}$. Neither the inner or outer surfaces of the jacket shall exhibit visible cracks, splits, tears, or other openings. The change in attenuation shall not exceed 0.30 dB at 1550 nm for single mode fiber and 0.50 dB at 1300 nm for multimode fiber.

Quality Assurance Provision

All cabled optical fibers > 1000 meters in length shall be 100% attenuation tested. The attenuation of each fiber shall be provided with each cable reel. The cable manufacturer shall be TL 9000 registered.

Packaging

Top and bottom ends of the cable shall be available for testing. Both ends of the cable shall be sealed to prevent the ingress of moisture. Each reel shall have a weather resistant reel tag attached identifying the reel and cable. The reel tag shall include the following information:

- Cable Number
- Gross Weight
- Shipped Cable Length in Meters
- Job Order Number
- Product Number
- Customer Order Number
- Date Cable was Tested
- Manufacturer Order Number
- Cable Length Markings
 - a: Top (inside end of cable)
 - b: Bottom (outside end of cable)

The reel (one flange) marking shall include:

- Manufacturer
- Country of origin
- An arrow indicating proper direction of roll when handling
- Fork lift-handling illustration
- Handling Warnings.

Each cable shall be accompanied by a cable data sheet. The cable data sheet shall include the following information:

- Manufacturer Cable Number
- Manufacturer Product Number
- Manufacturer Factory Order Number
- Customer Name
- Customer Cable Number
- Customer Purchase Order Number
- Mark for Information
- Ordered Length
- Maximum Billable Length
- Actual Shipped Length
- Measured Attenuation of Each Fiber

The cable shall be capable of withstanding a minimum-bending radius of 20 times its outer diameter during installation and 10 times its outer diameter during operation without changing the characteristics of the optical fibers.

The cable shall meet all of specified requirements under the following conditions:

- Shipping/storage temperature: -58° F to +158° F (-50° C to +70° C)
- Installation temperature: -22° F to +158° F (-30° C to +70° C)
- Operating temperature: -40° F to +158° F (-40° C to +70° C)
- Relative humidity from 0% to 95%, non-condensing

Optical Patch Cords and Pigtails.

The optical patch cords and pigtails shall comply with the following:

- The optical patch cords shall consist of a section of single fiber, jacketed cable equipped with optical connectors at both ends.
- The factory installed connector furnished as part of the optical patch cords and pigtails shall meet or exceed the requirements for approved connectors specified herein.
- The fiber portion of each patch cord and pigtail shall be a single, jacketed fiber with optical properties identical to the optical cable furnished under this contract.
- The twelve fiber single-mode fiber optic cable shall be installed as a pigtail with factory installed ST compatible connectors.
- The patch cords shall comply with Telcordia GR-326-CORE

Connectors.

The optical connectors shall comply with the following:

- All connectors shall be factory installed ST compatible connectors. Field installed connectors shall not be allowed.
- Maximum attenuation 0.4dB, typical 0.2dB.
- No more than 0.2dB increase in attenuation after 1000 insertions.
- Attenuation of all connectors will be checked and recorded at the time of installation with an insertion test minimum 5 times checked with an OTDR.
- All fibers shall be connectorized at each end.
- All fibers shall terminate at a fiber patch panel
- Unused fibers will be protected with a plastic cap to eliminate dust and moisture.
- Termination shall be facilitated by splicing factory OEM pigtails on the end of the bare fiber utilizing the fusion splicing method. Pigtails shall be one meter in length.

CONSTRUCTION REQUIREMENTS

Experience Requirements.

Personnel involved in the installation, splicing and testing of the fiber optic cables shall meet the following requirements:

- A minimum of three (3) years experience in the installation of fiber optic cables, including fusion splicing, terminating and testing single mode fibers.
- Install two systems where fiber optic cables are outdoors in conduit and where the systems have been in continuous satisfactory operation for at least two years. The Contractor shall submit as proof, photographs or other supporting documents, and the names, addresses and telephone numbers of the operating personnel who can be contacted regarding the installed fiber optic systems.
- One fiber optic cable system (which may be one of the two in the preceding paragraph), which the Contractor can arrange for demonstration to the Department representatives and the Engineer.

Installers shall be familiar with the cable manufacturer's recommended procedures for installing the cable. This shall include knowledge of splicing procedures for the fusion splicer being used on this project and knowledge of all hardware such as breakout (furcation) kits and splice closures. The Contractor shall submit documented procedures to the Engineer for approval and to be used by Construction inspectors.

Personnel involved in testing shall have been trained by the manufacturer of the fiber optic cable test equipment to be used, in fiber optic cable testing procedures. Proof of this training shall be submitted to the Engineer for approval. In addition, the Contractor shall submit documentation of the testing procedures and a copy of the test equipment operation manual for approval by the Engineer.

Installation in Raceways.

The Contractor shall provide a cable-pulling plan, identifying where the cable will enter the underground system and the direction of pull. This plan will address locations where the cable is pulled out of a handhole, coiled in a figure eight, and pulled back into the hand hole. The plan shall address the physical protection of the cable during installation and during periods of downtime. The cable-pulling plan shall be provided to the Engineer for approval a minimum of 15 working days prior to the start of installation. The Engineer's approval shall be for the operation on the freeway and does not include an endorsement of the proposed procedures. The Contractor is responsible for the technical adequacy of the proposed procedures.

During cable pulling operations, the Contractor shall ensure that the minimum bending of the cable is maintained during the unreeling and pulling operations. Entry guide chutes shall be used to guide the cable into the handhole conduit ports. Lubricating compound shall be used to minimize friction. Corner rollers (wheels), if used, shall not have radii less than the minimum installation-bending radius of the cable. A series array of smaller wheels can be used for accomplishing the bend if the cable manufacturers specifically approve the array.

The pulling tension shall be continuously measured and shall not be allowed to exceed the maximum tension specified by the manufacturer of the cable. Fuse links and breaks can be used to ensure that the cable tensile strength is not exceeded. The pulling system shall have an audible alarm that sounds whenever a pre-selected tension level is reached. Tension levels shall be recorded continuously and shall be given to the Engineer.

The cable shall be pulled into the conduit as a single component, absorbing the pulling force in all tension elements. The central strength member and Aramid yarn shall be attached directly to the pulling eye during cable pulling. "Basket grip" or "Chinese-finger type" attachments, which only attach to the cable's outer jacket, shall not be permitted. A breakaway swivel, rated at 95% of the cable manufacturer's approved maximum tensile loading, shall be used on all pulls. When simultaneously pulling fiber optic cable with other cables, separate grooved rollers shall be used for each cable.

To minimize the exposure of the backbone cable and to facilitate the longer lengths of fiber optic cable, the Contractor shall use a "blown cable" (pneumatically assisted) technique to place the fiber optic cable.

Where cable is to be pulled through existing conduit which contains existing cables, optical or other, the existing cables shall be removed and reinstalled with the fiber optic cable as indicated on the plans. The removal of the cable(s) shall be paid for separately. Reinstallation of the existing cables, if indicated on the plans, along with the fiber optic cable shall be included in this item for payment.

Tracer Wire

A tracer wire shall be installed with all fiber optic cable runs. One tracer wire shall be installed along with the fiber optic cable in each raceway. If a raceway has more than one fiber optic cable, only one tracer wire per raceway is required. If there are parallel raceways, a tracer wire is required in each raceway that contains a fiber optic cable. Tracer wire shall be installed in raceway segments which are metallic to provide a continuous tracer wire system.

The tracer wire shall be a direct burial rated, number 12 AWG (minimum) solid (.0808" diameter), steel core soft drawn high strength tracer wire. The wire shall have a minimum 380 pound average tensile break strength. The wire shall have a 30 mil high density yellow polyethylene (HDPE) jacket complying with ASTM-D-1248, and a 30 volt rating.

Connection devices used shall be as approved by the tracer wire manufacturer, except wire nuts of any type are not acceptable and shall not be used.

The cost of the tracer wire shall be included in the cost of the fiber optic cable and not paid for separately.

Aerial Fiber Optic Cable

Aerial fiber optic cable assemblies shall be of a self-supporting figure-8 design. The fiber optic cable shall be as described herein and shall be waterblocked utilizing water-swallowable materials. The cable assembly shall be designed and manufactured to facilitate midspan access.

The submittal information must include a copy of the standard installation instructions for the proposed cable. Installed cable sag shall not exceed 1% of the span distance. The submittal information must also include catalog cuts for all hardware to be utilized in the installation.

Construction Documentation Requirements

Installation Practices for Outdoor Fiber Optic Cable Systems

The Contractor shall examine the proposed cable plant design. At least one month prior to starting installation of the fiber optic cable plant, the Contractor shall prepare and submit to the Engineer for review and approval, ten (10) copies of the Contractor's "Installation Practices for Outdoor Fiber Optic Cable Systems" manual. This manual shall address the Contractor's proposed practices covering all aspects of the fiber optic cable plant. This submittal shall include all proposed procedures, list of installation equipment, and splicing and test equipment. Test and quality control procedures shall be detailed as well as procedures for corrective action.

Operation and Maintenance Documentation

After the fiber optic cable plant has been installed, ten (10) complete sets of Operation and Maintenance Documentation shall be provided. The documentation shall, as a minimum, include the following:

- Complete and accurate as-built diagrams showing the entire fiber optic cable plant including locations of all splices.
- Final copies of all approved test procedures
- Complete performance data of the cable plant showing the losses at each splice location and each terminal connector.
- Complete parts list including names of vendors.

Testing Requirements

The Contractor shall submit detailed test procedures for approval by the Engineer. All fibers (terminated and unterminated) shall be tested bi-directionally at both 1310 nm and 1550 nm with both an Optical Time Domain Reflectometer (OTDR) and a power meter with an optical source. For testing, intermediate breakout fibers may be concatenated and tested end-to-end. Any discrepancies between the measured results and these specifications will be resolved to the satisfaction of the Engineer.

Fibers which are not to be terminated shall be shall be tested with a temporary fusion spliced pigtail fiber. **Mechanical splice or bare fiber adapters are not acceptable.**

The Contractor shall provide the date, time and location of any tests required by this specification to the Engineer at least 5 days before performing the test. Upon completion of the cable installation, splicing, and termination, the Contractor shall test all fibers for continuity, events above 0.1 dB, and total attenuation of the cable. The test procedure shall be as follows:

A Certified Technician utilizing an Optical Time Domain Reflectometer (OTDR) and Optical Source/Power Meter shall conduct the installation test. The Technician is directed to conduct the test using the standard operating procedures defined by the manufacturer of the test equipment. All fibers installed shall be tested in both directions.

A fiber ring or fiber box shall be used to connect the OTDR to the fiber optic cable under test at both the launch and receive ends. The tests shall be conducted at 1310 and 1550 nm for all fibers.

All testing shall be witnessed by the IDOT Engineer and a copy of the test results (CD ROM or USB Drive) shall be submitted on the same day of the test. Hardcopies shall be submitted as described herein with copies on CD ROM.

At the completion of the test, the Contractor shall provide two copies of documentation of the test results to the Project Engineer. The test documentation shall be submitted as both a bound copy and a CDROM and shall include the following:

Cable & Fiber Identification:

- Cable ID
- Cable Location - beginning and end point
- Fiber ID, including tube and fiber color
- Wavelength
- Pulse width (OTDR)
- Refractory index (OTDR)
- Operator Name
- Date & Time
- Setup Parameters
- Range (OTDR)
- Scale (OTDR)
- Setup Option chosen to pass OTDR "dead zone"

Test Results shall include:

- OTDR Test results
- Total Fiber Trace
- Splice Loss/Gain
- Events > 0.10 dB
- Measured Length (Cable Marking)
- Total Length (OTDR)
- Optical Source/Power Meter Total Attenuation (dB/km)

Sample Power Meter Tabulation:

Power Meter Measurements (dB)									
Location		Fiber No.	Cable Length (km)	A to B		B to A		Bidirectional Average	
A	B			1310 nm	1550 nm	1310 nm	1550 nm	1310 nm	1550 nm
		1							
		2							
Maximum Loss									
Minimum Loss									

The OTDR test results file format must be Bellcore/Telcordia compliant according to GR-196-CORE Issue 2, OTDR Data Standard, GR 196, Revision 1.0, GR 196, Revision 1.1, GR 196, Revision 2.0 (SR-4731) in a ".SOR" file format. A copy of the test equipment manufacturer's software to read the test files, OTDR and power, shall be provided to the Department. These results shall also be provided in tabular form, see sample below:

Sample OTDR Summary					
Cable Designation:	<i>TCF-IK-03</i>	OTDR Location:	<i>Pump Sta. 67</i>	Date:	<i>1/1/00</i>
Fiber Number	Event Type	Event Location	Event Loss (dB)		
			1310 nm	1550 nm	
<i>1</i>	<i>Splice</i>	<i>23500 Ft.</i>	<i>.082</i>	<i>.078</i>	
<i>1</i>	<i>Splice</i>	<i>29000 Ft.</i>	<i>.075</i>	<i>.063</i>	
<i>2</i>	<i>Splice</i>	<i>29000 Ft.</i>	<i>.091</i>	<i>.082</i>	
<i>3</i>	<i>Splice</i>	<i>26000 Ft.</i>	<i>.072</i>	<i>.061</i>	
<i>3</i>	<i>Bend</i>	<i>27000 Ft.</i>	<i>.010</i>	<i>.009</i>	

The following shall be the criteria for the acceptance of the cable:

The test results shall show that the dB/km loss does not exceed +3% of the factory test or 1% of the cable's published production loss. However, no event shall exceed 0.10 dB. If any event is detected above 0.10 dB, the Contractor shall replace or repair the fiber including that event point.

The total loss of the cable (dB), less events, shall not exceed the manufacturer's production specifications as follows: 0.5 dB/km at both 1310 and 1550 nm.

If the total loss exceeds these specifications, the Contractor shall replace or repair that cable run at the no additional cost to the state, both labor and materials. Elevated attenuation due to exceeding the pulling tension during installation shall require the replacement of the cable run at no additional cost to the State, including labor and materials.

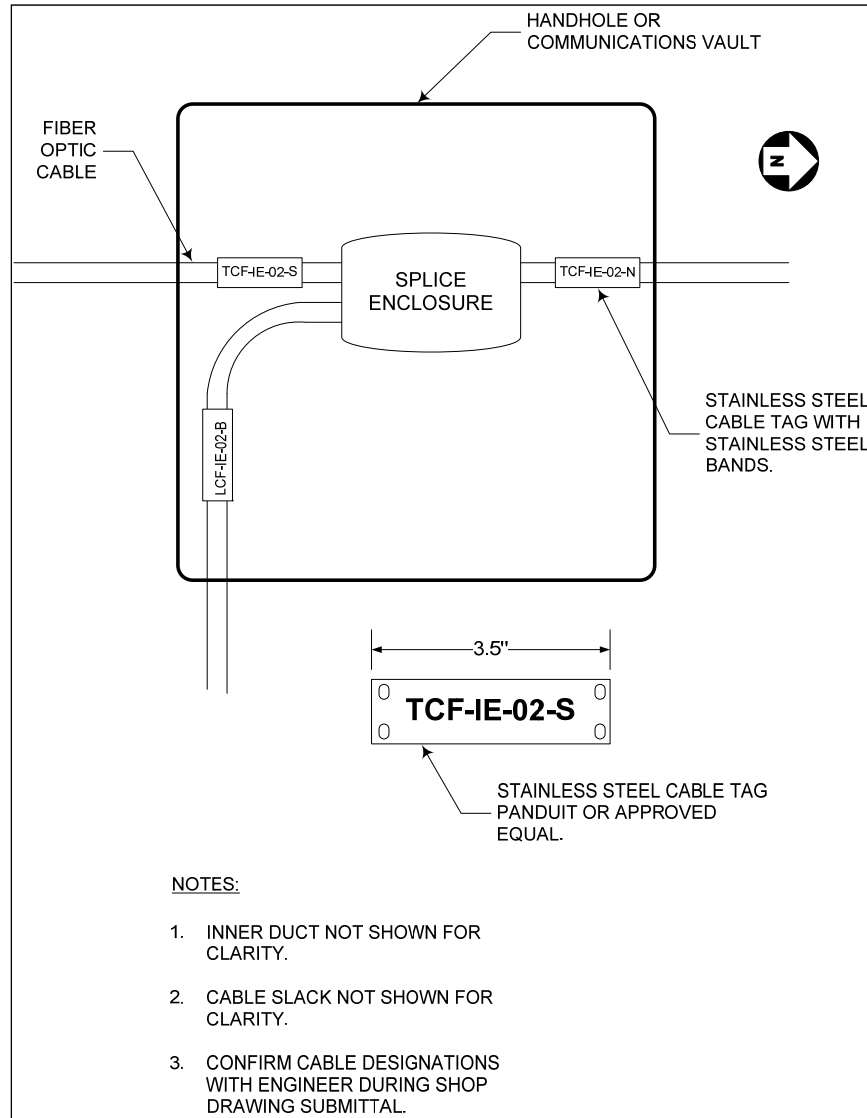
Splicing Requirements

Splices shall be made at locations shown on the Plans. Any other splices shall be permitted only with the approval of the Engineer. Splices will be paid for separately. All splice locations must be identified in the Record Drawings. **Cable runs which dead-end at a handhole, communications vault, interconnect cabinet, or any other type of enclosure, shall be dead ended in a splice enclosure.**

Slack Storage of Fiber Optic Cables.

Included as a part of this item, slack fiber shall be supplied as necessary to allow splicing the fiber optic cables in a controlled environment, such as a splicing van or tent. After splicing has been completed, the slack fiber shall be stored underground in handholes or in the raised base adapters of ground mounted cabinets in accordance with the fiber optic cable manufacturer's guidelines. Fiber optic cable slack shall be 100 feet for each cable at each splice location, above or below ground. Fiber optic cable slack shall be 50 feet for each cable at access points, above or below ground, where splicing is not involved. This slack shall be measured for payment.

Fiber optic cable shall be tagged inside handholes with yellow tape containing the text: "CAUTION - FIBER OPTIC CABLE." In addition, permanent tags, as approved by the engineer, shall be attached to all cable in a hand hole or other break-out environment. These tags shall be stainless steel, nominally 0.75" by 1.72", and permanently embossed. These tags shall be attached with stainless steel straps, and shall identify the cable number, the number of fibers, and the specific fiber count. Tags and straps shall be Panduit or approved equal. See figure below:



Label the destination of each trunk cable onto the cable in each handhole, vault or cable termination panel.

Method of Measurement Fiber optic cable will be measured for payment in feet in place installed and tested. Fiber optic cable will be measured horizontally and vertically between the changes in direction, including slack cable. The entire lengths of cables installed in buildings will be measured for payment

Basis of Payment This work will be paid for at the contract unit price per foot for **FIBER OPTIC CABLE** of the type, size, and number of fibers specified. Payment shall not be made until the cable is installed, spliced and tested in compliance with these special provisions.

LIGHT TOWER (D-1)

Effective: January 1, 2012

1. Description. This work shall consist of furnishing and delivering a light tower complete with lowering device, and all appurtenances required for a complete operating unit.
2. Definitions.

Light Tower: The complete light tower shaft and lowering device as one integral working system.

Shaft: The light tower shaft.

Lowering Device: The components involved with the mounting, operation, and raising and lowering of the luminaire ring, luminaires, and CCTV camera if so equipped.

Tower Height: The height of the tower shall be measured from the bottom of the base plate to the center-line of the luminaire tenon arm. This dimension is also referred to as Mounting Height.

3. Materials. Materials shall be as specified elsewhere herein.
4. Submittals and Certifications. Shop drawings, product data and certifications shall be submitted. The submitted information shall be complete and shall include information relative to all specified requirements suitable for verification of compliance.

THE SUBMITTALS SHALL BE ARRANGED AND CROSS-REFERENCED TO THE SPECIAL PROVISIONS. FAILURE TO CROSS-REFERENCE THE SUBMITTAL INFORMATION WITH THE SPECIAL PROVISIONS WILL RESULT IN THE SUBMITTAL BEING RETURNED WITHOUT REVIEW.

The submittal information shall be dated, current, project specific, identified as to the project, and shall also include the following calculations and certifications:

- Shaft design calculations, including Registered Engineer Certification.
- Lowering device seating force calculations.
- Certification of intent to provide domestic steel in accordance with Article 106.01 of the Standard Specifications.
- Welding details and procedures.
- Letter of intent to provide specified weld inspection reports.
- Confirmation of coordination between anchor rod supplier and tower manufacturer for adequacy of anchor rod assembly.
- Manufacturer's recommended installation procedures.
- Letter of intent to provide manufacturer's representative during installation and to provide specified installation certification.

All certifications shall be notarized.

5. Deleted

6. Light Tower

- 6.1 General. Light towers (high mast poles) shall consist of any poles 24 m (80 ft) or more in length.

Each light tower shall be complete with internal, integral motorized lowering mechanism, luminaire ring, pole top hood, internal electric power cables, luminaire counter-weight (when applicable), and all appurtenances required for a complete operating unit.

The design shall be based upon AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" current at the time the project is advertised. The calculated loading shall incorporate a total combined luminaire weight of 720 lbs and a total projected area of 7.3 m² (24 ft²). The towers shall also comply with AASHTO fatigue Category I.

Light towers shall be designed and constructed so no structural member or other component is applied in excess of the manufacturer's recommended rating (when applicable) or the published rating, whichever is lower.

The light towers shall be of a height and luminaire capacity as indicated and shall be of the non-latching ring support design. A latching-type ring support will not be acceptable.

The tower shall be provided as a single coordinated assembly, with one entity responsible as manufacturer of the whole. One entity must be the manufacturer of the lowering device or the tower shaft, or both, shall warrant the entire coordinated assembly.

- 6.2 Deflection. The design of the tower shaft shall achieve a maximum, fully loaded deflection at the top of the pole, which is not greater than the following percentage of the tower height:

Light Tower Maximum Deflection		
Tower Height		Maximum Deflection as % of Tower Height
Meters	Feet	
49	160	13.70
46	150	10.04
43	140	7.80
40	130	6.02
36	120	10.75
33	110	7.80
30	100	5.30
27	90	4.50
24	80	3.50

6.3 Shaft.

- 6.3.1 The tower shaft shall be a low deflection tapered shaft having polysided, circular, or elliptical cross sections. The shaft cross section at the top shall be not less than 190 mm (7.5 in.) in length across the major axis. The shaft cross section at the bottom shall not be greater than that which is compatible with the base plate bolt circle specified, and shall not be less than 600 mm (24 in.) in length across the minor axis for new installations.
- 6.3.2 All tower shaft components, including, but not limited to the shaft sections, tower sections, base plates, handhole door, handhole reinforcing, rain gutter, and base plate shall be fabricated from high strength, low alloy steel with minimum yield strength of 345,000 kPa (50,000 psi) according to AASHTO M 223 (ASTM A 572 GR 50).
- 6.3.3 Each tower shaft shall be constructed of not more than the following welded or slip fitted sections:

Maximum Light Tower Sections		
Tower Height		Maximum Number of Sections
Meters	Feet	
49	160	4
46	150	4
43	140	4
40	130	4
36	120	3
33	110	3
30	100	3
27	90	3
24	80	2

- 6.3.4 Sections which are slip fitted shall have slip joints with a minimum overlap of 1.5 times the diameter of the bottom of the upper section at the slip joint. Towers having slip joint construction shall be pre-fitted and match marked at the factory and shall be shipped disassembled for assembly at the job site. Slip joints shall be marked with a scribe to allow verification that 1.5 times diameter insertion is provided. A copper bonding jumper, included with the tower, shall bond slip fit pole sections together with a flat copper mesh and UL Listed ground lugs.

6.4 Handhole.

- 6.4.1 Each tower shaft shall be constructed with a handhole/access door for access to power connections and lowering mechanism equipment. The handhole shall be large enough to make the following items visible from an extended operating position and accessible for maintenance: cable drum, transition plate, and the drive train oil level indicator. The handhole shall be sized and arranged to permit removal of the lowering mechanism without excessive dismantling of the equipment. The handhole may be a reinforced opening in the pole shaft as detailed on the plans or may be a part of a flared shaft base assembly as approved by the Engineer. The flared base shall not be considered a separate section of the tower shaft. Minimum opening dimension for the handhole shall be 300 mm x 900 mm (12 in. x 36 in.) and it shall have a lockable door. The handhole shall be located so as to not interfere with the operation of the door clamps, and it shall be positioned on the tower shaft to align on center with one of the anchor bolt (rod) positions and at a minimum height, as detailed on the plans, to facilitate access to mounting nuts with tools required for installation.
- 6.4.2 The handholes in the pole shafts shall have rounded corners and shall be reinforced to maintain the original strength of the tower shaft. Flared base assemblies shall maintain the strength of the shaft and have no nonround protrusions.
- 6.4.3 Handhole Door. The handhole shall have a door with a full-height stainless steel piano hinge, or with not less than two stainless steel hinges. A bolt through a door and frame eyelet shall not constitute an acceptable hinge. Hinges shall be heavy duty, suitable for the weight of the handhole door. The handhole door shall not be warped in any direction. The door hinge shall be attached with stainless steel nuts and bolts.
- 6.4.4 Handhole door gasket. The door/opening shall be gasketed in a manner which will prevent the entry of water into the tower and the door shall have a tight compressive seal employing a tubular gasket to assure compressibility. The gasket shall be a one piece design and shall be jointed by chemical fusion at the bottom of the opening.
- 6.4.5 Handhole door clamps. The door shall be held closed with a 12 gauge captive adjustable, spring loaded, stainless steel clamp assembly. The clamps shall have a depth stop feature to insure uniform sealing pressure at all clamp points. A minimum of four clamps shall be used around the nonhinged sides of the door assembly. The door clamp locations and handhole shall be coordinated with the tower so that the clamps can operate over their full range of movement without any interference from other tower components including anchor bolts which may protrude up to 6" above the top surface of the base plate. The door clamps shall be attached with stainless steel nuts and bolts.

- 6.4.6 Padlock provision. A stainless steel padlock hasp and staple shall be provided for locking the door. Door hardware shall be stainless steel. The door shall be equipped with an integral door stop/hold-open mechanism.
- 6.4.7 Rain Shield. A rain shield shall be placed above the handhole to direct water away from the handhole. The shield shall be fabricated of the same material as the pole shaft, shall have rounded corners, and shall be permanently welded to the shaft. The rain shield cannot interfere with operation of the handhole door or door clamps. Details of the configuration and welding shall be submitted for the Engineer's approval.
- 6.4.8 Cable Hook. A cable hook/cradle, readily accessible from the front of the tower, shall be provided to hang the control operator cable assembly when not in use. The hook or cradle shall be made from steel rod no less than ½-inch in diameter and shall be painted as the pole is. This hook or cradle shall be large enough to hold 25 ft. (7.5m) of power cable and positioned for practical in-field use. The hook shall not have sharp edges or protrusions that could damage the cable, and it shall not interfere with the operation of the lowering mechanism.
- 6.4.9 Ground Lug. Each tower shaft shall have a handhole accessible ground lug welded to the shaft for connection of ground conductors. The lug shall be UL Listed and accessible with the lowering device installed.
- 6.4.10 Interior Bolt Exposure. Bolts attaching the various components to the tower, handhole, and handhole door shall be properly sized and coordinated with the matching nuts so that no more than 0.25" of thread is exposed past the nut when properly tightened.
- 6.5 CCTV component box mounting provision. The tower shaft shall include four (4) mounting standoffs welded to the tower shaft prior to finishing. The standoffs shall be configured as indicated on the drawings and shall be arranged to facilitate the installation of a standard 20" x 16" x 10" NEMA 4X stainless steel junction box as manufactured by Hoffman Enclosures (A-20H1610SSLP) or Electromate Enclosures (E-20H1610SS). The standoffs shall be drilled and tapped to accept a 7/16" diameter bolt.

Two 1" diameter holes shall be drilled and tapped at the upper third of the mounting area to facilitate the installation of conduits from the back of the box to the tower. The locations of these holes may be modified during the submittal process and must be approved by the Engineer. The holes shall be sealed with threaded steel plugs. The junction box mounting holes shall be sealed with threaded stainless steel bolts. The bolt and plug threads shall be coated with a generous amount of anti-seize compound prior to installation.

The manufacturer shall demonstrate that the specified junction box will fit by test fitting an actual junction box and documenting the results with photographs submitted to the Engineer for approval.

6.6 Base Plate.

6.6.1 The base plate shall be factory predrilled (slotted) for the number and configuration of anchor rods as provided in the following table:

Base Plate Configuration				
Tower Height		Min, number anchor rods	Rod Circle	
Meters	Feet		mm	inches
49	160	8	914	36
46	150	8	914	36
43	140	8	914	36
40	130	8	914	36
36	120	8	762	30
33	110	8	762	30
30	100	8	762	30
27	90	8	762	30
24	80	6	762	30

The base plate shall have a round (disk) shape of the specified outer diameter or as otherwise approved by the Engineer. The minimum thickness of the base plate shall be 50 mm (2.0 in.). The base plate shall be circumferentially welded to the tower shaft and, as noted above, the plate shall be oriented such that one anchor rod is aligned with the vertical center line of the handhole.

7. Welding.

7.1 Manufacturer Welding Requirements.

7.1.1 Circumferential welds. Circumferential welds, including top flange welds, shall be full penetration welds.

7.1.2 Longitudinal welds. Longitudinal welds shall have a minimum of 60 percent penetration, except the longitudinal welds on both the male and female shaft sections shall be full penetration welds within a distance of two diameters of overlap joints.

Minimum preheats for welds shall be 40° C (100° F) for fillets, 65° C (150° F) for seams, and 110° C (225° F) for circumferential welds.

Weld procedure specifications for seams and circumferential welds must be qualified according to Section 4, Part B of AWS D1.1. Charpy V-Notch (CVN) impact specimens shall be tested according to Table III-1 (note 2) of Appendix III for minimum values of 34 J (25 ft lb) at 4° C (40° F). Fillet weld procedures shall be tested according to Table 4.4 of AWS D1.1.

The welds shall be smooth and thoroughly cleaned of flux and spatter and be according to the AWS.

All full penetration welds shall be inspected for soundness by the ultrasonic method and all partial penetration welds shall be inspected by the magnetic particle method. Welding inspection reports shall be submitted to the Engineer for approval. The welding symbols and complete information regarding location, type, size, welding sequence, and WPSs shall be shown on all shop drawings. The Contractor shall submit the manufacturer's welding procedures, including inspection procedures, to the Engineer for approval.

- 7.2 Independent Welding Inspection. In addition to manufacturer's own welding inspection, the Contractor shall have welding inspected by an independent Certified Welding Inspector (CWI). The selected inspector shall be approved by the Engineer before any inspecting is performed. The NDE inspector(s) shall be independent nondestructive testing inspector(s), certified as level II in RT, UT, and/or MT as applicable. The methods for testing full penetration and partial penetration welds by the independent welding inspector(s) shall be the same as specified above in section 7.1

The independent welding inspector shall send the test results directly to the Engineers, as follows: Illinois Department of Transportation, Attn: Engineer of Structural Services, 2300 S. Dirksen Parkway, Bureau of Bridges & Structures, Springfield, Illinois 62764 and to: Illinois Department of Transportation, District 1, Attn: Electrical Design Section Chief, Bureau of Traffic Operations, 201 West Center Court, Schaumburg, Illinois 60196. All welds must pass inspection. Any deficient welds must be brought to the attention of the Engineer and corrective measures must be outlined.

8. Light Tower Finish.

8.1 General.

The light tower shall be finished with a duplex finishing system. Towers shall be hot dipped galvanized and then the exterior of the tower shall be painted with an intermediate coat of polyamide epoxy paint and a finish coat of aliphatic polyurethane paint.

Components receiving this duplex coating are the tower shaft, handhole, handhole door, base plate, mounting plate and all other elements attached to the exterior of the shaft.

The luminaire ring shall be painted with a three part paint system consisting of a organic zinc rich aromatic urethane primer, a polyamidoamine epoxy intermediate coat, and an aliphatic acrylic polyurethane finish coat.

The color of the finish coat shall be according to Federal Standard Color Number 6307, Hanford Gray. A color sample shall be included in the submittal information for review and approval.

All cleaning, preparation for painting, and painting shall be done in the same shop to ensure single source responsibility of the entire coating system. Also, all paint materials shall be from a single source to ensure compatibility.

In addition, sequence of operation shall be submitted describing the procedure used in preparing the galvanized surface, the brand names of the paint to be used, and certification that the paint that is used is compatible with galvanized surfaces.

The paint manufacturer shall also submit a detailed field touch-up procedure for the paint system. The procedure shall be specific to the various degrees of damage and shall include, but not limited to, the specific type of touch paint to be used, surface preparation, and application requirements including temperature and humidity ranges.

8.2 Galvanizing. Hot-Dip galvanizing shall be in accordance with the applicable portions of ASTM A 123/123M or A 153/A 153M. Water quenching or chromate conversion coating of the galvanized steel is not allowed.

8.3 Shop conditions, General. The surfaces to be painted after surface preparation must remain free of moisture and other contaminants. The Contractor shall control the operations to insure that dust, dirt, or moisture does not come in contact with surfaces prepared or painted that day. In addition to the manufacturer's written instructions for surface preparation and painting, the following conditions shall apply (when in conflict, the most restrictive conditions shall govern):

The minimum steel and air temperatures shall be 40° F (4° C). Painting shall not be applied to steel that is at a temperature that will cause blistering, porosity, or be otherwise detrimental to the life of the painted surfaces. Painting shall not be applied when the steel surface temperature is less than 5° F (3° C) above the dew point. Painting shall not be applied to wet, damp, or frosted surfaces. Paint shall not be applied when the relative humidity is above 85%. Work accomplished under unfavorable weather conditions will be considered unacceptable and complete re-cleaning and painting of these areas will be required at no additional cost to the State.

All material must be applied under conditions within the following tolerances and permanent records must be kept of the processing conditions during the complete finishing process:

- Air temperature 50° F (10° C) minimum and 90° F (32° C) maximum.
- Steel surface temperature 50° F (10° C) minimum and 100° F (37° C) maximum.
- Humidity 85% maximum.
- Steel temperature at least 5° F (3° C) above the dew point.

8.4 Galvanized Steel Preparation.

The galvanized steel surfaces shall be prepared and primed as soon after galvanizing as possible but the surfaces shall be primed within 24 hours of the galvanizing operations. There should be no visible signs of zinc oxide or zinc hydroxide, which first appear as a fine white powder.

8.4.1 Surface smoothing. Zinc high spots shall be removed by cleaning with hand or power tools as describe in SSPC SP2 or SP3. The zinc should be removed until it is level with the surrounding area, taking care that the basecoating is not removed by the cleaning methods. After cleaning, the surface shall be inspected for conformance to the required zinc thickness in accordance with ASTM A 123 utilizing a magnetic or eddy current type thickness instrument in accordance with ASTM E 376. Any item falling below the required zinc thickness, before or after removal of any high spots, shall be repaired in accordance with practice ASTM A 780.

8.4.2 Surface cleaning. Hot dip galvanized surfaces must be clean and free of oil and grease before they are painted. Absolutely no water quenching or chromate conversion coating is allowed of the galvanized surface that is to be painted, as they will interfere with the adhesion of the paint coatings to the zinc surface. Any of the following methods as deemed necessary by the paint manufacturer shall be used for surface cleaning of the galvanized surfaces. The paint submittal shall indicate the proposed method of surface cleaning.

- Aqueous Alkaline Cleaning. An alkaline solution, with a pH of 11 to 13 may be used to remove traces of oil, grease, or dirt. Alkaline cleaner may not be used for removal of heavy build-up of zinc oxide or wet storage stain. The solution can be applied through immersion in a tank filled with the solution, sprayed, or brushed with a soft bristle brush. After cleaning, rinse thoroughly in hot water or water under pressure. Heated drying to accelerate the complete removal of water from the surface should be used.
- Solvent Cleaning. Typical cleaning solvents, such as mineral spirits or high-flash naphtha, can be used to remove oil and grease. The procedure to be used is as specified in SSPC SP1. Proper rags or brushes should be used to wipe the galvanized parts. These rags or brushes should be cleaned or recycled often since oil can accumulate on their surfaces and be transferred back to the galvanized part. After cleaning, rinse thoroughly in hot water or water under pressure. Allow to dry completely before proceeding.

8.4.3 Surface preparation. Any of the following methods as per the written recommendation of the paint manufacturer may be used to prepare the galvanized surface for painting. The paint submittal shall indicate the proposed method of surface preparation.

- Sweep Blasting. Abrasive sweep or brush blasting which uses a rapid nozzle movement will roughen the galvanized surface profile. The abrasive material shall provide a stripping action without removing excess zinc layers. Particle size should be in the 8 mils to 20 mils (200 μm to 500 μm) range. Materials that can be used are aluminum/magnesium silicate, soft mineral sands with a mohs hardness of 5 or less, corundum, limestone, and organic media such as corncobs or walnut shells. Nozzle pressure shall not exceed 50 psi (350 kPa). The blasting angle to surface shall be 45° at a distance of 16" – 18" (406 – 457 mm). The purpose of the sweep blasting is to deform not to remove the galvanized metal. Any area falling below the required zinc thickness, before or after the sweep blasting should be repaired in accordance with ASTM A 780. The procedure for this process can be found in SSPC SP7. Sweep blasting of zinc shall not be less than 130 yds²/h (110 m² /h) using these types of abrasives. Substrate should be maintained at a temperature greater than 5° F (3° C) above the dew point temperature. Following abrasive blast cleaning, surfaces should be blown down with clean, compressed air. The formation of zinc oxide on the blasted surface will begin very quickly so the paint coating should be applied immediately, within 60 minutes, after sweep blasting.
- Wash Primer Treatment. This process involves the use of a metal conditioner to neutralize surface oxides and hydroxides along with etching the surface. One example of a wash primer is SSPC-Paint Specification No. 27. The process is based on three primary components: a hydroxyl-containing resin; a pigment capable of reacting with resin and acid; and an acid capable of making the resin insoluble by reacting with the resin, the pigment, and the zinc surface. The result is a film of approximately 0.3 mils to 0.5 mils (8 μm to 13 μm). Failures can occur if the film exceeds 0.5 mils (13 μm). The film is usually applied by spray, but may be applied by soft bristle brush, dip, or roller coater. For drying time prior to top coating, follow the manufacturer's instructions.

- **Acrylic Passivation/Pretreatment.** The passivation/pretreatment process consists of applying an acidic acrylic solution to the newly galvanized surface and then allowing it to dry, forming a thin film coating. The application methods for these water-based treatments are dipping, flow coating, spraying, or other appropriate means. Following application the coating is dried in an oven or in air. In some instances the coating is applied to hot galvanized articles in which case separate drying is not necessary. Rinsing is not required. The coating is approximately 0.04 mils (1 µm) thick. Painting is possible any time during a period of four months after application as long as the surface is free of visible zinc oxides or zinc hydroxides. However, if harmful contaminants such as dust, dirt, oils, grease, or deposits are present, they must be removed with a mild alkaline degreasing solution, pH 11.5 maximum, followed by a thorough rinse with hot water (140° F (60° C) maximum temperature) or a pressure wash, and then, thoroughly dried. This treatment applied in the galvanizing plant or later in the paint shop. When applied in the paint shop, the surface must first be appropriately cleaned as described above to remove contaminants picked up after galvanizing.

8.5 Bare Metal Preparation.

Bare metal shall be prepared in accordance with SSPC-SP6 (Commercial Blast Cleaning) with a 1.0 – 3.0 mil (25 –75 micron) surface profile.

8.6 General Paint Requirements.

- 8.6.1 **Compatibility.** Each coating in the system shall be supplied by the same paint manufacturer.
- 8.6.2 **Toxicity.** Each coating shall contain less than 0.01 percent lead in the dry film and no more than trace amounts of hexavalent chromium, cadmium, mercury or other toxic heavy metals.
- 8.6.3 **Volatile Organics.** The volatile organic compounds of each coating shall not exceed 420 g/L (3.5 lb/gal) as applied.
- 8.6.4 The paint system shall be manufactured by the following paint manufacturers or approved equal as determined by the Engineer.

Manufacturer	Primer Coat	Intermediate Coat	Finish Coat
Carboline	Carbozinc 859	Cabogaurd 888	Carboline 133 HB
Sherwin Williams	Zinc Clad III HS	Macropoxy 646	Acrolon 218

8.7 Zinc-Rich Primer Requirements.

- 8.7.1 Generic Type. This material shall be an organic zinc-rich epoxy or urethane primer. It shall be suitable for topcoating with epoxies, urethanes, and acrylics.
- 8.7.2 Zinc Dust. The zinc dust pigment shall comply with ASTM D 520, Type II.
- 8.7.3 Slip Coefficient. The organic zinc coating shall meet a Class B AASHTO slip coefficient (0.50 or greater) for structural steel joints using ASTM A 325M (A 325) or A 490M (A 490) bolts.
- 8.7.4 Salt Fog. There shall be no delamination, blistering, rust creepage at the scribe, or rusting at the scribe edges after 5,000 hours of salt fog exposure when tested according to ASTM B 117 and evaluated according to AASHTO R 31.
- 8.7.5 Cyclic Exposure. There shall be no delamination, blistering, rust creepage at the scribe, or rusting at the scribe edges after 5,000 hours of cyclic exposure when tested according to ASTM D 5894 and evaluated according to AASHTO R 31.
- 8.7.6 Humidity Exposure. There shall be no delamination, blistering, rust creepage at the scribe, or rusting at the scribe edges after 4,000 hours of humidity exposure when tested according to ASTM D 2247 and evaluated according to AASHTO R 31.
- 8.7.7 Adhesion. The adhesion to an abrasively blasted steel substrate shall not be less than 6200 kPa (900 psi) when tested according to ASTM D 4541 Annex A4.
- 8.7.8 Freeze Thaw Stability. There shall be no reduction of adhesion, which exceeds the test precision, after 30 days of freeze/thaw/immersion testing. One 24-hour cycle shall consist of 16 hours of approximately -30 C (-22° F) followed by 4 hours of thawing at 50 C (122° F) and 4 hours tap water immersion at 25° C (77° F). The test panels shall remain in the freezer on weekends and holidays.
- 8.7.9 Application. The primer shall be applied in accordance with manufacturer's instructions to a dry fill thickness of 2.5 – 3.5 mils.

8.8 Intermediate Coat Requirements.

- 8.8.1 Generic Type. This material shall be an epoxy or urethane. It shall be suitable as an intermediate coat over inorganic and organic zinc primers and compatible with acrylic, epoxy, and polyurethane topcoats.
- 8.8.2 Color. The color of the intermediate coat shall be white or off-white.

8.8.3 Application. The primer shall be applied in accordance with manufacturer's instructions to a dry fill thickness of 3.0 – 4.0 mils.

8.9 Urethane Finish Coat Requirements.

8.9.1 Generic Type. This material shall be an aliphatic urethane. It shall be suitable as a topcoat over epoxies and urethanes. The finish shall be semi-gloss

8.9.2 Color. The color of the finish coat shall be according to Federal Standard Color Number 6307, Hanford Gray. A color sample shall be included in the submittal information for review and approval.

8.9.4 Application. The finish coat shall be applied in accordance with manufacturer's instructions to a dry fill thickness of 2.5 – 3.5 mils.

8.10 Three Coat System Requirements.

The paint manufacturer shall certify that the paint system complies with the following requirements. The certification shall be signed by an officer of the manufacturer and shall be notarized.

8.10.1 Finish Coat Color. For testing purposes, the color of the finish coat shall be according to Federal Standard Color Number 6307, Hanford Gray.

8.10.2 Salt Fog. When tested according to ASTM B 117 and evaluated according to AASHTO R 31, the paint system shall exhibit no spontaneous delamination and not exceed the following acceptance levels after 5,000 hours of salt fog exposure:

Salt Fog Acceptance Criteria (max)			
Blister Criteria	Rust Criteria		
Size/Frequency	Maximum Creep	Average Creep	% Rusting at Scribed Edges
#8 Few	4mm	1mm	1

8.10.3 Cyclic Exposure. When tested according to ASTM D 5894 and evaluated according to AASHTO R 31, the paint system shall exhibit no spontaneous delamination and not exceed the following acceptance levels after 5,000 hours of cyclic exposure:

Cyclic Exposure Acceptance Criteria (max)			
Blister Criteria	Rust Criteria		
Size/Frequency	Maximum Creep	Average Creep	% Rusting at Scribed Edges
#8 Few	2mm	1mm	1

8.10.4 Humidity Exposure. There shall be no delamination, blistering, rust creepage at the scribe, or rusting at the scribe edges after 4,000 hours of humidity exposure when tested according to ASTM D 2247 and evaluated according to AASHTO R 31.

8.10.5 Adhesion. The adhesion to an abrasively blasted steel substrate shall not be less than 6200 kPa (900 psi) when tested according to ASTM D 4541 Annex A4.

8.10.6 Freeze Thaw Stability. There shall be no reduction of adhesion, which exceeds the test precision, after 30 days of freeze/thaw/immersion testing. One 24 hour cycle shall consist of 16 hours of approximately -30 C (-22° F) followed by 4 hours of thawing at 50° C (122° F) and 4 hours tap water immersion at 25° C (77° F).

8.11 Quality Control.

The Contractor shall conduct a quality control program that ensures that the work accomplished complies with these specifications. The quality control program shall consist of:

- Qualified personnel to manage the program and conduct quality control tests.
- Proper quality measuring instruments.
- Quality Control Plan.
- Condition and quality recording procedures.

The personnel managing the quality control program shall have experience and knowledge of industrial coatings and the measurements needed to assure quality work. The personnel performing the quality control tests shall be trained in the use of the quality control instruments. These personnel shall not perform surface preparation and painting. Painters shall perform wet film thickness measurements. The Contractor shall supply all necessary equipment to perform quality control testing of shop conditions, equipment, surface preparation, and profile and paint film thickness. The Contractor's personnel in accordance with the equipment manufacturer's recommendations shall calibrate these instruments.

The Contractor shall implement a Quality Control Plan approved by the Engineer including a schedule of required measurements and tests as outlined herein, procedures for correcting unacceptable work, and procedures for improving surface preparation and painting quality as a result of quality control findings. The Contractor shall supply and use forms approved by the Engineer to record the results of quality control tests. These reports shall be available at the work site for review by the Engineer. The purpose of the quality control program is to assist the Contractor in the proper performance of the work. Quality control tests performed by the Contractor will not be used as the sole basis for acceptance of the work.

- 8.12 Warranty. Before the painted surfaces, described herein, are accepted as a finished product, the light tower manufacturer shall have the paint manufacturer certify that the paint system was applied correctly in accordance with the paint manufacturer's procedures and these special provisions. The Contractor shall then furnish to the State, the tower manufacturer's, or paint manufacturer's normal paint warranty for a minimum of six months after final tower installation under a separate contract. It is anticipated that the towers will be installed by the end of 2005.
- 8.13 The paint thickness will be checked at the time of tower installation. If it is determined that the paint dry film thicknesses does not comply with the specified values, the Contractor shall apply another coat of finish paint, at no additional cost to the State, on the installed tower with surface preparation as required by the paint manufacturer. The dry film thickness will then be re-measured and if the thickness is not compliant, the procedure will be repeated again until the dry film thickness complies with all requirements at no additional cost to the State.
9. Head Frame.
- 9.1 Each tower shall be equipped with a head frame assembly to support and guide the luminaire ring assembly.
- 9.2 The head frame and luminaire ring shall have a positive mating/alignment interface at which the seating force is applied at each support cable. The interface shall be designed to operate with not less than 1.3 kN (300 lbs.) of total seating force distributed among the interface points. Manufacturer calculations shall be submitted to confirm this requirement. The stop used at the top of the tower shall not deform with the full force applied.
- 9.3 All head frame members and components, including support arms, shall be fabricated of steel of the same type as specified for the tower shafts or stainless steel of appropriate strength. The head frame shall have a head plate, a support, and 2 pulleys for each support cable. All openings in the head frame assembly shall be machined smooth and free from any burrs and sharp edges which could damage the support cables and power cable.
- 9.4 The head frame shall have a power cable pulley placed between and roughly equidistant from 2 support arms, with a pulley diameter around the groove of not less than 350 mm (14 inches).
- 9.5 The power cable shall pass through the head frame assembly utilizing a four-way roller guide assembly sized to accommodate the outside diameter of the power cable.
- 9.6 Pulleys shall be constructed to allow associated cables to ride freely within pulley grooves and cable guides shall be incorporated to prevent cables from riding out of pulleys.

- 9.7 Pulleys, attachment hardware, latches, hinges and the like shall be stainless steel. Pulleys shall be made of Unified Numbering System type 300 stainless steel and have permanently lubricated sealed bearings except the power cable pulleys may be cast aluminum or high-strength nylon.
- 9.8 The head frame assembly shall be equipped with a metal hood. The hood shall protect the operating head frame components from damage or deterioration from weather but shall permit pole ventilation while preventing the entry of birds. The hood shall have a strong secure mechanical means to open/raise the hood for the future maintenance of the head frame such as a spin screw mount, and shall have a double-secured latching system to assure closure. The Design shall be such as to minimize the risk that the hood will be displaced from gusts of wind. The head frame assembly shall be match-marked to its tower shaft and shall be attached to the shaft by stainless steel hardware.
10. Luminaire Ring.
- 10.1 Each tower shall be provided with a luminaire ring suitable for twelve (12) luminaires of the type, and orientation specified. The ring shall mate/align with the head frame and shall be coordinated relative to seating force.
- 10.2 The ring shall be designed for lowering to a position with the center line of luminaire arms 1.4 m (54 inches) or less above the top of the tower base plate. The exact fully-lowered position shall be adjustable in the field. Wiring shall be fully enclosed in a metal raceway.
- 10.3 The ring shall be equipped with spring loaded bumpers, spring loaded rollers, spring-loaded outriggers or other shock-absorbing mechanism to guide the ring during the raising/lowering operations. The guide mechanism shall be spring loaded and shall be designed to minimize shock to the luminaire during raising and lowering. These devices shall be attached in a secure manner. The mechanism does not have to maintain constant contact with the tower shaft.
- 10.4 Arms for the attachment of luminaires shall be standard 50 mm (2-inch) diameter tenon arms. The arms shall be attached to the ring in a secure manner either by welding or by means of stainless steel bolts, nuts, lock washers and hardware such that a permanent rigid attachment is achieved. Arms shall be approximately 325 mm (13 inches) in length, coordinated with luminaire size and configuration and shall be arranged so that the overall diameter of the ring, including the luminaire, does not exceed 3.4 m (11 ft.). A "T" arm configuration shall be used as indicated in the plans and described elsewhere herein. Tenon arm ends shall be threaded to accept a PVC pipe cap. All tenon arms shall be capped. The tenon arms shall be level when the ring is in the raised position.
- 10.5 The ring raceway shall be arranged with screened weep holes of not less than ½-inch diameter at no less than 90 degree intervals around the ring.
- 10.6 The ring shall be equipped with an enclosed wire raceway and a stainless steel NEMA 4X terminal box for wiring of the luminaires and CCTV camera.

- 10.6.1 Junction Box. The box shall be made of Type 304 stainless steel, not less than 2.03 mm (14 gauge), with all seams continuously welded with stainless steel weld wire and ground smooth. Exterior surfaces shall have a smooth polished finish. The box shall be UL 50 "Junction and Pull Box", "Junction Box", or "Pull Box".

A grounding lug shall be provided for the connection of the equipment grounding conductors as required by NEC Article 250-114.

The box shall have an overlapping stainless steel cover and shall be secured to the box with a continuous stainless steel hinge and a minimum of 4 captive stainless steel clamps utilizing captive stainless steel hex-head bolts or deep slotted stainless steel screws.

Be suitable for surface mounting, complete with external stainless steel mounting lugs or brackets welded to the enclosure.

The box cover shall have a continuous formed, seamless, urethane, oil-resistant gasket. The gasket shall be extruded directly onto the junction box cover. The gasket shall adhere to the cover without the use of adhesives. A neoprene strip gasket, or urethane strip gasket cut out of a larger sheet and glued to the junction box will not be acceptable.

- 10.6.2 The box shall be arranged and connected to the top of the ring from the top of the box in a manner that precludes moisture draining from the ring into the box. All fittings penetrating the box shall be watertight hubs with an integral O-ring. The hubs shall be watertight and corrosion resistant NEMA 4X and have an insulated polycarbonate throat. The insulated throat shall be rated up to 105° C. The hubs shall be UL Listed and comply with UL Standard 514B.

- 10.6.3 The box shall be equipped with a hinged door and a latch or with captive stainless steel closure hardware acceptable to the Engineer and an external special fixed-mount plug with a retained cap as specified elsewhere herein to accept a test power connection when the ring is in the lowered position.

- 10.6.4 The box shall be divided into two (2) compartments by a non-conductive barrier, minimum thickness of 0.04". One side of the box shall, on the top, have the main tower cable entry and the entry for the luminaire wires; it shall also contain a terminal strip with identified terminals for connection of the main power cord, luminaires, and the test power receptacle. The terminal strip shall have terminals sized to accommodate the cables to be connected and shall have luminaire connection terminals to accommodate the usage of all luminaire positions. The other side of the box shall, have on the top, a 3/4" inch conduit entry, capped, for extension of CCTV wiring, as applicable and shall contain an appropriate terminal strip for CCTV camera power and control connections as well as provisions for video output connections.

- 10.7 The ring shall facilitate ease of wiring to the arms by the use of removable gasketed covers, physical arrangement, or other means acceptable to the Engineer. Arms shall be factory or field wired according to NEC Article 410-31 using No. 10 wire having ethylene propylene rubber (EPR) insulation or bonded composite EPR insulation with a chlorosulfanated polyethylene jacket, rated 600 V not less than 90° C (194 ° F.), RHH-RHW, U.L. listed with solid color coding.

Luminaire wire		
Insulation Type	Average EPR Insulation Thickness	Average Jacket Thickness
Single Material EPR	1.1 mm (45 mils)	n/a
Bonded Composite Insulation Thickness	0.8 mm (30 mils)	0.4 mm (15 mils)

Wiring shall be color coded (black, red, white, and green, as applicable) with coloring via outer material color or by painting with a process approved by the Engineer. Wire rating information shall be visible in a contrasting color. Wires shall be installed to all luminaire arms. Luminaire wires shall extend 600 mm (24 inches) longer than their respective tenon arm and shall be trained back into the arm which shall then be closed with a protective cap for shipment of the jobsite. All wires shall be capped and crimped with sealant and heat-shrink insulating sleeves (wire nuts, tape, crimps, etc. will not be acceptable.). All ring wires shall be tagged with wire markers at both ends. The tenon arms shall also be tagged corresponding to the wiring contained within.

- 10.8 The luminaire ring shall be factory checked and marked for proper positioning and luminaire orientation. Catalog cuts and shop drawings shall indicate the orientation of the luminaire ring, handhole, and bolt circle in relation to each other on a single drawing.
- 10.9 The ring shall be complete with a counterweight for each unused luminaire position plus one additional counterweight. Counterweights shall be based upon the luminaires to be installed on each respective tower.
- 10.10 All luminaire rings shall be arranged to accommodate the complete indicated compliment of luminaires, regardless of the number actually to be installed, to facilitate luminaire positioning and orientation. For rings of 6 positions or less, each position shall have a tenon arm. For rings of more than 6 luminaire positions, the arrangement shall be accomplished by a "T" type of tenon arm to produce two luminaire mounting positions from a single extension arm, or by other means approved by the Engineer.
11. Lowering and Support Mechanism.
- 11.1 The support shall be of the non-latching design.
- 11.2 The mechanism shall operate to raise the luminaire ring to its fully raised position and to lower the ring to a position with the centerline of the luminaire tenon arms 1.4 m (54 inches) or less above the top of the tower base plate. The exact fully-lowered position shall be adjustable in the field.

- 11.3 The lowering and support mechanism shall include, but not be limited to the support cables, power cable, pulleys, winch, gear reducer, mechanical clutch, electric motor, control and all accessories and appurtenances for a coordinated operating system.
- 11.4 The lowering and support scheme shall be of the 2-cable or 3-cable type as specified.
- 11.5 Three-cable mechanisms shall incorporate 3 support cables joined via an appropriate proven transition design to a single hoist cable wound around a single hoist winch. The transition design shall be such to prevent twisting of the support cables, to assure smooth winding of the cables on the winch and to prevent binding on the inside of the tower shaft.
- 11.6 Two-cable mechanisms shall incorporate 2 support/hoist cables wound around a dual winch assembly. The design shall be such to prevent twisting of the cables and to assure smooth winding of the cables on their respective winches and to prevent binding on the inside of the tower shaft.
- 11.7 The hoisting system shall be securely mounted and the lower assembly, i.e. motor, winch, mechanical clutch, gear reducer, etc., shall be designed to allow ease in removal of the equipment via the tower handhole without dismantling the system. Individual components shall be accessible and removable without the removal of other components. Mounting plates and other mounting templates and provisions shall have standardized dimensions to facilitate removal and interchangeability from unit to unit. Mounting hardware shall have an abundant strength safety factor and shall be positioned for even distribution of load.
- 11.8 The lowering device shall tightly position the luminaire mounting ring against the head assembly frame by applying a holding force evenly distributed among the seating/interfacepoints. The total force required by the system must not be less than 1.3 kN (300 lbs.) greater than the weight of the luminaire mounting ring with all luminaire positions occupied by luminaires. There shall be a positive indication at the handhole that the required force has been applied, visible from the extended operating position away from the handhole and not under the ring. Submittal information shall include load and seating force calculations to demonstrate compliance with specified requirements.
- 11.9 The mechanism shall be equipped with a multi-point safety chain and hook assembly to maintain the tension on the support system, allowing the motorized winch assembly to be disengaged. Chain and all hardware shall be stainless steel.
- 11.10 The system shall be designed so that unbroken power cable, suspension and/or hoist cable can be replaced from ground level.
- 11.11 Support and Hoist Cables.

- 11.11.1 Cables (wire rope) shall be manufactured from Type 302 stainless steel having a carbon content of 0.09 to 0.15 and shall be a stranded assembly coated with a friction-limiting non-corrosive lubricant.
- 11.11.2 Cables shall be 7x19 wire strand and have no strand joints or strand splices.
- 11.11.3 Cables shall be manufactured and listed for compliance with military specification MIL-W-83420B, Type 1, Composition B.
- 11.11.4 Cable terminals shall be stainless steel compatible with the cable and as recommended by the cable manufacturer. The terminals, swaging, etc. shall meet the requirements of military specification MIL-T-781 and shall be so listed. Care shall be exercised to assure a match of connector sizes to the wire rope size(s), and, to the extent possible, connectors shall have visible size markings.
- 11.11.5 For 3-cable systems, the support cables shall each be not less than 5 mm (3/16 inch) in diameter and the hoist cable shall not be less than 8 mm (5/16 inch) in diameter.
- 11.11.6 For 2-cable systems, the support/hoist cables shall each be not less than 6 mm (1/4 inch) in diameter.
- 11.11.7 As part of the tower shop drawings and product data submitted for approval, support and hoist cable information shall be provided. Submittals without such information will be incomplete and will be rejected. The information shall include, but not limited to:
- Catalog information to confirm sizing, stranding and other specified requirements.
 - Evidence of listing as military specification cable as specified.
 - Certification of compliance with all specification requirements made by the cable manufacturer.

Documentation of arrangement to provide a sample of the support cable to an independent laboratory as selected by the Engineer for testing to the military specifications listed herein, with results to be sent directly to the Engineer, all included incidental to this item. Copies of recent test reports made on identical cable indicating compliance with military specification requirements shall be submitted. The test reports shall include as a minimum, the following:

- Breaking Strength test.
- Endurance test.
- Stretch test.
- Test load.
- Chemical Composition.

11.12 Winch.

- 11.12.1 Drum. The winch/gear reducer assembly shall have a drum suitable for the hoist of support/hoist cables, arranged to provide smooth winding of the cable and to prevent slippage. The drum shall be stainless steel or cast/ductile iron and shall have a diameter not less than 18 times the diameter of its respective cable (wire rope). The winch drum shall be designed with cable guides for a smooth cable take-up of level lays and to prevent the cable from riding over the drum flange. The drum shall have the end of the cable attached by means of a swaged connection and one full layer of cable shall be wound on the drum even when the ring is in the fully lowered position. The drum flange axle shall be supported at both ends.
- 11.12.2 Gear Reducer. Each assembly shall incorporate a gear reducer having a reduction ratio which will prevent free fall of the luminaire ring upon failure or disengagement of the drive unit and which will produce a travel rate of 3 m (10 ft.) to 4.6 m (15 ft.) per minute under normal operation.
- 11.12.3 The unit shall have a worm gear which is totally enclosed in a lubricating reservoir. The lubricant shall have a viscosity range suitable for proper operation in ambient temperatures from -40° C to 49° C (-40° F. to 120° F.)
- 11.12.4 The worm shall be manufactured of case hardened ground alloy steel or cast iron.
- 11.12.5 The gear shall be of bronze alloy or of a proven alternate material and design acceptable to the Engineer with and the gear shall be keyed to the output shaft. The output shaft shall be high quality medium carbon steel ground to close tolerances. The worm and output shaft shall be mounted on anti-friction bearings. All shaft extensions shall be equipped with a lip-type synthetic element and oil seals.
- 11.12.6 The unit shall have provisions to verify oil levels in all gear boxes, and oil level indication shall be visible from the handhole when the unit is installed.

- 11.13 Clutch. The mechanism shall incorporate a mechanical clutch, installed between the winch/gear reducer and the cable winch assembly. The clutch shall be of mechanical type, in a sealed cast metal housing. The clutch torque shall be factory calibrated and coordinated with the electric motor. The clutch shall act to limit the seating force of the raised ring to a pre-established value. The clutch shall be suitable for the application and torque limitation and shall not deteriorate with use.

11.14 Motor.

- 11.14.1 The electric motor shall be matched to the load and torque characteristics required for a fully loaded luminaire ring and shall not be less than 746 watts (1 horsepower).
- 11.14.2 The motor shall be capable of producing torque in excess of the clutch maximum torque rating. The motor shall be totally enclosed fan cooled (TEFC), shall be reversible to operate the lowering mechanism in both directions, and shall be suitable for operation on the power supply characteristics shown on the drawings. Submittal information shall include complete motor data, including, but not limited to:
- Manufacturer
 - Nameplate Rated Watts (Horsepower)
 - Rated Voltage
 - Full Load RPM
 - Full Load Current
 - Locked Rotor Current
 - NEMA Design Letter
 - Insulation Class
 - Torque Data
 - Dimensional Data

11.15 Lowering Device Control.

- 11.15.1 The lowering device control shall consist of motor short circuit and motor running overcurrent protection and motor control complete with all appurtenances and interconnecting wiring. The control may incorporate a reversing motor starter or a suitably-rated reversing control station.
- 11.15.2 The lowering device control may be provided in a separate NEMA 4X stainless steel enclosure or in the enclosure with the tower main Electrical breaker, provided the remote control station is a separate remote device.
- 11.15.3 The lowering device motor shall have a motor disconnecting means circuit and running overload protection according to N.E.C. requirements. The motor disconnect and short circuit protection shall be achieved by a molded case thermal magnetic bolt-on circuit breaker rated at 600 volts, of an ampere rating suitable for the motor and having a UL-listed interrupting rating of not less than 14,000 rms symmetrical amperes at 480 volts and 10,000 rms symmetrical amperes at 240 volts.

- 11.15.4 Running overcurrent protection shall be according to N.E.C. requirements. Motor overload protection shall be achieved by an appropriate dual element fuse in a spring-loaded screw-in type small-dimension fuse holder mounted within the enclosure in a suitable box or other arrangement approved by the Engineer.
- 11.15.5 The motor starter, if incorporated, shall not be smaller than NEMA size 1, shall be rated 600 volts and shall be full voltage, reversing type, with arc-extinguishing characteristics and renewable silver-to-silver contacts. A reversing control switch, if incorporated, shall be rated well in excess of the duty required and in no case less than 2,240 watts (3 horsepower) at 230 volts single phase. The control shall be momentary contact, raise-stop-lower with a neutral stop condition, requiring positive action by the person operating the device to keep the motor energized. The control shall have auxiliary contacts as indicated and as required for the control.
- 11.15.6 The enclosure shall have an exterior position-indicating trip-free operating handle for the motor circuit breaker. The enclosure(s) shall have exterior nameplates to read "LOWERING DEVICE CONTROL" and "MOTOR CIRCUIT BREAKER" as well as an interior nameplate "MOTOR OVERLOAD FUSE" which shall also be inscribed with the applicable fuse type and ratings. Nameplates shall be engraved, 2-color, attached with screws.
- 11.15.7 The line side power to the lowering device control shall be obtained via a plug extended connection to the power distribution cord/receptacle.
- 11.15.8 The control shall be complete with a cable-connected remote control station. The control station shall incorporate heavy duty control devices in a non-metallic impact-resistant NEMA 4X enclosure. The control shall be "dead man" type with "RAISE" and "LOWER" controls, requiring the operator to hold the respective control depressed in position for movement of the ring in either direction and with release of the control to stop the mechanism. The cord shall incorporate a No. 12 ground wire and the number of conductors required for a control, with control conductors not less than No. 14. The cord shall be weatherproof with watertight connections at either end and it shall be long enough to allow the operator to stand 7.5 m (25 ft.) away from the lowered luminaire ring. Provisions for storage of the control station and cord such as a suitable hanger cradle, shall be provided in a manner easily accessible at the handhole and in a location which precludes interference with the internal components of the lowering mechanism.

11.15.9 Cables extended from the enclosure shall be passed through a watertight sealing bushing and the cable shall be supported and arranged to preclude interference with the lowering mechanism. Wiring shall be in compliance with NEC requirements. Motor wires shall not be less than No. 12 and motor wiring shall be extended in UL-listed extra-flexible, weatherproof cord or other cord approved by the Engineer with suitable fittings, bushings and supports. All equipment shall be grounded and bonded via an appropriately sized equipment ground wire.

11.16 Electric Power Distribution.

11.16.1 Electric power for motorized operation of the lowering mechanism and for the power supply to the lighting shall be taken from the lighting circuitry feeding the tower. The distribution shall provide termination of the supply feeder, extension to a tower main breaker and distribution to lighting and the lowering device.

11.16.2 The tower shall be equipped with a main circuit breaker. The circuit breaker shall be molded case, 2-pole, 40-ampere thermal magnetic, bolt-on type having a UL-listed interrupting rating of not less than 14,000 rms symmetrical amperes at 480 volts. The breaker shall indicate "ON", "OFF" and "TRIPPED" conditions and the handle shall be trip-free.

11.16.3 The main breaker shall be housed in NEMA 4X stainless steel enclosure with an external, position-indicating operating handle with padlock provisions. The enclosure shall have a 2-color engraved nameplate to read "MAIN BREAKER", attached with screws. The box shall have openings and suitable bushings for cable extensions.

11.16.4 The main breaker shall be arranged for line-side connection to incoming feeder conductors entering the base of the tower via an extension of multi-conductor cable. The load side of the main breaker shall be connected to a cord and receptacle which shall be arranged for connection to either the luminaire ring main power, the lowered luminaire ring test power or the lowering device control.

11.16.5 Each connection to the main breaker shall be made with the specified electric power cable, extended from the enclosure through a watertight sealing/support bushing. The cables shall be arranged and secured to preclude any interference with the lowering device operation.

11.17 Electric Power Cable.

- 11.17.1 The electric power cable shall consist of a 4-conductor jacketed extra flexible cable, (2 phase conductors, neutral conductor and a ground conductor) Type W industrial grade portable power cable, as listed in NEC Table 400-4. The cable shall meet ICEA S-68-516, WC-3 and shall be approved by the Pennsylvania Bureau of Mines.
- 11.17.2 Each conductor shall be stranded assembly of 133 flexible annealed copper wires according to ASTM B 33. Each of the 4 conductors shall be sized No. 6. Each conductor shall be individually insulated with ethylene propylene rubber insulation, all in compliance with ICEA S-68-516. Insulation shall be rated not less than 600/2000 volts, 90° C (194° F.) and insulation thickness shall not be less than 1.5 mm (60 mils).
- 11.17.3 Each individual conductor's insulation shall be color coded; one black, one red, one white and one green.
- 11.17.4 The individual conductors shall be assembled in a cable, with non-hyrosopic reinforced rubber fillers to maintain a smooth round outer surface, with a jacket applied overall. The jacket shall be a heavy duty jacket manufactured according to ASTM D 752 and shall be imprinted with the manufacturer, conductor size number of conductors, type of cable, voltage rating, and Pennsylvania Bureau of Mines designation P-XXX-MSHA.

12. Ground Continuity.

- 12.1 A flexible copper braid connector of #2 copper equivalent shall be attached with studs and exothermic welds at tower shaft sections or the shafts shall be electrically joined by other means approved by the Engineer. Towers shall include all materials to achieve this bond.

13. Power Receptacles and Plugs.

- 13.1 Power receptacles and plugs shall be circuit-breaking devices which shall mate with each other. The plugs and receptacles shall be 4-wire 4-pole, 600 volt, 60 ampere weatherproof devices according to UL Standard 498 and International Electrical Commission Standard 309. The devices shall be listed by the manufacturer as suitable for make and break operation at rated current.
- 13.2 Components and insert assemblies shall be interchangeable to accept either pin or socket inserts to allow either plug or receptacle to be configured in an energized or de-energized condition, i.e. reverse-contact configurations shall be available. Locations of reverse-contact devices shall be as indicated.
- 13.3 Each plug or receptacle connection to a power cord shall be complete with a suitable non-metallic sealing connector body with a wire mesh strain relief. Other plugs and receptacles shall be complete with suitable sealing angle-adaptor panel of box mounting bodies, as applicable and shall be complete with back-boxes if so dictated by the power distribution configuration.

- 13.4 Each plug and each receptacle shall be complete with a retained flap-type or retained screw-on cover.
- 13.5 Plugs and receptacles shall be water-tight, dust-tight, and chemical resistant and be suitable for use when exposed to the weather and shall be applicable for safe use in harsh, wet weather conditions. The Engineer shall be the judge of applicability.
14. Shipment and Installation.
- 14.1 The light tower, luminaire ring, etc., and hardware shall be packaged during shipment to protect all surfaces from being scratched, marred, chipped, or damaged in any way. Prior to installation, the tower and all its components will be inspected by the Engineer and any parts found to be damaged or defective shall be replaced. Any minor damage to a completely painted light tower surface shall be touched up in a professional manner as approved by the paint manufacturer.
- 14.2 The tower shall be set plumb on the foundation and fastened to the anchor rods with double nuts and washers. Flat washers shall be installed below and above the base plate of the pole. Locknuts with nylon or steel inserts shall be installed on top of the top nut. The nuts shall be tightened in compliance with torque specifications recommended by the manufacturer of the lighting unit.
- 14.3 The space between the finished top of the foundation and the bottom of the base plate of the pole shall be enclosed with an expanded metal screen made of stainless steel. The size of the mesh of the screen shall be 1/4 in. (6 mm) or less and #18 gauge (1.22 mm) thick, or heavier as approved by the Engineer. The screen shall be held in place with a stainless steel band installed around the tower base plate. The band shall be held tight by a ratchet-type device. Grouting shall not be used to enclose the above described space.
- 14.4 The light tower shall be straight and centered on its longitudinal axis, under no-wind conditions, so, when examined with a transit from any direction, the deviation from the normal shall not exceed 1/8 in. in 3 ft (3 mm in 1 m) within any 5 ft (1.5 m) of height, with total deviation not to exceed 3 in. (75 mm) from the vertical axis through the center of the pole base.
15. Method of Measurement. Each light tower which is delivered and installed shall be counted as a unit for payment.
16. Basis of Payment. This work will be paid for at the contract unit price each for **LIGHT TOWER** of the mounting height, luminaire mounting positions specified.

LIGHTING CONTROLLER, BASE MOUNTED, 480 VOLT, 200 AMP (DUAL), RADIO SCADA
Effective: January 1, 2012

Description: This work shall consist of furnishing and installing a roadway lighting electrical control cabinet with radio control complete with foundation and wiring for the control of highway lighting.

General. The completed controller shall be an Industrial Control Panel under UL 508, and shall be suitable for use as service equipment

Double Door Enclosure.

Cabinet. The cabinet shall be of the dimensions shown on the plans and fabricated from 1/8 in. (3 mm) thick aluminum alloy No. 3003-H14. The cabinet shall comply with ANSI C 33.71 and UL 50 and be reinforced with aluminum angles.

Doors. The doors shall have stainless steel hinges. The door handle shall be stainless steel, a minimum diameter of 1/2 in. (13 mm) and be furnished with a rain and ice resistant lock. The doors shall be gasketed to exclude the entry of moisture, dirt, and insects. A linkage-arm system, of simple construction, shall be attached to the cabinet doors to allow securing in a wide open position during field operations.

Insulation. When specified, the interior compartment shall be insulated on the inside of the sides, back, top, bottom, and inside of the doors with 1 in. (25 mm) thick polyisocyanurate rigid foam insulation board. The foam board shall have foil facers on each side. The side facing the interior of the cabinet shall have a white tinted foil facer with a satin finish. The insulation shall have a minimum aged thermal resistance (R-value) of 8 at a 40°F (4°C) mean temperature. The insulation shall comply with Federal Specification HH-I-1972/1, Class 2.

Mounting. The cabinet shall be mounted as indicated on the plans.

Work Pad. Except where the cabinet is facing a sidewalk, a poured, 4 in. (100 mm) thick concrete pad, not less than 48 in. (1.2 m) square shall be provided in front of the cabinet.

Finish. All aluminum enclosures shall be finished.

Surface Preparation: The cabinet, doors and all other parts to be painted will be submerged in each tank of a 3 step iron phosphate conversion technique. After phosphatizing the parts shall be passed through an oven and baked to eliminate any moisture.

Finish coat: Shall be polyester powder paint applied electrostatically to a minimum thickness of 2 mils and baked at 375°F for 20 minutes.

The color of the finish paint shall be ANSI Standard No. 70 Sky Gray or as specified by the Engineer.

The finish shall be applied according to the paint manufacturer's recommendations and the manufacturer shall certify, in writing, to the Department, that the finish has been applied properly.

Submittal data submitted for approval shall address the requirement for the paint manufacturer's certification and shall include a standard, single source paint warranty by the paint manufacturer of the controller manufacturer to the Department.

Identification. The cabinet door shall have a stainless steel name plate of the dimensions and engraving indicated on the plans. An identification decal shall also be installed on the back of the cabinet as specified elsewhere herein.

Control Components.

Time Switch. When specified, each controller shall have an electric time switch for automatic control of highway lighting circuits operating on a daily schedule having a fixed relation to sunrise and sunset. Turn-on and Turn-off times shall be adjustable ± 45 minutes from sunrise and sunset. All settings shall be field adjustable without special tools. Complete installation instructions, details on wiring connections, and information on time setting, manual operation, and necessary adjustments shall be furnished with each time switch.

The time switch shall be a microprocessor-based two channel controller with astronomic functions on both channels. The latitude shall be adjustable from ten to 60 degrees in the Northern hemisphere. Latitude changes shall be user ettable without the use of special tools.

The time switch shall be programmable in an AM/PM format, with a resolution of one minute or better. The time switch shall automatically adjust for daylight saving time and have automatic leap year correction and operate on 240 V AC without the use of an additional transformer.

A battery backup shall be integral with the controller and shall use a nickel-cadmium battery. The battery backup shall provide power to the controller memory for a minimum of 72 hours in the event of power failures.

The published operating temperature range of the time switch shall be from 86 to 158°F (-30 to 70°C).

The time switch output relay contacts shall be rated sufficiently to handle the inrush current of two 200 A contactors. The time switch shall have a NEMA Type 1 enclosure as a minimum. The time switch programming instructions shall be moisture proof and permanently affixed to the time switch or as otherwise approved by the Engineer.

Circuit Breakers.

All feeders, branch circuits, and auxiliary and control circuits shall have overcurrent protection. The overcurrent protection shall be by means of circuit breakers.

Circuit breakers shall be standard UL listed molded case, thermal-magnetic bolt-on type circuit breakers with trip free indicating handles.

240 V circuit breakers shall have a UL listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated circuit voltage for which the breaker is applied. 480 V applications shall have a UL listed interrupting rating of not less than 14,000 rms symmetrical amperes at rated circuit voltage.

Multi-pole circuit breakers larger than 100 A size shall have adjustable magnetic trip settings.

The number of branch circuit breakers shall be as indicated on the Control Cabinet detail drawing or as indicated in the lighting system wiring diagram whichever is greater plus two spare circuit breakers.

Contactors.

Contactors shall be electrically operated, mechanically held as specified, with the number of poles required for the service and with operating coil voltage as indicated. The contactor shall have an in-line drive operating mechanism. Ampere rating of contactors shall be not less than required for the duty shown and shall otherwise be rated as indicated.

Contactors shall be complete with a non-conducting inorganic, non-asbestos subpanel for mounting.

Mechanically held contactors shall be complete with coil clearing contacts to interrupt current through the coil once the contactor is held in position.

The main contactor contacts shall be the double break, silver to silver type. They shall be spring loaded and provide a wiping action when opening and closing. The contacts shall be renewable from the front panel, self-aligning, and protected by auxiliary arcing contacts.

The line and load terminals shall be pressure type terminals of copper construction and of the proper size for the ampere rating of the contactor.

A lever for manual operation shall be incorporated in the mechanically held contactor. Protection from accidental contact with current carrying parts when operating the contactor manually shall be provided.

The contactor operating coil shall operate at phase to neutral voltage. Single phase contactors shall be two pole devices with continuous rating for the amperage selected per pole.

Open and closed positions for mechanically held contactors shall be clearly indicated and labeled in permanent manner as approved by the Engineer.

Auto/Manual Switches. The cabinet shall be equipped with automatic and manual operating controls via two, single pole double throw switches, one being a maintained-contact manual-automatic selector switch and one being a momentary-contact manual on-off switch with a center rest position. Both switches shall be premium specification grade, rated for the applied duty but not less than 20 A at 240 V and each shall be mounted in a 4 in. (100 mm) square box with cover.

The control circuit shall have overcurrent protection as indicated and as required by NEC requirements.

Ground & Neutral Bus Bars.

Separate ground and neutral bus bars shall be provided. The ground bus bar shall be copper, mounted on the equipment panel, fitted with 22 connectors of the type shown on the plans, as a minimum. The neutral bar shall be similar. The heads of connector screws shall be painted white for neutral bar connectors and green for ground bar connectors.

Interior Lighting, Receptacle and CCTV power.

The cabinet shall have an auxiliary device circuit at 120 V single phase to supply a convenience receptacle, cabinet light and a dedicated 120v circuit for CCTV camera power indicated in the plans. Where 120 V is not available directly from the service voltage, an outdoor dry type step-down transformer not less than 2 KVA shall be provided as described elsewhere herein.

The auxiliary circuit, including transformer primary and secondary, shall have overcurrent protection according to NEC requirements.

The interior, 60 W incandescent lighting fixture of the enclosed-and-gasketed type, shall be switched from a single pole, single throw, 20 A switch. The switch shall be premium specification grade in a suitable 4 in. (100 mm) box with a cover.

A 20 A duplex receptacle, ground fault interrupting, premium specification grade shall be furnished in a 4 in. (100 mm) square box with cover, for 120 V auxiliary use.

Surge Arrester.

The control circuit in the cabinet shall be protected by a surge arrester meeting the requirements of Article 1065.02.

Wiring and Identification.

Power wiring within the cabinet shall be of the size specified for the corresponding service conductors and branch circuits and shall be rated RHH/RHW, 600 V.

Control and auxiliary circuit wiring shall be rated RHH/RHW or MTW with jacket, 600 V.

All power and control wiring shall be stranded copper. When specified all wiring shall be tagged with self-sticking cable markers. When the contract drawings do not specifically indicate assigned wire designations, the manufacturer shall assign wire designations and indicate them on the shop drawings.

All switches, controls and the like shall be identified both as to function and position (as applicable) by means of engraved two color nameplates attached with screws, or where nameplate are not possible in the judgement of the Engineer, by the use of cloth-backed adhesive labels as approved by the Engineer.

The cabinet with all of its electrical components and parts shall be assembled in a neat orderly fashion. All of the electrical cables shall be installed in a trim, neat, professional manner. The cables shall be trained in straight horizontal and vertical directions and be parallel, next to, and adjacent to other cables whenever possible.

Transformer, General Purpose.

The transformer shall be dry type and weatherproof so that it may be installed indoors or outdoors without additional housing. It shall have an enclosure for splices with provisions for weather tight conduit connections.

The transformer shall have four taps on the primary side, one at 2 1/2 percent, one at 5 percent, one at 7 1/2 percent and one at ten percent below rated voltage.

Insulation shall be Class F or Class H. The transformer shall meet the applicable ASA and IEEE standards.

Mounting and back plates shall be of Aluminum Alloy 2024, 3003 or 6061. Bolts, nuts and washers shall be of Series 300 stainless steel. Bolts shall have hexheads. Nuts shall be hexagon and self locking. Washers shall be of the flat type.

Radio Control Equipment.

Receiver - Decoder: The radio control module consists of a radio receiver, digital decoder, and an output interface which allows centralized remote radio control of the lighting controller turn-on and turn-off functions. The radio control module must be capable of operation consistent with the existing radio control system, a Motorola SCADA Central Station.

The existing control system currently operates over 250 discrete lighting controllers via a securely coded proprietary data scheme. For this reason, the control module must consist of a Motorola ACE 3600 Modular Remote Unit, model F 7563, (small housing), with no less than the following options:

Motorola Designation	Description
F 7563 (VHF), F 7564 (UHF)	ACE 3600 CPU *
V 245	Mixed I/O
V 261	240 VAC Power Supply w/charger
Z 857AA	Surge Protection

* Includes (1) three slot frame, (1) ACE 3600 CPU plus firmware, (1) mixed I/O Module, (1) VHF or UHF (as directed by the Engineer) CDM 750 Radio with FSK Radio Interface, port 3 (1) AC Power Supply with Charger, (1) 6.5 Ah battery, installed in a 15" X 15" X 8.26" NEMA 4X/IP 56 painted metal enclosure with instruction manual.

The manufacturer's designation by no means relieves the Contractor of providing a fully functional radio system as described herein.

A 120/240 to 24VAC step down transformer shall be included for the SCADA system.

The Radio Control Module shall be programmed for the following operational parameters:

- Transceiver Frequency: To be specified by the Engineer
- Receive Frequency: To be specified by the Engineer
- Communications Failure Preset: Normally Open
- Individual Station address: To be specified by the Engineer

Antenna. The antenna shall be thick mount up to ½" mounting surface mounted by screw adapter (no magnet mounts). The low profile antenna mount shall be equivalent to Antenex – MABT8XNSI antenna Mount Low Profile. Accompanying antenna shall be equivalent to Antenex – B132 (Broad Band – VHF/UHF ¼ wave 150-928 MHz. Accompanying cable shall be equivalent to Antenex-RG8X and conductor equivalent to Antenex – CN8X from Radio to Antenna and shall be of appropriate length and not longer than 8 ft.

Installation. I/O Module. All motherboard cards shall be configured and installed as per manufacturer's specifications and IDOT specification Ltg SCADA 397. Modules include but are not limited to; CPU, Mixed I/O. All digital inputs terminated on the Mixed I/O card shall be dry. Termination points for all digital input points will be reflected on power center wiring diagram or additional wiring schematic provided by the engineer. All digital outputs received from the Mixed I/O card shall be rated at 24 VAC 2A. All digital outputs shall be connected to interposing relays prior to being integrated into the power center wiring logic. The digital outputs shall maintain a momentary closure for approximately 2 seconds.

All wiring termination points shall be tagged using the nomenclature given on the wiring diagram. The alarms acknowledge button shall be implemented with a placard stating "Alarm Acknowledge". Site configuration, map implementation, screens tagging and other related software configurations shall be specified elsewhere herein.

The antenna shall be centered on the top of the control cabinet. The antenna cable shall be dressed and trimmed for minimal length, allowing sufficient slack of removal of the radio connection for replacement or testing without disruption to the installation. The antenna connector shall be properly soldered to the cable assembly. Great care shall be exercised in the assembly of the antenna connector, excessive heat will destroy the inner insulation, and insufficient heat will produce a cold solder connection on the outer shield.

Intra-module wiring shall be 18 AWG stranded wire, color coded (American) consistent with battery polarity, and signal. The wire connection from terminal block (TB2) to the interpose relays shall be 14AWG stranded. All wires connected to the radio modules shall be dressed and tinned prior to insertion, (crimp on connectors will not be allowed for use in the radio system). Cost of all wire is inclusive within the scope of this work.

A terminal strip separate from the integral radio module and power supply shall be provided to interface power and signal conductors to the lighting controller. Terminals and wiring shall be labeled in accordance with the drawings, and dressed to allow service. The radio module shall be provided with constant 240 VAC power. The control power breaker shall provide power for the SCADA system. This is to allow the system to be energized at all times.

The SCADA system shall be tested in conjunction with the controller inspection, prior to field installation. The turn-on and turn-off function shall be tested ten (10) consecutive times utilizing actual signals originating from District 1 Headquarters. Any failures must be cleared before the controller is delivered to the job site.

Null covers shall be provided for the slots not used. All analog inputs shall be 4-20 mA. All I-O wiring including analog and digital shall be wired as per the enclosed table.

SCADA System Control Relay Assembly. The Contractor shall mount and wire four (4) relays in a box as shown in the wiring diagram. Two relays shall be 240 volts sealed type and two relays shall be 24 volts sealed type, unless otherwise indicated, shall have contacts rated at not less than 20 amperes at 240 volts. The power relay for activating the lighting contactors shall have contacts rated to handle the contactor inrush. The relays shall be wired to a marked terminal strip.

Testing. As part of final acceptance testing, all individual I/O points and internal status alarms shall be tested for proper operation and transmission. The transmission shall be confirmed at IDOT District 1 HQ. and the contractors dispatch facility. This full SCADA system start-up shall be completed with the Engineer present.

The SCADA radio system shall have the following items tested: VSWR, cable impedance, RSSI to the power center and confirmation that data sent from power center is received by the IDOT lighting system computers.

Analog Inputs and Transducers. The panel shall include one voltage transducer for monitoring the line voltage and one current transducer for monitoring the neutral current. Their outputs shall be 4-20 mA DC each and shall be wired to channels 1 and 2 of the Mixed I/O module as shown. The voltage transducer shall be Scientific Columbus Model # VT110 – PAN7 – A4-2 for 480/240 volt single phase systems. The current transducers shall be Mel Kirchler Technologies Model # AT2-420-24L-FT, with power supply, PS-240-24P-1A. Both analog inputs shall be wired using shielded cable. Both transducers shall also be calibrated so that the SCADA system reads the correct value.

Testing Of The Assembled Cabinet. Prior to shipment of the completed control cabinet, the control cabinet shall be tested for load, short circuits and complete operation of the cabinet as specified herein and as shown on the plans. The test shall be made at the manufacturer's shop, by the manufacturer and shall be witnessed by the Engineer. The Contractor shall arrange the test date with the Engineer and so allow not less than seven (7) days advance notice. The cabinet shall not be delivered to the job site until inspected, tested and approved for delivery by the Engineer.

Staging. All Central Configuration programming be completed prior to the initial check out/PM of the SCADA unit in the field. This is to assure/confirm 2 way radio communications from the field RTU the Central. Lighting controller information submitted for approval shall include any recommendations of the Manufacturer for storage as provided under this contract.

The packaging of the lighting controller shall incorporate the provisions recommended by the Manufacturer to accommodate storage.

TERM	MOSCAD DESTINATION	WIRE #	DESCRIPTION OF INPUT
32	Analog Input 1 (+)	TB2 B11	CABINET NEUTRAL CURRENT
33	Analog Input 1 (-)	TB2 B1	CABINET NEUTRAL CURRENT
34	Analog Input 2 (+)	TB2 A2	CABINET SERVICE VOLTAGE
35	Analog Input 2 (-)	TB2 B2	CABINET SERVICE VOLTAGE
40	P. Ground	TB2 A3	GROUND
1	Digital Input 1	TB2 B3	ALARM ACKNOWLEDGE
2	Digital Input 2	TB2 A4	DOOR OPEN
3	Digital input 3	TB2 A5	MAIN(S) BREAKER OPEN
4	Digital input 4	TB2 A7	CONTACTOR 1 OPEN
5	Digital Input 5	TB2 A8	CONTACTOR 2 OPEN
6	Digital input 6	TB2 A9	CABINET IN NON-AUTO
7	Digital input 7	TB2 A10	BACK-UP CLOCK OFF CALL
8	Digital Input 8	TB2 A11	BACK-UP CLOCK ON CALL
18	DI Common	*	COMMON
20	K1 NO	TB2 A12	LIGHTS ON CALL
21	K1 Com	TB2 B17	K1 COMMON
23	K2 NO	TB2 A13	LIGHTS OFF CALL
24	K2 Com	TB2 B17	K2 COMMON
17	24 V+	TB2 B13	24+ VDC

All analog inputs will be 4-20 mA only. Digital output relays will be electrically energized and momentarily held.

Mixed I/O module model number V 245

Lighting SCADA RTU terminal Configuration.

Description. This work shall consist of having the SCADA system manufacturer design, implement and test a new RTU on the Lighting SCADA System on all system terminals.

Materials. All software work shall be completed by the manufacturer or approved factory licensed sales and service company for the SCADA equipment. All licensing shall be provided by the entity completing the work. Licenses are to be held by IDOT.

SCADA RTU Configuration And Programming:

1. Setup of CPU and accompanying modules.
2. Setup of RTU site number, octal address, group call and All Call.
3. Configure application alarm parameters (download config./application).
4. Development and implementation of control and alarm application from IDOT submitted telemetry requirements.

NOTE: IDOT shall supply checklist listing I/O, telemetry, all call, group call and individual call data.

SCADA Service/Client Wonderware Programming:

1. Add RTU to Wonderware.
2. Configure Wonderware to poll SCADA CPU for data on that specific RTU.
3. Setup servers and clients for alarm notification and database I/O, for that specific RTU.
4. Configure RTU polling.
5. Activate RTU on FIU polling.

SCADA FIU CPU Programming:

If RTU exists as an Intrac site, it will have to be setup as a MOSCAD site (MOSCAD CPU). If RTU is a new site, it will have to be configured as a MOSCAD site (MOSCAD CPU).

Submittals. The Motorola VAR shall submit ladder programming, quiescent telemetry and SCADA configuration files for approval by the IDOT Engineer. Submittal will be reviewed by the Engineer and returned noting changes and/or comments.

Testing and Documentation. As part of final acceptance testing, all individual I/O points and internal status (COS) alarms shall be tested for proper operation and transmission. The transmission shall be confirmed at IDOT Dist. HQ. And the contractors dispatch facility. This full SCADA system start-up shall be completed with the Engineer present.

The control cabinet shall be tested for complete operation and the electrical load on each circuit shall be measured and documented on the Log form L-3. The ground resistance test shall be performed by the Contractor using the fall-of-potential method, with results recorded by the Contractor and witnessed by the Engineer. Ground continuity shall be tested using an approved low-impedance ohmmeter, to the farthest point of each circuit extension from the controller cabinet. Results shall be recorded by the Contractor and witnessed by the Engineer.

Installation.

The lighting controller installation shall be according to the details, location, and orientation shown on the plans.

Work Pad. A 4 in. (100 mm) thick portland cement concrete work pad, not less than 48 x 48 in. (1.2 x 1.2 m) shall be provided in front of the cabinet, except where the cabinet faces an adjacent sidewalk.

All conduit entrances into the lighting controller shall be sealed with a pliable waterproof material.

Concrete Foundation. The Contractor shall confirm the orientation of the lighting controller, and its door side, with the Engineer, prior to installing the foundation. A portland cement concrete foundation shall be constructed to the details shown on the plans and is included as a part of this pay items and shall not be paid for separately. The top of the foundation shall be 12-inches above grade.

The lighting controller enclosure shall be set plumb and level on the foundation. It shall be fastened to the anchor rods with hot-dipped galvanized or stainless steel nuts and washers. Foundation mounted lighting controllers shall be caulked at the base with silicone.

Where the controller has a metal bottom plate, the plate shall be sealed with a rodent and dust/moisture barrier.

Grounding.

Grounding shall be as shown on the lighting controller detail drawings. Ground rods, ground wells, connections, ground wire and other associated items shall be included in the cost the lighting controller and shall not be paid for separately.”

Method Of Measurement. Each lighting controller shall be counted each for payment.

Basis Of Payment. This item shall be paid for at the contract unit price each for **LIGHTING CONTROLLER, BASE MOUNTED, 480 VOLT, 200 AMP (DUAL) RADIO SCADA**, which shall be payment in full for the work, complete, as specified herein.

LUMINAIRE

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:

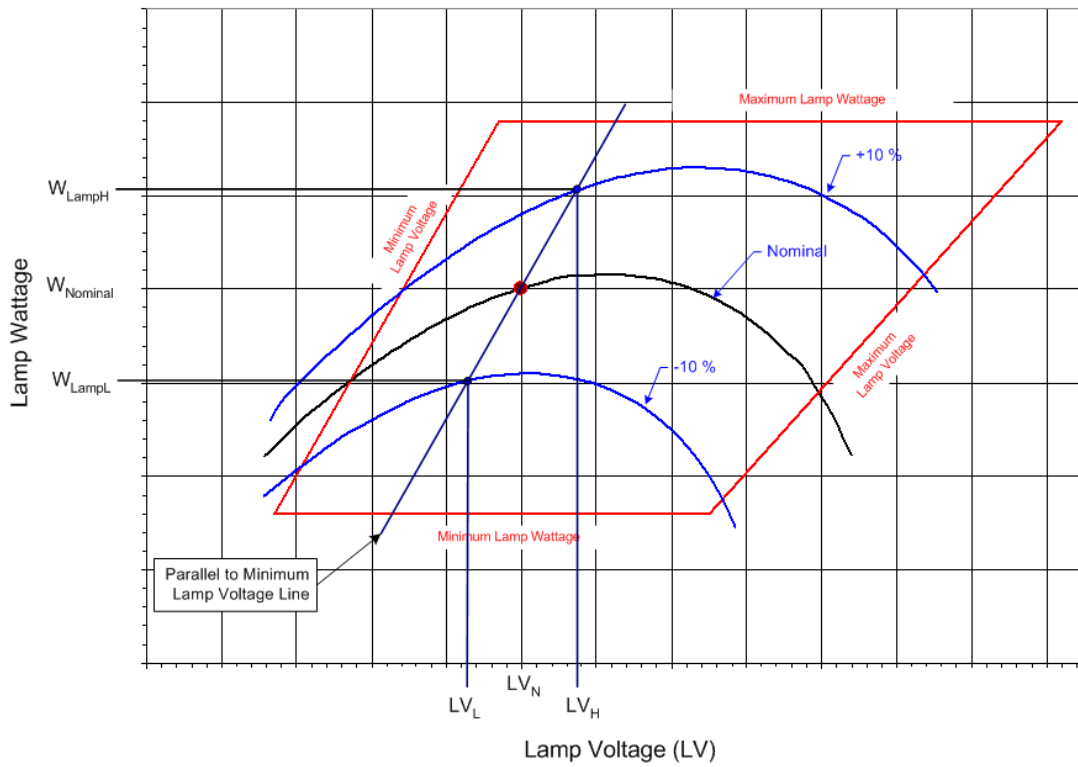
“The ballast shall be a High Pressure Sodium, high power factor, constant wattage auto-regulator, lead type (CWA) for operation on a nominal 240 volt system.”

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 (L_V) 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.”

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

IDOT DISTRICT 1 LUMINAIRE PERFORMANCE TABLE #1
 Typical DDI Roadway Section – High Mast Lighting

Given Conditions		
Roadway Data	Pavement Width	42 ft.
	Number of Lanes	3
	I.E.S. Surface Classification	R3
	Q-Zero Value	0.07
Light Pole Data	Mounting Height	90 (ft)
	Mast Arm Length	Highmast
	Pole Set-Back From Edge of Pavement	33 (ft)
Luminaire Data	Lamp Type	H.P.S.
	Lamp Lumens	105000
	I.E.S. Vertical Distribution	Symmetrical
	I.E.S. Control Of Distribution	Short Cut Off
	I.E.S. Lateral Distribution	Type V
	Total Light Loss Factor	.7
Layout Data	Spacing	440 (ft)
	Configuration	1 Row Median
	Luminaire Overhang over edge of pavement	N/A

NOTE: Variations from the above specified I.E.S. distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

Performance Requirements		
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NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

Illumination	Average Horizontal Illumination, E_{AVE}	1.3 (fc)
	Uniformity Ratio, E_{AVE}/E_{MIN}	3.0 (fc)
Luminance	Average Luminance, L_{AVE}	0.9 Cd/m ²
	Uniformity Ratio, L_{AVE}/L_{MIN}	3.00 Cd/m ²
	Uniformity Ratio, L_{MAX}/L_{MIN}	5.00 Cd/m ²
	Max. Veiling Luminance Ratio, L_V/L_{AVE}	0.30 Cd/m ²

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

IDOT DISTRICT 1 LUMINAIRE PERFORMANCE TABLE #2

Typical Roadway Section

Given Conditions		
Roadway Data	Pavement Width	48 ft.
	Number of Lanes	4
	I.E.S. Surface Classification	R3
	Q-Zero Value	0.07
Light Pole Data	Mounting Height	47.5 (ft)
	Mast Arm Length	12 (ft)
	Pole Set-Back From Edge of Pavement	SB-12' NB 17'
Luminaire Data	Lamp Type	H.P.S.
	Lamp Lumens	51000
	I.E.S. Vertical Distribution	Asymmetrical
	I.E.S. Control Of Distribution	Medium Cut Off
	I.E.S. Lateral Distribution	Type III
	Total Light Loss Factor	.7
Layout Data	Spacing	190 (ft)
	Configuration	Opposite
	Luminaire Overhang over edge of pavement	0 & -5 (ft)

NOTE: Variations from the above specified I.E.S. distribution pattern may be requested and acceptance of variations will be subject to review by the Engineer based on how well the performance requirements are met.

Performance Requirements		
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NOTE: These performance requirements shall be the minimum acceptable standards of photometric performance for the luminaire, based on the given conditions listed above.

Illumination	Average Horizontal Illumination, E_{AVE}	1.3 (fc)
	Uniformity Ratio, E_{AVE}/E_{MIN}	3.0 (fc)
Luminance	Average Luminance, L_{AVE}	0.9 Cd/m ²
	Uniformity Ratio, L_{AVE}/L_{MIN}	3.00 Cd/m ²
	Uniformity Ratio, L_{MAX}/L_{MIN}	5.00 Cd/m ²
	Max. Veiling Luminance Ratio, L_V/L_{AVE}	0.30 Cd/m ²

LUMINAIRE SAFETY CABLE ASSEMBLY

Effective: January 1, 2012

Description: This item shall consist of providing a luminaire safety cable assembly as specified herein and as indicated in the plans.

Materials. Materials shall be according to the following:

Wire Rope. Cables (wire rope) shall be manufactured from Type 304 or Type 316 stainless steel having a maximum carbon content of 0.08 % and shall be a stranded assembly. Cables shall be 3.18 mm (0.125") diameter, 7x19 Class strand core and shall have no strand joints or strand splices.

Cables shall be manufactured and listed for compliance with Federal Specification RR-W-410 and Mil-DTL-83420.

Cable terminals shall be stainless steel compatible with the cable and as recommended by the cable manufacturer. Terminations and clips shall be the same stainless steel grade as the wire rope they are connected to.

U-Bolts. U-Bolts and associated nuts, lock washers, and mounting plates shall be manufactured from Type 304 or Type 316 stainless steel.

CONSTRUCTION REQUIREMENTS

General. The safety cable assembly shall be installed as indicated in the plan details. One end of the cable assembly shall have a loop fabricated from a stainless steel compression sleeve. The other end of the cable assembly shall be connected with stainless steel wire rope clips as indicated. Slack shall be kept to a minimum to prevent the luminaire from creeping off the end of the mast arm. Unless otherwise indicated in the plans, the luminaire safety cable shall only be used in conjunction with luminaires which are directly above the traveled pavement.

Basis of Payment: This work shall be paid for at the contract price each for **LUMINAIRE SAFETY CABLE ASSEMBLY**, which shall be payment for the work as described herein and as indicated in the plans.

MAINTENANCE OF LIGHTING SYSTEMS

Effective: January 1, 2012

Replace Article 801.11 and 801.12 of the Standard Specifications with the following:

Effective the date the Contractor's activities (electrical or otherwise) at the job site begin, the Contractor shall be responsible for the proper operation and maintenance of all existing and proposed lighting systems which are part of, or which may be affected by the work until final acceptance or as otherwise determined by the Engineer.

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

Existing lighting systems, when depicted on the plans, are intended only to indicate the general equipment installation of the systems involved and shall not be construed as an exact representation of the field conditions. It remains the Contractor's responsibility to visit the site to confirm and ascertain the exact condition of the electrical equipment and systems to be maintained.

Maintenance of Existing Lighting Systems

Existing lighting systems. Existing lighting systems shall be defined as any lighting system or part of a lighting system in service at the time of contract Letting. The contract drawings indicate the general extent of any existing lighting, but whether indicated or not, it remains the Contractor's responsibility to ascertain the extent of effort required for compliance with these specifications and failure to do so will not be justification for extra payment or reduced responsibilities.

Extent of Maintenance.

Partial Maintenance. Unless otherwise indicated, if the number of circuits affected by the contract is equal to or less than 40% of the total number of circuits in a given controller and the controller is not part of the contract work, the Contractor needs only to maintain the affected circuits. 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 all applicable responsibilities of the Electrical Maintenance Contract, State of Illinois, Department of Transportation, Division of Highways, District One. These responsibilities shall include the maintenance of lighting units (including sign lighting), cable runs and lighting controls. In the case of a pole knockdown or sign light damage, the Contractor shall promptly clear the lighting unit and circuit discontinuity and restore the system to service. The equipment shall then be re-set by the contractor within the time limits specified herein.

If the 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	na	7 Calendar days
Radio problem	1 hour	4 hours	7 Calendar days
Motorist caused damage or leaning light pole 10 degrees or more	1 hour to clear	4 hours	7 Calendar days
Circuit out – Needs to reset breaker	1 hour	4 hours	na
Circuit out – Cable trouble	1 hour	24 hours	21 Calendar days
Outage of 3 or more successive lights	1 hour	4 hours	na
Outage of 75% of lights on one tower	1 hour	4 hours	na
Outage of light nearest RR crossing approach, Islands and gores	1 hour	4 hours	na
Outage (single or multiple) found on night outage survey or reported to EMC	na	na	7 Calendar days
Navigation light outage	na	na	24 hours

- **Service Response Time** -- amount of time from the initial notification to the Contractor until a patrolman physically arrives at the location.
- **Service Restoration Time** – amount of time from the initial notification to the Contractor until the time the system is fully operational again (In cases of motorist caused damage the undamaged portions of the system are operational.)
- **Permanent Repair Time** – amount of time from initial notification to the Contractor until the time permanent repairs are made if the Contractor was required to make temporary repairs to meet the service restoration requirement.

Failure to provide this service will result in liquidated damages of \$500 per day per occurrence. In addition, the Department reserves the right to assign any work not completed within this timeframe to the Electrical Maintenance Contractor. All costs associated to repair this uncompleted work shall be the responsibility of the Contractor. Failure to pay these costs to the Electrical Maintenance Contractor within one month after the incident will result in additional liquidated damages of \$500 per month per occurrence. Unpaid bills will be deducted from any 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.

Basis of Payment. Maintenance of lighting systems shall be paid for at the contract unit price per calendar month for **MAINTENANCE OF LIGHTING SYSTEM**, which shall include all work as described herein.

MODIFICATION OF EXISTING CCTV DISTRIBUTION SYSTEM

September 1, 2012

General. The CCTV (Closed Circuit Television) Distribution System is a fully integrated IP multicast system, comprised primarily of Cisco network hardware and software, providing multi-point internet protocol based video images and control over Ethernet to multiple monitoring center locations while minimizing bandwidth demand upon the system.

The system shall be generally configured to collect video images and connect control from field mounted cameras at distribution node locations and to produce video images and controls at designated distribution nodes and at three monitoring locations; District 1 Headquarters in Schaumburg, ITS Office in Schaumburg, Traffic Systems Center in Oak Park.

The system shall utilize existing CCTV elements, and shall include all materials and equipment necessary to integrate the new cameras into the existing system. The work under this Special Provision includes the coordination with camera equipment provided under this contract, adjacent contract(s), and coordination with existing CCTV equipment as indicated, including adjustments of or supplements to the equipment as may be required

Video Control software. The existing control software is ICX's 360 Cameleon Enterprise camera control. Included in this item, the Contactor shall provide 10 Enterprise software license units. The Contractor shall configure the cameras within the video control software. This work shall be coordinated with the Electrical Maintenance Contractor.

Provisioning of IP routing and switching equipment. The Contractor shall fully integrate all the equipment to be installed with the existing video distribution system as a part of this item and this coordination will require technical services of the existing system integrator, AT&T, a Cisco Systems Integrator (Contact: Jim Patterson, AT&T, 217.801.2329) and coordination with the State District 1 Electrical Maintenance Contractor. This work shall be included in the item and will not be paid for separately.

Method of Measurement. The modification of existing video distribution system shall be measured for payment as lump sum when furnished, installed, configured, warranted, made fully operational, and tested as detailed herein.

Basis Of Payment. This work will be paid for at the contract lump sum price for **MODIFICATION OF EXISTING VIDEO DISTRIBUTION SYSTEM** which shall be for the work as specified herein.

TEMPORARY WOOD POLE, INSTALL ONLY

Effective: January 1, 2012

Description. This item shall consist of retrieving from storage, transporting, and installing a temporary wood pole, and mast as applicable, as specified herein and as indicated on the plans.

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

Item	Article/Section
(a) Light Pole Identification.....	1069.06

CONSTRUCTION REQUIREMENTS

Inspection And Acceptance. The Contractor shall examine the wood pole, and mast as applicable, in the presence of the Engineer and after accepting the pole(s) shall be held responsible for preservation of the condition of each pole, as it was at the time of acceptance, until the Final Acceptance Inspection.

Transportation. The Contractor shall transport, handle the wood pole in complete conformance with industry standard recommendations. The Contractor shall make arrangements to transfer the light poles from the State's storage facility located within District 1 on weekdays between the hours of 8:00 a.m. and 4:00 p.m., excluding State holidays applicable to the Department.

Installation. Installation shall be as described in Article 830.03(c). Unless otherwise indicated, the Contractor shall provide all hardware to install the pole and mast arm as specified herein and indicated on the plans.

Unless otherwise indicated, the wood pole and mast arm, as applicable, shall remain the property of the owner and shall be removed as specified elsewhere herein.

Method Of Measurement. Wood poles shall be counted as, each installed.

Basis Of Payment. This item shall be paid at the contract unit price each for **TEMPORARY WOOD POLE**, of the mounting height, mast arm quantity and length indicated, **(INSTALL ONLY)**.

UNDERGROUND RACEWAYS

Effective: January 1, 2012

Revise Article 810.03 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 810.03 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 810.03 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."

Add the following to Article 810.03(c) of the Standard Specifications:

"Coilable non-metallic conduit shall be machine straightened to remove the longitudinal curvature caused by coiling the conduit onto reels prior to installing in trench, encasing in concrete or embedding in structure. The straightening shall not deform the cross-section of the conduit such that any two measured outside diameters, each from any location and at any orientation around the longitudinal axis along the conduit differ by more than 6 mm (0.25)". The longitudinal axis of the straightened conduit shall not deviate by more than 20 mm per meter (0.25" per foot" from a straight line. The HDPE and straightening mechanism manufacturer operating temperatures shall be followed.

UNIT DUCT

Effective: January 1, 2012

Revise the first paragraph of Article 810.04 to read:

“The unit duct shall be installed at a minimum depth of 30-inches (760 mm) unless otherwise directed by the Engineer.”

Revise Article 1088.01(c) to read:

“(c) Coilable Nonmetallic Conduit.

General:

The duct shall be a plastic duct which is intended for underground use and which can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance. The duct shall be a plastic duct which is intended for underground use and can be manufactured and coiled or reeled in continuous transportable lengths and uncoiled for further processing and/or installation without adversely affecting its properties of performance.

The duct shall be made of high density polyethylene which shall meet the requirements of ASTM D 2447, for schedule 40. The duct shall be composed of black high density polyethylene meeting the requirements of ASTM D 3350, Class C, Grade P33. The wall thickness shall be in accordance with Table 2 for ASTM D 2447.

The duct shall be UL Listed per 651-B for continuous length HDPE coiled conduit. The duct shall also comply with NEC Article 354.100 and 354.120.

Submittal information shall demonstrate compliance with the details of these requirements.

Dimensions:

Duct dimensions shall conform to the standards listed in ASTM D2447. Submittal information shall demonstrate compliance with these requirements.

Nominal Size		Nominal I.D.		Nominal O.D.		Minimum Wall	
mm	in	mm	in	mm	in	mm	in
31.75	1.25	35.05	1.380	42.16	1.660	3.556 +0.51	0.140 +0.020
38.1	1.50	40.89	1.610	48.26	1.900	3.683 +0.51	0.145 +0.020

Nominal Size		Pulled Tensile	
mm	in	N	lbs
31.75	1.25	3322	747
38.1	1.50	3972	893

Marking:

As specified in NEMA Standard Publication No. TC-7, the duct shall be clearly and durably marked at least every 3.05 meters (10 feet) with the material designation (HDPE for high density polyethylene), nominal size of the duct and the name and/or trademark of the manufacturer.

Performance Tests:

Polyethylene Duct testing procedures and test results shall meet the requirements of UL 651. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the duct. Duct crush test results shall meet or exceed the following requirements:

Duct Diameter		Min. force required to deform sample 50%	
mm	in	N	lbs
35	1.25	4937	1110
41	1.5	4559	1025

WIRE AND CABLE

Effective: January 1, 2012

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

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

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

Aerial Electric Cable Properties

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

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

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

Revise Article 1066.04 to read:

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

Revise the second paragraph of Article 1066.05 to read:

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

MULCH PLACEMENT

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

Description: This work shall consist of furnishing, transporting, and spreading an approved shredded hardwood bark mulch to the depth specified in areas as shown in the plans or as directed by the Engineer.

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

- Material shall be free of sticks, leaves, stones, dirt clods, and other debris.
- Individual wood chips shall not exceed 2 inches (50 mm) in the largest dimension.
- All hardwood mulch shall be processed through hammermill. Hardwood bark not processed through a hammermill shall not be accepted.

A mulch sample and request for material inspection must be supplied to the Engineer for approval prior to performing any work 72 hours prior to application.

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

The Contractor shall remove all weeds, litter and plant debris before mulching. Pre-emergent herbicide, if specified, shall be applied prior to the placement of shredded mulch. The Contractor shall repair the grade by raking and adding topsoil as needed, before mulching.

The Contractor shall supply and install shredded hardwood bark mulch, as required to mulch around trees, shrubs, and herbaceous plants in landscaped areas.

Care shall be taken not to bury leaves, stems, or vines under mulch material.

The shredded mulch shall be placed according at the required depth as specified in the plans. All finished mulch areas shall be left smooth and level to maintain uniform surface and appearance.

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

Method of Measurement: Mulch placement will be measured in place to the depth specified in square yards (square meters). Areas not meeting the depth specified shall not be measured for payment.

Basis of Payment: This work will be paid for at the contract unit price per square yard (square meter) for MULCH PLACEMENT, of the thickness specified. 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. Any mulch placement included as part of the work in other work items will not be measured separately for payment.

PLANTING WOODY PLANTS (MODIFIED)

Effective: January 1, 2012

Revised: February 7, 2012

This work shall consist of planting woody plants as specified in Section 253 of the Standard Specifications with the following revisions:

Delete the third sentence of Article 253.07 and substitute the following:

The Contractor shall place the marking flags and outline each area for mass or solid planting. The Engineer will contact the Roadside Development Unit at (847) 705-4171, at least 72 hours prior to any digging to verify the layout.

Delete the fourth paragraphs of Article 253.10 and substitute the following:

Trees, shrubs, and vines shall be thoroughly watered with a method approved by the Engineer. Place backfill in 6 inch-thick layers. Work each layer by hand to compact backfill and eliminate voids. Maintain plumb during backfilling. When backfill is approximately 2/3 complete, saturate backfill with water and repeat until no more water can be absorbed. Place and compact remainder of backfill and thoroughly water again. Approved watering equipment shall be at the site of the work and in operational condition prior to starting the planting operation and during all planting operations or planting will not be allowed.

Add the following to Article 253.10(e):

Spade a planting bed edge at approximately a 45 degree angle and to a depth of approximately 3-inches (75 mm) around the perimeter of the tree bed. Remove any debris created in the spade edging process and disposed of as specified in Article 202.03.

Delete Article 253.11 and substitute the following:

Within 48 hours after planting, mulch shall be placed around all plants in the entire mulched bed or saucer area specified to a depth of 4 inches (100 mm). 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 prior to mulching. See specification for Weed Control, Pre-Emergent Granular Herbicide. Mulch shall not be in contact with the base of the trunk.

Delete Article 253.12 and substitute the following:

Any paper or cardboard trunk wrap must be removed before placing the tree in the tree hole in order to inspect the condition of the trunks. "A layer of commercial screen wire mesh shall be wrapped around the trunk of all deciduous trees. All other plants planted individually shall be similarly wrapped when directed by the Engineer. The screen wire shall be secured to itself with staples or single wire strands tied to the mesh. Trees shall be wrapped at time of planting before the installation of mulch. The lower edge of the screen wire shall be in continuous contact with the ground and shall extend up to the lowest major branch.

Add the following to Article 253.13 Bracing:

Trees required to be braced shall be braced within 24 hours of planting.

Revise the first sentence of the second paragraph of Article 253.14 of the Standard Specifications to read:

"This period of establishment for the plants shall not delay acceptance of the entire project and final payment due if the contractor requires and receives from the subcontractor a third party performance bond naming the Department as obligee in the full amount of the planting quantities subject to this period of establishment, multiplied by their contract unit prices."

Revise Article 253.17 of the Standard Specifications to read:

" 253.17 Basis of Payment. This work will be paid for at the contract unit price per each for TREES, SHRUBS, or VINES, of the species, root type, and plant size specified; and per unit for SEEDLINGS. Payment will be made according to the following schedule.

(a) Initial Payment. Upon completion of planting, mulch covering, wrapping, and bracing, 90 percent of the pay item(s) will be paid.

(b) Final Payment. Upon inspection and acceptance of the plant material, or upon execution of a third party bond, the remaining ten percent of the pay item(s) will be paid."

PROTECTION OF EXISTING TREES

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

All work, materials and equipment shall conform to Section 201 and 1081 of the Standard Specifications except as modified herein.

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

1. Whenever proposed excavation falls within a drip-line of a tree, the Contractor shall:
 - a. Root prune 6-inches behind and parallel to the proposed edge of trench a neat, clean vertical cut to a minimum depth directed by the Engineer through all affected tree roots.
 - b. Root prune to a maximum width of 4-inches using a "Vermeer" wheel, or other similar machine. Trenching machines will not be permitted.
 - c. Exercise care not to cut any existing utilities.
 - d. If during construction it becomes necessary to expose tree roots which have not been pre-cut, the Engineer shall be notified and the Contractor shall provide a clean, vertical cut at the proper root location, nearer the tree trunk, as necessary, by means of hand-digging and trimming with chain saw or hand saw. Ripping, shredding, shearing, chopping or tearing will not be permitted.
 - e. Top Pruning: When thirty percent (30%) or more of the root zone is pruned, an equivalent amount of the top vegetative growth or the plant material shall be pruned off within one (1) week following root pruning.
2. Whenever curb and gutter is removed for replacement, or excavation for removal of or construction of a structure is within the drip line/root zone of a tree, the Contractor shall:
 - a. Root prune 6-inches behind the curbing so as to neatly cut the tree roots.
 - b. Depth of cut shall be 12 inches for curb removal and replacement and 24 inches for structural work. Any roots encountered at a greater depth shall be neatly saw cut at no additional cost.
 - c. Locations where earth saw cutting of tree roots is required will be marked in the field by the Engineer.
3. All root pruning work is to be performed through the services of a licensed arborist to be approved by the Engineer.

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

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

B. Temporary Fence:

1. The Contractor shall erect a temporary fence around all trees within the construction area to establish a "tree protection zone" before any work begins or any material is delivered to the jobsite. No work is to be performed (other than root pruning), materials stored or vehicles driven or parked within the "tree protection zone".
2. The exact location and establishment of the "tree protection zone" fence shall be approved by the Engineer prior to setting the fence.
3. The fence shall be erected on three sides of the tree at the drip-line of the tree or as determined by the Engineer.
4. All work within the "tree protection zone" shall have the Engineer's prior approval. All slopes and other areas not regarded should be avoided so that unnecessary damage is not done to the existing turf, tree root system ground cover.
5. The grade within the "tree protection zone" shall not be changed unless approved by the Engineer prior to making said changes or performing the work.

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

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

C. Tree Limb Pruning:

1. The Contractor shall inspect the work site in advance and arrange with the Roadside Development Unit (847.705.4171) to have any tree limbs pruned that might be damaged by equipment operations at least one week prior to the start of construction. Any tree limbs that are broken by construction equipment after the initial pruning must be pruned correctly within 72 hours.
2. Top Pruning: When thirty percent (30%) or more of the root zone of a tree is pruned, an equivalent amount of the top vegetative growth or the plant material shall be pruned off within one (1) week following root pruning.

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

D. Removal of Driveway Pavement and Sidewalk:

1. In order to minimize the potential damage to the tree root system(s), the Contractor will not be allowed to operate any construction equipment or machinery within the "tree protection zone" located between the curb or edge of pavement and the right-of-way property line.
2. Sidewalk to be removed in the areas adjacent to the "tree protection zones" shall be removed with equipment operated from the street pavement. Removal equipment shall be Gradall (or similar method), or by hand or a combination of these methods. The method of removal shall be approved by the Engineer prior to commencing any work.
3. Any pavement or pavement related work that is removed shall be immediately disposed of from the area and shall not be stockpiled or stored within the parkway area under any circumstances.

E. Backfilling:

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

F. Damages:

1. In the event that a tree not scheduled for removal is injured such that potential irreparable damage may ensure, as determined by the Roadside Development Unit, the Contractor shall be required to remove the damage tree and replace it on a three to one (3:1) basis, at his own expense. The Roadside Development Unit will select replacement trees from the pay items already established in the contract.
2. The Contractor shall place extreme importance upon the protection and care of trees and shrubs which are to remain during all times of this improvement. It is of paramount importance that the trees and shrubs which are to remain are adequately protected by the Contractor and made safe from harm and potential damage from the operations and construction of this improvement. If the Contractor is found to be in violation of storage or operations within the "tree protection zone" or construction activities not approved by the Engineer, a penalty shall be levied against the Contractor with the monies being deducted from the contract. The amount of the penalty shall be two hundred fifty dollars (\$250.00) per occurrence per day.

SUPPLEMENTAL WATERING

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

Schedule: See the plans for supplemental watering dates specified in the CALENDAR OF CONSTRUCTION AND ESTABLISHMENT WORK. Watering will only begin after the successful completion of all period of establishment requirements.

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

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

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

Perennial Plants:	5 gallons per square yard
Trees:	30 gallons per tree
Shrubs:	7 gallons per shrub
Vines:	3 gallons per vine

Method of Application: A spray nozzle that does not damage small plants must be used when watering perennial plants or turf. Water shall be applied at the base of the plant to keep as much water as possible off plant leaves. An open hose may be used to water trees, shrubs, and vines if mulch and soil are not displaced by watering. Water shall trickle slowly into soil and completely soak the root zone. The Contractor must supply metering equipment as needed to assure the specified application rate of water.

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

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

WEED CONTROL, PRE-EMERGENT GRANULAR HERBICIDE

Description: 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 mulch rings.

Materials: The pre-emergent granular herbicide (Snapshot 2.5 TG or equivalent) 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 seventy-two (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 are to be applied prior to mulching.

Apply the granular herbicide using a drop or rotary-type designed to apply granular herbicide or insecticides. Calibrate application equipment 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 100 lbs/acre (112 kg/ha) or 2.3 lbs/1000 sq. ft. (11.2 kg/1000 sq. meters).

Method of Measurement: Pre-emergent granular herbicide will be measured in place in Pounds (Kilograms) of Pre-emergent Granular Herbicide applied. Areas treated after mulch placement shall not be measured for payment.

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

TYPE III TEMPORARY TAPE FOR WET CONDITIONS

Effective: February 1, 2007

Revised: February 1, 2011

Description. This work shall consist of furnishing, installing, and maintaining Type III Temporary Pavement Marking Tape for Wet Conditions.

Materials. Materials shall be according to the following.

Item	Article/Section
(a) Pavement Marking Tape	1095.06

Initial minimum reflectance values under dry and wet conditions shall be as specified in Article 1095.06. The marking tape shall maintain its reflective properties when submerged in water. The wet reflective properties will be verified by a visual inspection method performed by the Department. The surface of the material shall provide an average skid resistance of 45 BPN when tested according to ASTM E 303.

CONSTRUCTION REQUIREMENTS

Type III Temporary Tape for Wet Conditions shall meet the requirements of Article 703.03 and 703.05. Application shall follow manufacturer's recommendations.

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

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for WET REFLECTIVE TEMPORARY TAPE TYPE III of the line width specified, and at the contract unit price per square foot (square meter) for WET REFLECTIVE TEMPORARY TAPE TYPE III, LETTERS AND SYMBOLS.

TRAFFIC SIGNAL SPECIFICATIONS

Effective: May 22, 2002

Revised: January 1, 2012

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. The locations and the details of all installations shall be as indicated on the Plans or as directed by the Engineer. Traffic signal construction and maintenance work shall be performed by personnel holding IMSA Traffic Signal Technician Level II certification. The work to be done under this contract consists of furnishing and installing all traffic signal work as specified in the Plans and as specified herein in a manner acceptable and approved by the Engineer.

SECTION 720 SIGNING

MAST ARM SIGN PANELS

Add the following to Article 720.02 of the Standard Specifications:

Signs attached to poles or posts (such as mast arm signs) shall have mounting brackets and sign channels which are equal to and completely interchangeable with those used by the District Sign Shops. Signfix Aluminum Channel Framing System is currently recommended, but other brands of mounting hardware are acceptable based upon the Department's approval.

DIVISION 800 ELECTRICAL

SUBMITTALS

Revise Article 801.05 of the Standard Specifications to read:

All material approval requests shall be submitted in accordance with the District's current Electrical Product Data and Documentation Submittal Guidelines. General requirements include:

1. Material approval requests shall be made at the preconstruction meeting, including major traffic signal items listed in the table 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 and separated from of other pay item submittals. 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. Partial or incomplete submittals will be returned without review.
4. Certain non-standard mast arm poles and structures will require additional review from IDOT's Central Office. Examples include ornamental/decorative and non-standard length mast arm pole assemblies. The Contractor shall account for the additional review time in his schedule.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.

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 facilities 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, or the Municipality 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. Automatic Traffic Enforcement equipment is not owned by the State and the Contractor shall not be responsible for maintaining it during construction. 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. 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. 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.
- c. Contracts such as pavement grinding or patching which result in the destruction of traffic signal loops do not require maintenance transfer, but require a notification of intent to work and an inspection. A minimum of seven (7) working days prior to the loop removal, the Contractor shall notify the Area Traffic Signal Maintenance and Operations Engineer at (847) 705-4424 and the Department's Electrical Maintenance Contractor, at which time arrangements will be made to adjust the traffic controller timing to compensate for the absence of detection. Damaged Automatic Traffic Enforcement equipment, including cameras, detectors, or other peripheral equipment, shall be replaced by others, per Permit agreement, at no cost to the contract. See additional requirements in these specifications under Inductive Loop Detector.

- d. 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 shutdown 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.
- e. The Contractor shall be fully responsible for the safe and efficient operation of the traffic signals. 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 \$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 the cost of the Contract. The District's Electrical Maintenance Contractor may inspect any signaling device on the Department's highway system at any time without notification.
- f. 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.

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 whatsoever 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.

Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, and peripheral equipment, damaged or not operating properly from any cause whatsoever, 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 vendor 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 not grant a field inspection until notification is provided from the Contractor that the equipment has been field tested and the intersection is operating according to Contract requirements. The Department's facsimile number is (847) 705-4089. 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 direct traffic at the time of testing.

The Contractor shall provide a representative from the control equipment vendor's office 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 from the Contractor at traffic signal turn-ons.

1. One set of signal plans of record with field revisions marked in red ink.
2. Written notification from the Contractor and the equipment vendor of satisfactory field testing.
3. A knowledgeable representative of the controller equipment supplier shall be required at the traffic signal turn-on. The representative shall be knowledgeable of the cabinet design and controller functions.
4. A copy of the approved material letter.
5. One (1) copy of the operation and service manuals of the signal controller and associated control equipment.
6. Five (5) copies 11" x 17" (280 mm X 430 mm) of the cabinet wiring diagrams.

7. The controller manufacturer shall supply a printed form, not to exceed 11" x 17" (280 mm X 430 mm) for recording 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 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.
8. All manufacturer and contractor warranties and guarantees required by Article 801.14.

Acceptance of the traffic signal equipment by the Department shall be based upon inspection results at the traffic signal "turn on." 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:

- a. "When the work is complete, and seven days before the request for a final inspection, the full-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.
- b. 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."

- c. Additional requirements are listed in the District’s Electrical Product Data and Documentation Guidelines.

Add the following to Article 801.16 of the Standard Specifications:

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

- All Mast Arm Poles and Posts
- Handholes
- Conduit roadway crossings
- Controller Cabinets
- Communication Cabinets
- Electric Service Disconnect locations
- CCTV Camera installations
- Fiber Optic Splice Locations

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. Description of item
2. Designation or approximate station if the item is undesignated
3. Latitude
4. Longitude

Examples:

Description	Designation	Latitude	Longitude
Mast Arm Pole Assembly (dual, combo, etc)	MP (SW, NW, SE or NE corner)	41.580493	-87.793378
FO mainline splice handhole	HHL-ST31	41.558532	-87.792571
Handhole	HH	41.765532	-87.543571
Electric Service	Elec Srv	41.602248	-87.794053
Conduit crossing	SB IL83 to EB I290 ramp SIDE A	41.584593	-87.793378
PTZ Camera	PTZ	41.584600	-87.793432
Signal Post	Post	41.558532	-87.792571
Controller Cabinet	CC	41.651848	-87.762053
Master Controller Cabinet	MCC	41.580493	-87.793378
Communication Cabinet	ComC	41.558532	-87.789771
Fiber splice connection	Toll Plaza34	41.606928	-87.794053

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 100 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.

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 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.”

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

LOCATING UNDERGROUND FACILITIES

Revise Section 803 to the Standard Specifications to read:

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, trench and backfill, 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.

ELECTRIC SERVICE INSTALLATION

Revise Section 805 of the Standard Specifications to read:

Description.

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

General.

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

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

Materials.

- a. General. The completed control panel shall be constructed in accordance with UL Std. 508A, Industrial Control Panel, and carry the UL label. Wire terminations shall be UL listed.
- b. Enclosures.
 1. Pole Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 4X, unfinished single door design, fabricated from minimum 0.080-inch (2.03 mm) thick Type 5052 H-32 aluminum. Seams shall be continuous welded and ground smooth. Stainless steel screws and clamps shall secure the cover and assure a watertight seal. The cover shall be removable by pulling the continuous stainless steel hinge pin. The cabinet shall have an oil-resistant gasket and a lock kit shall be provided with an internal O-ring in the locking mechanism assuring a watertight and dust-tight seal. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 14-inches (350 mm) high, 9-inches (225 mm) wide and 8-inches (200 mm) in depth is required. The cabinet shall be channel mounted to a wooden utility pole using assemblies recommended by the manufacturer.

2. Ground Mounted Cabinet. The cabinet shall be UL 50, NEMA Type 3R unfinished single door design with back panel. The cabinet shall be fabricated from Type 5052 H-32 aluminum with the frame and door 0.125-inch (3.175 mm) thick, the top 0.250-inch (6.350 mm) thick and the bottom 0.500-inch (12.70 mm) thick. Seams shall be continuous welded and ground smooth. The door and door opening shall be double flanged. The door shall be approximately 80% of the front surface, with a full length tamperproof stainless steel .075-inch (1.91 mm) thick hinge bolted to the cabinet with stainless steel carriage bolts and nylocks nuts. The locking mechanism shall be slam-latch type with a keyhole cover. The cabinet shall be sized to adequately house all required components with extra space for arrangement and termination of wiring. A minimum size of 40-inches (1000 mm) high, 16-inches (400 mm) wide and 15-inches (375 mm) in depth is required. The cabinet shall be mounted upon a square Type A concrete foundation as indicated on the plans. The foundation is paid for separately.
- c. Surge Protector. Overvoltage protection, with LED indicator, shall be provided for the 120 volt load circuit by the means MOV and thermal fusing technology. The response time shall be <math><5n</math> seconds and operate within a range of $-40C$ to $+85C$. The surge protector shall be UL 1449 Listed.
- d. Circuit Breakers. Circuit breakers shall be standard UL listed molded case, thermal-magnetic bolt-on type circuit breakers with trip free indicating handles. 120 volt circuit breakers shall have an interrupting rating of not less than 65,000 rms symmetrical amperes. Unless otherwise indicated, the main disconnect circuit breaker for the traffic signal controller shall be rated 60 amperes, 120 V and the auxiliary circuit breakers shall be rated 10 amperes, 120 V.
- e. Fuses, Fuseholders and Power Indicating Light. Fuses shall be small-dimensional cylindrical fuses of the dual element time-delay type. The fuses shall be rated for 600 V AC and shall have a UL listed interrupting rating of not less than 10,000 rms symmetrical amperes at rated voltage. The power indicating light shall be LED type with a green colored lens and shall be energized when electric utility power is present.
- f. Ground and Neutral Bus Bars. A single copper ground and neutral bus bar, mounted on the equipment panel shall be provided. Ground and neutral conductors shall be separated on the bus bar. Compression lugs, plus 2 spare lugs, shall be sized to accommodate the cables with the heads of the connector screws painted green for ground connections and white for neutral connections.
- g. Utility Services Connection. The Contractor shall notify the Utility Company marketing representative a minimum of 30 working days prior to the anticipated date of hook-up. This 30 day advance notification will begin only after the Utility Company marketing representative has received service charge payments from the Contractor. Prior to contacting the Utility Company marketing representative for service connection, the service installation controller cabinet and cable must be installed for inspection by the Utility Company.

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

Installation.

- a. General. The Contractor shall confirm the orientation of the traffic service installation and its door side with the engineer, prior to installation. All conduit entrances into the service installation shall be sealed with a pliable waterproof material.
- b. Pole Mounted. Brackets designed for pole mounting shall be used. All mounting hardware shall be stainless steel. Mounting height shall be as noted on the plans or as directed by the Engineer.
- c. Ground Mounted. The service installation shall be mounted plumb and level on the foundation and fastened to the anchor bolts with hot-dipped galvanized or stainless steel nuts and washers. The space between the bottom of the enclosure and the top of the foundation shall be caulked at the base with silicone.

Basis of Payment.

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

GROUNDING OF TRAFFIC SIGNAL SYSTEMS

Revise Section 806 of the Standard Specifications to read:

General.

All traffic signal systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC. See IDOT District One Traffic Signal detail plan sheets for additional information.

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

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

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

- (b) The equipment grounding conductor shall be green color coded. The following is in addition to Article 801.04 of the Standard Specifications.
1. Equipment grounding conductors shall be bonded to the grounded conductor (neutral conductor) only at the Electric Service Installation. The equipment grounding conductor is paid for separately and shall be continuous. The Earth shall not be used as the equipment grounding conductor.
 2. Equipment grounding conductors shall be bonded, using a Listed grounding connector, to all traffic signal mast arm poles, traffic signal posts, pedestrian posts, pull boxes, handhole frames and covers, conduits, and other metallic enclosures throughout the traffic signal wiring system, except where noted herein. Bonding shall be made with a splice and pigtail connection, using a sized compression type copper sleeve, sealant tape, and heat-shrinkable cap. A Listed electrical joint compound shall be applied to all conductors' terminations, connector threads and contact points. Conduit grounding bushings shall be installed at all conduit terminations.
 3. All metallic and non-metallic raceways containing traffic signal circuit runs shall have a continuous equipment grounding conductor, except raceways containing only detector loop lead-in circuits, circuits under 50 volts and/or fiber optic cable will not be required to include an equipment grounding conductor.
 4. Individual conductor splices in handholes shall be soldered and sealed with heat shrink. When necessary to maintain effective equipment grounding, a full cable heat shrink shall be provided over individual conductor heat shrinks.
- (c) The grounding electrode conductor shall be similar to the equipment grounding conductor in color coding (green) and size. The grounding electrode conductor is used to connect the ground rod to the equipment grounding conductor and is bonded to ground rods via exothermic welding, listed pressure connectors, listed clamps or other approved listed means.

GROUNDING EXISTING HANDHOLE FRAME AND COVER

Description.

This work shall consist of all materials and labor required to bond the equipment grounding conductor to the existing handhole frame and handhole cover. All installations shall meet the requirements of the details in the "District One Standard Traffic Signal Design Details," and applicable portions of the Standard Specifications and these specifications.

The equipment grounding conductor shall be bonded to the handhole frame and to the handhole cover. Two (2) ½-inch diameter x 1 ¼-inch long hex-head stainless steel bolts, spaced 1.75-inches apart center-to-center shall be fully welded to the frame and to the cover to accommodate a heavy duty Listed grounding compression terminal (Burndy type YGHA or approved equal). The grounding compression terminal shall be secured to the bolts with stainless steel split-lock washers and nylon-insert locknuts.

Welding preparation for the stainless steel bolt hex-head to the frame and to the cover shall include thoroughly cleaning the contact and weldment area of all rust, dirt and contaminants. The Contractor shall assure a solid strong weld. The welds shall be smooth and thoroughly cleaned of flux and spatter. The grounding installation shall not affect the proper seating of the cover when closed.

The grounding cable shall be paid for separately.

Method of Measurement.

Units measured for payment will be counted on a per handhole basis, regardless of the type of handhole and its location.

Basis of Payment.

This work shall be paid for at the contract unit price each for GROUNDING EXISTING HANDHOLE FRAME AND COVER which shall be payment in full for grounding the handhole complete.

COILABLE NON-METALLIC CONDUIT

Description.

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

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.

HANDHOLES

Add the following to Section 814 of the Standard Specifications:

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

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

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

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

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

GROUNDING CABLE

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

Add the following to Article 817.02 (b) of the Standard Specifications:

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

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

Add the following to Article 817.05 of the Standard Specifications:

Basis of Payment.

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

RAILROAD INTERCONNECT CABLE

The cable shall meet the requirements of Section 873 of the Standard Specifications, except for the following:

Add to Article 873.02 of the Standard Specifications:

The railroad interconnect cable shall be three conductor stranded #14 copper cable in a clear polyester binder, shielded with #36 AWG tinned copper braid with 85% coverage, and insulated with .016" polyethylene (black, blue, red). The jacket shall be black 0.045 PVC or polyethylene.

Add the following to Article 873.05 of the Standard Specifications:

Basis of Payment.

This work shall be paid for at the contract unit price per foot (meter) for ELECTRIC CABLE IN CONDUIT, RAILROAD, NO. 14 3C, which price shall be payment in full for furnishing, installing, and making all electrical connections in the traffic signal controller cabinet. Connections in the railroad controller cabinet shall be performed by railroad personnel.

FIBER OPTIC TRACER CABLE

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

Add the following to Article 817.03 of the Standard Specifications:

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

Add the following to Article 817.05 of the Standard Specifications:

Basis of Payment.

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

MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION

Revise Articles 850.02 and 850.03 of the Standard Specifications to read:

Procedure.

The energy charges for the operation of the traffic signal installation shall be paid for by others. Full maintenance responsibility shall start as soon as the Contractor begins any physical work on the Contract or any portion thereof.

The Contractor shall have electricians with IMSA Level II certification on staff to provide signal maintenance.

This item shall include maintenance of all traffic signal equipment at the intersection, including emergency vehicle pre-emption equipment, master controllers, uninterruptible power supply (UPS and batteries), telephone service installations, communication cables, conduits to adjacent intersections, and other traffic signal equipment, but shall not include Automatic Traffic Enforcement equipment, such as Red Light Enforcement cameras, detectors, or peripheral equipment, not owned by the State.

Maintenance.

The maintenance shall be according to MAINTENANCE AND RESPONSIBILITY in Division 800 of these specifications and the following:

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. 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.

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.

The Contractor shall provide the Engineer with a 24 hour telephone number for the maintenance of the traffic signal installation and for emergency calls by the Engineer.

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.

The Contractor shall respond to all emergency calls from the Department or others within one 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 required. 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.

TRAFFIC ACTUATED CONTROLLER

Add the following to Article 857.02 of the Standard Specifications:

Controllers shall be NTCIP compliant NEMA TS2 Type 1, Econolite ASC/3S-1000 or Eagle/Siemens M50 unless specified otherwise on the plans or elsewhere on these specifications. Only controllers supplied by one of the District One approved closed loop equipment manufacturers will be allowed. The controller shall be the most recent model and software version supplied by the manufacturer at the time of the approval and include the standard data key. The traffic signal controller shall provide features to inhibit simultaneous display of a circular yellow ball and a yellow arrow display. Individual load switches shall be provided for each vehicle, pedestrian, and right turn over lap phase. The controller shall prevent phases from being skipped during program changes and after all preemption events.

Add the following to Article 857.03 of the Standard Specifications:

The Contractor shall arrange to install a standard voice-grade dial-up telephone line to the RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET as called for on the traffic signal installation plans. If the traffic signal installation is part of a traffic signal system, a telephone line is usually not required, unless a telephone line is called for on the traffic signal plans. The Contractor shall follow the requirements for the telephone service installation as contained in the current District One Traffic Signal Special Provisions under Master Controller.

MASTER CONTROLLER

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

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

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

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

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

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

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

The Contractor shall arrange to install a standard voice-grade dial-up telephone line to the master controller. This shall be accomplished through the following process utilizing District One staff. This telephone line may be coupled with a DSL line and a phone filter to isolate the dial-up line. An E911 address is required.

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

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

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

As soon as practical or within one week after the contract has been awarded, the Contractor shall contact (via phone) the Administrative Support Manager in the District One Business Services Section at (847) 705-4011 to request a phone line installation.

A follow-up fax transmittal to the Administrative Support Manager (847-705-4712) with all required information pertaining to the phone installation is required from the Contractor as soon as possible or within one week after the initial request has been made. A copy of this fax transmittal must also be faxed by the Contractor to the Traffic Signal Systems Engineer at (847) 705-4089. The required information to be supplied on the fax shall include (but not limited to): A street address for the new traffic signal controller (or nearby address); a nearby existing telephone number; what type of telephone service is needed; the name and number of the Contractor's employee for the telephone company to contact regarding site work and questions.

The usual time frame for the activation of the phone line is 4-6 weeks after the Business Services Section has received the Contractor supplied fax. It is, therefore, imperative that the phone line conduit and pull-string be installed by the Contractor in anticipation of this time frame. On jobs which include roadway widening in which the conduit cannot be installed until this widening is completed, the Contractor will be allowed to delay the phone line installation request to the Business Services Section until a point in time that is 4-6 weeks prior to the anticipated completion of the traffic signal work. The contractor shall provide the Administrative Support Manager with an expected installation date considering the 4-6 week processing time.

The telephone line shall be installed and activated one month before the system final inspection.

All costs associated with the telephone line installation and activation (not including the Contract specified conduit installation between the point of telephone service and the traffic signal controller cabinet) shall be paid for by the District One Business Services Section (i.e., this will be an IDOT phone number not a Contractor phone number).

UNINTERRUPTIBLE POWER SUPPLY

Add the following to Article 862.01 of the Standard Specifications:

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

Add the following to Article 862.02 of the Standard Specifications:

Materials shall be according to Article 1074.04 as modified in UNINTERRUPTIBLE POWER SUPPLY in Division 1000 of these specifications.

Add the following to Article 862.03 of the Standard Specifications:

The UPS shall additionally include, but not be limited to, a battery cabinet. The UPS shall provide reliable emergency power to the traffic signals in the event of a power failure or interruption.

Revise Article 862.04 of the Standard Specifications to read:

Installation.

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

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

At locations where UPS is installed and Emergency Vehicle Priority System is in use, any existing incandescent confirmation beacons shall be replaced with LED lamps in accordance with the District One Emergency Vehicle Priority System specification at no additional cost to the contract. A concrete apron 67 in. x 50 in. x 5 in. (1702mm x 1270mm x 130mm) shall be provided on the side of the existing Type D Foundation, where the UPS cabinet is located. The concrete apron shall follow the District 1 Standard Traffic Signal Design Detail, Type D for Ground Mounted Controller Cabinet and UPS Battery Cabinet. The concrete apron shall follow Articles 424 and 202 of the Standard Specifications.

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

Revise Article 862.05 of the Standard Specifications to read:

Basis of Payment.

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

FIBER OPTIC CABLE

Add the following to Article 871.01 of the Standard Specifications:

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

Add the following to Article 872.02 of the Standard Specifications:

The control cabinet distribution enclosure shall be CSC FTWO12KST-W/O 12 Port Fiber Wall Enclosure or an approved equivalent. The fiber optic cable shall provide six fibers per tube for the amount of fibers called for in the Fiber Optic Cable pay item in the Contract. Fiber Optic cable may be gel filled or have an approved water blocking tape.

Add the following to Article 871.04 of the Standard Specifications:

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

Add the following to Article 871.06 of the Standard Specifications:

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

MAST ARM ASSEMBLY AND POLE

Revise Article 877.01 of the Standard Specifications to read:

Description.

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

Revise Article 877.03 of the Standard Specifications:

Mast arm assembly and pole shall be as follows.

- (a) Steel Mast Arm Assembly and Pole and Steel Combination Mast Arm Assembly and Pole. The steel mast arm assembly and pole and steel combination mast arm assembly and pole shall consist of a traffic signal mast arm, a luminaire mast arm or davit (for combination pole only), a pole, and a base, together with anchor rods and other appurtenances. The configuration of the mast arm assembly, pole, and base shall be according to the details shown on the plans.
 - (1) Loading. The mast arm assembly and pole, and combination mast arm assembly and pole shall be designed for the loading shown on the Highway Standards or elsewhere on the plans, whichever is greater. The design shall be according to AASHTO "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 1994 Edition for 80 mph (130 km/hr) wind velocity. However, the arm-to-pole connection for tapered signal and luminaire arms shall be according to the "ring plate" detail as shown in Figure 11-1(f) of the 2002 Interim, to the AASHTO "Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals" 2001 4th Edition.
 - (2) Structural Steel Grade. The mast arm and pole shall be fabricated according to ASTM A 595, Grade A or B, ASTM A 572 Grade 55, or ASTM A 1011 Grade 55 HSLAS Class 2. The base and flange plates shall be of structural steel according to AASHTO M 270 Grade 50 (M 270M Grade 345). Luminaire arms and trussed arms 15 ft (4.5 m) or less shall be fabricated from one steel pipe or tube size according to ASTM A 53 Grade B or ASTM A 500 Grade B or C. All mast arm assemblies, poles, and bases shall be galvanized according to AASHTO M 111.

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

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

- (4) Shop Drawing Approval. The Contractor shall submit detailed drawings showing design materials, thickness of sections, weld sizes, and anchor rods to the Engineer for approval prior to fabrication. These drawings shall be at least 11 x 17 in. (275 x 425 mm) in size and of adequate quality for microfilming. All product data and shop drawings shall be submitted in electronic form on CD-ROM
- (b) Anchor Rods. The anchor rods shall be ASTM F 1554 Grade 105, coated by the hot-dip galvanizing process according to AASHTO M 232, and shall be threaded a minimum of 7 1/2 in. (185 mm) at one end and have a bend at the other end. The first 12 in. (300 mm) at the threaded end shall be galvanized. Two nuts, one lock washer, and one flat washer shall be furnished with each anchor rod. All nuts and washers shall be galvanized.
- (c) The galvanized steel or extruded aluminum shroud shall have dimensions similar to those detailed in the "District One Standard Traffic Signal Design Details." The shroud shall be installed such that it allow air to circulate throughout the mast arm but not allow infestation of insects or other animals, and such that it is not hazardous to probing fingers and feet.

Add the following to Article 877.04 of the Standard Specifications:

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

CONCRETE FOUNDATIONS

Add the following to Article 878.03 of the Standard Specifications:

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

Concrete Foundations, Type "A" for Traffic Signal Posts shall provide anchor bolts with the bolt pattern specified within the "District One Standard Traffic Signal Design Details." All Type "A" foundations shall be a minimum depth of 48 inches (1220 mm).

Concrete Foundations, Type "C" for Traffic Signal Cabinets with Uninterruptible Power Supply (UPS) cabinet installations shall be a minimum of 72 inches (1830 mm) long and 31 inches (790 mm) wide. All Type "C" foundations shall be a minimum depth of 48 inches (1220 mm). The concrete apron in front of the Type IV or V cabinet shall be 36 in. x 48 in. x 5 in. (915 mm X 1220 mm X 130 mm). The concrete apron in front of the UPS cabinet shall be 36 in. x 67 in. x 5 in. (915 mm X 1700 mm X 130 mm). Anchor bolts shall provide bolt spacing as required by the manufacturer.

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

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

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

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

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

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

Basis of Payment.

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

LIGHT EMITTING DIODE (LED), SIGNAL HEAD, RETROFIT

Description.

This work shall consist of retrofitting an existing polycarbonate traffic signal head with a traffic signal module, pedestrian signal module, and pedestrian countdown signal module, with light emitting diodes (LEDs) as specified in the plans.

Materials.

Materials shall be according to LIGHT EMITTING DIODE (LED) AND OPTICALLY PROGRAMMED LED SIGNAL HEAD, AND LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD in Divisions 880, 881 and 1000 of these specifications.

Add the following to Article 880.04 of the Standard Specifications:

Basis of Payment.

This item shall be paid for at the contract unit price each for SIGNAL HEAD, LED, RETROFIT, or PEDESTRIAN SIGNAL HEAD, LED, RETROFIT, for the type and number of polycarbonate signal heads, faces, and sections specified, which price shall be payment in full for furnishing the equipment described above including LED modules, all mounting hardware, and installing them in satisfactory operating condition. The type specified will indicate the number of faces and the method of mounting.

LIGHT EMITTING DIODE (LED) PEDESTRIAN SIGNAL HEAD

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

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

Add the following to Article 881.03 of the Standard Specifications:

(a) Pedestrian Countdown Signal Heads.

- (1) Pedestrian Countdown Signal Heads shall not be installed at signalized intersections where traffic signals and railroad warning devices are interconnected.
- (2) Pedestrian Countdown Signal Heads shall be 16 inch (406mm) x 18 inch (457mm), for single units with the housings glossy black polycarbonate. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to the inspector at the signal turn-on.
- (3) Each pedestrian signal LED module shall be fully MUTCD compliant and shall consist of double overlay message combining full LED symbols of an Upraised Hand and a Walking Person. "Egg Crate" type sun shields are not permitted. Numerals shall measure 9 inches (229mm) in height and easily identified from a distance of 120 feet (36.6m).

Add the following to Article 881.04 of the Standard Specifications:

Basis of Payment.

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

DETECTOR LOOP

Revise Section 886 of the Standard Specifications to read:

Description.

This work shall consist of furnishing and installing a detector loop in the pavement.

Procedure.

A minimum of seven (7) working days prior to the Contractor cutting loops, the Contractor shall have the proposed loop locations marked 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.

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 Panduit PLFIM water proof tag, or an approved equal, 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 lead-in.
- (b) Loop sealant shall be a two-component thixotropic chemically cured polyurethane either Chemque Q-Seal 295, Percol Elastic Cement AC Grade or an approved equal. The sealant shall be installed 1/8 inch (3 mm) below the pavement surface, if installed above the surface the overlap shall be removed immediately.
- (c) Detector loop measurements shall include the saw cut and the length of the loop lead-in to the edge of pavement. The lead-in 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. Unit duct, trench and backfill, and drilling of pavement or handholes shall be included in detector loop quantities.
- (d) Preformed. This work shall consist of furnishing and installing a rubberized or crosslinked polyethylene heat resistant preformed traffic signal loop in accordance with the Standard Specifications, except for the following:
- (e) 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.

- (f) Handholes shall be placed next to the shoulder or back of curb when preformed detector loops enter the handhole. Non-metallic coilable duct, included in this pay item, shall be used to protect the preformed lead-ins from back of curb to the handhole.
- (g) Preformed detector loops shall be factory assembled with ends capped and sealed against moisture and other contaminants. Homeruns and interconnects shall be pre-wired and shall be an integral part of the loop assembly. 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 or interconnects 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.

This work will be measured for payment in feet (meters) in place. Type I detector loop will be measured along the sawed slot in the pavement containing the loop and lead-in, rather than the actual length of the wire. Preformed detector loops will be measured along the detector loop and lead-in embedded in the pavement, rather than the actual length of the wire.

Basis of Payment.

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

EMERGENCY VEHICLE PRIORITY SYSTEM

Revise Section 887 of the Standard Specifications to read:

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

All new installations shall be equipped with Confirmation Beacons as shown on the "District One Standard Traffic Signal Design Details." The Confirmation Beacon shall consist of a 6 watt Par 38 LED flood lamp with a 30 degree light spread, maximum 6 watt energy consumption at 120V, and a 2,000 hour warranty for each direction of pre-emption. The lamp shall have an adjustable mount with a weatherproof enclosure for cable splicing. All hardware shall be cast aluminum or stainless steel. Holes drilled into signal poles, mast arms, or posts shall require rubber grommets. In order to maintain uniformity between communities, the confirmation beacons shall indicate when the control equipment receives the pre-emption signal. The pre-emption movement shall be signalized by a flashing indication at the rate specified by Section 4L.01 of the "Manual on Uniform Traffic Control Devices," and other applicable sections of future editions. The stopped pre-empted movements shall be signalized by a continuous indication.

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

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

Basis of Payment.

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

TEMPORARY TRAFFIC SIGNAL INSTALLATION

Revise Section 890 of the Standard Specifications to read:

Description.

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

General.

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

Construction Requirements.

(a) Controllers.

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

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

(c) Grounding. Grounding shall be provided for the temporary traffic signal cabinet meeting or exceeding the applicable portions of the National Electrical Code, Section 806 of the Standard Specifications and shall meet the requirements of the District 1 Traffic Signal Specifications for "Grounding of Traffic Signal Systems."

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

(e) Interconnect.

1. Temporary traffic signal interconnect shall be provided using fiber optic cable or wireless interconnect technology as specified in the plans. The Contractor may request, in writing, to substitute the fiber optic temporary interconnect indicated in the contract documents with a wireless interconnect. The Contractor must provide assurances that the radio device will operate properly at all times and during all construction staging. If approved for use by the Engineer, the Contractor shall submit marked-up traffic signal plans indicating locations of radios and antennas and installation details. If wireless interconnect is used, and in the opinion of the engineer, it is not viable, or if it fails during testing or operations, the Contractor shall be responsible for installing all necessary poles, fiber optic cable, and other infrastructure for providing temporary fiber optic interconnect at no cost to the contract.
2. The existing system interconnect and phone lines are to be maintained as part of the Temporary Traffic Signal Installation specified for on the plan. The interconnect shall be installed into the temporary controller cabinet as per the notes or details on the plans. All labor and equipment required to install and maintain the existing interconnect as part of the Temporary Traffic Signal Installation shall be included in the item Temporary Traffic Signal Installation. When shown in the plans, temporary traffic signal interconnect equipment shall be furnished and installed. The temporary traffic signal interconnect shall maintain interconnect communications throughout the entire signal system for the duration of the project.
3. Temporary wireless interconnect, complete. The radio interconnect system shall be compatible with Eagle or Econolite controller closed loop systems. This item shall include all temporary wireless interconnect components, complete, at the adjacent existing traffic signal(s) to provide a completely operational closed loop system. This item shall include all materials, labor and testing to provide the completely operational closed loop system as shown on the plans. The radio interconnect system shall include the following components:

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

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

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

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

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

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

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

- (g) Vehicle Detection. All temporary traffic signal installations shall have vehicular detection installed as shown on the plans or as directed by the Engineer. Pedestrian push buttons shall be provided for all pedestrian signal heads/phases as shown on the plans or as directed by the Engineer. All approaches shall have vehicular detection provided by vehicle detection system as shown on the plans or as directed by the Engineer. Microwave vehicle sensors or video vehicle detection system shall be approved by IDOT prior to Contractor furnishing and installing. The Contractor shall install, wire, and adjust the alignment of the microwave vehicle sensor or video vehicle detection system in accordance to the manufacturer's recommendations and requirements. The Contractor shall be responsible for adjusting the alignment of the microwave vehicle sensor or video vehicle detection system for all construction staging changes and for maintaining proper alignment throughout the project. A representative of the approved control equipment vendor shall be present and assist the contractor in setting up and maintaining the microwave vehicle sensor or video vehicle detection system. An in-cabinet video monitor shall be provided with all video vehicle detection systems and shall be included in the item Temporary Traffic Signal Installation.
- (h) Uninterruptible Power Supply. All temporary traffic signal installations shall have Uninterruptible Power Supply (UPS). The UPS cabinet shall be mounted to the temporary traffic signal cabinet and meet the requirements of Uninterruptible Power Supply in Divisions 800 and 1000 of these specifications.
- (i) Signs. All existing street name and intersection regulatory signs shall be removed from existing poles and relocated to the temporary signal span wire. If new mast arm assembly and pole(s) and posts are specified for the permanent signals, the signs shall be relocated to the new equipment at no extra cost. Any intersection regulatory signs that are required for the temporary traffic signal shall be provided as shown on the plans or as directed by the Engineer. Relocation, removing, bagging and installing the regulatory signs for the various construction stages shall be provided as shown on the plans or as directed by the Engineer.
- (j) Energy Charges. The electrical utility energy charges for the operation of the temporary traffic signal installation shall be paid for by others if the installation replaces an existing signal. Otherwise charges shall be paid for under 109.05 of the Standard Specifications.
- (k) Maintenance. Maintenance shall meet the requirements of the Standard Specifications and MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION in Division 800 of these specifications. Maintenance of temporary signals and of the existing signals shall be included in the cost of the TEMPORARY TRAFFIC SIGNAL INSTALLATION pay item. When temporary traffic signals are to be installed at locations where existing signals are presently operating, the Contractor shall be fully responsible for the maintenance of the existing signal installation as soon as he begins any physical work on the Contract or any portion thereof. In addition, a minimum of seven (7) days prior to assuming maintenance of the existing traffic signal installation(s) under this Contract, the Contractor shall request that the Resident Engineer contact the Bureau of Traffic Operations (847) 705-4424 for an inspection of the installation(s).

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

(m) Temporary Portable Traffic Signal for Bridge Projects.

1. Unless otherwise directed by the Engineer, temporary portable traffic signals shall be restricted to use on roadways of less than 8000 ADT that have limited access to electric utility service, shall not be installed on projects where the estimated need exceeds ten (10) weeks, and shall not be in operation during the period of November through March. The Contractor shall replace the temporary portable traffic signals with temporary span wire traffic signals noted herein at no cost to the contract if the bridge project or Engineer requires temporary traffic signals to remain in operation into any part of period of November through March. If, in the opinion of the engineer, the reliability and safety of the temporary portable traffic signal is not similar to that of a temporary span wire traffic signal installation, the Contractor shall replace the temporary portable traffic signals with temporary span wire traffic signals noted herein at no cost to the contract.
2. The controller and LED signal displays shall meet the Standard Specifications and all other requirements in this TEMPORARY TRAFFIC SIGNAL INSTALLATION specification.
3. Work shall be according to Article 701.18(b) of the Standard Specifications except as noted herein.
4. General.
 - a. The temporary portable bridge traffic signals shall be trailer-mounted units. The trailer-mounted units shall be set up securely and level. Each unit shall be self-contained and consist of two signal heads. The left signal head shall be mounted on a mast arm capable of extending over the travel lane. Each unit shall contain a solar cell system to facilitate battery charging. There shall be a minimum of 12 days backup reserve battery supply and the units shall be capable of operating with a 120 V power supply from a generator or electrical service.

- b. All signal heads located over the travel lane shall be mounted at a minimum height of 17 feet (5m) from the bottom of the signal back plate to the top of the road surface. All far right signal heads located outside the travel lane shall be mounted at a minimum height of 8 feet (2.5m) from the bottom of the signal back plate to the top of the adjacent travel lane surface.
- c. The long all red intervals for the traffic signal controller shall be adjustable up to 250 seconds in one-second increments.
- d. As an alternative to detector loops, temporary portable bridge traffic signals may be equipped with microwave sensors or other approved methods of vehicle detection and traffic actuation.
- e. All portable traffic signal units shall be interconnected using hardwire communication cable. Radio communication equipment may be used only with the approval of the Engineer. If radio communication is used, a site analysis shall be completed to ensure that there is no interference present that would affect the traffic signal operation. The radio equipment shall meet all applicable FCC requirements.
- f. The temporary portable bridge traffic signal system shall meet the physical display and operational requirements of conventional traffic signals as specified in Part IV and other applicable portions of the currently adopted version of the Manual on Uniform Traffic Control Devices (MUTCD) and the Illinois MUTCD. The signal system shall be designed to continuously operate over an ambient temperature range between -30 °F (-34 °C) and 120 °F (48 °C). When not being utilized to inform and direct traffic, portable signals shall be treated as nonoperating equipment according to Article 701.11.
- g. Basis of Payment. This work will be paid for according to Article 701.20(c).

Basis of Payment.

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

REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT

Add the following to Article 895.05 of the Standard Specifications:

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

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

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

Traffic signal equipment which is lost or not returned to the Department for any reason shall be replaced with new equipment meeting the requirements of these Specifications at no cost to the contract.

TRAFFIC SIGNAL PAINTING

Description.

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

Surface Preparation.

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

Painted Finish.

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

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

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

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

Warranty.

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

Packaging.

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

Basis of Payment.

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

ILLUMINATED STREET NAME SIGN

Description.

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

Materials.

Materials shall be in accordance with ILLUMINATED STREET NAME SIGN in Division 1000 of these specifications.

Installation.

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

The sign shall be located on a steel traffic signal mast arm no further than 8-feet from the center of the pole to the center of the sign at a height of between 16 to 18-feet above traveled pavement. Mounting hardware shall be Pelco model SE-5015, or approved equal, utilizing stainless steel components.

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

Basis of Payment.

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

RE-OPTIMIZE TRAFFIC SIGNAL SYSTEM

Description.

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

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

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

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

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

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

(a) LEVEL I Re-Optimization

1. The following tasks are associated with LEVEL I Re-Optimization.
 - a. Appropriate signal timings shall be developed for the subject intersection and existing timings shall be utilized for the rest of the intersections in the system.
 - b. Proposed signal timing plan for the new or modified intersection(s) shall be forwarded to IDOT for review prior to implementation.
 - c. Consultant shall conduct on-site implementation of the timings at the turn-on and make fine-tuning adjustments to the timings of the subject intersection in the field to alleviate observed adverse operating conditions and to enhance operations.
2. The following deliverables shall be provided for LEVEL I Re-Optimization.
 - a. Consultant shall furnish to IDOT a cover letter describing the extent of the re-optimization work performed.
 - b. Consultant shall furnish an updated intersection graphic display for the subject intersection to IDOT and to IDOT's Traffic Signal Maintenance Contractor.

(b) LEVEL II Re-Optimization

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

2. The following deliverables shall be provided for LEVEL II Re-Optimization.
 - a. Consultant shall furnish to IDOT one (1) copy of a technical memorandum for the optimized system. The technical memorandum shall include the following elements:
 - (1) Brief description of the project
 - (2) Printed copies of the analysis output from Synchro (or other appropriate, approved optimization software file)
 - (3) Printed copies of the traffic counts conducted at the subject intersection
 - b. Consultant shall furnish to IDOT two (2) CDs for the optimized system. The CDs shall include the following elements:
 - (1) Electronic copy of the technical memorandum in PDF format
 - (2) Revised Synchro files (or other appropriate, approved optimization software file) including the new signal and the rest of the signals in the closed loop system
 - (3) Traffic counts conducted at the subject intersection
 - (4) New or updated intersection graphic display file for the subject intersection
 - (5) The CD shall be labeled with the IDOT system number and master location, as well as the submittal date and the consultant logo. The CD case shall include a clearly readable label displaying the same information securely affixed to the side and front.

Basis of Payment.

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

OPTIMIZE TRAFFIC SIGNAL SYSTEM

Description.

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

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

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

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

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

1. Appropriate signal timings and offsets shall be developed for each intersection and appropriate cycle lengths shall be developed for the closed loop signal system.
2. Traffic counts shall be taken at all intersections after the permanent traffic signals are approved for operation by the Area Traffic Signal Operations Engineer. Manual turning movement counts shall be conducted from 6:30 a.m. to 9:30 a.m., 11:00 a.m. to 1:00 p.m., and 3:30 p.m. to 6:30 p.m. on a typical weekday from midday Monday to midday Friday. The turning movement counts shall identify cars, and single-unit and multi-unit heavy vehicles.
3. As necessary, the intersections shall be re-addressed and all system detectors reassigned in the master controller according to the current standard of District One.
4. A traffic responsive program shall be developed, which considers both volume and occupancy. A time-of-day program shall be developed for used as a back-up system.
5. Proposed signal timing plan for the new or modified intersection shall be forwarded to IDOT for review prior to implementation.
6. Consultant shall conduct on-site implementation of the timings and make fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.
7. Speed and delay studies shall be conducted during each of the count periods along the system corridor in the field before and after implementation of the proposed timing plans for comparative evaluations. These studies should utilize specialized electronic timing and measuring devices.

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

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

Cover Page in color showing a System Map
Figures <ol style="list-style-type: none"> 1. System overview map – showing system number, system schematic map with numbered system detectors, oversaturated movements, master location, system phone number, cycle lengths, and date of completion. 2. General location map in color – showing signal system location in the metropolitan area. 3. Detail system location map in color – showing cross street names and local controller addresses. 4. Controller sequence – showing controller phase sequence diagrams.
Table of Contents
Tab 1: Final Report <ol style="list-style-type: none"> 1. Project Overview 2. System and Location Description (Project specific) 3. Methodology 4. Data Collection 5. Data Analysis and Timing Plan Development 6. Implementation <ol style="list-style-type: none"> a. Traffic Responsive Programming (Table of TRP vs. TOD Operation) 7. Evaluation <ol style="list-style-type: none"> a. Speed and Delay runs
Tab 2. Turning Movement Counts <ol style="list-style-type: none"> 1. Turning Movement Counts (Showing turning movement counts in the intersection diagram for each period, including truck percentage)
Tab 3. Synchro Analysis <ol style="list-style-type: none"> 1. AM: Time-Space diagram in color, followed by intersection Synchro report (Timing report) summarizing the implemented timings. 2. Midday: same as AM 3. PM: same as AM
Tab 4: Speed, Delay Studies <ol style="list-style-type: none"> 1. Summary of before and after runs results in two (2) tables showing travel time and delay time. 2. Plot of the before and after runs diagram for each direction and time period.
Tab 5: Environmental Report <ol style="list-style-type: none"> 1. Environmental impact report including gas consumption, NO2, HCCO, improvements.
Tab 6: Electronic Files <ol style="list-style-type: none"> 1. Two (2) CDs for the optimized system. The CDs shall include the following elements: <ol style="list-style-type: none"> a. Electronic copy of the SCAT Report in PDF format b. Copies of the Synchro files for the optimized system c. Traffic counts for the optimized system d. New or updated intersection graphic display files for each of the system intersections and the system graphic display file including system detector locations and addresses.

Basis of Payment.

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

TEMPORARY TRAFFIC SIGNAL TIMINGS

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 TIMINGS.

- (a) Consultant shall attend temporary traffic signal inspection (turn-on) and/or detour meeting and conduct on-site implementation of the traffic signal timings. Make fine-tuning adjustments to the timings in the field to alleviate observed adverse operating conditions and to enhance operations.
- (b) Consultant shall provide monthly observation of traffic signal operations in the field.
- (c) 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.
- (d) Consultant shall make timing adjustments and prepare comment responses as directed by the Area Traffic Signal Operations Engineer.

Basis of Payment.

The work shall be paid for at the contract unit price each for TEMPORARY TRAFFIC SIGNAL TIMINGS, which price shall be payment in full for performing all work described herein per intersection. When the temporary traffic signal installation is turned on and/or detour implemented, 50 percent of the bid price will be paid. The remaining 50 percent of the bid price will be paid following the removal of the temporary traffic signal installation and/or detour.

MODIFYING EXISTING CONTROLLER CABINET

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

- (a) Uninterruptible Power Supply (UPS). The addition of uninterruptible power supply (UPS) to an existing controller cabinet could require the relocation of the existing controller cabinet items to allow for the installation of the uninterruptible power supply (UPS) components inside the existing controller cabinet as outlined under Sections 862 and 1074.04 of the Standard Specifications.
- (b) Light Emitting Diode (LED) Signal Heads, Light Emitting Diode (LED) Optically Programmed Signal Heads and Light Emitting Diode (LED) Pedestrian Signal Heads. The contractor shall verify that the existing load switches meet the requirements of Section 1074.03(5)(b)(2) of the Standard Specifications and the recommended load requirements of the light emitting diode (LED) signal heads that are being installed at the existing traffic signal. If any of the existing load switches do not meet these requirements, they shall be replaced, as directed by the Engineer.
- (c) Light Emitting Diode (LED), Signal Head, Retrofit. The contractor shall verify that the existing load switches meet the requirements of Section 1074.03(2) of the Standard Specifications and the recommended load requirements of light emitting diode (LED) traffic signal modules, pedestrian signal modules, and pedestrian countdown signal modules as specified in the plans. If any of the existing load switches do not meet these requirements, they shall be replaced, as directed by the Engineer.

Basis of Payment.

Modifying an existing controller cabinet will be paid for at the contract unit price per each for MODIFY EXISTING CONTROLLER CABINET. This shall include all material and labor required to complete the work as described above, the removal and disposal of all items removed from the controller cabinet, as directed by the Engineer. The equipment for the Uninterruptible Power Supply (UPS) and labor to install it in the existing controller cabinet shall be included in the pay item Uninterruptible Power Supply. Modifying an existing controller will be paid for at the contract unit price per each for MODIFY EXISTING CONTROLLER, per Sections 895.04 and 895.08 of the Standard Specifications.

DIVISION 1000 MATERIALS

PEDESTRIAN PUSH-BUTTON

Revise Article 1074.02(a) of the Standard Specifications to read:

The pedestrian push-button housing shall be constructed of aluminum alloy according to ASTM B 308 6061-T6 and powder coated yellow, unless otherwise noted on the plans. The housing shall be furnished with suitable mounting hardware.

Revise Article 1074-02(e) of the Standard Specifications to read:

Stations shall be designed to be mounted directly to a post, mast arm pole or wood pole. The station shall be aluminum and shall accept a 3 inch (75mm) round push-button assembly and a regulatory pedestrian instruction sign according to MUTCD, sign series R10-3e 9 x 15 inch sign with arrow(s) for a count-down pedestrian signal. The pedestrian station size without count-down pedestrian signals shall accommodate a MUTCD sign series R10-3b or R10-3d 9 x 12 inch sign with arrow(s).

Add the following to Article 1074.02(a) of the Standard Specifications:

- (f) Location. Pedestrian push-buttons and stations shall be mounted directly to a post, mast arm pole or wood pole as shown on the plans and shall be fully accessible from a paved or concrete surface. See the District's Detail sheets for orientation and mounting details.

CONTROLLER CABINET AND PERIPHERAL EQUIPMENT

Add the following to Article 1074.03 of the Standard Specifications:

- (a) (6) Cabinets shall be designed for NEMA TS2 Type 1 operation. All cabinets shall be pre-wired for a minimum of eight (8) phases of vehicular, four (4) phases of pedestrian and four (4) phases of overlap operation.
- (b) (5) Cabinets – Provide 1/8" (3.2 mm) thick unpainted aluminum alloy 5052-H32. The surface shall be smooth, free of marks and scratches. All external hardware shall be stainless steel.
- (b) (6) Controller Harness – Provide a TS2 Type 2 "A" wired harness in addition to the TS2 Type 1 harness.
- (b) (7) Surge Protection – Plug-in type EDCO SHA-1250 or Atlantic/Pacific approved equal.
- (b) (8) BIU – Containment screw required.
- (b) (9) Transfer Relays – Solid state or mechanical flash relays are acceptable.
- (b) (10) Switch Guards – All switches shall be guarded.
- (b) (11) Heating – One (1) 200 watt, thermostatically-controlled, Hoffman electric heater, or approved equivalent.
- (b) (12) Lighting – One (1) LED Panel shall be placed inside the cabinet top panel and one (1) LED Panel shall be placed on each side of the pull-out drawer/shelf assembly located beneath the controller support shelf. The LED Panels shall be controlled by a wall switch. Relume Traffic Control Box LED Panels and power supply or approved equivalent.
- (b) (13) The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1 ½ inch (38mm) deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one (1) complete set of cabinet prints and manuals. This drawer shall support 50 lbs. (23 kg) in weight when fully extended. The drawer shall open and close smoothly. Drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 24 inches (610mm) wide.

- (b) (14) Plan & Wiring Diagrams – 12” x 16” (3.05mm x 4.06mm) moisture sealed container attached to door.
- (b) (15) Detector Racks – Fully wired and labeled for four (4) channels of emergency vehicle pre-emption and sixteen channels (16) of vehicular operation.
- (b) (16) Field Wiring Labels – All field wiring shall be labeled.
- (b) (17) Field Wiring Termination – Approved channel lugs required.
- (b) (18) Power Panel – Provide a nonconductive shield.
- (b) (19) Circuit Breaker – The circuit breaker shall be sized for the proposed load but shall not be rated less than 30 amps.
- (b) (20) Police Door – Provide wiring and termination for plug in manual phase advance switch.
- (b) (21) Railroad Pre-Emption Test Switch – Eaton 8830K13 SHA 1250 or equivalent.

RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET

Controller shall comply with Article 1073.01 as amended in these Traffic Signal Special Provisions.

Controller Cabinet and Peripheral Equipment shall comply with Article 1074.03 as amended in these Traffic Signal Special Provisions.

Add the following to Articles 1073.01 (c) (2) and 1074.03 (a) (5) (e) of the Standard Specifications:

Controllers and cabinets shall be new and NEMA TS2 Type 1 design.

A method of monitoring and/or providing redundancy to the railroad preemptor input to the controller shall be included as a component of the Railroad, Full Actuated Controller and Cabinet installation and be verified by the traffic signal equipment supplier prior to installation.

Railroad interconnected controllers and cabinets shall be assembled only by an approved traffic signal equipment supplier. All railroad interconnected (including temporary railroad interconnect) controllers and cabinets shall be new, built, tested and approved by the controller equipment vendor, in the vendor's District One facility, prior to field installation. The vendor shall provide the technical equipment and assistance as required by the Engineer to fully test this equipment.

UNINTERRUPTIBLE POWER SUPPLY (UPS)

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

The UPS shall be line interactive and provide voltage regulation and power conditioning when utilizing utility power. The UPS shall be sized appropriately for the intersection's normal traffic signal operating connected load, plus 20 percent (20%). The total connected traffic signal load shall not exceed the published ratings for the UPS. The UPS shall provide a minimum of six (6) hours of normal operation run-time for signalized intersections with LED type signal head optics at 77 °F (25 °C) (minimum 700 W/1000 VA active output capacity, with 90 percent minimum inverter efficiency).

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

The UPS shall have a minimum of four (4) sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) relay contact closures, available on a panel mounted terminal block or locking circular connectors, rated at a minimum 120 V/1 A, and labeled so as to identify each contact according to the plans.

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

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

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

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

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

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

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

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

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

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

UPS

End of paragraph 1074.04(b) (2)e

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

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

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

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

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

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

- (8) The UPS shall include a tip or kill switch installed in the battery cabinet, which shall completely disconnect power from the UPS when the switch is manually activated.
- (9) The UPS shall incorporate a flanged electric generator inlet for charging the batteries and operating the UPS. The generator connector shall be male type, twist-lock, rated as 15A, 125VAC with a NEMA L5-15P configuration and weatherproof lift cover plate (Hubbell model HBL4716C or approved equal). Access to the generator inlet shall be from a secured weatherproof lift cover plate or behind a locked battery cabinet police panel.

Battery System.

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

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

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

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

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

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

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

- (e) Warranty. The warranty for an uninterruptible 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 from the date the traffic signal and UPS are placed into service.

ELECTRIC CABLE

Delete “or stranded, and No. 12 or” from the last sentence of Article 1076.04 (a) of the Standard Specifications.

Add the following to the Article 1076.04(d) of the Standard Specifications:

Service cable may be single or multiple conductor cable.

TRAFFIC SIGNAL POST

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

All posts and bases shall be steel and hot dipped galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with TRAFFIC SIGNAL PAINTING in Division 800 of these specifications.

PEDESTRIAN PUSH-BUTTON POST

Add the following to Article 1077.02(b) of the Standard Specifications:

All posts and bases shall be steel and hot-dipped galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with Traffic Signal Painting in Division 800 of these specifications.

MAST ARM ASSEMBLY AND POLE

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

Traffic signal mast arms shall be one piece construction, unless otherwise approved by the Engineer. All poles shall be galvanized. If the Department approves painting, powder coating by the manufacturer will be required over the galvanization in accordance with with TRAFFIC SIGNAL PAINTING in Division 800 of these specifications.

The shroud shall be of sufficient strength to deter pedestrian and vehicular damage. The shroud shall be constructed and designed to allow air to circulate throughout the mast arm but not allow infestation of insects or other animals, and such that it is not hazardous to probing fingers and feet. All mounting hardware shall be stainless steel.

LIGHT EMITTING DIODE (LED) TRAFFIC SIGNAL HEAD

Add the following to Section 1078 of the Standard Specifications:

General.

All signal and pedestrian heads shall provide 12" (300 mm) displays with glossy yellow or black polycarbonate housings. All head housings shall be the same color (yellow or black) at the intersection. For new signalized intersections and existing signalized intersections where all signal and/or pedestrian heads are being replaced, the proposed head housings shall be black. Where only selected heads are being replaced, the proposed head housing color (yellow or black) shall match existing head housings. Connecting hardware and mounting brackets shall be polycarbonate (black). A corrosion resistant anti-seize lubricant shall be applied to all metallic mounting bracket joints, and shall be visible to the inspector at the signal turn-on. Post top mounting collars are required on all posts, and shall be constructed of the same material as the brackets.

Pedestrian signal heads shall be furnished with the international symbolic "Walking Person" and "Upraised Palm" displays. Egg crate sun shields are not permitted.

Signal heads shall be positioned according to the "District One Standard Traffic Signal Design Details."

LED signal heads (All Face and Section Quantities), (All Mounting Types) shall conform fully to the requirements of Articles 1078.01 and 1078.02 of the Standard Specifications amended herein.

1. The LED signal modules shall be replaced or repaired if an LED signal module fails to function as intended due to workmanship or material defects within the first 60 months from the date of delivery. LED signal modules which exhibit luminous intensities less than the minimum values specified in Table 1 of the ITE Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement (June 27, 2005) [VTSCH], or applicable successor ITE specifications, or show signs of entrance of moisture or contaminants within the first 60 months of the date of delivery shall be replaced or repaired. The manufacturer's written warranty for the LED signal modules shall be dated, signed by an Officer of the company and included in the product submittal to the State.

(a) Physical and Mechanical Requirements

1. Modules can be manufactured under this specification for the following faces:
 - a. 12 inch (300 mm) circular, multi-section
 - b. 12 inch (300 mm) arrow, multi-section
 - c. 12 inch (300 mm) pedestrian, 2 sections
2. The maximum weight of a module shall be 4 lbs. (1.8 kg).
3. Each module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.), and shall be weather proof after installation and connection.

4. Material used for the lens and signal module construction shall conform to ASTM specifications for the materials.
5. The lens of the module shall be tinted with a wavelength-matched color to reduce sun phantom effect and enhance on/off contrast. The tinting shall be uniform across the lens face. Polymeric lens shall provide a surface coating or chemical surface treatment applied to provide abrasion resistance. The lens of the module shall be integral to the unit, convex with a smooth outer surface and made of plastic. The lens shall have a textured surface to reduce glare.
6. The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.
7. Each module shall have a symbol of the type of module (i.e. circle, arrow, etc.) in the color of the module. The symbol shall be 1 inch (25.4 mm) in diameter. Additionally, the color shall be written out in 1/2 inch (12.7mm) letters next to the symbol.

(b) Photometric Requirements

1. The minimum initial luminous intensity values for the modules shall conform to the values in Table 1 of the VTCSH (2005) for circular signal indications, and as stated in Table 3 of these specifications for arrow and pedestrian indications at 25 °C.
2. The modules shall meet or exceed the illumination values stated in Articles 1078.01 and 1078.02 the Standard Specifications for circular signal indications, and Table 3 of these specifications for arrow and pedestrian indications, throughout the useful life based on normal use in a traffic signal operation over the operating temperature range.
3. The measured chromaticity coordinates of the modules shall conform to the chromaticity requirements of Section 4.2 of the VTCSH (2005) or applicable successor ITE specifications.
4. The LEDs utilized in the modules shall be AlInGaP technology for red, yellow, Portland orange (pedestrian) and white (pedestrian) indications, and GaN for green indications, and shall be the ultra bright type rated for 100,000 hours of continuous operation from -40 °C to +74 °C.

(c) Electrical

1. Maximum power consumption for LED modules is per Table 2.
2. Operating voltage of the modules shall be 120 VAC. All parameters shall be measured at this voltage.
3. The modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors).
4. When a current of 20 mA AC (or less) is applied to the unit, the voltage read across the two leads shall be 15 VAC or less.

5. The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.
6. The individual LEDs shall be wired such that a catastrophic loss or the failure of one or more LED will not result in the loss of the entire module.

(d) Retrofit Traffic Signal Module

1. The following specification requirements apply to the Retrofit module only. All general specifications apply unless specifically superseded in this section.
2. Retrofit modules can be manufactured under this specification for the following faces:
 - a. 12 inch (300 mm) circular, multi-section
 - b. 12 inch (300 mm) arrow, multi-section
 - c. 12 inch (300 mm) pedestrian, 2 sections
3. Each Retrofit module shall be designed to be installed in the doorframe of a standard traffic signal housing. The Retrofit module shall be sealed in the doorframe with a one-piece EPDM (ethylene propylene rubber) gasket.
4. The maximum weight of a Retrofit module shall be 4 lbs. (1.8 kg).
5. Each Retrofit module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a lens and gasket, etc.), and shall be weather proof after installation and connection.
6. Electrical conductors for modules, including Retrofit modules, shall be 39.4 inches (1m) in length, with quick disconnect terminals attached.
7. The lens of the Retrofit module shall be integral to the unit, shall be convex with a smooth outer surface and made of plastic or of glass.

(e) The following specification requirements apply to the 12 inch (300 mm) arrow module only. All general specifications apply unless specifically superseded in this section.

1. The arrow module shall meet specifications stated in Section 9.01 of the Equipment and Material Standards of the Institute of Transportation Engineers (November 1998) [ITE Standards], Chapter 2 (Vehicle Traffic Control Signal Heads) or applicable successor ITE specifications for arrow indications.
2. The LEDs arrow indication shall be a solid display with a minimum of three (3) outlining rows of LEDs and at least one (1) fill row of LEDs.

(f) The following specification requirement applies to the 12 inch (300 mm) programmed visibility (PV) module only. All general specifications apply unless specifically superseded in this section.

1. The LED module shall be a module designed and constructed to be installed in a programmed visibility (PV) signal housing without modification to the housing.

- (g) The following specification requirements apply to the 12 inch (300 mm) Pedestrian module only. All general specifications apply unless specifically superseded in this section.
1. Each pedestrian signal LED module shall provide the ability to actuate the solid upraised hand and the solid walking person on one 12 inch (300mm) section.
 2. Two (2) pedestrian sections shall be installed. The top section shall be wired to illuminate only the upraised hand and the bottom section shall be the walking man.
 2. "Egg Crate" type sun shields are not permitted. All figures must be a minimum of 9 inches (225mm) in height and easily identified from a distance of 120-feet (36.6m).

LIGHT EMITTING DIODE (LED) PEDESTRIAN COUNTDOWN SIGNAL HEAD

Add the following to Article 1078.02 of the Standard Specifications:

General.

1. The module shall operate in one mode: Clearance Cycle Countdown Mode Only. The countdown module shall display actual controller programmed clearance cycle and shall start counting when the flashing clearance signal turns on and shall countdown to "0" and turn off when the steady Upraised Hand (symbolizing Don't Walk) signal turns on. Module shall not have user accessible switches or controls for modification of cycle.
2. At power on, the module shall enter a single automatic learning cycle. During the automatic learning cycle, the countdown display shall remain dark.
3. The module shall re-program itself if it detects any increase or decrease of Pedestrian Timing. The counting unit will go blank once a change is detected and then take one complete pedestrian cycle (with no counter during this cycle) to adjust its buffer timer.
4. The module shall allow for consecutive cycles without displaying the steady Upraised Hand.
5. The module shall recognize preemption events and temporarily modify the crossing cycle accordingly.
6. If the controller preempts during the Walking Person (symbolizing Walk), the countdown will follow the controller's directions and will adjust from Walking Person to flashing Upraised Hand. It will start to count down during the flashing Upraised Hand.
7. If the controller preempts during the flashing Upraised Hand, the countdown will continue to count down without interruption.
8. The next cycle, following the preemption event, shall use the correct, initially programmed values.

9. If the controller output displays Upraised Hand steady condition and the unit has not arrived to zero or if both the Upraised Hand and Walking Person are dark for some reason, the unit suspends any timing and the digits will go dark.
10. The digits will go dark for one pedestrian cycle after loss of power of more than 1.5 seconds.
11. The countdown numerals shall be two (2) "7 segment" digits forming the time display utilizing two rows of LEDs.
12. The LED module shall meet the requirements of the Institute of Transportation Engineers (ITE) LED purchase specification, "Pedestrian Traffic Control Signal Indications - Part 2: LED Pedestrian Traffic Signal Modules," or applicable successor ITE specifications, except as modified herein.
13. The LED modules shall provide constant light output under power. Modules with dimming capabilities shall have the option disabled or set on a non-dimming operation.
14. In the event of a power outage, light output from the LED modules shall cease instantaneously.
15. The LEDs utilized in the modules shall be AlInGaP technology for Portland Orange (Countdown Numerals and Upraised Hand) and GaN technology for Lunar White (Walking Person) indications.
16. The individual LEDs shall be wired such that a catastrophic loss or the failure of one or more LED will not result in the loss of the entire module.

Electrical.

1. Maximum power consumption for LED modules is 29 watts.
2. The measured chromaticity shall remain unchanged over the input line voltage range listed of 80 VAC to 135 VAC.

TRAFFIC SIGNAL BACKPLATE

Delete 1st sentence of Article 1078.03 of the Standard Specifications and add "All backplates shall be aluminum and louvered".

Add the following to the third paragraph of Article 1078.03 of the Standard Specifications. The reflective backplate shall not contain louvers.

Delete second sentence of the fourth paragraph of Article 1078.03 of the Standard Specifications.

Add the following to the fourth paragraph of Article 1078.03 of the Standard Specifications:

When retro reflective sheeting is specified, it shall be Type ZZ sheeting according to Article 1091.03 and applied in preferred orientation for the maximum angularity according to the manufacturer's recommendations. The retro reflective sheeting shall be installed under a controlled environment at the manufacturer/supplier before shipment to the contractor. The aluminum backplate shall be prepared and cleaned, following recommendations of the retro reflective sheeting manufacturer.

INDUCTIVE LOOP DETECTOR

Add the following to Article 1079.01 of the Standard Specifications:

Contracts requiring new cabinets shall provide for rack mounted detector amplifier cards. Detector amplifiers shall provide LCD displays with loop frequency, inductance, and change of inductance readings.

ILLUMINATED SIGN, LIGHT EMITTING DIODE

Delete last sentence of Article 1084.01(a) and add "Mounting hardware shall be black polycarbonate or galvanized steel and similar to mounting Signal Head hardware and bracket specified herein and shall provide tool free access to the interior."

Revise the second paragraph of Article 1084.01(a) to read:

The exterior surface of the housing shall be acid-etched and shop painted with one coat of zinc-chromate primer and two coats of exterior enamel. The housing shall be the same color (yellow or black) to match the existing or proposed signal heads. The painting shall be according to Section 851.

Add the following to Article 1084.01 (b) of the Standard Specifications:

The message shall be formed by rows of LEDs. The sign face shall be 24 inches (600 mm) by 24 inches (600 mm).

Add the following to Article 1084.01 of the Standard Specifications:

- (e) The light emitting diode (LED) blank out signs shall be manufactured by National Sign & Signal Company, or an approved equal and consist of a weatherproof housing and door, LEDs and transformers.

ILLUMINATED STREET NAME SIGN

The illuminate street name sign shall be as follows.

(a) Description.

The LEDs shall be white in color and utilize InGaN or UV thermally efficient technology. The LED Light Engines shall be designed to fit inside a standard fluorescent illuminated street sign housing in lieu of fluorescent lamps and ballasts or a slim line type housing. The LED internally-illuminated street name sign shall display the designated street name clearly and legibly in the daylight hours without being energized and at night when energized. The sign assembly shall consist of a four-, six-, or eight-foot aluminum housing. White translucent 3M DG³ reflective sheeting sign faces with the street name applied in 3M/Scotchlite Series 1177 or current 3M equivalent transparent green shall be installed in hinged doors on the side of the sign for easy access to perform general cleaning and maintenance operations. Illumination shall occur with LED Light Engine as specified.

(b) Environmental Requirements.

The LED lamp shall be rated for use in the ambient operating temperature range of -40 to +50°C (-40 to +122°F) for storage in the ambient temperature range of -40 to +75°C (-40 to +167°F).

(c) General Construction.

1. The LED Light Engine shall be a single, self-contained device, for installation in an existing street sign housing. The power supply must be designed to fit and mounted on the inside wall at one end of the street sign housing. The LED Light Engine shall be mounted within the inner top portion of the housing and no components of the light source shall sit between the sign faces.
2. The assembly and manufacturing processes of the LED Light Engine shall be designed to ensure that all LED and electronic components are adequately supported to withstand mechanical shocks and vibrations in compliance with the specifications of the ANSI, C136.31-2001 standards.

(d) Mechanical Construction.

1. The sign shall be constructed using a weatherproof, aluminum housing consisting of an extruded aluminum top with a minimum thickness of .140" x 10 3/4" deep (including the drip edge). The extruded aluminum bottom is .094" thick x 5 7/8" deep. The ends of the housing shall be cast aluminum with a minimum thickness of .250". A six-foot sign shall be 72 5/8" long and 22 5/16" tall and not weigh more than 77 pounds. An eight-foot sign shall be 96 5/8" long and 22 5/16" tall and not weigh more than 92 pounds. All corners are continuous TIG (Tungsten Inert Gas) welded to provide a weatherproof seal around the entire housing.
2. The door shall be constructed of extruded aluminum. Two corners are continuous TIG welded with the other two screwed together to make one side of the door removable for installation of the sign face. The door is fastened to the housing on the bottom by a full length, .040" x 1 1/8" open stainless steel hinge. The door shall be held secure onto a 1" wide by 5/32" thick neoprene gasket by three (six total for two-way sign) quarter-turn fasteners to form a watertight seal between the door and the housing.

3. The sign face shall be constructed of .125" white translucent polycarbonate. The letters shall be 8" upper case and 6" lower case. The sign face legend background shall consist of 3M/Scotchlite Series 4090T or current equivalent 3M translucent DG³ white VIP (Visual Impact Performance) diamond grade sheeting (ATSM Type 9) and 3M/Scotchlite Series 1177 or current 3M equivalent transparent green acrylic EC (electronic cut-able) film applied to the front of the sign face. The legend shall be framed by a white polycarbonate border. A logo symbol and/or name of the community may be included with approval of the Engineer.
4. All surfaces of the sign shall be etched and primed in accordance to industry standards before receiving appropriate color coats of industrial enamel.
5. All fasteners and hardware shall be corrosion resistant stainless steel. No tools are required for routine maintenance.
6. All wiring shall be secured by insulated wire compression nuts.
7. A wire entrance junction box shall be supplied with the sign assembly. The box may be supplied mounted to the exterior or interior of the sign and provide a weather tight seal.
8. A photoelectric switch shall be mounted in the control cabinet to control lighting functions for day and night display. Each sign shall be individually fused.
9. Brackets and Mounting: LED internally-illuminated street name signs will be factory drilled to accommodate mast arm two-point support assembly mounting brackets.

(e) Electrical.

1. Photocell shall be rated 105-305V, turn on at 1.5 fcs. with a 3-5 second delay. A manufacturer's warranty of six (6) years shall be provided. Power consumption shall be no greater than 1 watt at 120V.
2. The LED Light Engine shall operate from a 60 +/- 3 cycle AC line power over a voltage range of 80 to 135 Vac rms. Fluctuations in line voltage over the range of 80 to 135 Vac shall not affect luminous intensity by more than +/- 10%.
3. Total harmonic distortion induced into the AC power line by the LED Light Engine, operated at a nominal operating voltage, and at a temperature of +25°C (+77°F), shall not exceed 20%.
4. The LED Light Engine shall cycled ON and OFF with a photocell as shown on the detail sheet and shall not exceed the following maximum power values:

4-Foot Sign	60 W
6-Foot Sign	90 W
8-Foot Sign	120 W

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

(f) Photometric Requirements.

1. The entire surface of the sign panel shall be evenly illuminated. The average maintained luminous intensity measured across the letters, operating under the conditions defined in Environmental Requirements and Wattage Sections shall be of a minimum value of 100 cd/m².
2. The manufacturer shall make available independent laboratory test results to verify compliance to Voltage Range and Luminous Intensity Distribution Sections.
3. Twelve (12) 1.25 watt LED units shall be mounted on 1-inch x 22-inch metal cone printed circuit boards (MCPCB). The viewing angle shall be 120 degrees. LED shall have a color temperature of 5200k nominal, CRI of 80 with a life expectancy of 75,000 hrs.

(g) Quality Assurance.

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

DRILLED SOLDIER PILE RETAINING WALL

Effective: September 20, 2001

Revised: August 17, 2012

Description. This work shall consist of providing all labor, materials, and equipment necessary to fabricate and furnish the soldier piles, create and maintain the shaft excavations, set and brace the soldier piles into position and encase the soldier piles in concrete to the specified elevation. Also included in this work is the backfilling of the remainder of the shaft excavation with Controlled Low-Strength Material (CLSM), and the furnishing and installation of lagging. All work shall be according to the details shown on the plans and as directed by the Engineer.

The remainder of the retaining wall components as shown on the plans, such as concrete facing, shear studs, reinforcement bars, tie backs, hand rails, and various drainage items etc., are not included in this Special Provision but are paid for as specified elsewhere in this Contract.

Materials. The materials used for the soldier piles and lagging shall satisfy the following requirements:

- (a) The structural steel components for the soldier piles shall conform to the requirements of AASHTO M270, Grade 36 (M270M Grade 250), unless otherwise designated on the plans.
- (b) The soldier pile encasement concrete shall be Class DS according to Article 516.02.
- (c) The Controlled Low-Strength Material (CLSM), used for backfilling shaft excavations above the soldier pile encasement concrete and for backfilling secant lagging excavations, to the existing ground surface, shall be according to Section 1019.
- (d) Temporary casing shall be produced by electric seam, butt, or spiral welding to produce a smooth wall surface, fabricated from steel satisfying ASTM A252 Grade 2. The minimum wall thickness shall be as required to resist the anticipated installation and dewatering stresses, as determined by the Contractor, but in no case less than 1/4 in. (6 mm).
- (e) Drilling slurry shall consist of a polymer or mineral base material. Mineral slurry shall have both a mineral grain size that will remain in suspension with sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. The percentage and specific gravity of the material used to make the suspension shall be sufficient to maintain the stability of the excavation and to allow proper concrete placement. For polymer slurry, the calcium hardness of the mixing water shall not exceed 100 mg/L.
- (f) Timber Lagging. The minimum tabulated unit stress in bending (F_b), used for the design of the timber lagging, shall be 1000 psi (6.9 MPa) unless otherwise specified on the plans. When treated timber lagging is specified on the plans, the method of treatment shall be according to Article 1007.12. All timber shall meet the inspection requirements of Article 1007.01.
- (g) Precast Concrete Lagging. Precast concrete lagging shall be according to Section 504 of the Standard Specifications, except as modified herein. Unless specified otherwise, precast concrete lagging surfaces exposed to view in the completed wall shall be finished according to Article 503.15. When specified on the plans, the exposed surface shall be finished with a concrete form liner approved by the Engineer. The back face of the panel shall be roughly screeded to eliminate open pockets of aggregate and surface distortions in excess of 1/4 in. Reinforcement for precast concrete lagging shall be epoxy coated. Lifting inserts shall have a total minimum design capacity based on yield strength of 4 times the dead load calculated for the width of lagging used. Fabric bearing pads, when specified on the plans, shall meet the requirements of Section 1082. Threaded inserts, or other accessories, cast into the precast concrete lagging shall be galvanized according to AASHTO M111 or M232 as applicable.

Equipment. The drilling equipment shall have adequate capacity, including power, torque and down thrust, to create a shaft excavation of the maximum diameter specified to a depth of 20 percent beyond the depths shown on the plans. Concrete equipment shall be according to Article 1020.03.

Construction Requirements. The shaft excavation for each soldier pile shall extend to the tip elevation indicated on the plans for soldier piles terminating in soil or to the required embedment in rock when rock is indicated on the contract plans. The Contractor shall satisfy the following requirements:

- (a) Drilling Methods. The soldier pile installation shall be according to Articles 516.06(a),(b), or(c).

No shaft excavation shall be made adjacent to a soldier pile with encasement concrete that has a compressive strength less than 1500 psi (10.35 MPa), nor adjacent to secant lagging until the CLSM has reached sufficient strength to maintain its position and shape unless otherwise approved by the Engineer. Materials removed generated from the shaft excavations shall be disposed of by the Contractor according to Article 202. Excavation by blasting will not be permitted.

- (b) Drilling Slurry. During construction, the level of the slurry shall be maintained at a height sufficient to prevent caving of the hole. In the event of a sudden or significant loss of slurry to the hole, the construction of that shaft shall be stopped and the shaft excavation backfilled or supported by temporary casing until a method to stop slurry loss, or an alternate construction procedure, has been developed and approved by the Engineer.
- (c) Obstructions. Obstructions shall be defined as any object (such as but not limited to, boulders, logs, old foundations, etc.) that cannot be removed with normal earth drilling procedures, but requires special augers, tooling, core barrels or rock augers to remove the obstruction. When obstructions are encountered, the Contractor shall notify the Engineer and upon concurrence of the Engineer, the Contractor shall begin working to core, break up, push aside, or remove the obstruction. Lost tools or equipment in the excavation, as a result of the Contractor's operation, shall not be defined as obstructions and shall be removed at the Contractor's expense.
- (d) Top of Rock. The top of rock will be considered as the point where rock, defined as bedded deposits and conglomerate deposits exhibiting the physical characteristics and difficulty of rock removal as determined by the Engineer, is encountered which cannot be drilled with earth augers and/or underreaming tools configured to be effective in the soils indicated in the contract documents, and requires the use of special rock augers, core barrels, air tools, blasting, or other methods of hand excavation.
- (e) Design Modifications. If the top of rock elevation encountered is below that estimated on the plans, such that the soldier pile length above rock is increased by more than 10 percent, the Engineer shall be contacted to determine if any soldier pile design changes are required. In addition, if the type of soil or rock encountered is not similar to that shown in the subsurface exploration data, the Engineer shall be contacted to determine if revisions are necessary.
- (f) Soldier Pile Fabrication and Placement. The soldier pile is defined as the structural steel section(s) shown on the plans as well as any connecting plates used to join multiple sections. The types of soldier piles shall be defined as HP, W Sections, or Built-Up Sections. Cleaning and painting of all steel components, when specified, shall be as shown on the plans and accomplished according to Section 506. This work will not be paid for separately, but shall be considered included in the cost of Furnishing Soldier Piles of the type specified.

The soldier pile shall be shop fabricated such that no field welding is required. The Contractor shall attach suitable bracing or support to maintain the position of the soldier pile within the shaft excavation such that the final location will satisfy the Construction Tolerances portion of this Special Provision. The bracing or supports shall remain in place until the concrete for encasement has reached a minimum compressive strength of 1500 psi (10.35 MPa).

When embedment in rock is indicated on the plans, modification to the length of a soldier pile may be required to satisfy the required embedment. The modification shall be made to the top of the soldier pile unless otherwise approved by the Engineer. When the top of rock encountered is above the estimated elevation indicated on the plans, the soldier piles shall be cut to the required length. If the top of rock encountered is below that estimated on the plans, the Contractor shall either furnish longer soldier piles or splice on additional length of soldier pile per Article 512.05(a) to satisfy the required embedment in rock. In order to avoid delays, the Contractor may have additional soldier pile sections fabricated as necessary to make the required adjustments. Additional soldier pile quantities, above those shown on the plans, shall not be furnished without prior written approval by the Engineer.

- (g) Concrete Placement. Concrete work shall be performed according to Article 516.12 and as specified herein.

The soldier pile encasement concrete pour shall be made in a continuous manner from the bottom of the excavation to the elevation indicated on the plans. Concrete shall be placed as soon as possible after excavation is completed and the soldier pile is secured in the proper position. Uneven levels of concrete placed in front, behind, and on the sides of the soldier pile shall be minimized to avoid soldier pile movement and to ensure complete encasement.

Following the soldier pile encasement concrete pour, the remaining portion of the shaft excavation shall be backfilled with CLSM according to Section 593. CLSM Secant lagging placement shall be placed as soon as practical after the shaft excavation is cleared.

- (h) Construction Tolerances. The soldier piles shall be drilled and located within the excavation to satisfy the following tolerances:

- (1) The center of the soldier pile shall be within 1 1/2 in. (38 mm) of plan station and 1/2 in. (13 mm) offset at the top of the shaft.
- (2) The out of vertical plumbness of the soldier pile shall not exceed 0.83 percent.
- (3) The top of the soldier pile shall be within ± 1 in. (± 25 mm) of the plan elevation.

- (i) Timber Lagging. Timber lagging, when required by the plans, installed below the original ground surface, shall be placed from the top down as the excavation proceeds. Lagging shown above grade shall be installed and backfilled against prior to installing any permanent facing to minimize post construction deflections. Over-excavation required to place the timber lagging behind the flanges of the soldier piles shall be the minimum necessary to install the lagging. Any voids produced behind the lagging shall be filled with porous granular embankment at the Contractors expense. When the plans require the Contractor to design the timber lagging, the design shall be based on established practices published in FHWA or AASHTO documents considering lateral earth pressure, construction loading, traffic surcharges and the lagging span length(s). The nominal thickness of the lagging selected shall not be less than 3 in. (75 mm) and shall satisfy the minimum tabulated unit stress in bending (F_b) stated elsewhere in this Special Provision. The Contractor shall be responsible for the successful performance of the lagging system until the concrete facing is installed. When the nominal timber lagging thickness(s) and allowable stress are specified on the plans, the timber shall be according to Article 1007.03.
- (j) Precast Concrete Lagging. Precast concrete lagging, when required by the plans, installed below the original ground surface, shall be placed from the top down as the excavation proceeds. Lagging shown above grade shall be installed and backfilled against prior to installing any permanent facing to minimize post construction deflections. Over-excavation required to place the precast lagging behind the flanges of the soldier piles shall be the minimum necessary to install the lagging. Any voids produced behind the lagging shall be filled with porous granular embankment at the Contractor's expense. When the plans require the Contractor to design the precast concrete lagging, the design shall be based on established practices published in FHWA or AASHTO documents considering lateral earth pressure, construction loading, traffic surcharges and the lagging span length(s). The Contractor shall be responsible for the successful performance of the lagging system until the permanent concrete facing, when specified on the plans, is installed.

The precast concrete lagging shall be reinforced with a minimum of 0.31 square inches/foot (655 Sq. mm/meter) of horizontal and vertical reinforcement per unit width of lagging with a minimum thickness of 3 in. (75 mm).

When precast concrete lagging is exposed to view in the completed wall, shop drawings for the lagging shall be submitted according to Article 1042.03(b) and Article 105.04 of the Standard Specifications. The supplier selected by the Contractor shall submit complete design calculations and shop drawings, prepared and sealed by an Illinois Licensed Structural Engineer, for approval by the Engineer.

- (k) Structure Excavation. When structure excavation is necessary to place a concrete facing, it shall be made and paid for according to Section 502 except that the horizontal limits for structure excavation shall be from the face of the soldier pile to a vertical plane 2 ft. (600 mm) from the finished face of the wall. The depth shall be from the top of the original ground surface to the bottom of the concrete facing. The additional excavation necessary to place the lagging whether through soil or CLSM shall be included in this work.

- (l) Geocomposite Wall Drain. When required by the plans, the geocomposite wall drain shall be installed and paid for according to Section 591 except that, in the case where a concrete facing is specified on the plans, the wall drain shall be installed on the concrete facing side of the lagging with the pervious (fabric) side of the drain installed to face the lagging. When a concrete facing is not specified on the plans, the pervious (fabric) side of the drain shall be installed to face the soil. In this case, the drain shall be installed in stages as the lagging is installed. The wall drain shall be placed in sections and spliced, or kept on a continuous roll, so that as each piece of lagging is placed, the drain can be properly located as the excavation proceeds.

Method of Measurement. The furnishing of soldier piles will be measured for payment in feet (meters) along the centerline of the soldier pile for each of the types specified. The length shall be determined as the difference between the plan top of soldier pile and the final as built shaft excavation bottom.

The drilling and setting of soldier piles in soil and rock, will be measured for payment and the volumes computed in cubic feet (cubic meters) for the shaft excavation required to set the soldier piles according to the plans and specifications, and accepted by the Engineer. These volumes shall be the theoretical volumes computed using the diameter(s) of the shaft(s) shown in the plans and the depth of the excavation in soil and/or rock as appropriate. The depth in soil will be defined as the difference in elevation between the ground surface at the time of concrete placement and the bottom of the shaft excavation or the top of rock (when present), whichever is encountered first. The depth in rock will be defined as the difference in elevation between the measured top of rock and the bottom of the shaft excavation.

Drilling and placing CLSM secant lagging shall be measured for payment in cubic feet (cubic meters) of the shaft excavation required to install the secant lagging as shown in the plans. This volume shall be the theoretical volume computed using the diameter(s) shown on the plans and the difference in elevation between the as built shaft excavation bottom and the ground surface at the time of the CLSM placement.

Timber and precast concrete lagging shall be measured for payment in square feet (square meters) of lagging installed to the limits as shown on the plans. The quantity shall be calculated using the minimum lagging length required on the plans multiplied by the as-installed height of lagging, for each bay of lagging spanning between the soldier piles.

Basis of Payment. The furnishing of soldier piles will be paid for at the contract unit price per foot (meter) for FURNISHING SOLDIER PILES, of the type specified, for the total number of feet (meters) furnished to the job site. The cost of any field splices required due to changes in top of rock elevation shall be paid for according to Article 109.04.

The drilling and setting of soldier piles will be paid for at the contract unit price per cubic foot (cubic meter) for DRILLING AND SETTING SOLDIER PILES (IN SOIL) and DRILLING AND SETTING SOLDIER PILES (IN ROCK). The required shaft excavation, soldier pile encasement concrete and any CLSM backfill required around each soldier pile will not be paid for separately but shall be included in this item.

Timber lagging will be paid for at the contract unit price per square foot (square meter) for UNTREATED TIMBER LAGGING, or TREATED TIMBER LAGGING as detailed on the plans. Precast concrete lagging will be paid for at the contract unit price per square foot (square meter) for PRECAST CONCRETE LAGGING as detailed on the plans.

The secant lagging will be paid for at the contract unit price per cubic foot (cubic meter) for SECANT LAGGING. The required shaft excavation and CLSM backfill required to fill that excavation shall be included in this item.

Obstruction mitigation shall be paid for according to Article 109.04.

No additional compensation, other than noted above, will be allowed for removing and disposing of excavated materials, for furnishing and placing concrete, CLSM, bracing, lining, temporary casings placed and removed or left in place, or for any excavation made or concrete placed outside of the plan diameter(s) of the shaft(s) specified.

TEMPORARY SOIL RETENTION SYSTEM

Effective: December 30, 2002

Revised : May 11, 2009

Description. This work shall consist of designing, furnishing, installing, adjusting for stage construction when required and subsequent removal of the temporary soil retention system according to the dimensions and details shown on the plans and in the approved design submittal.

General. The temporary soil retention system shall be designed by the Contractor as a minimum, to retain the exposed surface area specified in the plans or as directed by the Engineer.

The design calculations and details for the temporary soil retention system proposed by the Contractor shall be submitted to the Engineer for approval. The calculations shall be prepared and sealed by an Illinois Licensed Structural Engineer. This approval will not relieve the Contractor of responsibility for the safety of the excavation. Approval shall be contingent upon acceptance by all involved utilities and/or railroads.

Construction. The Contractor shall verify locations of all underground utilities before installing any of the soil retention system components or commencing any excavation. Any disturbance or damage to existing structures, utilities or other property, caused by the Contractor's operation, shall be repaired by the Contractor in a manner satisfactory to the Engineer at no additional cost to the Department. The soil retention system shall be installed according to the Contractor's approved design, or as directed by the Engineer, prior to commencing any related excavation. If unable to install the temporary soil retention system as specified in the approved design, the Contractor shall have the adequacy of the design re-evaluated. Any reevaluation shall be submitted to the Engineer for approval prior to commencing the excavation adjacent to the area in question. The Contractor shall not excavate below the maximum excavation line shown in the approved design without the prior permission of the Engineer. The temporary soil retention system shall remain in place until the Engineer determines it is no longer required.

The temporary soil retention system shall be removed and disposed of by the Contractor when directed by the Engineer. When allowed, the Contractor may elect to cut off a portion of the temporary soil retention system leaving the remainder in place. The remaining temporary soil retention system shall be removed to a depth which will not interfere with the new construction, and as a minimum, to a depth of 12 in. (300 mm) below the finished grade, or as directed by the Engineer. Removed system components shall become the property of the Contractor.

When an obstruction is encountered, the Contractor shall notify the Engineer and upon concurrence of the Engineer, the Contractor shall begin working to break up, push aside, or remove the obstruction. An obstruction shall be defined as any object (such as but not limited to, boulders, logs, old foundations etc.) where its presence was not obvious or specifically noted on the plans prior to bidding, that cannot be driven or installed through or around, with normal driving or installation procedures, but requires additional excavation or other procedures to remove or miss the obstruction.

Method of Measurement. The temporary soil retention system furnished and installed according to the Contractor's approved design or as directed by the Engineer will be measured for payment in place, in square feet (square meters). The area measured shall be the vertical exposed surface area envelope of the excavation supported by temporary soil retention system. Portions of the temporary soil retention system left in place for reuse in later stages of construction shall only be measured for payment once.

Any temporary soil retention system installed beyond those dimensions shown on the contract plans or the approved contractor's design without the written permission of the Engineer, shall not be measured for payment but shall be done at the contractor's own expense.

Basis of Payment. This work will be paid for at the contract unit price per square foot (square meter) for TEMPORARY SOIL RETENTION SYSTEM.

Payment for any excavation, related solely to the installation and removal of the temporary soil retention system and/or its components, shall not be paid for separately but shall be included in the unit bid price for TEMPORARY SOIL RETENTION SYSTEM. Other excavation, performed in conjunction with this work, will not be included in this item but shall be paid for as specified elsewhere in this contract.

Obstruction mitigation shall be paid for according to Article 109.04 of the Standard Specifications.

PERMANENT STEEL SHEET PILING (LRFD)

Effective: January 31, 2012

Revised: August 17, 2012

Description. This work shall consist of furnishing and installing the permanent sheet piling to the limits and tolerances shown on the plans according to Section 512 of the Standard Specifications.

Material. The sheet piling shall be made of steel and shall be new material. Unless otherwise specified the sheeting shall have a minimum yield strength of 50 ksi (345 MPa) according to ASTM A 572. The sheeting shall be identifiable and free of bends and other structural defects. The Contractor shall furnish a copy of the published sheet pile section properties to the Engineer for verification purposes. The Engineer's approval will be required prior to driving any sheeting. All driven sheeting not approved by the Engineer shall be removed at the Contractor's expense.

The Contractor shall furnish a sheet pile section, to be used for each wall section, with a published section modulus equal to or larger than that specified on the plans.

The selection of the sheet pile section shall not relieve the Contractor of the responsibility to satisfy all details including minimum clearances, cover, reinforcement, shear stud locations, interlocking, and field cutting. Any modifications of the plans to accommodate the Contractor's selection shall be paid for by the Contractor and subject to the approval of the Engineer.

Construction. The Contractor shall verify locations of all underground utilities before driving any sheet piling. Any disturbance or damage to existing structures, utilities or other property, caused by the Contractor's operation, shall be repaired by the Contractor in a manner satisfactory to the Engineer at no additional cost to the Department. The Contractor shall be responsible for determining the appropriate equipment necessary to drive the sheeting to the tip elevation(s) specified on the plans or according to the Contractor's approved design. The sheet piling shall be driven, as a minimum, to the tip elevation(s) specified, prior to commencing any related construction. If unable to reach the minimum tip elevation, the adequacy of the sheet piling design will require re-evaluation by the Department prior to allowing construction adjacent to the sheet piling in question.

Obstructions. Obstructions shall be defined as any object (such as but not limited to, boulders, logs, old foundations, etc.) that cannot be driven through with normal driving procedures, but requires special equipment to remove the obstruction. When obstructions are encountered, the Contractor shall notify the Engineer and upon concurrence of the Engineer, the Contractor shall begin working to break up, push aside, or remove the obstruction.

Method of Measurement. This work will be measured in place in square feet (square meters). Sheet piling associated with other work in this contract or for permanent sheet piling that is cut off or driven beyond those dimensions shown on the plans will not be measured for payment.

Obstruction mitigation shall be paid for according to Article 109.04.

Basis of Payment. This work will be paid for at the contract unit price per square foot (square meter) for PERMANENT STEEL SHEET PILING at the location shown on the plans.

BOND BREAKER FOR PRESTRESSED CONCRETE BULB-T BEAMS

Effective: April 19, 2012

Description. This work shall consist of furnishing and applying a bond breaker to the top flange of prestressed concrete bulb T-beams as detailed on the contract plans. After the beams have been erected at the job site and just prior to installation of the bridge deck reinforcement, portions of the top surface of the beams identified on the plans shall have one of the following bond breakers applied:

1. Two coats of Type I, II or III membrane curing compound according to Article 1022.01 and applied with a roller.
2. Two coats of protective coat according to Article 1023.01 and applied with a roller.
3. Bonded Roofing felt - 30 lbs. (13.6 kg)

The concrete surface shall be clean of loose debris and dry for a minimum of 2 hours prior to application of the bond breaking material. The temperature of the concrete and air shall be 40°F (4°C) or higher at the time of application.

For systems requiring multiple coats, the second coat may follow immediately after the first coat. Also, the material shall not be exposed to rain, snow, or foot traffic for a minimum period of 4 hours after application.

Damaged or compromised bond breaker, as determine by the Engineer, shall be repaired.

Basis of Payment. This work will not be measured for payment but shall be considered included in the cost for Concrete Superstructure.

GRANULAR BACKFILL FOR STRUCTURES

Effective: April 19, 2012

Revised: October 30, 2012

Revise Section 586 of the Standard Specifications to read:

SECTION 586. GRANULAR BACKFILL FOR STRUCTURES

586.01 Description. This work shall consist of furnishing, transporting and placing granular backfill for abutment structures.

586.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Fine Aggregate.....	1003.04
(b) Coarse Aggregates	1004.05

CONSTRUCTION REQUIREMENTS

586.03 General. This work shall be done according to Article 502.10 except as modified below. The backfill volume shall be backfilled, with granular material as specified in Article 586.02, to the required elevation as shown in the contract plans. The backfill volume shall be placed in convenient lifts for the full width to be backfilled. Unless otherwise specified in the contract plans, mechanical compaction will not be required. A deposit of gravel or crushed stone placed behind drain holes shall not be required. All drains not covered by geocomposite wall drains or other devices to prevent loss of backfill material shall be covered by sufficient filter fabric material meeting the requirements of Section 1080 and Section 282 with either 6 or 8 oz/sq yd (200 or 270 g/sq m) material allowed, with free edges overlapping the drain hole by at least 12 in. (300 mm) in all directions.

The granular backfill shall be brought to the finished grade as shown in the contract plans. When concrete is to be cast on top of the granular backfill, the Contractor, subject to approval of the Engineer, may prepare the top surface of the fill to receive the concrete as he/she deems necessary for satisfactory placement at no additional cost to the Department.

586.04 Method of Measurement. This work will be measured for payment as follows.

- (a) Contract Quantities. The requirements for the use of contract quantities shall conform to Article 202.07(a).
- (b) Measured Quantities. This work will be measured for payment in place and the volume computed in cubic yards (cubic meters). The volume will be determined by the method of average end areas behind the abutment.

586.05 Basis of Payment. This work will be paid for at the contract unit price per cubic yard (cubic meter) for GRANULAR BACKFILL FOR STRUCTURES.

WEEP HOLE DRAINS FOR ABUTMENTS, WINGWALLS, RETAINING WALLS AND CULVERTS

Effective: April 19, 2012

Delete the last paragraphs of 205.05 and 502.10 and replace with the following.

If a geocomposite wall drain according to Section 591 is not specified, a prefabricated geocomposite strip drain according to Section 1040.07 shall be placed at the back of each drain hole. The strip drain shall be 24 inches (600 mm) wide and 48 inches (1.220 m) tall. The strip drain shall be centered over the drain hole with the bottom located 12 inches (300 mm) below the bottom of the drain hole. All form boards or other obstructions shall be removed from the drain holes before placing any geocomposite strip drain.

Revise the title of 1040.07 to Geocomposite Wall Drains and Strip Drains.

ANCHOR BOLTS (BDE)

Effective: January 1, 2013

Revise the fourth sentence of the first paragraph of Article 1006.09 of the Standard Specifications to read:

“Stud bolts or fully threaded rods shall be according to either ASTM A 354 Grade BC, ASTM A 193 Grade B7, or ASTM F 1554 Grade 105.”

Revise the second paragraph of Article 1006.09 of the Standard Specifications to read:

“Washers and nuts shall match with the hardness of the anchor bolt, stud, or rod. For ASTM F 1554 Grade 36 (Grade 250) or Grade 55 (Grade 380) anchor rods or bolts, washers shall be according to ASTM F 844 or ASTM F 436, and nuts shall be according to AASHTO M 291 Grade A. For ASTM F 1554 Grade 105 (Grade 725) bolts, ASTM A 354, or ASTM A 193 stud bolts, washers shall be according to AASHTO M 293 Type 1 or Type 3, and nuts shall be according to AASHTO M 291 Grade DH or DH3.”

Revise the seventh paragraph of Article 1006.09 of the Standard Specifications to read:

“Anchor bolts, rods, studs, nuts, and washers requiring galvanizing shall be hot dipped, with zinc coatings conforming to the requirements of ASTM F 2329.”

Revise the fourth paragraph of Article 1070.01 of the Standard Specifications to read:

“Fully threaded and galvanized anchor rods or stud bolts with washers and nuts shall be furnished with the foundations and shall be according to Article 1006.09. Anchors furnished according to ASTM F 1554 shall be Grade 105 (Grade 725).”

Revise the second paragraph of Article 1070.03 of the Standard Specifications to read:

“Top anchor rod nuts for all towers shall be the self-locking type with nylon or steel inserts.”

BRIDGE RELIEF JOINT SEALER (BDE)

Effective: January 1, 2012

Revised: August 1, 2012

Add the following to the end of the second paragraph of Article 503.19 of the Standard Specifications:

“After the surface is clean and before applying protective coat, relief joints being sealed according to Section 588 shall be covered with a masking tape to prevent protective coat from contacting the vertical faces of the joint.”

Revise Section 588 of the Standard Specifications to read:

“SECTION 588. BRIDGE RELIEF JOINT SEALER

588.01 Description. This work shall consist of sealing transverse relief joints in the bridge decks.

588.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Hot-Poured Joint Sealer.....	1050.02

CONSTRUCTION REQUIREMENTS

588.03 General. The relief joint opening shall be formed to produce a reservoir for the sealing material and shall be 1/4 in. (6 mm) wide by 3/4 in. (20 mm) deep. For concrete surfaces the relief joint shall be formed into the concrete. For HMA surfaces the relief joint shall be sawed into the surface. Immediately prior to pouring the sealer the joint opening shall be cleaned with compressed air so that it is free of all foreign and loose material and in a dry condition. The bridge deck relief joints to be sealed shall be free of cracked or spalled areas. Any cracked areas shall be chipped back to sound material before placing joint sealer.

The hot-poured joint sealer shall not be placed when the air temperature in the shade is below 40 °F (5 °C) or when foggy or rainy, unless approved by the Engineer.

Hot-poured joint sealer shall be stirred during heating to prevent localized overheating. The sealing material shall be applied to each joint opening according to the details shown on the plans or as directed by the Engineer, without spilling on the exposed deck surfaces.

All bridge relief joints shall be filled with sufficient sealer compound so that the top of the seal is flush with the top of the finished deck or wearing surface.

Any sealing compound that is not bonded to the relief joint wall or face 24 hours after placing shall be removed and the joint shall be cleaned and resealed.

588.04 Basis of Payment. This work will not be paid for as a separate item, but shall be considered as included in the unit price bid for the major item of construction involved.”

Revise Section 589 of the Standard Specifications to read:

“SECTION 589. Reserved”

COARSE AGGREGATE IN BRIDGE APPROACH SLABS/FOOTINGS (BDE)

Effective: April 1, 2012

Revised: April 1, 2013

Revise the third paragraph of Article 1004.01(b) of the Standard Specifications to read:

“Aggregates used in Class BS concrete (except when poured on subgrade), Class PS concrete, and Class PC concrete (bridge superstructure products only, excluding the approach slab) 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.”

Revise the first sentence of the first paragraph of Article 1004.02(f) of the Standard Specifications to read:

“(f) Freeze-Thaw Rating. When coarse aggregate is used to produce portland cement concrete for base course, base course widening, pavement (including precast), driveway pavement, sidewalk, shoulders, curb, gutter, combination curb and gutter, median, paved ditch, concrete superstructures on subgrade such as bridge approach slabs (excluding precast), concrete structures on subgrade such as bridge approach footings, or their repair using concrete, the gradation permitted will be determined from the results of the Department’s Freeze-Thaw Test (Illinois Modified AASHTO T 161).”

COATED GALVANIZED STEEL CONDUIT (BDE)

Effective: January 1, 2013

Revise Article 1088.01(a)(3) of the Standard Specifications to read:

“(3) Coated Galvanized Steel Conduit. The conduit prior to coating shall meet the requirements for rigid metal conduit and be manufactured according to NEMA Standard No. RN1.

The coating shall have the following characteristics.

Hardness	85+ Shore A Durometer
Dielectric Strength	400 V/mil @ 60 Hz
Aging	1,000 Hours Atlas Weatherometer
Brittleness Temperature	0 °F (-18 °C) when tested according to ASTM D 746
Elongation	200 percent

The exterior galvanized surfaces shall be coated with a primer before the coating to ensure a bond between the zinc substrate and the coating. The bond strength created shall be greater than the tensile strength of the plastic coating. The nominal thickness of the coating shall be 40 mils (1 mm). The coating shall pass the following bonding test.

Two parallel cuts 1/2 in. (13 mm) apart and 1 1/2 in. (38 mm) in length shall be made with a sharp knife along the longitudinal axis. A third cut shall be made perpendicular to and crossing the longitudinal cuts at one end. The knife shall then be worked under the coating for 1/2 in. (13 mm) to free the coating from the metal.

Using pliers, the freed tab shall be pulled with a force applied vertically and away from the conduit. The tab shall tear rather than cause any additional coating to separate from the substrate.

A two part urethane coating shall be applied to the interior of the conduit. The internal coating shall have a nominal thickness of 2 mils (50 µm). The interior coating shall be applied in a manner so there are no runs, drips, or pinholes at any point. The coating shall not peel, flake, or chip off after a cut is made in the conduit or a scratch is made in the coating. The urethane interior coating applied shall afford sufficient flexibility to permit field bending without cracking or flaking of the interior coating.

All conduit fittings and couplings shall be as specified and recommended by the conduit manufacturer. All conduit fitting covers shall be furnished with stainless steel screws which have been encapsulated with a polyester material on the head to ensure maximum corrosion protection.”

CONSTRUCTION AIR QUALITY – DIESEL RETROFIT (BDE)

Effective: June 1, 2010

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/otaq/retrofit/verif-list.htm>), or verified by the California Air Resources Board (CARB) (<http://www.arb.ca.gov/diesel/verde/verdev.htm>); or
- b) Retrofitted with a non-verified diesel retrofit emission control device if verified retrofit emission control devices are not available for equipment proposed to be used on the project, and if the Contractor has obtained a performance certification from the retrofit device manufacturer that the emission control device provides a minimum PM emission reduction of 50 percent.

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

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

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

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

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

Any costs associated with retrofitting any diesel powered off-road equipment with emission control devices shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed. The Contractor's compliance with this notice and any associated regulations shall not be grounds for a claim.

Diesel Retrofit Deficiency Deduction

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

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

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

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)

Effective: September 1, 2000

Revised: August 2, 2011

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.

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 **22.00%** 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 www.dot.il.gov.

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

- (a) The bidder shall submit a Disadvantaged Business Utilization Plan on Department forms SBE 2025 and 2026 with the bid.
- (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 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 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 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.

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 performance 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.
 - (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.

- (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 and/or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be forwarded to the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person in order to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for consideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

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

- (a) DBE as the Contractor: 100 percent goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE does not count toward the DBE goals.
- (b) DBE as a joint venture Contractor: 100 percent goal credit for that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work performed by the DBE's own forces.
- (c) DBE as a subcontractor: 100 percent goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subcontractor from the prime Contractor or its affiliates. Work that a DBE subcontractor in turn subcontracts to a non-DBE does not count toward the DBE goal.

(d) DBE as a trucker: 100 percent goal credit for trucking participation provided the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible. At least one truck owned, operated, licensed, and insured by the DBE must be used on the contract. Credit will be given for the following:

- (1) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
- (2) The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it 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 or 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 regular dealer or 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 Participation 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) **TERMINATION OR REPLACEMENT.** 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 the Special Provision.

- (c) 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, 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.
- (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 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 1,200 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 contractor 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.

- (f) PAYMENT RECORDS. The Contractor shall maintain a record of payments for work performed to the DBE participants. The records shall be made available to the Department for inspection upon request. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than thirty calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Regional 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 BDE 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.

GRANULAR MATERIALS (BDE)

Effective: November 1, 2012

Revise the title of Article 1003.04 of the Standard Specifications to read:

"1003.04 Fine Aggregate for Bedding, Trench Backfill, Embankment, Porous Granular Backfill, Sand Backfill for Underdrains, and French Drains."

Revise Article 1003.04(c) of the Standard Specifications to read:

"(c) Gradation. The fine aggregate gradations for granular embankment, granular backfill, bedding, and trench backfill for pipe culverts and storm sewers shall be FA 1, FA 2, or FA 6 through FA 21.

The fine aggregate gradation for porous granular embankment, porous granular backfill, french drains, and sand backfill for underdrains shall be FA 1, FA 2, or FA 20, except the percent passing the No. 200 (75 µm) sieve shall be 2±2.”

Revise Article 1004.05(c) of the Standard Specifications to read:

“(c) Gradation. The coarse aggregate gradations shall be as follows.

Application	Gradation
Blotter	CA 15
Granular Embankment, Granular Backfill, Bedding, and Trench Backfill for Pipe Culverts and Storm Sewers	CA 6, CA 9, CA 10, CA 12, CA17, CA18, and CA 19
Porous Granular Embankment, Porous Granular Backfill, and French Drains	CA 7, CA 8, CA 11, CA 15, CA 16 and CA 18”

HOT-MIX ASPHALT - DENSITY TESTING OF LONGITUDINAL JOINTS (BDE)

Effective: January 1, 2010

Revised: April 1, 2012

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 ten feet apart longitudinally along the unconfined pavement edge and centered at the random density test location.”

Revise the Density Control Limits table in Article 1030.05(d)(4) of the Standard Specifications to read:

"Mixture Composition	Parameter	Individual Test (includes confined edges)	Unconfined Edge Joint Density Minimum
IL-4.75	Ndesign = 50	93.0 – 97.4%	91.0%
IL-9.5, IL-12.5	Ndesign ≥ 90	92.0 – 96.0%	90.0%
IL-9.5,IL-9.5L, IL-12.5	Ndesign < 90	92.5 – 97.4%	90.0%
IL-19.0, IL-25.0	Ndesign ≥ 90	93.0 – 96.0%	90.0%
IL-19.0, IL-19.0L, IL-25.0	Ndesign < 90	93.0 – 97.4%	90.0%
SMA	Ndesign = 50 & 80	93.5 – 97.4%	91.0%
All Other	Ndesign = 30	93.0 - 97.4%	90.0%”

LIQUIDATED DAMAGES (BDE)

Effective: April 1, 2013

Revise the table in Article 108.09 of the Standard Specifications to read:

"Schedule of Deductions for Each Day of Overrun in Contract Time			
Original Contract Amount		Daily Charges	
From More Than	To and Including	Calendar Day	Work Day
\$ 0	\$ 100,000	\$ 475	\$ 675
100,000	500,000	750	1,050
500,000	1,000,000	1,025	1,425
1,000,000	3,000,000	1,275	1,725
3,000,000	6,000,000	1,425	2,000
6,000,000	12,000,000	2,300	3,450
12,000,000	And over	6,775	9,525”

PAVEMENT MARKING REMOVAL (BDE)

Effective: April 1, 2009

Add the following to the end of the first paragraph of Article 783.03(a) of the Standard Specifications:

“The use of grinders will not be allowed on new surface courses.”

PAVEMENT PATCHING (BDE)

Effective: January 1, 2010

Revise the first sentence of the second paragraph of Article 701.17(e)(1) of the Standard Specifications to read:

“In addition to the traffic control and protection shown elsewhere in the contract for pavement, two devices shall be placed immediately in front of each open patch, open hole, and broken pavement where temporary concrete barriers are not used to separate traffic from the work area.”

PAVEMENT REMOVAL (BDE)

Effective: April 1, 2013

Revise Article 440.07(c) of the Standard Specifications to read:

“(c) Adjustment of Quantities. The quantity of pavement removal will be adjusted if the thickness of the existing pavement varies more than 15 percent from that shown on the plans. The quantity will be either increased or decreased according to the following table.

% change of thickness	% change of quantity
0 to less than 15	0
15 to less than 20	10
20 to less than 30	15
30 to less than 50	20

If the thickness of the existing pavement varies by 50 percent or more from that shown on the plans, the character of the work will be considered significantly changed and an adjustment to the contract will be made according to Article 104.02.

When an adjustment is made for variations in pavement thickness a resulting adjustment will also be made in the earthwork quantities when applicable.

No adjustment will be made for variations in the amount of reinforcement.”

PAYMENTS TO SUBCONTRACTORS (BDE)

Effective: June 1, 2000

Revised: January 1, 2006

Federal regulations found at 49 CFR §26.29 mandate the Department to establish a contract clause to require Contractors to pay subcontractors for satisfactory performance of their subcontracts and to set the time for such payments.

State law also addresses the timing of payments to be made to subcontractors and material suppliers. Section 7 of the Prompt Payment Act, 30 ILCS 540/7, requires that when a Contractor receives any payment from the Department, the Contractor shall make corresponding, proportional payments to each subcontractor and material supplier performing work or supplying material within 15 calendar days after receipt of the Department payment. Section 7 of the Act further provides that interest in the amount of two percent per month, in addition to the payment due, shall be paid to any subcontractor or material supplier by the Contractor if the payment required by the Act is withheld or delayed without reasonable cause. The Act also provides that the time for payment required and the calculation of any interest due applies to transactions between subcontractors and lower-tier subcontractors and material suppliers throughout the contracting chain.

This Special Provision establishes the required federal contract clause, and adopts the 15 calendar day requirement of the State Prompt Payment Act for purposes of compliance with the federal regulation regarding payments to subcontractors. This contract is subject to the following payment obligations.

When progress payments are made to the Contractor according to Article 109.07 of the Standard Specifications, the Contractor shall make a corresponding payment to each subcontractor and material supplier in proportion to the work satisfactorily completed by each subcontractor and for the material supplied to perform any work of the contract. The proportionate amount of partial payment due to each subcontractor and material supplier throughout the contracting chain shall be determined by the quantities measured or otherwise determined as eligible for payment by the Department and included in the progress payment to the Contractor. Subcontractors and material suppliers shall be paid by the Contractor within 15 calendar days after the receipt of payment from the Department. The Contractor shall not hold retainage from the subcontractors. These obligations shall also apply to any payments made by subcontractors and material suppliers to their subcontractors and material suppliers; and to all payments made to lower tier subcontractors and material suppliers throughout the contracting chain. Any payment or portion of a payment subject to this provision may only be withheld from the subcontractor or material supplier to whom it is due for reasonable cause.

This Special Provision does not create any rights in favor of any subcontractor or material supplier against the State or authorize any cause of action against the State on account of any payment, nonpayment, delayed payment, or interest claimed by application of the State Prompt Payment Act. The Department will not approve any delay or postponement of the 15 day requirement except for reasonable cause shown after notice and hearing pursuant to Section 7(b) of the State Prompt Payment Act. State law creates other and additional remedies available to any subcontractor or material supplier, regardless of tier, who has not been paid for work properly performed or material furnished. These remedies are a lien against public funds set forth in Section 23(c) of the Mechanics Lien Act, 770 ILCS 60/23(c), and a recovery on the Contractor's payment bond according to the Public Construction Bond Act, 30 ILCS 550.

PLACING AND CONSOLIDATING CONCRETE (BDE)

Effective: January 1, 2013

Revise the first paragraph of Article 503.06 of the Standard Specifications to read:

“503.06 Forms. Forms shall be set and maintained to the lines and grades shown on the plans, and shall be tight to prevent concrete leakage.”

Revise Article 503.07 of the Standard Specifications to read:

“503.07 Placing and Consolidating. No concrete shall be placed on ice, snow, or frozen foundation material.

The method and manner of placing concrete shall be such as to avoid segregation or separation of the aggregates or the displacement of the reinforcement. The external surface of all concrete shall be thoroughly worked during the operations of placing in such a manner as to work the mortar against the forms to produce a smooth finish free of honeycomb and with a minimum of water and air pockets.

Open troughs and chutes shall extend as nearly as practicable to the point of deposit. Dropping the concrete a distance of more than 5 ft (1.5 m) or depositing a large quantity at any point and running or working it along the forms will not be permitted. The concrete for walls with an average thickness of 12 in. (300 mm) or less shall be placed with tubes so that the drop is not greater than 5 ft (1.5 m).

For self-consolidating concrete, the maximum distance of horizontal flow from the point of deposit shall be 15 ft (4.6 m). The distance may be increased if the dynamic segregation index (DSI) at the maximum flow distance is 10.0 percent or less according to Illinois Test Procedure SCC-8 (Option C). The maximum distance using the DSI shall be 25 ft (7.6 m). In addition, this specified horizontal flow distance shall apply to precast products. In the case of precast prestressed concrete products, refer to the Department's "Manual of Fabrication for Precast Prestressed Concrete Products" for the specified horizontal flow distance requirements.

When the form height for placing the self-consolidating concrete is greater than 10 ft (3.0 m), direct monitoring of form pressure shall be performed by the Contractor according to Illinois Test Procedure SCC-10. The monitoring requirement is a minimum, and the Contractor shall remain responsible for adequate design of the falsework and forms. The Contractor shall record the formwork pressure during concrete placement. This information shall be used by the Contractor to prevent the placement rate from exceeding the maximum formwork pressure allowed, to monitor the thixotropic change in the concrete during the pour, and to make appropriate adjustments to the mix design. This information shall be provided to the Engineer during the pour.

When concrete is pumped, the equipment shall be suitable in kind and adequate in capacity for the work and arranged so that vibrations will not damage freshly placed concrete. Aluminum pipe or conduit will not be permitted in pumping or placing concrete. Mixed concrete shall be supplied to maintain continuous operation of the pumping equipment.

When air entrained concrete is pumped, an accessory or accessories shall be incorporated in the discharge components to minimize air loss. The maximum allowable air loss caused by the pumping operation shall be 3.0 percent with the minimum air content at the point of discharge meeting the requirements of Article 1020.04.

Placing of concrete shall be regulated so that the pressures caused by the wet concrete will not exceed those used in the design of the forms. Special care shall be taken to fill each part of the forms by depositing the concrete as near its final position as possible, to work the coarser aggregates back from the face, and to force the concrete under and around the reinforcement bars without displacing them. Leakage through forms onto beams or girders shall not be allowed to harden and shall be removed while in a plastic state.

The concrete shall be consolidated by internal vibration unless self-consolidating concrete is used. Self-consolidating concrete may be used for inaccessible locations where consolidation by internal vibration is not practicable. The self consolidating concrete shall be rodded with a piece of lumber, conduit, or vibrator if the material has lost its fluidity prior to placement of additional concrete. The vibrator may only be permitted if it can be used in a manner that does not cause segregation as determined by the Engineer. Any other method for restoring the fluidity of the concrete shall be approved by the Engineer.

The Contractor shall provide and use a sufficient number of vibrators to ensure that consolidation can be started immediately after the concrete has been deposited in the forms.

The vibrators shall be inserted into the concrete immediately after it is deposited and shall be moved throughout the mass so as to thoroughly work the concrete around the reinforcement, embedded fixtures, and into the corners and angles of the forms. Vibrators shall not be attached to the forms, reinforcement bars, or the surface of the concrete.

Application of vibrators shall be at points uniformly spaced and not farther apart than twice the radius over which the vibration is visibly effective. The duration of the vibration at the points of insertion shall be sufficient to thoroughly consolidate the concrete into place but shall not be continued so as to cause segregation. When consolidating concrete in bridge decks, the vibrator shall be vertically inserted into the concrete for 3 - 5 seconds or for a period of time determined by the Engineer. Vibration shall be supplemented by spading when required by the Engineer. In addition to the internal vibration required herein, formed surfaces which will be exposed to view after completion of the work shall be spaded with a spading tool approved by the Engineer.

Concrete shall be placed in continuous horizontal layers. When it is necessary by reason of an emergency to place less than a complete horizontal layer in one operation, such layer shall terminate in a vertical bulkhead. Separate batches shall follow each other closely and in no case shall the interval of time between the placing of successive batches be greater than 20 minutes.

If mix foaming or detrimental material is observed during placement or at the completion of a pour, the material shall be removed while the concrete is still plastic

After the concrete has taken its initial set, care shall be exercised to avoid jarring the forms or placing any strain on the ends of projecting reinforcement.”

Revise Article 516.12(a) of the Standard Specifications to read:

“(a) Free Fall Placement. The free fall placement shall only be permitted in shafts that can be dewatered to ensure less than 3 in. (75 mm) of standing water exist at the time of placement without causing side wall instability. The height of free fall placement shall be a maximum of 60 ft (18.3 m) as measured from the discharge end, but it shall be reduced to a maximum of 30 ft (9.1 m) when self-consolidating concrete is used. The Contractor shall obtain approval from the Engineer to place self-consolidating concrete by free fall.

Concrete placed by free fall shall fall directly to the base without contacting either the rebar cage or shaft sidewall. Drop chutes may be used to direct concrete to the base during free fall placement.

Drop chutes used to direct placement of free fall concrete shall consist of a smooth tube of either one continuous section or multiple pieces that can be added and removed. Concrete may be placed through either a hopper at the top of the tube or side openings as the drop chute is retrieved during concrete placement. The drop chute shall be supported so that free fall does not exceed the specified maximum 60 ft (18.3 m) or 30 ft (9.1 m) at all times from the discharge end, and to ensure the concrete does not strike the rebar cage. If placement cannot be satisfactorily accomplished by free fall in the opinion of the Engineer, either a tremie or pump shall be used to accomplish the pour.”

POLYUREA PAVEMENT MARKINGS (BDE)

Effective: November 1, 2012

Revise: January 1, 2013

Revise the first paragraph of Article 780.13 of the Standard Specifications to read:

“**780.13 Basis of Payment.** This work will be paid for at the contract unit prices per foot (meter) of applied line width, as specified, for THERMOPLASTIC PAVEMENT MARKING - LINE; PAINT PAVEMENT MARKING - LINE; EPOXY PAVEMENT MARKING - LINE; PREFORMED PLASTIC PAVEMENT MARKING - LINE - TYPE B, C, or B - INLAID; PREFORMED THERMOPLASTIC PAVEMENT MARKING - LINE, POLYUREA PAVEMENT MARKING TYPE I - LINE, POLYUREA PAVEMENT MARKING TYPE II - LINE; and/or per square foot (square meter) for THERMOPLASTIC PAVEMENT MARKING - LETTERS AND SYMBOLS; PAINT PAVEMENT MARKING - LETTERS AND SYMBOLS; EPOXY PAVEMENT MARKING - LETTERS AND SYMBOLS; PREFORMED PLASTIC PAVEMENT MARKING - TYPE B, C, or B - INLAID - LETTERS AND SYMBOLS; PREFORMED THERMOPLASTIC PAVEMENT MARKING - LETTERS AND SYMBOLS; POLYUREA PAVEMENT MARKING TYPE I - LETTERS AND SYMBOLS; POLYUREA PAVEMENT MARKING TYPE II - LETTERS AND SYMBOLS.”

PORTLAND CEMENT CONCRETE (BDE)

Effective: January 1, 2012

Revised: January 1, 2013

Revise Notes 1 and 2 of Article 312.24 of the Standard Specifications to read:

“Note 1. Coarse aggregate shall be gradation CA 6, CA 7, CA 9, CA 10, or CA 11, Class D quality or better. Article 1020.05(d) shall apply.

Note 2. Fine aggregate shall be FA 1 or FA 2. Article 1020.05(d) shall apply.”

Revise the first paragraph of Article 312.26 of the Standard Specifications to read:

“312.26 Proportioning and Mix Design. At least 60 days prior to start of placing CAM II, the Contractor shall submit samples of materials for proportioning and testing. The mixture shall contain a minimum of 200 lb (90 kg) of cement per cubic yard (cubic meter). Portland cement may be replaced with fly ash according to Article 1020.05(c)(1), however the minimum portland cement content in the mixture shall be 170 lbs/cu yd (101 kg/cu m). Blends of coarse and fine aggregates will be permitted, provided the volume of fine aggregate does not exceed the volume of coarse aggregate. The Engineer will determine the proportions of materials for the mixture. However, the Contractor may substitute their own mix design. Article 1020.05(a) shall apply and a Level III PCC Technician shall develop the mix design.”

Revise the second paragraph of Article 503.22 of the Standard Specifications to read:

Other cast-in-place concrete for structures will be paid for at the contract unit price per cubic yard (cubic meter) for CONCRETE HANDRAIL, CONCRETE ENCASUREMENT, and SEAL COAT CONCRETE.”

Add the following to Article 1003.02 of the Standard Specifications:

(e) Alkali Reaction.

(1) ASTM C 1260. Each fine aggregate will be tested by the Department for alkali reaction according to ASTM C 1260. The test will be performed with Type I or II portland cement having a total equivalent alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) of 0.90 percent or greater. The Engineer will determine the assigned expansion value for each aggregate, and these values will be made available on the Department’s Alkali-Silica Potential Reactivity Rating List. The Engineer may differentiate aggregate based on ledge, production method, gradation number, or other factors. An expansion value of 0.03 percent will be assigned to limestone or dolomite fine aggregates (manufactured stone sand). However, the Department reserves the right to perform the ASTM C 1260 test.

(2) ASTM C 1293 by Department. In some instances, such as chert natural sand or other fine aggregates, testing according to ASTM C 1260 may not provide accurate test results. In this case, the Department may only test according to ASTM C 1293.

- (3) ASTM C 1293 by Contractor. If an individual aggregate has an ASTM C 1260 expansion value that is unacceptable to the Contractor, an ASTM C 1293 test may be performed by the Contractor to evaluate the Department's ASTM C 1260 test result. The laboratory performing the ASTM C 1293 test shall be approved by the Department according to the current Bureau of Materials and Physical Research Policy Memorandum "Minimum Laboratory Requirements for Alkali-Silica Reactivity (ASR) Testing".

The ASTM C 1293 test shall be performed with Type I or II portland cement having a total equivalent alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) of 0.80 percent or greater. The interior vertical wall of the ASTM C 1293 recommended container (pail) shall be half covered with a wick of absorbent material consisting of blotting paper. If the testing laboratory desires to use an alternate container, wick of absorbent material, or amount of coverage inside the container with blotting paper, ASTM C 1293 test results with an alkali-reactive aggregate of known expansion characteristics shall be provided to the Engineer for review and approval. If the expansion is less than 0.040 percent after one year, the aggregate will be assigned an ASTM C 1260 expansion value of 0.08 percent that will be valid for two years, unless the Engineer determines the aggregate has changed significantly. If the aggregate is manufactured into multiple gradation numbers, and the other gradation numbers have the same or lower ASTM C 1260 value, the ASTM C 1293 test result may apply to multiple gradation numbers.

The Engineer reserves the right to verify a Contractor's ASTM C 1293 test result. When the Contractor performs the test, a split sample shall be provided to the Engineer. The Engineer may also independently obtain a sample at any time. The aggregate will be considered reactive if the Contractor or Engineer obtains an expansion value of 0.040 percent or greater.

Revise the first paragraph of Article 1004.01(e)(5) of the Standard Specifications to read:

"Crushed concrete, crushed slag, or lightweight aggregate for portland cement concrete shall be stockpiled in a moist condition (saturated surface dry or greater) and the moisture content shall be maintained uniformly throughout the stockpile by periodic sprinkling."

Revise Article 1004.02(d) of the Standard Specifications to read:

"(d)Combining Sizes. Each size shall be stored separately and care shall be taken to prevent them from being mixed until they are ready to be proportioned. Separate compartments shall be provided to proportion each size.

- (1) When Class BS concrete is to be pumped, the coarse aggregate gradation shall have a minimum of 45 percent passing the 1/2 in. (12.5 mm) sieve. The Contractor may combine two or more coarse aggregate sizes, consisting of CA 7, CA 11, CA 13, CA 14, and CA 16, provided a CA 7 or CA 11 is included in the blend.
- (2) If the coarse aggregate is furnished in separate sizes, they shall be combined in proportions to provide a uniformly graded coarse aggregate grading within the following limits.

Class of Concrete ^{1/}	Combined Sizes	Sieve Size and Percent Passing						
		2 1/2 in.	2 in.	1 3/4 in.	1 1/2 in.	1 in.	1/2 in.	No. 4
PV ^{2/}	CA 5 & CA 7	---	---	100	98±2	72±22	22±12	3±3
	CA 5 & CA 11	---	---	100	98±2	72±22	22±12	3±3
SI and SC ^{2/}	CA 3 & CA 7	100	95±5	---	---	55±25	20±10	3±3
	CA 3 & CA 11	100	95±5	---	---	55±25	20±10	3±3
	CA 5 & CA 7	---	---	100	98±2	72±22	22±12	3±3
	CA 5 & CA 11	---	---	100	98±2	72±22	22±12	3±3

Class of Concrete ^{1/}	Combined Sizes	Sieve Size (metric) and Percent Passing						
		63 mm	50 mm	45 mm	37.5 mm	25 mm	12.5 mm	4.75 mm
PV ^{2/}	CA 5 & CA 7	---	---	100	98±2	72±22	22±12	3±3
	CA 5 & CA 11	---	---	100	98±2	72±22	22±12	3±3
SI and SC ^{2/}	CA 3 & CA 7	100	95±5	---	---	55±25	20±10	3±3
	CA 3 & CA 11	100	95±5	---	---	55±25	20±10	3±3
	CA 5 & CA 7	---	---	100	98±2	72±22	22±12	3±3
	CA 5 & CA 11	---	---	100	98±2	72±22	22±12	3±3

1/ See Table 1 of Article 1020.04.

2/ Any of the listed combination of sizes may be used.”

Add the following to Article 1004.02 of the Standard Specifications:

(g) Alkali Reaction.

- (1) ASTM C 1260. Each coarse aggregate will be tested by the Department for alkali reaction according to ASTM C 1260. The test will be performed with Type I or II portland cement having a total equivalent alkali content (Na₂O + 0.658K₂O) of 0.90 percent or greater. The Engineer will determine the assigned expansion value for each aggregate, and these values will be made available on the Department’s Alkali-Silica Potential Reactivity Rating List. The Engineer may differentiate aggregate based on ledge, production method, gradation number, or other factors. An expansion value of 0.05 percent will be assigned to limestone or dolomite coarse aggregates. However, the Department reserves the right to perform the ASTM C 1260 test.
- (2) ASTM C 1293 by Department. In some instances testing a coarse aggregate according to ASTM C 1260 may not provide accurate test results. In this case, the Department may only test according to ASTM C 1293.
- (3) ASTM C 1293 by Contractor. If an individual aggregate has an ASTM C 1260 expansion value that is unacceptable to the Contractor, an ASTM C 1293 test may be performed by the Contractor according to Article 1003.02(e)(3).

Revise the first paragraph of Article 1019.06 of the Standard Specifications to read:

“1019.06 Contractor Mix Design. A Contractor may submit their own mix design and may propose alternate fine aggregate materials, fine aggregate gradations, or material proportions. Article 1020.05(a) shall apply and a Level III PCC Technician shall develop the mix design.”

Revise Section 1020 of the Standard Specifications to read:

“SECTION 1020. PORTLAND CEMENT CONCRETE

1020.01 Description. This item shall consist of the materials, mix design, production, testing, curing, low air temperature protection, and temperature control of concrete.

1020.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Cement	1001
(b) Water	1002
(c) Fine Aggregate	1003
(d) Coarse Aggregate	1004
(e) Concrete Admixtures	1021
(f) Finely Divided Minerals	1010
(g) Concrete Curing Materials	1022
(h) Straw	1081.06(a)(1)
(i) Calcium Chloride	1013.01

1020.03 Equipment. Equipment shall be according to the following.

Item	Article/Section
(a) Concrete Mixers and Trucks	1103.01
(b) Batching and Weighing Equipment	1103.02
(c) Automatic and Semi-Automatic Batching Equipment	1103.03
(d) Water Supply Equipment	1103.11
(e) Membrane Curing Equipment	1101.09
(f) Mobile Portland Cement Concrete Plants	1103.04

1020.04 Concrete Classes and General Mix Design Criteria. The classes of concrete shown in Table 1 identify the various mixtures by the general uses and mix design criteria. If the class of concrete for a specific item of construction is not specified, Class SI concrete shall be used.

For the minimum cement factor in Table 1, it shall apply to portland cement, portland-pozzolan cement, and portland blast-furnace slag except when a particular cement is specified in the Table.

The Contractor shall not assume that the minimum cement factor indicated in Table 1 will produce a mixture that will meet the specified strength. In addition, the Contractor shall not assume that the maximum finely divided mineral allowed in a mix design according to Article 1020.05(c) will produce a mixture that will meet the specified strength. The Contractor shall select a cement factor within the allowable range that will obtain the specified strength. The Contractor shall take into consideration materials selected, seasonal temperatures, and other factors which may require the Contractor to submit multiple mix designs.

For a portland-pozzolan cement, portland blast-furnace slag cement, or when replacing portland cement with finely divided minerals per Articles 1020.05(c) and 1020.05(d), the portland cement content in the mixture shall be a minimum of 375 lbs/cu yd (222 kg/cu m). When the total of organic processing additions, inorganic processing additions, and limestone exceed 5.0 percent in the cement, the minimum portland cement content in the mixture shall be 400 lbs/cu yd (237 kg/cu m). When calculating the portland cement portion in the portland-pozzolan or portland blast-furnace slag cement, the AASHTO M 240 tolerance may be ignored.

Special classifications may be made for the purpose of including the concrete for a particular use or location as a separate pay item in the contract. The concrete used in such cases shall conform to this section.

TABLE 1. CLASSES OF CONCRETE AND MIX DESIGN CRITERIA											
Class of Conc.	Use	Specification Section Reference	Cement Factor		Water / Cement Ratio lb/lb	S l u m p in. (4)	Mix Design Compressive Strength (Flexural Strength) psi, minimum			Air Content %	Coarse Aggregate Gradations (14)
			Min.	Max			Days				
							3	14	28		
PV	Pavement Base Course	420 or 421 353	5.65 (1) 6.05 (2)	7.05	0.32 - 0.42	2 - 4 (5)	Ty III 3500 (650)	3500 (650)		5.0 - 8.0 (5)	CA 5 & CA 7, CA 5 & CA 11, CA 7, CA 11, or CA 14
	Base Course Widening	354									
	Driveway Pavement	423									
	Shoulders	483									
	Shoulder Curb	662									
PP	Pavement Patching Bridge Deck Patching (10)	442					3200 (600) Article 701.17(e)(3)b.				CA 7, CA 11, CA 13, CA 14, or CA 16
	PP-1		6.50 6.20 (Ty III)	7.50 7.20 (Ty III)	0.32 - 0.44	2 - 4	at 48 hours			4.0 - 7.0	
	PP-2		7.35	8.20	0.32 - 0.38	2 - 6	at 24 hours			4.0 - 6.0	
	PP-3		7.35 (Ty III) (8)	7.35 (Ty III) (8)	0.32 - 0.35	2 - 4	at 16 hours			4.0 - 6.0	
	PP-4		6.00 (9)	6.25 (9)	0.32 - 0.50	2 - 6	at 8 hours			4.0 - 6.0	
	PP-5		6.75 (9)	6.75 (9)	0.32 - 0.40	2 - 8	at 4 hours			4.0 - 6.0	
RR	Railroad Crossing	422	6.50 6.20 (Ty III)	7.50 7.20 (Ty III)	0.32 - 0.44	2 - 4	3500 (650) at 48 hours			4.0 - 7.0	CA 7, CA 11, or CA 14
BS	Bridge Superstructure Bridge Approach Slab	503	6.05	7.05	0.32 - 0.44	2 - 4 (5)	4000 (675)			5.0 - 8.0 (5)	CA 7, CA 11, or CA 14 (7)
PC	Various Precast Concrete Items Wet Cast Dry Cast	1042	5.65 5.65 (TY III)	7.05 7.05 (TY III)	0.32 - 0.44 0.25 - 0.40	1 - 4 0 - 1	See Section 1042			5.0 - 8.0 N/A	CA7, CA11,CA 13, CA 14, CA 16, or CA 7 & CA 16
PS	Precast Prestressed Members	504	5.65 5.65 (TY III)	7.05 7.05 (TY III)	0.32 - 0.44	1 - 4			Plans	5.0 - 8.0	CA 11 (11), CA 13, CA 14 (11), or CA 16
	Precast Prestressed Piles and Extensions	512							5000		
	Precast Prestressed Sight Screen	639							3500		

TABLE 1. CLASSES OF CONCRETE AND MIX DESIGN CRITERIA												
Class of Conc.	Use	Specification Section Reference	Cement Factor		Water / Cement Ratio lb/lb	Slump in. (4)	Mix Design Compressive Strength (Flexural Strength) psi, minimum			Air Content %	Coarse Aggregate Gradations (14)	
			cwt/cu yd (3)	Min.			Max.	Days				
								3	14			28
DS	Drilled Shaft (12) Metal Shell Piles (12) Sign Structures Drilled Shaft (12) Light Tower Foundation (12)	516 512 734 837	6.65	7.05	0.32 - 0.44	6 - 8 (6)		4000 (675)		5.0 - 8.0	CA 13, CA 14, CA 16, or a blend of these gradations.	
SC	Seal Coat	503	5.65 (1) 6.05 (2)	7.05	0.32 - 0.44	3 - 5		3500 (650)		Optional 6.0 max.	CA 3 & CA 7, CA 3 & CA 11, CA 5 & CA 7, CA 5 & CA 11, CA 7, or CA 11	
SI	Structures (except Superstructure) Sidewalk Slope Wall Encasement Box Culverts End Section and Collar Curb, Gutter, Curb & Gutter, Median, and Paved Ditch Concrete Barrier Sign Structures Spread Footing Concrete Foundation Pole Foundation (12) Traffic Signal Foundation Drilled Shaft (12) Square or Rectangular	503 424 511 512 540 542 606 637 734 836 878	5.65 (1) 6.05 (2)	7.05	0.32 - 0.44	2 - 4 (5)		3500 (650)		5.0 - 8.0 (5)	CA 3 & CA 7, CA 3 & CA 11, CA 5 & CA 7, CA 5 & CA 11, CA 7, CA 11, CA 13, CA 14, or CA 16 (13)	

- Notes:
- (1) Central-mixed.
 - (2) Truck-mixed or shrink-mixed.
 - (3) For Class SC concrete and for any other class of concrete that is to be placed underwater, except Class DS concrete, the cement factor shall be increased by ten percent.
 - (4) The maximum slump may be increased to 7 in. when a high range water-reducing admixture is used for all classes of concrete, except Class PV, SC, and PP. For Class SC, the maximum slump may be increased to 8 in. For Class PP-1, the maximum slump may be increased to 6 in. For Class PS, the 7 in. maximum slump may be increased to 8 1/2 in. if the high range water-reducing admixture is the polycarboxylate type.
 - (5) The slump range for slipform construction shall be 1/2 to 2 1/2 in. and the air content range shall be 5.5 to 8.0 percent.
 - (6) If concrete is placed to displace drilling fluid, or against temporary casing, the slump shall be 8 - 10 in. at the point of placement. If a water-reducing admixture is used in lieu of a high range water-reducing admixture according to Article 1020.05(b)(7), the slump shall be 2 - 4 in.
 - (7) For Class BS concrete used in bridge deck patching, the coarse aggregate gradation shall be CA 13, CA 14, or CA 16, except CA 11 may be used for full-depth patching.
 - (8) In addition to the Type III portland cement, 100 lb/cu yd of ground granulated blast-furnace slag and 50 lb/cu yd of microsilica (silica fume) shall be used. For an air temperature greater than 85 °F, the Type III portland cement may be replaced with Type I or II portland cement.
 - (9) The cement shall be a rapid hardening cement from the Department's "Approved List of Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repairs" for PP-4 and calcium aluminate cement for PP-5.
 - (10) For Class PP concrete used in bridge deck patching, the coarse aggregate gradation shall be CA 13, CA 14, or CA 16, except CA 11 may be used for full-depth patching. In addition, the mix design shall have 72 hours to obtain a 4,000 psi compressive or 675 psi flexural strength for all PP mix designs.
 - (11) The nominal maximum size permitted is 3/4 in. Nominal maximum size is defined as the largest sieve which retains any of the aggregate sample particles.
 - (12) The concrete mix shall be designed to remain fluid throughout the anticipated duration of the pour plus one hour. At the Engineer's discretion, the Contractor may be required to conduct a minimum 2 cu yd trial batch to verify the mix design.
 - (13) CA 3 or CA 5 may be used when the nominal maximum size does not exceed two-thirds the clear distance between parallel reinforcement bars, or between the reinforcement bar and the form. Nominal maximum size is defined in Note 11.
 - (14) Alternate combinations of gradation sizes may be used with the approval of the Engineer. Refer also to Article 1004.02(d) for additional information on combining sizes.

TABLE 1. CLASSES OF CONCRETE AND MIX DESIGN CRITERIA (metric)											
Class of Conc.	Use	Specification Section Reference	Cement Factor		Water / Cement Ratio kg/kg	S l u m p mm (4)	Mix Design Compressive Strength (Flexural Strength) kPa, minimum			Air Content %	Coarse Aggregate Gradations (14)
			kg/cu m (3)				Days				
			Min.	Max			3	14	28		
PV	Pavement Base Course	420 or 421 353									CA 5 & CA 7, CA 5 & CA 11, CA 7, CA 11, or CA 14
	Base Course Widening	354	335 (1)	418	0.32 - 0.42	50 - 100 (5)	Ty III 24,000 (4500)	24,000 (4500)		5.0 - 8.0 (5)	
	Driveway Pavement	423	360 (2)								
	Shoulders	483									
	Shoulder Curb	662									
PP	Pavement Patching Bridge Deck Patching (10)	442						22,100 (4150) Article 701.17(e)(3)b.			CA 7, CA 11, CA 13, CA 14, or CA 16
	PP-1		385 365 (Ty III)	445 425 (Ty III)	0.32 - 0.44	50 - 100	at 48 hours		4.0 - 7.0		
	PP-2		435	485	0.32 - 0.38	50 - 150	at 24 hours		4.0 - 6.0		
	PP-3		435 (Ty III) (8)	435 (Ty III) (8)	0.32 - 0.35	50 - 100	at 16 hours		4.0 - 6.0		
	PP-4		355 (9)	370 (9)	0.32 - 0.50	50 - 150	at 8 hours		4.0 - 6.0		
	PP-5		400 (9)	400 (9)	0.32 - 0.40	50 - 200	at 4 hours		4.0 - 6.0		
RR	Railroad Crossing	422	385 365 (Ty III)	445 425 (Ty III)	0.32 - 0.44	50 - 100	24,000 (4500) at 48 hours		4.0 - 7.0	CA 7, CA 11, or CA 14	
BS	Bridge Superstructure Bridge Approach Slab	503	360	418	0.32 - 0.44	50 - 100 (5)	27,500 (4650)		5.0 - 8.0 (5)	CA 7, CA 11, or CA 14 (7)	
PC	Various Precast Concrete Items Wet Cast Dry Cast	1042	335 335 (TY III)	418 418 (TY III)	0.32 - 0.44 0.25 - 0.40	25 - 100 0 - 25	See Section 1042		5.0 - 8.0 N/A	CA7, CA11, CA13, CA 14, CA 16, or CA 7 & CA 16	
PS	Precast Prestressed Members	504						Plans	5.0 - 8.0	CA 11 (11), CA 13, CA 14 (11), or CA 16	
	Precast Prestressed Piles and Extensions	512	335 335 (TY III)	418 418 (TY III)	0.32 - 0.44	25 - 100		34,500			
	Precast Prestressed Sight Screen	639						24,000			

TABLE 1. CLASSES OF CONCRETE AND MIX DESIGN CRITERIA (metric)											
Class of Conc.	Use	Specification Section Reference	Cement Factor		Water / Cement Ratio kg/kg	S l u m p mm (4)	Mix Design Compressive Strength (Flexural Strength)			Air Content %	Coarse Aggregate Gradations (14)
			kg/cu m (3)				kPa, minimum				
			Min.	Max			Days				
							3	14	28		
DS	Drilled Shaft (12) Metal Shell Piles (12) Sign Structures Drilled Shaft (12) Light Tower Foundation (12)	516 512 734 837	395	418	0.32 - 0.44	150 -200 (6)		27,500 (4650)		5.0 - 8.0	CA 13, CA 14, CA 16, or a blend of these gradations.
SC	Seal Coat	503	335 (1) 360 (2)	418	0.32 - 0.44	75 - 125		24,000 (4500)		Optional 6.0 max.	CA 3 & CA 7, CA 3 & CA 11, CA 5 & CA 7, CA 5 & CA 11, CA 7, or CA 11
SI	Structures (except Superstructure) Sidewalk Slope Wall Encasement Box Culverts End Section and Collar Curb, Gutter, Curb & Gutter, Median, and Paved Ditch Concrete Barrier Sign Structures Spread Footing Concrete Foundation Pole Foundation (12) Traffic Signal Foundation Drilled Shaft (12) Square or Rectangular	503 424 511 512 540 542 606 637 734 836 878	335 (1) 360 (2)	418	0.32 - 0.44	50 - 100 (5)		24,000 (4500)		5.0 - 8.0 (5)	CA 3 & CA 7, CA 3 & CA 11, CA 5 & CA 7, CA 5 & CA 11, CA 7, CA 11, CA 13, CA 14, or CA 16 (13)

- Notes:
- (1) Central-mixed.
 - (2) Truck-mixed or shrink-mixed.
 - (3) For Class SC concrete and for any other class of concrete that is to be placed underwater, except Class DS concrete, the cement factor shall be increased by ten percent.
 - (4) The maximum slump may be increased to 175 mm when a high range water-reducing admixture is used for all classes of concrete except Class PV, SC, and PP. For Class SC, the maximum slump may be increased to 200 mm. For Class PP-1, the maximum slump may be increased to 150 mm. For Class PS, the 175 mm maximum slump may be increased to 215 mm if the high range water-reducing admixture is the polycarboxylate type.
 - (5) The slump range for slipform construction shall be 13 to 64 mm and the air content range shall be 5.5 to 8.0 percent.
 - (6) If concrete is placed to displace drilling fluid, or against temporary casing, the slump shall be 200 - 250 mm at the point of placement. If a water-reducing admixture is used in lieu of a high range water-reducing admixture according to Article 1020.05(b)(7), the slump shall be 50 – 100 mm.
 - (7) For Class BS concrete used in bridge deck patching, the coarse aggregate gradation shall be CA 13, CA 14, or CA 16, except CA 11 may be used for full-depth patching.
 - (8) In addition to the Type III portland cement, 60 kg/cu m of ground granulated blast-furnace slag and 30 kg/cu m of microsilica (silica fume) shall be used. For an air temperature greater than 30 °C, the Type III portland cement may be replaced with Type I or II portland cement.
 - (9) The cement shall be a rapid hardening cement from the Department's "Approved List of Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repairs" for PP-4 and calcium aluminate cement for PP-5.
 - (10) For Class PP concrete used in bridge deck patching, the coarse aggregate gradation shall be CA 13, CA 14, or CA 16, except CA 11 may be used for full-depth patching. In addition, the mix design shall have 72 hours to obtain a 27,500 kPa compressive or 4,650 kPa flexural.
 - (11) The nominal maximum size permitted is 19 mm. Nominal maximum size is defined as the largest sieve which retains any of the aggregate sample particles.
 - (12) The concrete mix shall be designed to remain fluid throughout the anticipated duration of the pour plus one hour. At the Engineer's discretion, the Contractor may be required to conduct a minimum 1.5 cu m trial batch to verify the mix design.
 - (13) CA 3 or CA 5 may be used when the nominal maximum size does not exceed two-thirds the clear distance between parallel reinforcement bars, or between the reinforcement bar and the form. Nominal maximum size is defined in Note 11.
 - (14) Alternate combinations of gradation sizes may be used with the approval of the Engineer. Refer also to Article 1004.02(d) for additional information on combining sizes.

Self-consolidating concrete is a flowable mixture that does not require mechanical vibration for consolidation. Self-consolidating concrete mix designs may be developed for Class BS, PC, PS, DS, and SI concrete. Self-consolidating concrete mix designs may also be developed for precast concrete products that are not subjected to Class PC concrete requirements according to Section 1042. The mix design criteria for the concrete mixture shall be according to Article 1020.04 with the following exceptions.

- (a) The slump requirements shall not apply.
- (b) The concrete mixture should be uniformly graded, and information in the "Portland Cement Concrete Level III Technician Course – Manual of Instructions for Design of Concrete Mixtures" may be used to develop the uniformly graded mix design. The coarse aggregate gradations shall be CA 11, CA 13, CA 14, CA 16, or a blend of these gradations. However, the final gradation when using a single coarse aggregate or combination of coarse aggregates shall have 100 percent pass the 1 in. (25 mm) sieve, and minimum 95 percent pass the 3/4 in. (19 mm) sieve. The fine aggregate proportion shall be a maximum 50 percent by weight (mass) of the total aggregate used.
- (c) The slump flow range shall be 22 in. (560 mm) minimum to 28 in. (710 mm) maximum and tested according to Illinois Test Procedure SCC-2.
- (d) The visual stability index shall be a maximum of 1 and tested according to Illinois Test Procedure SCC-2.
- (e) The J-Ring value shall be a maximum of 2 in. (50 mm) and tested according to Illinois Test Procedure SCC-3. The L-Box blocking ratio shall be a minimum of 80 percent and tested according to Illinois Test Procedure SCC-3. The Contractor has the option to select either test.
- (f) The hardened visual stability index shall be a maximum of 1 and tested according to Illinois Test Procedure SCC-6.
- (g) If Class PC concrete requirements do not apply to the precast concrete product according to Section 1042, the maximum cement factor shall be 7.05 cwt/cu yd (418 kg/cu m) and the maximum allowable water/cement ratio shall be 0.44.
- (h) If the measured slump flow, visual stability index, J-Ring value, or L-Box blocking ratio fall outside the limits specified, a check test will be made. In the event of a second failure, the Engineer may refuse to permit the use of the batch of concrete represented.

The Contractor may use water or self-consolidating admixtures at the jobsite to obtain the specified slump flow, visual stability index, J-ring value, or L-box blocking ratio. The maximum design water/cement ratio shall not be exceeded.

1020.05 Other Concrete Criteria. The concrete shall be according to the following.

- (a) Proportioning and Mix Design. For all Classes of concrete, it shall be the Contractor's responsibility to determine mix design material proportions and to proportion each batch of concrete. A Level III PCC Technician shall develop the mix design for all Classes of concrete, except Classes PC and PS. The mix design, submittal information, trial batch, and Engineer verification shall be according to the "Portland Cement Concrete Level III Technician" course material.

The Contractor shall provide the mix designs a minimum of 45 calendar days prior to production. More than one mix design may be submitted for each class of concrete.

The Engineer will verify the mix design submitted by the Contractor. Verification of a mix design shall in no manner be construed as acceptance of any mixture produced. Once a mix design has been verified, the Engineer shall be notified of any proposed changes.

Tests performed at the jobsite will determine if a mix design can meet specifications. If the tests indicate it cannot, the Contractor shall make adjustments to a mix design, or submit a new mix design if necessary, to comply with the specifications.

- (b) Admixtures. The Contractor shall be responsible for using admixtures and determining dosages for all Classes of concrete, cement aggregate mixture II, and controlled low-strength material that will produce a mixture with suitable workability, consistency, and plasticity. In addition, admixture dosages shall result in the mixture meeting the specified plastic and hardened properties. The Contractor shall obtain approval from the Engineer to use an accelerator when the concrete temperature is greater than 60 °F (16 °C). However, this accelerator approval by the Engineer will not be required for Class PP, RR, PC, and PS concrete. The accelerator shall be the non-chloride type unless otherwise specified in the contract plans.

The Department will maintain an Approved List of Corrosion Inhibitors. Corrosion inhibitor dosage rates shall be according to Article 1020.05(b)(10). For information on approved controlled low-strength material air-entraining admixtures, refer to Article 1019.02. The Department will also maintain an Approved List of Concrete Admixtures, and an admixture technical representative shall be consulted by the Contractor prior to the pour when determining an admixture dosage from this list or when making minor admixture dosage adjustments at the jobsite. The dosage shall be within the range indicated on the approved list unless the influence by other admixtures, jobsite conditions (such as a very short haul time), or other circumstances warrant a dosage outside the range. The Engineer shall be notified when a dosage is proposed outside the range. To determine an admixture dosage, air temperature, concrete temperature, cement source and quantity, finely divided mineral sources and quantity, influence of other admixtures, haul time, placement conditions, and other factors as appropriate shall be considered. The Engineer may request the Contractor to have a batch of concrete mixed in the lab or field to verify the admixture dosage is correct. An admixture dosage or combination of admixture dosages shall not delay the initial set of concrete by more than one hour. When a retarding admixture is required or appropriate for a bridge deck or bridge deck overlay pour, the initial set time shall be delayed until the deflections due to the concrete dead load are no longer a concern for inducing cracks in the completed work. However, a retarding admixture shall not be used to further extend the pour time and justify the alteration of a bridge deck pour sequence.

When determining water in admixtures for water/cement ratio, the Contractor shall calculate 70 percent of the admixture dosage as water, except a value of 50 percent shall be used for a latex admixture used in bridge deck latex concrete overlays.

The sequence, method, and equipment for adding the admixtures shall be approved by the Engineer. Admixtures shall be added to the concrete separately. An accelerator shall always be added prior to a high range water-reducing admixture, if both are used.

Admixture use shall be according to the following.

- (1) When the atmosphere or concrete temperature is 65 °F (18 °C) or higher, a retarding admixture shall be used in the Class BS concrete and concrete bridge deck overlays. The proportions of the ingredients of the concrete shall be the same as without the retarding admixture, except that the amount of mixing water shall be reduced, as may be necessary, in order to maintain the consistency of the concrete as required. In addition, a high range water-reducing admixture shall be used in bridge deck concrete. At the option of the Contractor, a water-reducing admixture may be used with the high range water-reducing admixture in Class BS concrete.
- (2) At the Contractor's option, admixtures in addition to an air-entraining admixture may be used for Class PP-1 or RR concrete. When the air temperature is less than 55 °F (13 °C) and an accelerator is used, the non-chloride accelerator shall be calcium nitrite.
- (3) When Class C fly ash or ground granulated blast-furnace slag is used in Class PP-1 or RR concrete, a water-reducing or high range water-reducing admixture shall be used.
- (4) For Class PP-2 or PP-3 concrete, a non-chloride accelerator followed by a high range water-reducing admixture shall be used, in addition to the air-entraining admixture. The Contractor has the option to use a water-reducing admixture with the high range water-reducing admixture. For Class PP-3 concrete, the non-chloride accelerator shall be calcium nitrite. For Class PP-2 concrete, the non-chloride accelerator shall be calcium nitrite when the air temperature is less than 55 °F (13 °C).
- (5) For Class PP-4 concrete, a high range water-reducing admixture shall be used in addition to the air-entraining admixture. The Contractor has the option to use a water-reducing admixture with the high range water-reducing admixture. An accelerator shall not be used. For stationary or truck-mixed concrete, a retarding admixture shall be used to allow for haul time. The Contractor has the option to use a mobile portland cement concrete plant, but a retarding admixture shall not be used unless approved by the Engineer.

For PP-5 concrete, a non-chloride accelerator, high range water-reducing admixture, and air-entraining admixture shall be used. The accelerator, high range water-reducing admixture, and air-entraining admixture shall be per the Contractor's recommendation and dosage. The approved list of concrete admixtures shall not apply. A mobile portland cement concrete plant shall be used to produce the patching mixture.

- (6) When a calcium chloride accelerator is specified in the contract, the maximum chloride dosage shall be 1.0 quart (1.0 L) of solution per 100 lb (45 kg) of cement. The dosage may be increased to a maximum 2.0 quarts (2.0 L) per 100 lb (45 kg) of cement if approved by the Engineer. When a calcium chloride accelerator for Class PP-2 concrete is specified in the contract, the maximum chloride dosage shall be 1.3 quarts (1.3 L) of solution per 100 lb (45 kg) of cement. The dosage may be increased to a maximum 2.6 quarts (2.6 L) per 100 lb (45 kg) of cement if approved by the Engineer.
- (7) For Class DS concrete a retarding admixture and a high range water-reducing admixture shall be used. For dry excavations that are 10 ft (3 m) or less, the high range water-reducing admixture may be replaced with a water-reducing admixture if the concrete is vibrated. The use of admixtures shall take into consideration the slump loss limits specified in Article 516.12 and the fluidity requirement in Article 1020.04 (Note 12).
- (8) At the Contractor's option, when a water-reducing admixture or a high range water-reducing admixture is used for Class PV, PP-1, RR, SC, and SI concrete, the cement factor may be reduced a maximum 0.30 hundredweight/cu yd (18 kg/cu m). However, a cement factor reduction will not be allowed for concrete placed underwater.
- (9) When Type F or Type G high range water-reducing admixtures are used, the initial slump shall be a minimum of 1 1/2 in. (40 mm) prior to addition of the Type F or Type G admixture, except as approved by the Engineer.
- (10) When specified, a corrosion inhibitor shall be added to the concrete mixture utilized in the manufacture of precast, prestressed concrete members and/or other applications. It shall be added, at the same rate, to all grout around post-tensioning steel when specified.

When calcium nitrite is used, it shall be added at the rate of 4 gal/cu yd (20 L/cu m), and shall be added to the mix immediately after all compatible admixtures have been introduced to the batch.

When Rheocrete 222+ is used, it shall be added at the rate of 1.0 gal/cu yd (5.0 L/cu m), and the batching sequence shall be according to the manufacturer's instructions.

- (c) Finely Divided Minerals. Use of finely divided minerals shall be according to the following.

- (1) Fly Ash. At the Contractor's option, fly ash from approved sources may partially replace portland cement in cement aggregate mixture II, Class PV, PP-1, PP-2, RR, BS, PC, PS, DS, SC, and SI concrete.

The use of fly ash shall be according to the following.

- a. Measurements of fly ash and portland cement shall be rounded up to the nearest 5 lb (2.5 kg).
 - b. When Class F fly ash is used in cement aggregate mixture II, Class PV, BS, PC, PS, DS, SC, and SI concrete, the amount of portland cement replaced shall not exceed 25 percent by weight (mass).
 - c. When Class C fly ash is used in cement aggregate mixture II, Class PV, PP-1, PP-2, RR, BS, PC, PS, DS, SC, and SI concrete, the amount of portland cement replaced shall not exceed 30 percent by weight (mass).
 - d. Fly ash may be used in concrete mixtures when the air temperature is below 40 °F (4 °C), but the Engineer may request a trial batch of the concrete mixture to show the mix design strength requirement will be met.
- (2) Ground Granulated Blast-Furnace (GGBF) Slag. At the Contractor's option, GGBF slag may partially replace portland cement in Class PV, PP-1, PP-2, RR, BS, PC, PS, DS, SC, and SI concrete. For Class PP-3 concrete, GGBF slag shall be used according to Article 1020.04.

The use of GGBF slag shall be according to the following.

- a. Measurements of GGBF slag and portland cement shall be rounded up to the nearest 5 lb (2.5 kg).
 - b. When GGBF slag is used in Class PV, PP-1, PP-2, RR, BS, PC, PS, DS, SC and SI concrete, the amount of portland cement replaced shall not exceed 35 percent by weight (mass).
 - c. GGBF slag may be used in concrete mixtures when the air temperature is below 40 °F (4 °C), but the Engineer may request a trial batch of the concrete mixture to show the mix design strength requirement will be met.
- (3) Microsilica. At the Contractor's option, microsilica may be added at a maximum of 5.0 percent by weight (mass) of the cement and finely divided minerals summed together.

Microsilica shall be used in Class PP-3 concrete according to Article 1020.04.

- (4) High Reactivity Metakaolin (HRM). At the Contractor's option, HRM may be added at a maximum of 5.0 percent by weight (mass) of the cement and finely divided minerals summed together.
- (5) Mixtures with Multiple Finely Divided Minerals. Except as specified for Class PP-3 concrete, the Contractor has the option to use more than one finely divided mineral in Class PV, PP-1, PP-2, RR, BS, PC, PS, DS, SC, and SI concrete as follows.

- a. The mixture shall contain a maximum of two finely divided minerals. The finely divided mineral in portland-pozzolan cement or portland blast-furnace slag cement shall count toward the total number of finely divided minerals allowed. The finely divided minerals shall constitute a maximum of 35.0 percent of the total cement plus finely divided minerals. The fly ash portion shall not exceed 30.0 percent for Class C fly ash or 25.0 percent for Class F fly ash. The Class C and F fly ash combination shall not exceed 30.0 percent. The ground granulated blast-furnace slag portion shall not exceed 35.0 percent. The microsilica or high-reactivity metakaolin portion used together or separately shall not exceed ten percent. The finely divided mineral in the portland-pozzolan cement or portland blast-furnace slag blended cement shall apply to the maximum 35.0 percent.
- b. Central Mixed. For Class PV, SC, and SI concrete, the mixture shall contain a minimum of 565 lbs/cu yd (335 kg/cu m) of cement and finely divided minerals summed together. If a water-reducing or high-range water-reducing admixture is used, the Contractor has the option to use a minimum of 535 lbs/cu yd (320 kg/cu m).
- c. Truck-Mixed or Shrink-Mixed. For Class PV, SC, and SI concrete, the mixture shall contain a minimum of 605 lbs/cu yd (360 kg/cu m) of cement and finely divided minerals summed together. If a water-reducing or high-range water-reducing admixture is used, the Contractor has the option to use a minimum of 575 lbs/cu yd (345 kg/cu m).
- d. Central-Mixed, Truck-Mixed or Shrink-Mixed. For Class PP-1 and RR concrete, the mixture shall contain a minimum of 650 lbs/cu yd (385 kg/cu m) of cement and finely divided minerals summed together. For Class PP-1 and RR concrete using Type III portland cement, the mixture shall contain a minimum of 620 lbs/cu yd (365 kg/cu m).

For Class PP-2 concrete, the mixture shall contain a minimum of 735 lbs/cu yd (435 kg/cu m) of cement and finely divided minerals summed together. For Class BS concrete, the mixture shall contain a minimum of 605 lbs/cu yd (360 kg/cu m). For Class DS concrete, the mixture shall contain a minimum of 665 lbs/cu yd (395 kg/cu m).

If a water-reducing or high range water-reducing admixture is used in Class PP-1 and RR concrete, the Contractor has the option to use a minimum of 620 lbs/cu yd (365 kg/cu m) of cement and finely divided minerals summed together. If a water-reducing or high-range water-reducing admixture is used with Type III portland cement in Class PP-1 and RR concrete, the Contractor has the option to use a minimum of 590 lbs/cu yd (350 kg/cu m).

- e. Central-Mixed or Truck-Mixed. For Class PC and PS concrete, the mixture shall contain a minimum of 565 lbs/cu yd (335 kg/cu m) of cement and finely divided minerals summed together.

- f. The mixture shall contain a maximum of 705 lbs/cu yd (418 kg/cu m) of cement and finely divided mineral(s) summed together for Class PV, BS, PC, PS, DS, SC, and SI concrete. For Class PP-1 and RR concrete, the mixture shall contain a maximum of 750 lbs/cu yd (445 kg/cu m). For Class PP-1 and RR concrete using Type III portland cement, the mixture shall contain a maximum of 720 lbs/cu yd (425 kg/cu m). For Class PP-2 concrete, the mixture shall contain a maximum of 820 lbs/cu yd (485 kg/cu m).
 - g. For Class SC concrete and for any other class of concrete that is to be placed underwater, except Class DS concrete, the allowable cement and finely divided minerals summed together shall be increased by ten percent.
 - h. The combination of cement and finely divided minerals shall comply with Article 1020.05(d).
- (d) Alkali-Silica Reaction. For cast-in-place (includes cement aggregate mixture II and latex mixtures), precast, and precast prestressed concrete, one of the mixture options provided in Article 1020.05(d)(2) shall be used to reduce the risk of a deleterious alkali-silica reaction in concrete exposed to humid or wet conditions. The mixture options are not intended or adequate for concrete exposed to potassium acetate, potassium formate, sodium acetate, or sodium formate. The mixture options will not be required for the dry environment (humidity less than 60 percent) found inside buildings for residential or commercial occupancy.

The mixture options shall not apply to concrete revetment mats, insertion lining of pipe culverts, portland cement mortar fairing course, controlled low-strength material, miscellaneous grouts that are not prepackaged, Class PP-3 concrete, Class PP-4 concrete, and Class PP-5 concrete.

- (1) Aggregate Groups. Each combination of aggregates used in a mixture will be assigned to an aggregate group. The point at which the coarse aggregate and fine aggregate expansion values intersect in the following table will determine the group.

Aggregate Groups			
Coarse Aggregate or Coarse Aggregate Blend ASTM C 1260 Expansion	Fine Aggregate Or Fine Aggregate Blend ASTM C 1260 Expansion		
	≤0.16%	>0.16% - 0.27%	>0.27%
≤0.16%	Group I	Group II	Group III
>0.16% - 0.27%	Group II	Group II	Group III
>0.27%	Group III	Group III	Group IV

- (2) Mixture Options. Based upon the aggregate group, the following mixture options shall be used. However, the Department may prohibit a mixture option if field performance shows a deleterious alkali-silica reaction or Department testing indicates the mixture may experience a deleterious alkali-silica reaction.

Reduction of Risk for Deleterious Alkali-Silica Reaction					
Aggregate Groups	Mixture Options				
	Option 1	Option 2	Option 3	Option 4	Option 5
Group I	Mixture options are not applicable. Use any cement or finely divided mineral.				
Group II	X	X	X	X	X
Group III	X	Combine Option 2 with Option 3	Combine Option 2 with Option 3	X	X
Group IV	X	Combine Option 2 with Option 4	Invalid Option	Combine Option 2 with Option 4	X

“X” denotes valid mixture option for aggregate group.

- a. Mixture Option 1. The coarse or fine aggregates shall be blended to place the material in a group that will allow the selected cement or finely divided mineral to be used. Coarse aggregate may only be blended with another coarse aggregate. Fine aggregate may only be blended with another fine aggregate. Blending of coarse with fine aggregate to place the material in another group will not be permitted.

When a coarse or fine aggregate is blended, the weighted expansion value shall be calculated separately for the coarse and fine aggregate as follows:

$$\text{Weighted Expansion Value} = (a/100 \times A) + (b/100 \times B) + (c/100 \times C) + \dots$$

Where: a, b, c... = percentage of aggregate in the blend;
A, B, C... = expansion value for that aggregate.

- b. Mixture Option 2. A finely divided mineral shall be used as described in 1), 2), 3), or 4) that follow. In addition, a blended cement with a finely divided mineral may be added to a separate finely divided mineral to meet the following requirements, provided the finely divided minerals are the same material. However, adding together two different finely divided minerals to obtain the specified minimum percentage of one material will not be permitted for 1), 2), 3), and 4). Refer to Mixture Option 5 to address this situation.

1. Class F Fly Ash. For cement aggregate mixture II, Class PV, BS, PC, PS, MS, DS, SC and SI concrete, the Class F fly ash shall be a minimum 25.0 percent by weight (mass) of the cement and finely divided minerals summed together.

If the maximum total equivalent available alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) exceeds 4.50 percent for the Class F fly ash, it may be used only if it complies with Mixture Option 5.

2. Class C Fly Ash. For cement aggregate mixture II, Class PV, PP-1, PP-2, RR, BS, PC, PS, DS, SC, and SI concrete, Class C fly ash shall be a minimum of 25.0 percent by weight (mass) of the cement and finely divided minerals summed together.

If the maximum total equivalent available alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) exceeds 4.50 percent or the calcium oxide exceeds 26.50 percent for the Class C fly ash, it may be used only per Mixture Option 5.

3. Ground Granulated Blast-Furnace Slag. For Class PV, PP-1, PP-2, RR, BS, PC, PS, DS, SC, and SI concrete, ground granulated blast-furnace slag shall be a minimum of 25.0 percent by weight (mass) of the cement and finely divided minerals summed together.

If the maximum total equivalent available alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) exceeds 1.00 percent for the ground granulated blast-furnace slag, it may be used only per Mixture Option 5.

4. Microsilica or High Reactivity Metakaolin, Microsilica solids or high reactivity metakaolin shall be a minimum 5.0 percent by weight (mass) of the cement and finely divided minerals summed together.

If the maximum total equivalent available alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) exceeds 1.00 percent for the Microsilica or High Reactivity Metakaolin, it may be used only if it complies with Mixture Option 5.

- c. Mixture Option 3. The cement used shall have a maximum total equivalent alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) of 0.60 percent. When aggregate in Group II is involved and the Contractor desires to use a finely divided mineral, any finely divided mineral may be used with the cement unless the maximum total equivalent available alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) exceeds 4.50 percent for the fly ash; or 1.00 percent for the ground granulated blast-furnace slag, microsilica or high reactivity metakaolin. If the alkali content is exceeded, the finely divided mineral may be used only per Mixture Option 5.
- d. Mixture Option 4. The cement used shall have a maximum total equivalent alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) of 0.45 percent. When aggregate in Group II or III is involved and the Contractor desires to use a finely divided mineral, any finely divided mineral may be used with the cement unless the maximum total equivalent available alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$) exceeds 4.50 percent for the fly ash; or 1.00 percent for the ground granulated blast-furnace slag, microsilica, or high reactivity metakaolin. If the alkali content is exceeded, the finely divided mineral may be used only per Mixture Option 5.

- e. Mixture Option 5. The proposed cement or finely divided mineral may be used if the ASTM C 1567 expansion value is ≤ 0.16 percent when performed on the aggregate in the concrete mixture with the highest ASTM C 1260 test result. The laboratory performing the ASTM C 1567 test shall be approved by the Department according to the current Bureau of Materials and Physical Research Policy Memorandum "Minimum Laboratory Requirements for Alkali-Silica Reactivity (ASR) Testing". The ASTM C 1567 test will be valid for two years, unless the Engineer determines the materials have changed significantly.

For latex concrete, the ASTM C 1567 test shall be performed without the latex.

The 0.20 percent autoclave expansion limit in ASTM C 1567 shall not apply.

If during the two year time period the Contractor needs to replace the cement, and the replacement cement has an equal or lower total equivalent alkali content ($\text{Na}_2\text{O} + 0.658\text{K}_2\text{O}$), a new ASTM C 1567 test will not be required.

The Engineer reserved the right to verify a Contractor's ASTM C 1567 test result. When the Contractor performs the test, a split sample may be requested by the Engineer. The Engineer may also independently obtain a sample at any time. The proposed cement or finely divided mineral will not be allowed for use if the Contractor or Engineer obtains an expansion value greater than 0.16 percent.

1020.06 Water/Cement Ratio. The water/cement ratio shall be determined on a weight (mass) basis. When a maximum water/cement ratio is specified, the water shall include mixing water, water in admixtures, free moisture on the aggregates, and water added at the jobsite. The quantity of water may be adjusted within the limit specified to meet slump requirements.

When fly ash, ground granulated blast-furnace slag, high-reactivity metakaolin, or microsilica (silica fume) are used in a concrete mix, the water/cement ratio will be based on the total cement and finely divided minerals contained in the mixture.

1020.07 Slump. The slump shall be determined according to Illinois Modified AASHTO T 119.

If the measured slump falls outside the limits specified, a check test will be made. In the event of a second failure, the Engineer may refuse to permit the use of the batch of concrete represented.

If the Contractor is unable to add water to prepare concrete of the specified slump without exceeding the maximum design water/cement ratio, a water-reducing admixture shall be added.

1020.08 Air Content. The air content shall be determined according to Illinois Modified AASHTO T 152 or Illinois Modified AASHTO T 196. The air-entrainment shall be obtained by the use of cement with an approved air-entraining admixture added during the mixing of the concrete or the use of air-entraining cement.

If the air-entraining cement furnished is found to produce concrete having air content outside the limits specified, its use shall be discontinued immediately and the Contractor shall provide other air-entraining cement which will produce air contents within the specified limits.

If the air content obtained is above the specified maximum limit at the jobsite, the Contractor may have the concrete further mixed, within the limits of time and revolutions specified, to reduce the air content. If the air content obtained is below the specified minimum limit, the Contractor may add to the concrete a sufficient quantity of an approved air-entraining admixture at the jobsite to bring the air content within the specified limits.

1020.09 Strength Tests. The specimens shall be molded and cured according to Illinois Modified AASHTO T 23. Specimens shall be field cured with the construction item as specified in Illinois Modified AASHTO T 23. The compressive strength shall be determined according to Illinois Modified AASHTO T 22. The flexural strength shall be determined according to Illinois Modified AASHTO T 177.

Except for Class PC and PS concrete, the Contractor shall transport the strength specimens from the site of the work to the field laboratory or other location as instructed by the Engineer. During transportation in a suitable light truck, the specimens shall be embedded in straw, burlap, or other acceptable material in a manner meeting with the approval of the Engineer to protect them from damage; care shall be taken to avoid impacts during hauling and handling. For strength specimens, the Contractor shall provide a field curing box for initial curing and a water storage tank for final curing. The field curing box will be required when an air temperature below 60 °F (16 °C) is expected during the initial curing period. The device shall maintain the initial curing temperature range specified in Illinois Modified AASHTO T 23, and may be insulated or power operated as appropriate.

1020.10 Handling, Measuring, and Batching Materials. Aggregates shall be handled in a manner to prevent mixing with soil and other foreign material.

Aggregates shall be handled in a manner which produces a uniform gradation, before placement in the plant bins. Aggregates delivered to the plant in a nonuniform gradation condition shall be stockpiled. The stockpiled aggregate shall be mixed uniformly before placement in the plant bins.

Aggregates shall have a uniform moisture content before placement in the plant bins. This may require aggregates to be stockpiled for 12 hours or more to allow drainage, or water added to the stockpile, or other methods approved by the Engineer. Moisture content requirements for crushed concrete, crushed slag or lightweight aggregate shall be according to Article 1004.01(e)(5).

Aggregates, cement, and finely divided minerals shall be measured by weight (mass). Water and admixtures shall be measured by volume or weight (mass).

The Engineer may permit aggregates, cement, and finely divided minerals to be measured by volume for small isolated structures and for miscellaneous items. Aggregates, cement, and finely divided minerals shall be measured individually. The volume shall be based upon dry, loose materials.

1020.11 Mixing Portland Cement Concrete. The mixing of concrete shall be according to the following.

(a) Ready-Mixed Concrete. Ready-mixed concrete is central-mixed, truck-mixed, or shrink-mixed concrete transported and delivered in a plastic state ready for placement in the work and shall be according to the following.

(1) Central-Mixed Concrete. Central-mixed concrete is concrete which has been completely mixed in a stationary mixer and delivered in a truck agitator, a truck mixer operating at agitating speed, or a nonagitator truck.

The stationary mixer shall operate at the drum speed for which it was designed. The batch shall be charged into the drum so that some of the water shall enter in advance of the cement, finely divided minerals, and aggregates. The flow of the water shall be uniform and all water shall be in the drum by the end of the first 15 seconds of the mixing period. Water shall begin to enter the drum from zero to two seconds in advance of solid material and shall stop flowing within two seconds of the beginning of mixing time.

Some coarse aggregate shall enter in advance of other solid materials. For the balance of the charging time for solid materials, the aggregates, finely divided minerals, and cement (to assure thorough blending) shall each flow at acceptably uniform rates, as determined by visual observation. Coarse aggregate shall enter two seconds in advance of other solid materials and a uniform rate of flow shall continue to within two seconds of the completion of charging time.

The entire contents of the drum, or of each single compartment of a multiple-drum mixer, shall be discharged before the succeeding batch is introduced.

The volume of concrete mixed per batch shall not exceed the mixer's rated capacity as shown on the standard rating plate on the mixer by more than ten percent.

The minimum mixing time shall be 75 seconds for a stationary mixer having a capacity greater than 2 cu yd (1.5 cu m). For a mixer with a capacity equal to or less than 2 cu yd (1.5 cu m) the mixing time shall be 60 seconds. Transfer time in multiple drum mixers is included in the mixing time. Mixing time shall begin when all materials are in the mixing compartment and shall end when the discharge of any part of the batch is started. The required mixing times will be established by the Engineer for all types of stationary mixers.

When central-mixed concrete is to be transported in a truck agitator or a truck mixer, the stationary-mixed batch shall be transferred to the agitating unit without delay and without loss of any portion of the batch. Agitating shall start immediately thereafter and shall continue without interruption until the batch is discharged from the agitator. The ingredients of the batch shall be completely discharged from the agitator before the succeeding batch is introduced. Drums and auxiliary parts of the equipment shall be kept free from accumulations of materials.

The vehicles used for transporting the mixed concrete shall be of such capacity, or the batches shall be so proportioned, that the entire contents of the mixer drum can be discharged into each vehicle load.

- (2) **Truck-Mixed Concrete.** Truck-mixed concrete is completely mixed and delivered in a truck mixer. When the mixer is charged with fine and coarse aggregates simultaneously, not less than 60 nor more than 100 revolutions of the drum or blades at mixing speed shall be required, after all of the ingredients including water are in the drum. When fine and coarse aggregates are charged separately, not less than 70 revolutions will be required. For self-consolidating concrete, a minimum of 100 revolutions is required in all cases. Additional mixing beyond 100 revolutions shall be at agitating speed unless additions of water, admixtures, or other materials are made at the jobsite. The mixing operation shall begin immediately after the cement and water, or the cement and wet aggregates, come in contact. The ingredients of the batch shall be completely discharged from the drum before the succeeding batch is introduced. The drum and auxiliary parts of the equipment shall be kept free from accumulations of materials. If additional water or an admixture is added at the jobsite, the concrete batch shall be mixed a minimum of 40 additional revolutions after each addition.
- (3) **Shrink-Mixed Concrete.** Shrink-mixed concrete is mixed partially in a stationary mixer and completed in a truck mixer for delivery. The mixing time of the stationary mixer may be reduced to a minimum of 30 seconds to intermingle the ingredients, before transferring to the truck mixer. All ingredients for the batch shall be in the stationary mixer and partially mixed before any of the mixture is discharged into the truck mixer. The partially mixed batch shall be transferred to the truck mixer without delay and without loss of any portion of the batch, and mixing in the truck mixer shall start immediately. The mixing time in the truck mixer shall be not less than 50 nor more than 100 revolutions of the drum or blades at mixing speed. For self-consolidating concrete, a minimum of 100 revolutions is required in the truck mixer. Additional mixing beyond 100 revolutions shall be at agitating speed, unless additions of water, admixtures, or other materials are made at the jobsite. Units designed as agitators shall not be used for shrink mixing. The ingredients of the batch shall be completely discharged from the drum before the succeeding batch is introduced. The drum and auxiliary parts of the equipment shall be kept free from accumulations of materials. If additional water or an admixture is added at the jobsite, the concrete batch shall be mixed a minimum of 40 additional revolutions after each addition.
- (4) **Mixing Water.** Wash water shall be completely discharged from the drum or container before a batch is introduced. All mixing water shall be added at the plant and any adjustment of water at the jobsite by the Contractor shall not exceed the specified maximum water/cement ratio or slump. If strength specimens have been made for a batch of concrete, and subsequently during discharge there is more water added, additional strength specimens shall be made for the batch of concrete. No additional water may be added at the jobsite to central-mixed concrete if the mix design has less than 565 lbs/cu yd (335 kg/cu m) of cement and finely divided minerals summed together.
- (5) **Mixing and Agitating Speeds.** The mixing or agitating speeds used for truck mixers or truck agitators shall be per the manufacturer's rating plate.

- (6) Capacities. The volume of plastic concrete in a given batch will be determined according to AASHTO T 121, based on the total weight (mass) of the batch, determined either from the weight (masses) of all materials, including water, entering the batch or directly from the net weight (mass) of the concrete in the batch as delivered.

The volume of mixed concrete in truck mixers or truck agitators shall in no case be greater than the rated capacity determined according to the Truck Mixer, Agitator, and Front Discharge Concrete Carrier Standards of the Truck Mixer Manufacturer's Bureau, as shown by the rating plate attached to the truck. If the truck mixer does not have a rating plate, the volume of mixed concrete shall not exceed 63 percent of the gross volume of the drum or container, disregarding the blades. For truck agitators, the value is 80 percent.

- (7) Time of Haul. Haul time shall begin when the delivery ticket is stamped. The delivery ticket shall be stamped no later than five minutes after the addition of the mixing water to the cement, or after the addition of the cement to the aggregate when the combined aggregates contain free moisture in excess of two percent by weight (mass). If more than one batch is required for charging a truck using a stationary mixer, the time of haul shall start with mixing of the first batch. Haul time shall end when the truck is emptied for incorporation of the concrete into the work.

The time elapsing from when water is added to the mix until it is deposited in place at the site of the work shall not exceed 30 minutes when the concrete is transported in nonagitating trucks.

The maximum haul time for concrete transported in truck mixers or truck agitators shall be according to the following.

Concrete Temperature at Point of Discharge °F (°C)	Haul Time	
	Hours	Minutes
50-64 (10-17.5)	1	30
>64 (>17.5) - without retarder	1	0
>64 (>17.5) - with retarder	1	30

To encourage start-up testing for mix adjustments at the plant, the first two trucks will be allowed an additional 15 minutes haul time whenever such testing is performed.

For a mixture which is not mixed on the jobsite, a delivery ticket shall be required for each load. The following information shall be recorded on each delivery ticket: (1) ticket number; (2) name of producer and plant location; (3) contract number; (4) name of Contractor; (5) stamped date and time batched; (6) truck number; (7) quantity batched; (8) amount of admixture(s) in the batch; (9) amount of water in the batch; and (10) Department mix design number.

For concrete mixed in jobsite stationary mixers, the above delivery ticket may be waived, but a method of verifying the haul time shall be established to the satisfaction of the Engineer.

- (8) Production and Delivery. The production of ready-mixed concrete shall be such that the operations of placing and finishing will be continuous insofar as the job operations require. The Contractor shall be responsible for producing concrete that will have the required workability, consistency, and plasticity when delivered to the work. Concrete which is unsuitable for placement as delivered will be rejected. The Contractor shall minimize the need to adjust the mixture at the jobsite, such as adding water and admixtures prior to discharging.
- (9) Use of Multiple Plants in the Same Construction Item. The Contractor may simultaneously use central-mixed, truck-mixed, and shrink-mixed concrete from more than one plant, for the same construction item, on the same day, and in the same pour. However, the following criteria shall be met.
- a. Each plant shall use the same cement, finely divided minerals, aggregates, admixtures, and fibers.
 - b. Each plant shall use the same mix design. However, material proportions may be altered slightly in the field to meet slump and air content criteria. Field water adjustments shall not result in a difference that exceeds 0.02 between plants for water/cement ratio. The required cement factor for central-mixed concrete shall be increased to match truck-mixed or shrink-mixed concrete, if the latter two types of mixed concrete are used in the same pour.
 - c. The maximum slump difference between deliveries of concrete shall be 3/4 in. (19 mm) when tested at the jobsite. If the difference is exceeded, but test results are within specification limits, the concrete may be used. The Contractor shall take immediate corrective action and shall test subsequent deliveries of concrete until the slump difference is corrected. For each day, the first three truck loads of delivered concrete from each plant shall be tested for slump by the Contractor. Thereafter, when a specified test frequency for slump is to be performed, it shall be conducted for each plant at the same time.
 - d. The maximum air content difference between deliveries of concrete shall be 1.5 percent when tested at the jobsite. If the difference is exceeded, but test results are within specification limits, the concrete may be used. The Contractor shall take immediate corrective action and shall test subsequent deliveries of concrete until the air content difference is corrected. For each day, the first three truck loads of delivered concrete from each plant shall be tested for air content by the Contractor. Thereafter, when a specified test frequency for air content is to be performed, it shall be conducted for each plant at the same time.
 - e. Strength tests shall be performed and taken at the jobsite for each plant. When a specified strength test is to be performed, it shall be conducted for each plant at the same time. The difference between plants for strength shall not exceed 900 psi (6200 kPa) compressive and 90 psi (620 kPa) flexural. If the strength difference requirements are exceeded, the Contractor shall take corrective action.

- f. The maximum haul time difference between deliveries of concrete shall be 15 minutes. If the difference is exceeded, but haul time is within specification limits, the concrete may be used. The Contractor shall take immediate corrective action and check subsequent deliveries of concrete.
- (b) Class PC Concrete. The concrete shall be central-mixed or truck-mixed. Variations in plastic concrete properties shall be minimized between batches.
- (c) Class PV Concrete. The concrete shall be central-mixed, truck-mixed, or shrink-mixed.

The required mixing time for stationary mixers with a capacity greater than 2 cu yd (1.5 cu m) may be less than 75 seconds upon satisfactory completion of a mixer performance test. Mixer performance tests may be requested by the Contractor when the quantity of concrete to be placed exceeds 50,000 sq yd (42,000 sq m). The testing shall be conducted according to the current Bureau of Materials and Physical Research's Policy Memorandum, "Field Test Procedures for Mixer Performance and Concrete Uniformity Tests".

The Contractor will be allowed to test two mixing times within a range of 50 to 75 seconds. If satisfactory results are not obtained from the required tests, the mixing time shall continue to be 75 seconds for the remainder of the contract. If satisfactory results are obtained, the mixing time may be reduced. In no event will mixing time be less than 50 seconds.

The Contractor shall furnish the labor, equipment, and material required to perform the testing according to the current Bureau of Materials and Physical Research's Policy Memorandum, "Field Test Procedures for Mixer Performance and Concrete Uniformity Tests".

A contract which has 12 ft (3.6 m) wide pavement or base course, and a continuous length of 1/2 mile (0.8 km) or more, shall have the following additional requirements.

- (1) The plant and truck delivery operation shall be able to provide a minimum of 50 cu yd (38 cu m) of concrete per hour.
 - (2) The plant shall have automatic or semi-automatic batching equipment.
- (d) All Other Classes of Concrete. The concrete shall be central-mixed, truck-mixed, or shrink-mixed concrete.

1020.12 Mobile Portland Cement Concrete Plants. The use of a mobile portland cement concrete plant may be approved under the provisions of Article 1020.10 for volumetric proportioning in small isolated structures, thin overlays, and for miscellaneous and incidental concrete items.

The first 1 cu ft (0.03 cu m) of concrete produced may not contain sufficient mortar and shall not be incorporated in the work. The side plate on the cement feeder shall be removed periodically (normally the first time the mixer is used each day) to see if cement is building up on the feed drum.

Sufficient mixing capacity of mixers shall be provided to enable continuous placing and finishing insofar as the job operations and the specifications require.

Slump and air tests made immediately after discharge of the mix may be misleading, since the aggregates may absorb a significant amount of water for four or five minutes after mixing.

1020.13 Curing and Protection. The method of curing, curing period, and method of protection for each type of concrete construction is included in the following Index Table.

INDEX TABLE OF CURING AND PROTECTION OF CONCRETE CONSTRUCTION			
TYPE OF CONSTRUCTION	CURING METHODS	CURING PERIOD DAYS	LOW AIR TEMPERATURE PROTECTION METHODS
Cast-in-Place Concrete ^{11/}			
Pavement			
Shoulder	1020.13(a)(1)(2)(3)(4)(5) ^{3/ 5/}	3	1020.13(c)
Base Course			
Base Course Widening	1020.13(a)(1)(2)(3)(4)(5) ^{2/}	3	1020.13(c)
Driveway			
Median			
Barrier			
Curb			
Gutter	1020.13(a)(1)(2)(3)(4)(5) ^{4/ 5/}	3	1020.13(c) ^{16/}
Curb & Gutter			
Sidewalk			
Slope Wall			
Paved Ditch			
Catch Basin			
Manhole	1020.13(a)(1)(2)(3)(4)(5) ^{4/}	3	1020.13(c)
Inlet			
Valve Vault			
Pavement Patching	1020.13(a)(1)(2)(3)(4)(5) ^{2/}	3 ^{12/}	1020.13(c)
Bridge Deck Patching	1020.13(a)(3)(5)	3 or 7 ^{12/}	1020.13(c)
Railroad Crossing	1020.13(a)(3)(5)	1	1020.13(c)
Piles and Drilled Shafts	1020.13(a)(3)(5)	7	1020.13(d)(1)(2)(3)
Foundations & Footings			
Seal Coat	1020.13(a)(1)(2)(3)(4)(5) ^{4/ 6/}	7	1020.13(d)(1)(2)(3)
Substructure	1020.13(a)(1)(2)(3)(4)(5) ^{1/ 7/}	7	1020.13(d)(1)(2)(3)
Superstructure (except deck)	1020.13(a)(1)(2)(3)(5) ^{8/}	7	1020.13(d)(1)(2)
Deck			
Bridge Approach Slab	1020.13(a)(5)	7	1020.13(d)(1)(2) ^{17/}
Retaining Walls	1020.13(a)(1)(2)(3)(4)(5) ^{1/ 7/}	7	1020.13(d)(1)(2)
Pump Houses	1020.13(a)(1)(2)(3)(4)(5) ^{1/}	7	1020.13(d)(1)(2)
Culverts	1020.13(a)(1)(2)(3)(4)(5) ^{4/ 6/}	7	1020.13(d)(1)(2) ^{18/}
Other Incidental Concrete	1020.13(a)(1)(2)(3)(5)	3	1020.13(c)
Precast Concrete ^{11/}			
Bridge Slabs			
Piles and Pile Caps	1020.13(a)(3)(5) ^{9/ 10/}	As ^{13/}	9/
Other Structural Members		Required	
All Other Precast Items	1020.13(a)(3)(4)(5) ^{2/ 9/ 10/}	As ^{14/}	9/
		Required	
Precast, Prestressed Concrete ^{11/}			
All Items	1020(a)(3)(5) ^{9/ 10/}	Until Strand Tensioning is Released ^{15/}	9/

Notes-General:

- 1/ Type I, membrane curing only
- 2/ Type II, membrane curing only
- 3/ Type III, membrane curing only
- 4/ Type I, II and III membrane curing
- 5/ Membrane Curing will not be permitted between November 1 and April 15.
- 6/ The use of water to inundate foundations and footings, seal coats or the bottom slab of culverts is permissible when approved by the Engineer, provided the water temperature can be maintained at 45 °F (7 °C) or higher.
- 7/ Asphalt emulsion for waterproofing may be used in lieu of other curing methods when specified and permitted according to Article 503.18.
- 8/ On non-traffic surfaces which receive protective coat according to Article 503.19, a linseed oil emulsion curing compound may be used as a substitute for protective coat and other curing methods. The linseed oil emulsion curing compound will be permitted between April 16 and October 31 of the same year, provided it is applied with a mechanical sprayer according to Article 1101.09(b).
- 9/ Steam, supplemental heat, or insulated blankets (with or without steam/supplemental heat) are acceptable and shall be according to the Bureau of Materials and Physical Research's Policy Memorandum "Quality Control/Quality Assurance Program for Precast Concrete Products" and the "Manual for Fabrication of Precast, Prestressed Concrete Products".
- 10/ A moist room according to AASHTO M 201 is acceptable for curing.
- 11/ If curing is required and interrupted because of form removal for cast-in-place concrete items, precast concrete products, or precast prestressed concrete products, the curing shall be resumed within two hours from the start of the form removal.
- 12/ Curing maintained only until opening strength is attained for pavement patching, with a maximum curing period of three days. For bridge deck patching the curing period shall be three days if Class PP concrete is used and 7 days if Class BS concrete is used.
- 13/ The curing period shall end when the concrete has attained the mix design strength. The producer has the option to discontinue curing when the concrete has attained 80 percent of the mix design strength or after seven days. All strength test specimens shall remain with the units and shall be subjected to the same curing method and environmental condition as the units, until the time of testing.

14/ The producer shall determine the curing period or may elect to not cure the product. All strength test specimens shall remain with the units and shall be subjected to the same curing method and environmental condition as the units, until the time of testing.

15/ The producer has the option to continue curing after strand release.

16/ When structural steel or structural concrete is in place above slope wall, Article 1020.13(c) shall not apply. The protection method shall be according to Article 1020.13(d)(1).

17/ When Article 1020.13(d)(2) is used to protect the deck, the housing may enclose only the bottom and sides. The top surface shall be protected according to Article 1020.13(d)(1).

18/ For culverts having a waterway opening of 10 sq ft (1 sq m) or less, the culverts may be protected according to Article 1020.13(d)(3).

(a) Methods of Curing. Except as provided for in the Index Table of Curing and Protection of Concrete Construction, curing shall be accomplished by one of the following described methods. When water is required to wet the surface, it shall be applied as a fine spray so that it will not mar or pond on the surface. Except where otherwise specified, the curing period shall be at least 72 hours.

(1) Waterproof Paper Method. The surface of the concrete shall be covered with waterproof paper as soon as the concrete has hardened sufficiently to prevent marring the surface. The surface of the concrete shall be wetted immediately before the paper is placed. The blankets shall be lapped at least 12 in. (300 mm) end to end, and these laps shall be securely weighted with a windrow of earth, or other approved method, to form a closed joint. The same requirements shall apply to the longitudinal laps where separate strips are used for curing edges, except the lap shall be at least 9 in. (225 mm). The edges of the blanket shall be weighted securely with a continuous windrow of earth or any other means satisfactory to the Engineer to provide an air-tight cover. Any torn places or holes in the paper shall be repaired immediately by patches cemented over the openings, using a bituminous cement having a melting point of not less than 180 °F (82 °C). The blankets may be reused, provided they are air-tight and kept serviceable by proper repairs.

A longitudinal pleat shall be provided in the blanket to permit shrinkage where the width of the blanket is sufficient to cover the entire surface. The pleat will not be required where separate strips are used for the edges. Joints in the blanket shall be sewn or cemented together in such a manner that they will not separate during use.

- (2) Polyethylene Sheeting Method. The surface of the concrete shall be covered with white polyethylene sheeting as soon as the concrete has hardened sufficiently to prevent marring the surface. The surface of the concrete shall be wetted immediately before the sheeting is placed. The edges of the sheeting shall be weighted securely with a continuous windrow of earth or any other means satisfactory to the Engineer to provide an air-tight cover. Adjoining sheets shall overlap not less than 12 in. (300 mm) and the laps shall be securely weighted with earth, or any other means satisfactory to the Engineer, to provide an air tight cover. For surface and base course concrete, the polyethylene sheets shall be not less than 100 ft (30 m) in length nor longer than can be conveniently handled, and shall be of such width that, when in place, they will cover the full width of the surface, including the edges, except that separate strips may be used to cover the edges. Any tears or holes in the sheeting shall be repaired. When sheets are no longer serviceable as a single unit, the Contractor may select from such sheets and reuse those which will serve for further applications, provided two sheets are used as a single unit; however, the double sheet units will be rejected when the Engineer deems that they no longer provide an air tight cover.
- (3) Wetted Burlap Method. The surface of the concrete shall be covered with wetted burlap blankets as soon as the concrete has hardened sufficiently to prevent marring the surface. The blankets shall overlap 6 in. (150 mm). At least two layers of wetted burlap shall be placed on the finished surface. The burlap shall be kept saturated by means of a mechanically operated sprinkling system. In place of the sprinkling system, at the Contractor's option, two layers of burlap covered with impermeable covering shall be used. The burlap shall be kept saturated with water. Plastic coated burlap may be substituted for one layer of burlap and impermeable covering.

The blankets shall be placed so that they are in contact with the edges of the concrete, and that portion of the material in contact with the edges shall be kept saturated with water.

- (4) Membrane Curing Method. Membrane curing will not be permitted where a protective coat, concrete sealer, or waterproofing is to be applied, or at areas where rubbing or a normal finish is required, or at construction joints other than those necessary in pavement or base course. Concrete at these locations shall be cured by another method specified in Article 1020.13(a).

After all finishing work to the concrete surface has been completed, it shall be sealed with membrane curing compound of the type specified within ten minutes. The seal shall be maintained for the specified curing period. The edges of the concrete shall, likewise, be sealed within ten minutes after the forms are removed. Two separate applications, applied at least one minute apart, each at the rate of not less than 1 gal/250 sq ft (0.16 L/sq m) will be required upon the surfaces and edges of the concrete. These applications shall be made with the mechanical equipment specified. Type III compound shall be agitated immediately before and during the application.

At locations where the coating is discontinuous or where pin holes show or where the coating is damaged due to any cause and on areas adjacent to sawed joints, immediately after sawing is completed, an additional coating of membrane curing compound shall be applied at the above specified rate. The equipment used may be of the same type as that used for coating variable widths of pavement. Before the additional coating is applied adjacent to sawed joints, the cut faces of the joint shall be protected by inserting a suitable flexible material in the joint, or placing an adhesive width of impermeable material over the joint, or by placing the permanent sealing compound in the joint. Material, other than the permanent sealing compound, used to protect cut faces of the joint, shall remain in place for the duration of the curing period. In lieu of applying the additional coating, the area of the sawed joint may be cured according to any other method permitted.

When rain occurs before an application of membrane curing compound has dried, and the coating is damaged, the Engineer may require another application be made in the same manner and at the same rate as the original coat. The Engineer may order curing by another method specified, if unsatisfactory results are obtained with membrane curing compound.

- (5) Wetted Cotton Mat Method. After the surface of concrete has been textured or finished, it shall be covered immediately with dry or damp cotton mats. The cotton mats shall be placed in a manner which will not mar the concrete surface. A texture resulting from the cotton mat material is acceptable. The cotton mats shall then be wetted immediately and thoroughly soaked with a gentle spray of water. For bridge decks, a foot bridge shall be used to place and wet the cotton mats.

The cotton mats shall be maintained in a wetted condition until the concrete has hardened sufficiently to place soaker hoses without marring the concrete surface. The soaker hoses shall be placed on top of the cotton mats at a maximum 4 ft (1.2 m) spacing. The cotton mats shall be kept wet with a continuous supply of water for the remainder of the curing period. Other continuous wetting systems may be used if approved by the Engineer.

After placement of the soaker hoses, the cotton mats shall be covered with white polyethylene sheeting or burlap-polyethylene blankets.

For construction items other than bridge decks, soaker hoses or a continuous wetting system will not be required if the alternative method keeps the cotton mats wet. Periodic wetting of the cotton mats is acceptable.

For areas inaccessible to the cotton mats on bridge decks, curing shall be according to Article 1020.13(a)(3).

- (b) Removing and Replacing Curing Covering. When curing methods specified above in Article 1020.13(a), (1), (2), or (3) are used for concrete pavement, the curing covering for each day's paving shall be removed to permit testing of the pavement surface with a profilograph or straightedge, as directed by the Engineer.

Immediately after testing, the surface of the pavement shall be wetted thoroughly and the curing coverings replaced. The top surface and the edges of the concrete shall not be left unprotected for a period of more than 1/2 hour.

- (c) Protection of Concrete, Other Than Structures, From Low Air Temperatures. When the official National Weather Service forecast for the construction area predicts a low of 32 °F (0 °C), or lower, or if the actual temperature drops to 32 °F (0 °C), or lower, concrete less than 72 hours old shall be provided at least the following protection.

Minimum Temperature	Protection
25 – 32 °F (-4 – 0 °C)	Two layers of polyethylene sheeting, one layer of polyethylene and one layer of burlap, or two layers of waterproof paper.
Below 25 °F (-4 °C)	6 in. (150 mm) of straw covered with one layer of polyethylene sheeting or waterproof paper.

These protective covers shall remain in place until the concrete is at least 96 hours old. When straw is required on pavement cured with membrane curing compound, the compound shall be covered with a layer of burlap, polyethylene sheeting or waterproof paper before the straw is applied.

After September 15, there shall be available to the work within four hours, sufficient clean, dry straw to cover at least two days production. Additional straw shall be provided as needed to afford the protection required. Regardless of the precautions taken, the Contractor shall be responsible for protection of the concrete placed and any concrete damaged by cold temperatures shall be removed and replaced.

- (d) Protection of Concrete Structures From Low Air Temperatures. When the official National Weather Service forecast for the construction area predicts a low below 45 °F (7 °C), or if the actual temperature drops below 45 °F (7 °C), concrete less than 72 hours old shall be provided protection. Concrete shall also be provided protection when placed during the winter period of December 1 through March 15. Concrete shall not be placed until the materials, facilities, and equipment for protection are approved by the Engineer.

When directed by the Engineer, the Contractor may be required to place concrete during the winter period. When winter construction is specified, the Contractor shall proceed with the construction, including excavation, pile driving, concrete, steel erection, and all appurtenant work required for the complete construction of the item, except at times when weather conditions make such operations impracticable.

Regardless of the precautions taken, the Contractor shall be responsible for protection of the concrete placed and any concrete damaged by cold temperatures shall be removed and replaced.

- (1) Protection Method I. The concrete shall be completely covered with insulating material such as fiberglass, rock wool, or other approved commercial insulating material having the minimum thermal resistance R, as defined in ASTM C 168, for the corresponding minimum dimension of the concrete unit being protected as shown in the following table.

Minimum Pour Dimension		Thermal Resistance R
in.	(mm)	
6 or less	(150 or less)	R=16
> 6 to 12	(> 150 to 300)	R=10
> 12 to 18	(> 300 to 450)	R=6
> 18	(> 450)	R=4

The insulating material manufacturer shall clearly mark the insulating material with the thermal resistance R value.

The insulating material shall be completely enclosed on sides and edges with an approved waterproof liner and shall be maintained in a serviceable condition. Any tears in the liner shall be repaired in a manner approved by the Engineer. The Contractor shall provide means for checking the temperature of the surface of the concrete during the protection period.

On formed surfaces, the insulating material shall be attached to the outside of the forms with wood cleats or other suitable means to prevent any circulation of air under the insulation and shall be in place before the concrete is placed. The blanket insulation shall be applied tightly against the forms. The edges and ends shall be attached so as to exclude air and moisture. If the blankets are provided with nailing flanges, the flanges shall be attached to the studs with cleats. Where tie rods or reinforcement bars protrude, the areas adjacent to the rods or bars shall be adequately protected in a manner satisfactory to the Engineer. Where practicable, the insulation shall overlap any previously placed concrete by at least 1 ft (300 mm). Insulation on the underside of floors on steel members shall cover the top flanges of supporting members. On horizontal surfaces, the insulating material shall be placed as soon as the concrete has set, so that the surface will not be marred and shall be covered with canvas or other waterproof covering. The insulating material shall remain in place for a period of seven days after the concrete is placed.

The Contractor may remove the forms, providing the temperature is 35 °F (2 °C) and rising and the Contractor is able to wrap the particular section within two hours from the time of the start of the form removal. The insulation shall remain in place for the remainder of the seven days curing period.

- (2) Protection Method II. The concrete shall be enclosed in adequate housing and the air surrounding the concrete kept at a temperature of not less than 50 °F (10 °C) nor more than 80 °F (27 °C) for a period of seven days after the concrete is placed. The Contractor shall provide means for checking the temperature of the surface of the concrete or air temperature within the housing during the protection period. All exposed surfaces within the housing shall be cured according to the Index Table.

The Contractor shall provide adequate fire protection where heating is in progress and such protection shall be accessible at all times. The Contractor shall maintain labor to keep the heating equipment in continuous operation.

At the close of the heating period, the temperature shall be decreased to the approximate temperature of the outside air at a rate not to exceed 15 °F (8 °C) per 12 hour period, after which the housing maybe removed. The surface of the concrete shall be permitted to dry during the cooling period.

- (3) Protection Method III. As soon as the surface is sufficiently set to prevent marring, the concrete shall be covered with 12 in. (300 mm) of loose, dry straw followed by a layer of impermeable covering. The edges of the covering shall be sealed to prevent circulation of air and prevent the cover from flapping or blowing. The protection shall remain in place until the concrete is seven days old. If construction operations require removal, the protection removed shall be replaced immediately after completion or suspension of such operations.

1020.14 Temperature Control for Placement. Temperature control for concrete placement shall be according to the following.

- (a) Concrete other than Structures. Concrete may be placed when the air temperature is above 35 °F (2 °C) and rising, and concrete placement shall stop when the falling temperature reaches 40 °F (4 °C) or below, unless otherwise approved by the Engineer.

The temperature of concrete immediately before placement shall be a minimum of 50 °F (10 °C) and a maximum of 90 °F (32 °C). If concrete is pumped, the temperature of the concrete at point of placement shall be a minimum of 50 °F (10 °C) and a maximum of 90 °F (32 °C). A maximum concrete temperature shall not apply to Class PP concrete.

- (b) Concrete in Structures. Concrete may be placed when the air temperature is above 40 °F (4 °C) and rising, and concrete placement shall stop when the falling temperature reaches 45 °F (7 °C) or below, unless otherwise approved by the Engineer.

The temperature of the concrete immediately before placement shall be a minimum of 50 °F (10 °C) and a maximum of 90 °F (32 °C). If concrete is pumped, the temperature of the concrete at point of placement shall be a minimum of 50 °F (10 °C) and a maximum of 90 °F (32 °C).

When insulated forms are used according to Article 1020.13(d)(1), the maximum temperature of the concrete mixture immediately before placement shall be 80 °F (25 °C).

When concrete is placed in contact with previously placed concrete, the temperature of the freshly mixed concrete may be increased to 80 °F (25 °C) by the Contractor to offset anticipated heat loss.

- (c) All Classes of Concrete. Aggregates and water shall be heated or cooled uniformly and as necessary to produce concrete within the specified temperature limits. No frozen aggregates shall be used in the concrete.

- (d) Temperature. The concrete temperature shall be determined according to Illinois Modified AASHTO T 309.

1020.15 Heat of Hydration Control for Concrete Structures. The Contractor shall control the heat of hydration for concrete structures when the least dimension for a drilled shaft, foundation, footing, substructure, or superstructure concrete pour exceeds 5.0 ft (1.5 m). The work shall be according to the following.

- (a) Temperature Restrictions. The maximum temperature of the concrete after placement shall not exceed 150 °F (66 °C). The maximum temperature differential between the internal concrete core and concrete 2 to 3 in. (50 to 75 mm) from the exposed surface shall not exceed 35 °F (19 °C). The Contractor shall perform temperature monitoring to ensure compliance with the temperature restrictions.
- (b) Thermal Control Plan. The Contractor shall provide a thermal control plan a minimum of 28 calendar days prior to concrete placement for review by the Engineer. Acceptance of the thermal control plan by the Engineer shall not preclude the Contractor from specification compliance, and from preventing cracks in the concrete. At a minimum, the thermal control plan shall provide detailed information on the following requested items and shall comply with the specific specifications indicated for each item.
- (1) Concrete mix design(s) to be used. Grout mix design if post-cooling with embedded pipe.

The mix design requirements in Articles 1020.04 and 1020.05 shall be revised to include the following additional requirements to control the heat of hydration.

- a. The concrete mixture should be uniformly graded and preference for larger size aggregate should be used in the mix design. Article 1004.02(d)(2) shall apply and information in the "Portland Cement Concrete Level III Technician Course – Manual of Instructions for Design of Concrete Mixtures" may be used to develop the uniformly graded mixture.
- b. The following shall apply to all concrete except Class DS concrete or when self-consolidating concrete is desired. For central-mixed concrete, the Contractor shall have the option to develop a mixture with a minimum of 520 lbs/cu yd (309 kg/cu m) of cement and finely divided minerals summed together. For truck-mixed or shrink-mixed concrete, the Contractor shall have the option to develop a mixture with a minimum of 550 lbs/cu yd (326 kg/cu m) of cement and finely divided minerals summed together. A water-reducing or high range water-reducing admixture shall be used in the central mixed, truck-mixed or shrink-mixed concrete mixture. For any mixture to be placed underwater, the minimum cement and finely divided minerals shall be 550 lbs/cu yd (326 kg/cu m) for central-mixed concrete, and 580 lbs/cu yd (344 kg/cu m) for truck-mixed or shrink-mixed concrete.

For Class DS concrete, CA 11 may be used. If CA 11 is used, the Contractor shall have the option to develop a mixture with a minimum cement and finely divided minerals of 605 lbs/cu yd (360 kg/cu m) summed together. If CA 11 is used and either Class DS concrete is placed underwater or a self-consolidating concrete mixture is desired, the Contractor shall have the option to develop a mixture with a minimum cement and finely divided minerals of 635 lbs/cu yd (378 kg/cu m) summed together.

- c. The minimum portland cement content in the mixture shall be 375 lbs/cu yd (222 kg/cu m). When the total of organic processing additions, inorganic processing additions, and limestone addition exceed 5.0 percent in the cement, the minimum portland cement content in the mixture shall be 400 lbs/cu yd (237 kg/cu m). For a drilled shaft, foundation, footing, or substructure, the minimum portland cement may be reduced to as low as 330 lbs/cu yd (196 kg/cu m) if the concrete has adequate freeze/thaw durability. The Contractor shall provide freeze/thaw test results according to AASHTO T 161 Procedure A or B, and the relative dynamic modulus of elasticity of the mix design shall be a minimum of 80 percent. Freeze/thaw testing will not be required for concrete that will not be exposed to freezing and thawing conditions as determined by the Engineer.
- d. The maximum cement replacement with fly ash shall be 40.0 percent. The maximum cement replacement with ground granulated blast-furnace slag shall be 65.0 percent. When cement replacement with ground granulated blast-furnace slag exceeds 35.0 percent, only Grade 100 shall be used.
- e. The mixture may contain a maximum of two finely divided minerals. The finely divided mineral in portland-pozzolan cement or portland blast-furnace slag cement shall count toward the total number of finely divided minerals allowed. The finely divided minerals shall constitute a maximum of 65.0 percent of the total cement plus finely divided minerals. The fly ash portion shall not exceed 40.0 percent. The ground granulated blast-furnace slag portion shall not exceed 65.0 percent. The microsilica or high-reactivity metakaolin portion used together or separately shall not exceed 5.0 percent.
- f. The time to obtain the specified strength may be increased to a maximum 56 days, provided the curing period specified in Article 1020.13 is increased to a minimum of 14 days.

The minimum grout strength for filling embedded pipe shall be as specified for the concrete, and testing shall be according to AASHTO T 106.

- (2) The selected mathematical method for evaluating heat of hydration thermal effects, which shall include the calculated adiabatic temperature rise, calculated maximum concrete temperature, and calculated maximum temperature differential between the internal concrete core and concrete 2 to 3 in. (50 to 75 mm) from the exposed surface. The time when the maximum concrete temperature and maximum temperature differential will occur is required.

Acceptable mathematical methods include ACI 207.2R "Report on Thermal and Volume Change Effects on Cracking of Mass Concrete" as well as other proprietary methods. The Contractor shall perform heat of hydration testing on the cement and finely divided minerals to be used in the concrete mixture. The test shall be according to ASTM C 186 or other applicable test methods, and the result for heat shall be used in the equation to calculate adiabatic temperature rise. Other required test parameters for the mathematical model may be assumed if appropriate.

The Contractor has the option to propose a higher maximum temperature differential between the internal concrete core and concrete 2 to 3 in. (50 to 75 mm) from the exposed surface, but the proposed value shall not exceed 50 °F (28 °C). In addition, based on strength gain of the concrete, multiple maximum temperature differentials at different times may be proposed. The proposed value shall be justified through a mathematical method.

- (3) Proposed maximum concrete temperature or temperature range prior to placement.

Article 1020.14 shall apply except a minimum 40 °F (4 °C) concrete temperature will be permitted.

- (4) Pre-cooling, post-cooling, and surface insulation methods that will be used to ensure the concrete will comply with the specified maximum temperature and specified or proposed temperature differential. For reinforcement that extends beyond the limits of the pour, the Contractor shall indicate if the reinforcement is required to be covered with insulation.

Refer to ACI 207.4R "Cooling and Insulating Systems for Mass Concrete" for acceptable methods that will be permitted. If embedded pipe is used for post-cooling, the material shall be polyvinyl chloride or polyethylene. The embedded pipe system shall be properly supported, and the Contractor shall subsequently inspect glued joints to ensure they are able to withstand free falling concrete. The embedded pipe system shall be leak tested after inspection of the glued joints, and prior to the concrete placement. The leak test shall be performed at maximum service pressure or higher for a minimum of 15 minutes. All leaks shall be repaired. The embedded pipe cooling water may be from natural sources such as streams and rivers, but shall be filtered to prevent system stoppages. When the embedded pipe is no longer needed, the surface connections to the pipe shall be removed to a depth of 4 in. (100 mm) below the surface of the concrete. The remaining pipe shall be completely filled with grout. The 4 in. (100 mm) deep concrete hole shall be filled with nonshrink grout. Form and insulation removal shall be done in a manner to prevent cracking and ensure the maximum temperature differential is maintained. Insulation shall be in good condition as determined by the Engineer and properly attached.

- (5) Dimensions of each concrete pour, location of construction joints, placement operations, pour pattern, lift heights, and time delays between lifts.

Refer to ACI 207.1R "Guide to Mass Concrete" for acceptable placement operations that will be permitted.

- (6) Type of temperature monitoring system, the number of temperature sensors, and location of sensors.

A minimum of two independent temperature monitoring systems and corresponding sensors shall be used.

The temperature monitoring system shall have a minimum temperature range of 32 °F (0 °C) to 212 °F (100 °C), an accuracy of ± 2 °F (± 1 °C), and be able to automatically record temperatures without external power. Temperature monitoring shall begin once the sensor is encased in concrete, and with a maximum interval of one hour. Temperature monitoring may be discontinued after the maximum concrete temperature has been reached, post-cooling is no longer required, and the maximum temperature differential between the internal concrete core and the ambient air temperature does not exceed 35 °F (19 °C). The Contractor has the option to select a higher maximum temperature differential, but the proposed value shall not exceed 50 °F (28 °C). The proposed value shall be justified through a mathematical method.

At a minimum, a temperature sensor shall be located at the theoretical hottest portion of the concrete, normally the geometric center, and at the exterior face that will provide the maximum temperature differential. At the exterior face, the sensor shall be located 2 to 3 in. (50 to 75 mm) from the surface of the concrete. Sensors shall also be located a minimum of 1 in. (25 mm) away from reinforcement, and equidistant between cooling pipes if either applies. A sensor will also be required to measure ambient air temperature. The entrant/exit cooling water temperature for embedded pipe shall also be monitored.

Temperature monitoring results shall be provided to the Engineer a minimum of once each day and whenever requested by the Engineer. The report may be electronic or hard copy. The report shall indicate the location of each sensor, the temperature recorded, and the time recorded. The report shall be for all sensors and shall include ambient air temperature and entrant/exit cooling water temperatures. The temperature data in the report may be provided in tabular or graphical format, and the report shall indicate any corrective actions during the monitoring period. At the completion of the monitoring period, the Contractor shall provide the Engineer a final report that includes all temperature data and corrective actions.

- (7) Indicate contingency operations to be used if the maximum temperature or temperature differential of the concrete is reached after placement.

- (c) Temperature Restriction Violations. If the maximum temperature of the concrete after placement exceeds 150 °F (66 °C), but is equal to or less than 158 °F (70 °C), the concrete will be accepted if no cracking or other unacceptable defects are identified. If cracking or unacceptable defects are identified, Article 105.03 shall apply. If the concrete temperature exceeds 158 °F (70 °C), Article 105.03 shall apply.

If a temperature differential between the internal concrete core and concrete 2 to 3 in. (50 to 75 mm) from the exposed surface exceeds the specified or proposed maximum value allowed, the concrete will be accepted if no cracking or other unacceptable defects are identified. If unacceptable defects are identified, Article 105.03 shall apply.

When the maximum 150 °F (66 °C) concrete temperature or the maximum allowed temperature differential is violated, the Contractor shall implement corrective action prior to the next pour. In addition, the Engineer reserves the right to request a new thermal control plan for acceptance before the Contractor is allowed to pour again.

- (d) Inspection and Repair of Cracks. The Engineer will inspect the concrete for cracks after the temperature monitoring is discontinued, and the Contractor shall provide access for the Engineer to do the inspection. A crack may require repair by the Contractor as determined by the Engineer. The Contractor shall be responsible for the repair of all cracks. Protective coat or a concrete sealer shall be applied to a crack less than 0.007 in. (0.18 mm) in width. A crack that is 0.007 in. (0.18 mm) or greater shall be pressure injected with epoxy according to Section 590.

QUALITY CONTROL/QUALITY ASSURANCE OF CONCRETE MIXTURES (BDE)

Effective: January 1, 2012

Revised: January 1, 2013

Add the following to Section 1020 of the Standard Specifications:

“1020.16 Quality Control/Quality Assurance of Concrete Mixtures. This Article specifies the quality control responsibilities of the Contractor for concrete mixtures (except Class PC and PS concrete), cement aggregate mixture II, and controlled low-strength material incorporated in the project, and defines the quality assurance and acceptance responsibilities of the Engineer.

A list of quality control/quality assurance (QC/QA) documents is provided in Article 1020.16(g), Schedule D.

A Level I Portland Cement Concrete (PCC) Technician shall be defined as an individual who has successfully completed the Department’s training for concrete testing.

A Level II Portland Cement Concrete (PCC) Technician shall be defined as an individual who has successfully completed the Department’s training for concrete proportioning.

A Level III Portland Cement Concrete (PCC) Technician shall be defined as an individual who has successfully completed the Department’s training for concrete mix design.

A Concrete Tester shall be defined as an individual who has successfully completed the Department’s training to assist with concrete testing and is monitored on a daily basis.

Aggregate Technician shall be defined as an individual who has successfully completed the Department’s training for gradation testing involving aggregate production and mixtures.

Mixture Aggregate Technician shall be defined as an individual who has successfully completed the Department's training for gradation testing involving mixtures.

Gradation Technician shall be defined as an individual who has successfully completed the Department's training to assist with gradation testing and is monitored on a daily basis.

- (a) Equipment/Laboratory. The Contractor shall provide a laboratory and test equipment to perform their quality control testing.

The laboratory shall be of sufficient size and be furnished with the necessary equipment, supplies, and current published test methods for adequately and safely performing all required tests. The laboratory will be approved by the Engineer according to the current Bureau of Materials and Physical Research Policy Memorandum "Minimum Private Laboratory Requirements for Construction Materials Testing or Mix Design". Production of a mixture shall not begin until the Engineer provides written approval of the laboratory. The Contractor shall refer to the Department's "Required Sampling and Testing Equipment for Concrete" for equipment requirements.

Test equipment shall be maintained and calibrated as required by the appropriate test method, and when required by the Engineer. This information shall be documented on the Department's "Calibration of Concrete Testing Equipment" form.

Test equipment used to determine compressive or flexural strength shall be calibrated each 12 month period by an independent agency, using calibration equipment traceable to the National Institute of Standards and Technology (NIST). The Contractor shall have the calibration documentation available at the test equipment location.

The Engineer will have unrestricted access to the plant and laboratory at any time to inspect measuring and testing equipment, and will notify the Contractor of any deficiencies. Defective equipment shall be immediately repaired or replaced by the Contractor.

- (b) Quality Control Plan. The Contractor shall submit, in writing, a proposed Quality Control (QC) Plan to the Engineer. The QC Plan shall be submitted a minimum of 45 calendar days prior to the production of a mixture. The QC Plan shall address the quality control of the concrete, cement aggregate mixture II, and controlled low-strength material incorporated in the project. The Contractor shall refer to the Department's "Model Quality Control Plan for Concrete Production" to prepare a QC Plan. The Engineer will respond in writing to the Contractor's proposed QC Plan within 15 calendar days of receipt.

Production of a mixture shall not begin until the Engineer provides written approval of the QC Plan. The approved QC Plan shall become a part of the contract between the Department and the Contractor, but shall not be construed as acceptance of any mixture produced.

The QC Plan may be amended during the progress of the work, by either party, subject to mutual agreement. The Engineer will respond in writing to a Contractor's proposed QC Plan amendment within 15 calendar days of receipt. The response will indicate the approval or denial of the Contractor's proposed QC Plan amendment.

- (c) Quality Control by Contractor. The Contractor shall perform quality control inspection, sampling, testing, and documentation to meet contract requirements. Quality control includes the recognition of obvious defects and their immediate correction. Quality control also includes appropriate action when passing test results are near specification limits, or to resolve test result differences with the Engineer. Quality control may require increased testing, communication of test results to the plant or the jobsite, modification of operations, suspension of mixture production, rejection of material, or other actions as appropriate. The Engineer shall be immediately notified of any failing tests and subsequent remedial action. Passing tests shall be reported no later than the start of the next work day.

When a mixture does not comply with specifications, the Contractor shall reject the material; unless the Engineer accepts the material for incorporation in the work, according to Article 105.03.

- (1) Personnel Requirements. The Contractor shall provide a Quality Control (QC) Manager who will have overall responsibility and authority for quality control. The jobsite and plant personnel shall be able to contact the QC Manager by cellular phone, two-way radio or other methods approved by the Engineer.

The QC Manager shall visit the jobsite a minimum of once a week. A visit shall be performed the day of a bridge deck pour, the day a non-routine mixture is placed as determined by the Engineer, or the day a plant is anticipated to produce more than 1000 cu yd (765 cu m). Any of the three required visits may be used to meet the once per week minimum requirement.

The Contractor shall provide personnel to perform the required inspections, sampling, testing and documentation in a timely manner. The Contractor shall refer to the Department's "Qualifications and Duties of Concrete Quality Control Personnel" document.

A Level I PCC Technician shall be provided at the jobsite during mixture production and placement, and may supervise concurrent pours on the project. For concurrent pours, a minimum of one Concrete Tester shall be required at each pour location. If the Level I PCC Technician is at one of the pour locations, a Concrete Tester is still required at the same location. Each Concrete Tester shall be able to contact the Level I PCC Technician by cellular phone, two-way radio or other methods approved by the Engineer. A single Level I PCC Technician shall not supervise concurrent pours for multiple contracts.

A Level II PCC Technician shall be provided at the plant, or shall be available, during mixture production and placement. A Level II PCC Technician may supervise a maximum of three plants. Whenever the Level II PCC Technician is not at the plant during mixture production and placement, a Concrete Tester or Level I PCC Technician shall be present at the plant to perform any necessary concrete tests. The Concrete Tester, Level I PCC Technician, or other individual shall also be trained to perform any necessary aggregate moisture tests, if the Level II PCC Technician is not at the plant during mixture production and placement. The Concrete Tester, Level I PCC Technician, plant personnel, and jobsite personnel shall have the ability to contact the Level II PCC Technician by cellular phone, two-way radio, or other methods approved by the Engineer.

For a mixture which is produced and placed with a mobile portland cement concrete plant as defined in Article 1103.04, a Level II PCC Technician shall be provided. The Level II PCC Technician shall be present at all times during mixture production and placement. However, the Level II PCC Technician may request to be available if operations are satisfactory. Approval shall be obtained from the Engineer, and jobsite personnel shall have the ability to contact the Level II PCC Technician by cellular phone, two-way radio, or other methods approved by the Engineer.

A Concrete Tester, Mixture Aggregate Technician, and Aggregate Technician may provide assistance with sampling and testing. A Gradation Technician may provide assistance with testing. A Concrete Tester shall be supervised by a Level I or Level II PCC Technician. A Gradation Technician shall be supervised by a Level II PCC Technician, Mixture Aggregate Technician, or Aggregate Technician.

- (2) Required Plant Tests. Sampling and testing shall be performed at the plant, or at a location approved by the Engineer, to control the production of a mixture. The required minimum Contractor plant sampling and testing is indicated in Article 1020.16(g) Schedule A.
- (3) Required Field Tests. Sampling and testing shall be performed at the jobsite to control the production of a mixture, and to comply with specifications for placement. For standard curing, after initial curing, and for strength testing; the location shall be approved by the Engineer. The required minimum Contractor jobsite sampling and testing is indicated in Article 1020.16(g), Schedule B.
- (d) Quality Assurance by Engineer. The Engineer will perform quality assurance tests on independent samples and split samples. An independent sample is a field sample obtained and tested by only one party. A split sample is one of two equal portions of a field sample, where two parties each receive one portion for testing. The Engineer may request the Contractor to obtain a split sample. Aggregate split samples and any failing strength specimen shall be retained until permission is given by the Engineer for disposal. The results of all quality assurance tests by the Engineer will be made available to the Contractor. However, Contractor split sample test results shall be provided to the Engineer before Department test results are revealed. The Engineer's quality assurance independent sample and split sample testing is indicated in Article 1020.16(g), Schedule C.

- (1) Strength Testing. For strength testing, Article 1020.09 shall apply, except the Contractor and Engineer strength specimens may be placed in the same field curing box for initial curing and may be cured in the same water storage tank for final curing.
- (2) Comparing Test Results. Differences between the Engineer's and the Contractor's split sample test results will be considered reasonable if within the following limits:

Test Parameter	Acceptable Limits of Precision
Slump	0.75 in. (20 mm)
Air Content	0.9%
Compressive Strength	900 psi (6200 kPa)
Flexural Strength	90 psi (620 kPa)
Slump Flow (Self-Consolidating Concrete (SCC))	1.5 in. (40 mm)
Visual Stability Index (SCC)	Not Applicable
J-Ring (SCC)	1.5 in. (40 mm)
L-Box (SCC)	10 %
Hardened Visual Stability Index (SCC)	Not Applicable
Dynamic Segregation Index (SCC)	1.0 %
Flow (Controlled Low-Strength Material (CLSM))	1.5 in. (40 mm)
Strength (Controlled Low-Strength Material (CLSM))	40 psi (275 kPa)
Aggregate Gradation	See "Guideline for Sample Comparison" in Appendix "A" of the Manual of Test Procedures for Materials.

When acceptable limits of precision have been met, but only one party is within specification limits, the failing test shall be resolved before the material may be considered for acceptance.

- (3) Test Results and Specification Limits.
 - a. Split Sample Testing. If either the Engineer's or the Contractor's split sample test result is not within specification limits, and the other party is within specification limits; immediate retests on a split sample shall be performed for slump, air content, slump flow, visual stability index, J-Ring, L-Box, dynamic segregation index, flow (CLSM), or aggregate gradation. A passing retest result by each party will require no further action. If either the Engineer's or Contractor's slump, air content, slump flow, visual stability index, J-Ring, L-Box, dynamic segregation index, flow (CLSM), or aggregate gradation split sample retest result is a failure; or if either the Engineer's or Contractor's strength or hardened visual stability index test result is a failure, and the other party is within specification limits; the following actions shall be initiated to investigate the test failure:
 1. The Engineer and the Contractor shall investigate the sampling method, test procedure, equipment condition, equipment calibration, and other factors.

2. The Engineer or the Contractor shall replace test equipment, as determined by the Engineer.
3. The Engineer and the Contractor shall perform additional testing on split samples, as determined by the Engineer.

For aggregate gradation, jobsite slump, jobsite air content, jobsite slump flow, jobsite visual stability index, jobsite J-Ring, jobsite L-Box, jobsite dynamic segregation index, and jobsite flow (CLSM); if the failing split sample test result is not resolved according to 1., 2., or 3., and the mixture has not been placed, the Contractor shall reject the material; unless the Engineer accepts the material for incorporation in the work according to Article 105.03. If the mixture has already been placed, or if a failing strength or hardened visual stability index test result is not resolved according to 1., 2., or 3., the material will be considered unacceptable.

If a continued trend of difference exists between the Engineer's and the Contractor's split sample test results, or if split sample test results exceed the acceptable limits of precision, the Engineer and the Contractor shall investigate according to items 1., 2., and 3.

- b. Independent Sample Testing. For aggregate gradation, jobsite slump, jobsite air content jobsite slump flow, jobsite visual stability index, jobsite J-Ring, jobsite L-Box, jobsite dynamic segregation index, jobsite flow (CLSM); if the result of a quality assurance test on a sample independently obtained by the Engineer is not within specification limits, and the mixture has not been placed, the Contractor shall reject the material, unless the Engineer accepts the material for incorporation in the work according to Article 105.03. If the mixture has already been placed or the Engineer obtains a failing strength or hardened visual stability index test result, the material will be considered unacceptable.
- (e) Acceptance by the Engineer. Final acceptance will be based on the Standard Specifications and the following:
- (1) The Contractor's compliance with all contract documents for quality control.
 - (2) Validation of Contractor quality control test results by comparison with the Engineer's quality assurance test results using split samples. Any quality control or quality assurance test determined to be flawed may be declared invalid only when reviewed and approved by the Engineer. The Engineer will declare a test result invalid only if it is proven that improper sampling or testing occurred. The test result is to be recorded and the reason for declaring the test invalid will be provided by the Engineer.
 - (3) Comparison of the Engineer's quality assurance test results with specification limits using samples independently obtained by the Engineer.

The Engineer may suspend mixture production, reject materials, or take other appropriate action if the Contractor does not control the quality of concrete, cement aggregate mixture II, or controlled low-strength material for acceptance. The decision will be determined according to (1), (2), or (3).

(f) Documentation.

- (1) Records. The Contractor shall be responsible for documenting all observations, inspections, adjustments to the mix design, test results, retest results, and corrective actions in a bound hardback field book, bound hardback diary, or appropriate Department form, which shall become the property of the Department. The documentation shall include a method to compare the Engineer's test results with the Contractor's results. The Contractor shall be responsible for the maintenance of all permanent records whether obtained by the Contractor, the consultants, the subcontractors, or the producer of the mixture. The Contractor shall provide the Engineer full access to all documentation throughout the progress of the work.

The Department's form MI 504M, form BMPR MI654, and form BMPR MI655 shall be completed by the Contractor, and shall be submitted to the Engineer weekly or as required by the Engineer. A correctly completed form MI 504M, form BMPR MI654, and form BMPR MI655 are required to authorize payment by the Engineer, for applicable pay items.

- (2) Delivery Truck Ticket. The following information shall be recorded on each delivery ticket or in a bound hardback field book: initial revolution counter reading (final reading optional) at the jobsite, if the mixture is truck-mixed; time discharged at the jobsite; total amount of each admixture added at the jobsite; and total amount of water added at the jobsite.

- (g) Basis of Payment and Schedules. Quality Control/Quality Assurance of portland cement concrete mixtures will not be paid for separately, but shall be considered as included in the cost of the various concrete contract items.

SCHEDULE A

CONTRACTOR PLANT SAMPLING AND TESTING			
Item	Test	Frequency	IL Modified AASHTO or Department Test Method ^{1/}
Aggregates (Arriving at Plant)	Gradation ^{2/}	As needed to check source for each gradation number	2, 11, 27, and 248
Aggregates (Stored at Plant in Stockpiles or Bins)	Gradation ^{2/}	2,500 cu yd (1,900 cu m) for each gradation number ^{3/}	2, 11, 27, and 248
Aggregates (Stored at Plant in Stockpiles or Bins)	Moisture ^{4/} : Fine Aggregate	Once per week for moisture sensor, otherwise daily for each gradation number	Flask, Dunagan, Pycnometer Jar, or 255
	Moisture ^{4/} : Coarse Aggregate	As needed to control production for each gradation number	Dunagan, Pycnometer Jar, or 255
Mixture ^{5/}	Slump Air Content Unit Weight / Yield Slump Flow (SCC) Visual Stability Index (SCC) J-Ring (SCC) ^{6/} L-Box (SCC) ^{6/} Temperature	As needed to control production	T 141 and T 119 T 141 and T 152 or T 196 T 141 and T 121 SCC-1 and SCC-2 SCC-1 and SCC-2 SCC-1 and SCC-3 SCC-1 and SCC-4 T 141 and T 309
Mixture (CLSM) ^{7/}	Flow Air Content Temperature	As needed to control production	Illinois Test Procedure 307

1/ Refer to the Department's "Manual of Test Procedures for Materials".

2/ All gradation tests shall be washed. Testing shall be completed no later than 24 hours after the aggregate has been sampled.

3/ One per week (Sunday through Saturday) minimum unless the stockpile has not received additional aggregate material since the previous test.

One per day minimum for a bridge deck pour unless the stockpile has not received additional aggregate material since the previous test. The sample shall be taken and testing completed prior to the pour. The bridge deck aggregate sample may be taken the day before the pour or as approved by the Engineer.

4/ If the moisture test and moisture sensor disagree by more than 0.5 percent, retest. If the difference remains, adjust the moisture sensor to an average of two or more moisture tests. The Department's "Water/Cement Ratio Worksheet" form shall be completed when applicable.

5/ The Contractor may also perform strength testing according to Illinois Modified AASHTO T 141, T 23, and T 22 or T 177; or water content testing according to Illinois Modified AASHTO T 318.

The Contractor may also perform other available self-consolidating concrete (SCC) tests at the plant to control mixture production.

6/ The Contractor shall select the J-Ring or L-Box test for plant sampling and testing.

7/ The Contractor may also perform strength testing according to Illinois Test Procedure 307.

SCHEDULE B

CONTRACTOR JOBSITE SAMPLING & TESTING ^{1/}			
Item	Measured Property	Random Sample Testing Frequency per Mix Design and per Plant ^{2/}	IL Modified AASHTO Test Method
Pavement, Shoulder, Base Course, Base Course Widening, Driveway Pavement, Railroad Crossing, Cement Aggregate Mixture II	Slump ^{3/ 4/}	1 per 500 cu yd (400 cu m) or minimum 1/day	T 141 and T 119
	Air Content ^{3/ 5/ 6/}	1 per 100 cu yd (80 cu m) or minimum 1/day	T 141 and T 152 or T 196
	Compressive Strength ^{7/ 8/} or Flexural Strength ^{7/ 8/}	1 per 1250 cu yd (1000 cu m) or minimum 1/day	T 141, T 22 and T 23 or T 141, T 177 and T 23
Bridge Approach Slab ^{9/} , Bridge Deck ^{9/} , Bridge Deck Overlay ^{9/} , Superstructure ^{9/} , Substructure, Culvert, Miscellaneous Drainage Structures, Retaining Wall, Building Wall, Drilled Shaft Pile & Encasement Footing, Foundation, Pavement Patching, Structural Repairs	Slump ^{3/ 4/}	1 per 50 cu yd (40 cu m) or minimum 1/day	T 141 and T 119
	Air Content ^{3/ 5/ 6/}	1 per 50 cu yd (40 cu m) or minimum 1/day	T 141 and T 152 or T 196
	Compressive Strength ^{7/ 8/} or Flexural Strength ^{7/ 8/}	1 per 250 cu yd (200 cu m) or minimum 1/day	T 141, T 22 and T 23 or T 141, T 177 and T 23
Seal Coat	Slump ^{3/}	1 per 250 cu yd (200 cu m) or minimum 1/day	T 141 and T 119
	Air Content ^{3/ 5/ 6/}	1 per 250 cu yd (200 cu m) or minimum 1/day when air is entrained	T 141 and T 152 or T 196
	Compressive Strength ^{7/ 8/} or Flexural Strength ^{7/ 8/}	1 per 250 cu yd (200 cu m) or minimum 1/day	T 141, T 22 and T 23 or T 141, T 177 and T 23

CONTRACTOR JOBSITE SAMPLING & TESTING ^{1/}			
Curb, Gutter, Median, Barrier, Sidewalk, Slope Wall, Paved Ditch, Fabric Formed Concrete Revetment Mat ^{10/} , Miscellaneous Items, Incidental Items	Slump ^{3/ 4/}	1 per 100 cu yd (80 cu m) or minimum 1/day	T 141 and T 119
	Air Content ^{3/ 5/ 6/}	1 per 50 cu yd (40 cu m) or minimum 1/day	T 141 and T 152 or T 196
	Compressive Strength ^{7/ 8/} or Flexural Strength ^{7/ 8/}	1 per 400 cu yd (300 cu m) or minimum 1/day	T 141, T 22 and T 23 or T 141, T 177 and T 23
The Item will use a Self-Consolidating Concrete Mixture	Slump Flow ^{3/} VSI ^{3/} J-Ring ^{3/ 11/} L-Box ^{3/ 11/}	Perform at same frequency that is specified for the Item's slump	SCC-1 & SCC-2 SCC-1 & SCC-2 SCC-1 & SCC-3 SCC-1 & SCC-4
The Item will use a Self-Consolidating Concrete Mixture	HVSI ^{12/}	Minimum 1/day at start of production for that day	SCC-1 and SCC-6
The Item will use a Self-Consolidating Concrete Mixture	Dynamic Segregation Index (DSI)	Minimum 1/week at start of production for that week	SCC-1 and SCC-8 (Option C)
The Item will use a Self-Consolidating Concrete Mixture	Air Content ^{3/ 5/ 6/}	Perform at same frequency that is specified for the Item's air content	SCC-1 and T 152 or T 196
The Item will use a Self-Consolidating Concrete Mixture	Compressive Strength ^{7/ 8/} or Flexural Strength ^{7/ 8/}	Perform at same frequency that is specified for the Item's strength	SCC-1, T 22 and T 23 or SCC-1, T 177 and T 23
All	Temperature ^{3/}	As needed to control production	T 141 and T 309
Controlled Low-Strength Material (CLSM)	Flow, Air Content, Compressive Strength (28-day) ^{13/} , and Temperature	First truck load delivered and as needed to control production thereafter	Illinois Test Procedure 307

1/ Sampling and testing of small quantities of curb, gutter, median, barrier, sidewalk, slope wall, paved ditch, miscellaneous items, and incidental items may be waived by the Engineer if requested by the Contractor. However, quality control personnel are still required according to Article 1020.16(c)(1) The Contractor shall also provide recent evidence that similar material has been found to be satisfactory under normal sampling and testing procedures. The total quantity that may be waived for testing shall not exceed 100 cu yd (76 cu m) per contract.

If the Contractor's or Engineer's test result for any jobsite mixture test is not within the specification limits, all subsequent truck loads delivered shall be tested by the Contractor until the problem is corrected.

2/ If one mix design is being used for several construction items during a day's production, one testing frequency may be selected to include all items. The construction items shall have the same slump, air content, and water/cement ratio specifications. For self-consolidating concrete, the construction items shall have the same slump flow, visual stability index, J-Ring, L-Box, air content, and water/cement ratio specifications. The frequency selected shall equal or exceed the testing required for the construction item.

One sufficiently sized sample shall be taken to perform the required test(s). Random numbers shall be determined according to the Department's "Method for Obtaining Random Samples for Concrete". The Engineer will provide random sample locations.

- 3/ The temperature, slump, and air content tests shall be performed on the first truck load delivered, for each pour. For self consolidating concrete, the temperature, slump flow, visual stability index, J-Ring or L-Box, and air content tests shall be performed on the first truck load delivered, for each pour. Unless a random sample is required for the first truck load, testing the first truck load does not satisfy random sampling requirements.
- 4/ The slump random sample testing frequency shall be a minimum 1/day for a construction item which is slipformed.
- 5/ If a pump or conveyor is used for placement, a correction factor shall be established to allow for a loss of air content during transport. The first three truck loads delivered shall be tested, before and after transport by the pump or conveyor, to establish the correction factor. Once the correction is determined, it shall be re-checked after an additional 50 cu yd (40 cu m) is pumped, or an additional 100 cu yd (80 cu m) is conveyed. This shall continue throughout the pour. If the re-check indicates the correction factor has changed, a minimum of two truckloads is required to re-establish the correction factor. The correction factor shall also be re-established when significant changes in temperature, distance, pump or conveyor arrangement, and other factors have occurred. If the correction factor is >3.0 percent, the Contractor shall take corrective action to reduce the loss of air content during transport by the pump or conveyor. The Contractor shall record all air content test results, correction factors and corrected air contents. The corrected air content shall be reported on form Bmpr MI654.
- 6/ If the Contractor's or Engineer's air content test result is within the specification limits, and 0.2 percent or closer to either limit, the next truck load delivered shall be tested by the Contractor. For example, if the specified air content range is 5.0 to 8.0 percent and the test result is 5.0, 5.1, 5.2, 7.8, 7.9 or 8.0 percent, the next truck shall be tested by the Contractor.
- 7/ The test of record for strength shall be the day indicated in Article 1020.04. For cement aggregate mixture II, a strength requirement is not specified and testing is not required. Additional strength testing to determine early falsework and form removal, early pavement or bridge opening to traffic, or to monitor strengths is at the discretion of the Contractor. Strength shall be defined as the average of at least two cylinder or two beam breaks for field tests.
- 8/ In addition to the strength test, a slump test, air content test, and temperature test shall be performed on the same sample. For self-consolidating concrete, a slump flow test, visual stability index test, J-Ring or L-Box test, air content test, and temperature test shall be performed on the same sample as the strength test. For mixtures pumped or conveyed, the Contractor shall sample according to Illinois Modified AASHTO T 141.
- 9/ The air content test will be required for each delivered truck load.

- 10/ For fabric formed concrete revetment mat, the slump test is not required and the flexural strength test is not applicable.
- 11/ The Contractor shall select the J-Ring or L-Box test for jobsite sampling and testing.
- 12/ In addition to the hardened visual stability index (HVSI) test, a slump flow test, visual stability index (VSI) test, J-Ring or L-Box test, air content test, and temperature test shall be performed on the same sample. The Contractor shall retain all hardened visual stability index cut cylinder specimens until the Engineer notifies the Contractor that the specimens may be discarded.
- 13/ The test of record for strength shall be the day indicated in Article 1019.04. In addition to the strength test, a flow test, air content test, and temperature test shall be performed on the same sample. The strength test may be waived by the Engineer if future removal of the material is not a concern.

SCHEDULE C

ENGINEER QUALITY ASSURANCE INDEPENDENT SAMPLE TESTING		
Location	Measured Property	Testing Frequency ^{1/}
Plant	Gradation of aggregates stored in stockpiles or bins, Slump and Air Content	As determined by the Engineer.
Jobsite	Slump, Air Content, Slump Flow, Visual Stability Index, J-Ring, L-Box, Hardened Visual Stability Index, Dynamic Segregation Index and Strength	As determined by the Engineer.
	Flow, Air Content, Strength (28-day), and Dynamic Cone Penetration for Controlled Low-Strength Material (CLSM)	As determined by the Engineer

ENGINEER QUALITY ASSURANCE SPLIT SAMPLE TESTING		
Location	Measured Property	Testing Frequency ^{1/}
Plant	Gradation of aggregates stored in stockpiles or bins ^{2/}	At the beginning of the project, the first test performed by the Contractor. Thereafter, a minimum of 10% of total tests required of the Contractor will be performed per aggregate gradation number and per plant.
	Slump and Air Content	As determined by the Engineer.
Jobsite	Slump ^{2/} , Air Content ^{2/3/} , Slump Flow ^{2/} , Visual Stability Index ^{2/} , J-Ring ^{2/} and L-box ^{2/}	At the beginning of the project, the first three tests performed by the Contractor. Thereafter, a minimum of 20% of total tests required of the Contractor will be performed per plant, which will include a minimum of one test per mix design.
	Hardened Visual Stability Index ^{2/}	As determined by the Engineer.
	Dynamic Segregation Index ^{2/}	As determined by the Engineer.
	Strength ^{2/}	At the beginning of the project, the first test performed by the Contractor. Thereafter, a minimum of 20% of total tests required of the Contractor will be performed per plant, which will include a minimum of one test per mix design.
	Flow, Air Content, and Strength (28-day) for Controlled Low-Strength Material (CLSM)	As determined by the Engineer.

- 1/ The Engineer will perform the testing throughout the period of quality control testing by the Contractor.
- 2/ The Engineer will witness and take immediate possession of or otherwise secure the Department's split sample obtained by the Contractor.
- 3/ Before transport by pump or conveyor, a minimum of 20 percent of total tests required of the Contractor will be performed per mix design and per plant. After transport by pump or conveyor, a minimum of 20 percent of total tests required of the Contractor will be performed per mix design and per plant.

SCHEDULE D

CONCRETE QUALITY CONTROL AND QUALITY ASSURANCE DOCUMENTS

- (a) Model Quality Control Plan for Concrete Production (*)
- (b) Qualifications and Duties of Concrete Quality Control Personnel (*)
- (c) Development of Gradation Bands on Incoming Aggregate at Mix Plants (*)
- (d) Required Sampling and Testing Equipment for Concrete (*)
- (e) Method for Obtaining Random Samples for Concrete (*)
- (f) Calibration of Concrete Testing Equipment (BMPR PCCQ01 through BMPR PCCQ09)
(*)
- (g) Water/Cement Ratio Worksheet (BMPR PCCW01) (*)
- (h) Field/Lab Gradations (MI 504M) (*)
- (i) Concrete Air, Slump and Quantity (BMPR MI654) (*)
- (j) P.C. Concrete Strengths (BMPR MI655) (*)
- (k) Aggregate Technician Course or Mixture Aggregate Technician Course (*)
- (l) Portland Cement Concrete Tester Course (*)
- (m) Portland Cement Concrete Level I Technician Course - Manual of Instructions for
Concrete Testing (*)
- (n) Portland Cement Concrete Level II Technician Course - Manual of Instructions for
Concrete Proportioning (*)
- (o) Portland Cement Concrete Level III Technician Course - Manual of Instructions for
Design of Concrete Mixtures (*)
- (p) Manual of Test Procedures for Materials

* Refer to Appendix C of the Manual of Test Procedures for Materials for more information.”

REMOVAL AND DISPOSAL OF SURPLUS MATERIALS (BDE)

Effective: November 2, 2012

Revise the first four paragraphs of Article 202.03 of the Standard Specifications to read:

“202.03 Removal and Disposal of Surplus, Unstable, Unsuitable, and Organic Materials. Suitable excavated materials shall not be wasted without permission of the Engineer. The Contractor shall dispose of all surplus, unstable, unsuitable, and organic materials, in such a manner that public or private property will not be damaged or endangered.

Suitable earth, stones and boulders naturally occurring within the right-of-way may be placed in fills or embankments in lifts and compacted according to Section 205. Broken concrete without protruding metal bars, bricks, rock, stone, reclaimed asphalt pavement with no expansive aggregate, or uncontaminated dirt and sand generated from construction or demolition activities may be used in embankment or in fill. If used in fills or embankments, these materials shall be placed and compacted to the satisfaction of the Engineer; shall be buried under a minimum of 2 ft (600 mm) of earth cover (except when the materials include only uncontaminated dirt); and shall not create an unsightly appearance or detract from the natural topographic features of an area. Broken concrete without protruding metal bars, bricks, rock, or stone may be used as riprap as approved by the Engineer. If the materials are used for fill in locations within the right-of-way but outside project construction limits, the Contractor must specify to the Engineer, in writing, how the landscape restoration of the fill areas will be accomplished. Placement of fill in such areas shall not commence until the Contractor’s landscape restoration plan is approved by the Engineer.

Aside from the materials listed above, all other construction and demolition debris or waste shall be disposed of in a licensed landfill, recycled, reused, or otherwise disposed of as allowed by State or Federal laws and regulations. When the Contractor chooses to dispose of uncontaminated soil at a clean construction and demolition debris (CCDD) facility or at an uncontaminated soil fill operation, it shall be the Contractor’s responsibility to have the pH of the material tested to ensure the value is between 6.25 and 9.0, inclusive. A copy of the pH test results shall be provided to the Engineer.

A permit shall be obtained from IEPA and made available to the Engineer prior to open burning of organic materials (i.e., plant refuse resulting from pruning or removal of trees or shrubs) or other construction or demolition debris. Organic materials originating within the right-of-way limits may be chipped or shredded and placed as mulch around landscape plantings within the right-of-way when approved by the Engineer. Chipped or shredded material to be placed as mulch shall not exceed a depth of 6 in. (150 mm).”

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: April 2, 2005

Revised: April 1, 2011

To account for the preparatory work and operations necessary for the movement of subcontractor personnel, equipment, supplies, and incidentals to the project site and for all other work or operations that must be performed or costs incurred when beginning work approved for subcontracting according to Article 108.01 of the Standard Specifications, the Contractor shall make a mobilization payment to each subcontractor.

This mobilization payment shall be made at least 14 days prior to the subcontractor starting work. The amount paid shall be equal to 3 percent of the amount of the subcontract reported on form BC 260A submitted for the approval of the subcontractor's work.

The mobilization payment to the subcontractor is an advance payment of the reported amount of the subcontract and is not a payment in addition to the amount of the subcontract; therefore, the amount of the advance payment will be deducted from future progress payments.

This provision shall be incorporated directly or by reference into each subcontract approved by the Department.

TEMPORARY EROSION AND SEDIMENT CONTROL (BDE)

Effective: January 1, 2012

Revise the first paragraph of Article 280.04(f) of the Standard Specifications to read:

“(f) Temporary Erosion Control Seeding. This system consists of seeding all erodible/bare areas to minimize the amount of exposed surface area. Seed bed preparation will not be required if the surface of the soil is uniformly smooth and in a loose condition. Light disking shall be done if the soil is hard packed or caked. Erosion rills greater than 1 in. (25 mm) in depth shall be filled and area blended with the surrounding soil. Fertilizer nutrients will not be required.”

Delete the last sentence of Article 280.08(e) of the Standard Specifications.

TRACKING THE USE OF PESTICIDES (BDE)

Effective: August 1, 2012

Add the following paragraph after the first paragraph of Article 107.23 of the Standard Specifications:

“Within 48 hours of the application of pesticides, including but not limited to herbicides, insecticides, algacides, and fungicides, the Contractor shall complete and return to the Engineer, Operations form “OPER 2720”.”

TRAFFIC CONTROL DEFICIENCY DEDUCTION (BDE)

Effective: August 1, 2011

Revise the third sentence of the third paragraph of Article 105.03(b) of the Standard Specifications to read:

“The daily monetary deduction will be \$2,500.”

UTILITY COORDINATION AND CONFLICTS (BDE)

Effective: April 1, 2011

Revised: January 1, 2012

Revise Article 105.07 of the Standard Specifications to read:

“**105.07 Cooperation with Utilities.** The Department reserves the right at any time to allow work by utilities on or near the work covered by the contract. The Contractor shall conduct his/her work so as not to interfere with or hinder the progress or completion of the work being performed by utilities. The Contractor shall also arrange the work and shall place and dispose of the materials being used so as not to interfere with the operations of utility work in the area.

The Contractor shall cooperate with the owners of utilities in their removal and rearrangement operations so work may progress in a reasonable manner, duplication or rearrangement of work may be reduced to a minimum, and services rendered by those parties will not be unnecessarily interrupted.

The Contractor shall coordinate with any planned utility adjustment or new installation and the Contractor shall take all precautions to prevent disturbance or damage to utility facilities. Any failure on the part of the utility owner, or their representative, to proceed with any planned utility adjustment or new installation shall be reported promptly by the Contractor to the Engineer.”

Revise the first sentence of the last paragraph of Article 107.19 of the Standard Specifications to read:

“When the Contractor encounters unexpected regulated substances due to the presence of utilities in unanticipated locations, the provisions of Article 107.40 shall apply; otherwise, if the Engineer does not direct a resumption of operations, the provisions of Article 108.07 shall apply.”

Revise Article 107.31 of the Standard Specification to read:

“**107.31 Reserved.**”

Add the following four Articles to Section 107 of the Standard Specifications:

“**107.37 Locations of Utilities within the Project Limits.** All known utilities existing within the limits of construction are either indicated on the plans or visible above ground. For the purpose of this Article, the limits of proposed construction are defined as follows:

(a) Limits of Proposed Construction for Utilities Paralleling the Roadway.

- (1) The horizontal limits shall be a vertical plane, outside of, parallel to, and 2 ft (600 mm) distant at right angles from the plan or revised slope limits.

In cases where the limits of excavation for structures are not shown on the plans, the horizontal limits shall be a vertical plane 4 ft (1.2 m) outside the edges of structure footings or the structure where no footings are required.

- (2) The upper vertical limits shall be the regulations governing the roadbed clearance for the specific utility involved.
- (3) The lower vertical limits shall be either the top of the utility at the depth below the proposed grade as prescribed by the governing agency or the limits of excavation, whichever is less.

(b) Limits of Proposed Construction for Utilities Crossing the Roadway in a Generally Transverse Direction.

- (1) Utilities crossing excavations for structures that are normally made by trenching such as sewers, underdrains, etc. and all minor structures such as manholes, inlets, foundations for signs, foundations for traffic signals, etc., the limits shall be the space to be occupied by the proposed permanent construction, unless otherwise required by the regulations governing the specific utility involved.
- (2) For utilities crossing the proposed site of major structures such as bridges, sign trusses, etc., the limits shall be as defined above for utilities extending in the same general direction as the roadway.

It is understood and agreed that the Contractor has considered in the bid all of the permanent and temporary utilities in their present and/or adjusted positions as indicated in the contract. It is further understood the actual location of the utilities may be located anywhere within the tolerances provided in 220 ILCS 50/2.8 or Administrative Code Title 92 Part 530.40(c), and the proximity of some utilities to construction may require extraordinary measures by the Contractor to protect those utilities.

No additional compensation will be allowed for any delays, inconveniences, or damages sustained by the Contractor due to the presence of or any claimed interference from known utility facilities or any adjustment of them, except as specifically provided in the contract.

107.38 Adjustments of Utilities within the Project Limits. The adjustment of utilities consists of the relocation, removal, replacement, rearrangements, reconstruction, improvement, disconnection, connection, shifting, new installation, or altering of an existing utility facility in any manner.

Utilities which are to be adjusted shall be adjusted by the utility owner or the owner's representative or by the Contractor as a contract item. Generally, arrangements for adjusting known utilities will be made by the Department prior to project construction; however, utilities will not necessarily be adjusted in advance of project construction and, in some cases, utilities will not be removed from the proposed construction limits as described in Article 107.37. When utility adjustments must be performed in conjunction with construction, the utility adjustment work will be indicated in the contract.

The Contractor may make arrangements for adjustment of utilities indicated in the contract, but not scheduled by the Department for adjustment, provided the Contractor furnishes the Department with a signed agreement with the utility owner covering the adjustments to be made. The cost of any such adjustments shall be the responsibility of the Contractor.

107.39 Contractor's Responsibility for Locating and Protecting Utility Property and Services. At points where the Contractor's operations are adjacent to properties or facilities of utility companies, or are adjacent to other property, damage to which might result in considerable expense, loss, or inconvenience, work shall not be commenced until all arrangements necessary for the protection thereof have been made.

Within the State of Illinois, a State-Wide One Call Notice System has been established for notifying utilities. Outside the city limits of the City of Chicago, the system is known as the Joint Utility Locating Information for Excavators (JULIE) System. Within the city limits of the City of Chicago the system is known as DIGGER. All utility companies and municipalities which have buried utility facilities in the State of Illinois are a part of this system.

The Contractor shall call JULIE (800-892-0123) or DIGGER (312-744-7000), a minimum of 48 hours in advance of work being done in the area, and they will notify all member utility companies involved their respective utility should be located.

For utilities which are not members of JULIE or DIGGER, the Contractor shall contact the owners directly. The plan general notes will indicate which utilities are not members of JULIE or DIGGER.

The following table indicates the color of markings required of the State-Wide One Call Notification System.

Utility Service	Color
Electric Power, Distribution and Transmission	Safety Red
Municipal Electric Systems	Safety Red
Gas Distribution and Transmission	High Visibility Safety Yellow
Oil Distribution and Transmission	High Visibility Safety Yellow
Telephone and Telegraph System	Safety Alert Orange
Community Antenna Television Systems	Safety Alert Orange
Water Systems	Safety Precaution Blue
Sewer Systems	Safety Green
Non-Potable Water and Slurry Lines	Safety Purple
Temporary Survey	Safety Pink
Proposed Excavation	Safety White (Black when snow is on the ground)

The State-Wide One Call Notification System will provide for horizontal locations of utilities. When it is determined that the vertical location of the utility is necessary to facilitate construction, the Engineer may make the request for location from the utility after receipt of notice from the Contractor. If the utility owner does not field locate their facilities to the satisfaction of the Engineer, the Engineer will authorize the Contractor in writing to proceed to locate the facilities in the most economical and reasonable manner, subject to the approval of the Engineer, and be paid according to Article 109.04.

The Contractor shall be responsible for maintaining the excavations or markers provided by the utility owners.

The Contractor shall take all necessary precautions for the protection of the utility facilities. The Contractor shall be responsible for any damage or destruction of utility facilities resulting from neglect, misconduct, or omission in the Contractor's manner or method of execution or nonexecution of the work, or caused by defective work or the use of unsatisfactory materials. Whenever any damage or destruction of a utility facility occurs as a result of work performed by the Contractor, the utility company will be immediately notified. The utility company will make arrangements to restore such facility to a condition equal to that existing before any such damage or destruction was done.

In the event of interruption of utility services as a result of accidental breakage or as a result of being exposed or unsupported, the Contractor shall promptly notify the proper authority and shall cooperate with the said authority in the restoration of service. If water service is interrupted, repair work shall be continuous until the service is restored. No work shall be undertaken around fire hydrants until provisions for continued service have been approved by the local fire authority.

107.40 Conflicts with Utilities. Except as provided hereinafter, the discovery of a utility in an unanticipated location will be evaluated according to Article 104.03. It is understood and agreed that the Contractor has considered in the bid all facilities not meeting the definition of a utility in an unanticipated location and no additional compensation will be allowed for any delays, inconveniences, or damages sustained by the Contractor due to the presence of or any claimed interference from such facilities.

When the Contractor discovers a utility in an unanticipated location, the Contractor shall not interfere with said utility, shall take proper precautions to prevent damage or interruption of the utility, and shall promptly notify the Engineer of the nature and location of said utility.

(a) Definition. A utility in an unanticipated location is defined as an active or inactive utility, which is either:

(1) Located underground and (a) not shown in any way in any location on the contract documents; (b) not identified in writing by the Department to the Contractor prior to the letting; or (c) not located relative to the location shown in the contract within the tolerances provided in 220 ILCS 50/2.8 or Administrative Code Title 92 Part 530.40(c); or

(2) Located above ground or underground and not relocated as provided in the contract.

Service connections shall not be considered to be utilities in unanticipated locations.

(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 applicable to the utility 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 Contractor's operation is completely stopped by a utility in an unanticipated location for more than two hours, but not to exceed three weeks.
- (2) Major Delay. A major delay occurs when the Contractor's operation is completely stopped by a utility in an unanticipated location for more than three weeks.
- (3) Reduced Rate of Production Delay. A reduced rate of production delay occurs when the contractor's rate of production decreases by more than 25 percent and lasts longer than seven days.

(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 three weeks plus the cost of move-out to either the Contractor's yard or another job, whichever is less. Rental equipment may be paid for longer than three 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 days. Determination of compensation will be in accordance with Article 104.02, except labor and material additives will not be permitted.

Whether covered by (1), (2) or (3) above, additional traffic control required as a result of the operation(s) delayed will be paid for according to Article 109.04 for the total length of the delay.

If the delay is clearly shown to have caused work, which would have otherwise been completed, to be done after material or labor costs have increased, such increases may be paid. Payment for materials will be limited to increased cost substantiated by documentation furnished by the Contractor. Payment for increased labor rates will include those items in Article 109.04(b)(1) and (2), except the 35 percent and ten percent additives will not be permitted. On a working day contract, a delay occurring between November 30 and May 1, when work has not started, will not be considered as eligible for payment of measured labor and material costs.

Project overhead (not including interest) will be allowed when all progress on the contract has been delayed, and will be calculated as 15 percent of the delay claim.

- (d) Other Obligations of Contractor. Upon payment of a claim 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."

WARM MIX ASPHALT (BDE)

Effective: January 1, 2012

Revised: November 1, 2012

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.

Materials.

Add the following to Article 1030.02 of the Standard Specifications.

"(h) Warm Mix Asphalt (WMA) Technologies (Note 3)"

Add the following note to Article 1030.02 of the Standard Specifications.

“Note 3. Warm mix additives or foaming processes shall be selected from the current Bureau of Materials and Physical Research Approved List, “Warm-Mix Asphalt Technologies”.”

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.

“(13) 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.

“(d) 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. Additional mixture verification requirements include Hamburg Wheel testing according to Illinois Modified AASHTO T324 and tensile strength testing according to Illinois Modified AASHTO T283 which shall meet the criteria in Tables 1 and 2 respectively herein. The Contractor shall provide the additional material as follows:

- a. Four gyratory specimens to be prepared in the Contractor's lab according to Illinois Modified AASHTO T324.
- b. Sufficient mixture to conduct tensile strength testing according to Illinois Modified AASHTO T283.

Table 1. Illinois Modified AASHTO T324 Requirements ^{1/}

Asphalt Binder Grade	# Wheel Passes	Max Rut Depth in. (mm)
PG 76-XX	20,000	1/2 in. (12.5 mm)
PG 70-XX	15,000	1/2 in. (12.5 mm)
PG 64-XX	7,500	1/2 in. (12.5 mm)
PG 58-XX	5,000	1/2 in. (12.5 mm)

1/ Loose WMA shall be oven aged at 270 ± 5 °F (132 ± 3 °C) for two hours prior to gyratory compaction of Hamburg Wheel specimens.

Table 2. Tensile Strength Requirements

Asphalt Binder Grade	Tensile Strength psi (kPa)	
	Minimum	Maximum
PG 76-XX	80 (552)	200 (1379)
PG 70-XX		
PG 64-XX	60 (414)	200 (1379)"
PG 58-XX		

Production.

Revise the second paragraph of Article 1030.06(a) of the Standard Specifications to read:

“At the start of mix production for HMA, WMA, and HMA using WMA technologies, QC/QA mixture start-up will be required for the following situations; at the beginning of production of a new mix of a new mixture design, at the beginning of each production season, and at every plant utilized to produce mixtures, regardless of the mix.”

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

“Warm mix technologies shall be as follows.

- (1) Mixture sampled to represent the test strip shall include additional material sufficient for the Department to conduct Hamburg Wheel testing according to Illinois Modified AASHTO T324 and tensile strength testing according to Illinois Modified AASHTO T283 (approximately 110 lb (50 kg) total).

- (2) Upon completion of the start-up, WMA, or HMA using WMA technologies, production shall cease. The Contractor may revert to conventional HMA production provided a start-up has been previously completed for the current construction season for the mix design. WMA, or HMA using WMA technologies, may resume once all the test results, including Hamburg Wheel results are completed and found acceptable by the Engineer.”

Add the following after the first paragraph of Article 1030.05(d)(2)c. of the Standard Specifications:

“During production of each WMA mixture or HMA utilizing WMA technologies, the Engineer will request a minimum of one randomly located sample, identified by the Engineer, for Hamburg Wheel testing to determine compliance with the requirements specified in Table 1 herein.”

Quality Control/Quality Assurance Testing.

Revise the table in Article 1030.05(d)(2)a. of the Standard Specifications to read:

Parameter	Frequency of Tests		Test Method See Manual of Test Procedures for Materials
	High ESAL Mixture Low ESAL Mixture	All Other Mixtures	
Aggregate Gradation % passing sieves: 1/2 in. (12.5 mm), No. 4 (4.75 mm), No. 8 (2.36 mm), No. 30 (600 μm) No. 200 (75 μm) Note 1.	1 washed ignition oven test on the mix per half day of production Note 4.	1 washed ignition oven test on the mix per day of production Note 4.	Illinois Procedure
Asphalt Binder Content by Ignition Oven Note 2.	1 per half day of production	1 per day	Illinois-Modified AASHTO T 308
VMA Note 3.	Day's production ≥ 1200 tons: 1 per half day of production Day's production < 1200 tons: 1 per half day of production for first 2 days and 1 per day thereafter (first sample of the day)	N/A	Illinois-Modified AASHTO R 35

Air Voids Bulk Specific Gravity of Gyratory Sample Note 5.	Day's production ≥ 1200 tons: 1 per half day of production	1 per day	Illinois-Modified AASHTO T 312
	Day's production < 1200 tons: 1 per half day of production for first 2 days and 1 per day thereafter (first sample of the day)		
Maximum Specific Gravity of Mixture	Day's production ≥ 1200 tons: 1 per half day of production	1 per day	Illinois-Modified AASHTO T 209
	Day's production < 1200 tons: 1 per half day of production for first 2 days and 1 per day thereafter (first sample of the day)		

Note 1. The No. 8 (2.36 mm) and No. 30 (600 µm) sieves are not required for All Other Mixtures.

Note 2. The Engineer may waive the ignition oven requirement for asphalt binder content if the aggregates to be used are known to have ignition asphalt binder content calibration factors which exceed 1.5 percent. If the ignition oven requirement is waived, other Department approved methods shall be used to determine the asphalt binder content.

Note 3. The G_{sb} used in the voids in the mineral aggregate (VMA) calculation shall be the same average G_{sb} value listed in the mix design.

Note 4. The Engineer reserves the right to require additional hot bin gradations for batch

Note 5. The WMA compaction temperature for mixture volumetric testing shall be 270 ± 5 °F (132 ± 3 °C) for quality control testing. The WMA compaction temperature for quality assurance testing will be 270 ± 5 °F (132 ± 3 °C) if the mixture is not allowed to cool to room temperature. If the mixture is allowed to cool to room temperature it shall be reheated to standard HMA compaction temperatures.”

Construction Requirements.

Revise the second paragraph of Article 406.06(b)(1) of the Standard Specifications to read:

“The HMA shall be delivered at a temperature of 250 to 350 °F (120 to 175 °C). WMA shall be delivered at a minimum temperature of 215 °F (102 °C).”

Basis of Payment.

This work will be paid at the contract unit price bid for the HMA pay items involved. Anti-strip will not be paid for separately, but shall be considered as included in the cost of the work.

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012

The Contractor shall provide 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 on the jobsite; or used for the delivery and/or removal of equipment/material to and from the jobsite. The jobsite shall also include offsite locations, such as plant sites or storage sites, when those locations are used solely for this contract.

The report shall be submitted on the form provided by the Department within ten business days following the reporting period. The reporting period shall be Monday through Sunday for each week reportable trucking activities occur. The report shall be submitted to the Engineer and a copy shall be provided to the district EEO Officer.

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.

STORM WATER POLLUTION PREVENTION PLAN



Storm Water Pollution Prevention Plan

Route	<u>FAP 338</u>	Marked Rte.	<u>Illinois Route 59</u>
Section	<u>Various (See Item I.B)</u>	Project No.	<u>Various (See Item I.B)</u>
County	<u>DuPage</u>	Contract No.	<u>Various (See Item I.B)</u>

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issued by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

 Diane O'Keefe
 Print Name
 Director, District One Engineer
 Title
 Illinois Department of Transportation
 Agency

 Signature
 3-21-12
 Date

I. Site Description:

A. Provide a description of the project location (include latitude and longitude):

The project consists of six construction contracts for the proposed improvements of 3.50 miles of Illinois Route 59 and reconstruction of the intersecting cross streets from New York Street / Aurora Avenue to Ferry Road. The project is located in the City of Naperville and City of Aurora in DuPage County. The approximate latitude and longitude for the beginning and ending project limits are 41° 45' 35" N / 88° 12' 21" W and 41° 48' 35" N / 88° 12' 13" W, respectively.

B. Provide a description of the construction activity which is the subject of this plan:

Advance Work - Tree Removal
 Section 2011-037-DTR
 Project No. C-91-540-11
 Contract No. 60P43

Work in this contract includes removal of all existing trees in conflict with the proposed roadway improvement on Illinois Route 59 from New York Street / Aurora Avenue to Ferry Road. Tree removal will also occur on the following side roads: New Your Street, Aurora Avenue, Liberty Street, Jefferson Avenue, Meridian Parkway, Glacier Park Avenue, North Aurora Road, Bruce Lane, Brookdale Road and Diehl Road.

Advance Work - Pump Station 47 Replacement
 Section 2011-035-I
 Project No. C-91-538-11
 Contract No. 60P41

Work in this contract includes advance work to remove and reconstruct Pump Station 47 at the B.N.S.F. Railroad underpass and construction of one retaining wall on Illinois Route 59 south of North Aurora Road.

Advance Work - Retaining Walls

Section 2011-036-1
Project No. C-91-539-11
Contract No. 60P42

Work in this contract includes advance work to construct five retaining walls for the proposed improvement on Illinois Route 59 from New York Street / Aurora Avenue to Diehl Road. Two retaining walls to be constructed are located on the east side of Illinois Route 59 between New York Street / Aurora Avenue and Liberty Street / Jefferson Avenue. Two retaining walls to be constructed are located at the B.N.S.F. Railroad underpass on Illinois Route 59. The fifth wall retaining wall to be constructed in this contract is located north of Brookdale Road on the east side of IL Route 59.

Roadway Reconstruction (New York St. / Aurora Ave. to North Aurora Road)

Section (112 & 113) WRS-7
Project No. C-91-064-12
Contract No. 60R30

Construction for this contract will include the reconstruction of Illinois Route 59 from New York Street / Aurora Avenue to North Aurora Road. Side road reconstruction includes New York Street, Aurora Avenue, Liberty Street, Jefferson Street, Glacier Park Avenue, Meridian Parkway and North Aurora Road. Additional activities will include storm sewer, drainage structures, combination concrete curb and gutter, pavement marking, signing, landscaping, traffic signal modernization and all incidental and collateral work necessary to complete the contract.

Roadway Reconstruction (North Aurora Road to Diehl Road)

Section (112 & 113) WRS-6
Project No. C-91-065-12
Contract No. 60R31

Construction for this contract will include the reconstruction of Illinois Route 59 from North Aurora Road to Diehl Road. Side road reconstruction includes Brookdale Avenue and Diehl Road. Additional activities will include storm sewer, drainage structures, combination concrete curb and gutter, pavement marking, signing, landscaping, traffic signal modernization and all incidental and collateral work necessary to complete the contract.

Roadway and Interchange Reconstruction

Section (112 & 113) WRS-5
Project No. C-91-014-10
Contract No. 60I31

Construction for this contract will include the reconstruction of Illinois Route 59 from Diehl Road and Ferry Road, and the replacement of the existing I-88 and Illinois Route 59 interchange with a Diverging Diamond Interchange (DDI). Additional activities will include storm sewer, drainage structures, combination concrete curb and gutter, pavement marking, signing, landscaping, traffic signal modernization and all incidental and collateral work necessary to complete the contract.

- C. Provide the estimated duration of this project:
The estimated duration of all construction contracts associated with this project is 24 to 36 months.
- D. The total area of the construction site is estimated to be 149.57 acres.
The total area of the site estimated to be disturbed by excavation, grading or other activities is 149.57 acres.
- E. The following is a weighted average of the runoff coefficient for this project before and after construction activities are completed:
The weighted average run off coefficient for this project is 0.56 prior to construction.
The weighted average run off coefficient for this project is 0.66 following construction.

- F. List all soils found within project boundaries. Include map unit name, slope information, and erosivity:

Eleven soil types are located within the project area of the Illinois Route 59 Improvement Project, which are listed below. A soils map provided by the United States Department of Agriculture (USDA) is attached.

Drummer silty clay loam (152A) – A poorly drained soil with moderate permeability. This soil has a slight susceptibility to water and wind erosion with slopes that are between zero and two percent.

Varna silty clay loam (223B) – A moderately well drained soil with moderately slow permeability. This soil is susceptible to water erosion and slightly susceptible to wind erosion with slopes that are between two and four percent.

Peotone silty clay loam (330A) – A very poorly drained soil with moderately slow permeability. This soil has a slight susceptibility to water and wind erosion with slopes that are between zero and two percent.

Waupecan silt loam (369B) – A well-drained soil with moderate permeability. This soil is susceptible to water erosion and slightly susceptible to wind erosion with slopes that are between two and four percent.

Mundelein silt loam (442A) – A somewhat poorly drained soil with moderately slow permeability. This soil has a slight susceptibility to water and wind erosion with slopes that are between zero and two percent.

Barrington silt loam (443B) – A moderately well drained soil with moderate permeability. This soil has a slight susceptibility to water and wind erosion with slopes that are between two and four percent.

Ozaukee silt loam (530C2) – A moderately well drained soil with moderate permeability. This soil is susceptible to water erosion and slightly susceptible to wind erosion with slopes that are between four and six percent.

Markham silt loam (531B) – A moderately well drained soil with moderately slow permeability. This soil is susceptible to water erosion and slightly susceptible to wind erosion with slopes that are between two and four percent slope.

Graymont silt loam (541B) – A moderately well drained soil with slow permeability. This soil is susceptible to water erosion and slightly susceptible to wind erosion with slopes that are between two and five percent.

Chenoa silty clay loam (614A) – A somewhat poorly drained soil with slow permeability. This soil has a slight susceptibility to water and wind erosion with slopes that are between zero and two percent.

Orthents, loamy, undulating (802B) – A well-drained soil with moderately slow permeability. This soil is susceptible to water erosion and slightly susceptible to wind erosion with slopes that are between one and six percent.

- G. Provide an aerial extent of wetland acreage at the site:

There are eight wetland sites and one Waters of the US within the ESR project limits that total an area of 2.97 acres. The following is a list of sites and their areas.

Site No.	General Location	Type	Acres
1	West side of IL 59 north of Ferry Road	Wet Meadow	0.04
2	Adjacent to outside of Ramp C	Wet Shrubland	0.27
4	Infield area adjacent to Ramp D	Marsh	1.13
5	Approximately 250 feet west of IL 59 on the south side of Diehl Road	Marsh	0.01
7	Approximately 550 feet east of IL 59 on the south side of LaSalle Avenue	Wet Meadow	0.44
9	Approximately 400 feet east of IL 59 between Brookdale Road and LaSalle Avenue	Marsh	0.04
16	Adjacent to the east side of IL 59, north of Ramp B Terminus	Marsh	0.34
17	North side of Ramp B east of IL 59	Wet Meadow	0.02
20	Adjacent to the north side of I-88, west of Ramp C	Wet Meadow	0.38
21	Adjacent to the south side of I-88, west of Ramp D	Wetland Pond	0.03
W1	South of the BNSF Railroad and north of Meridian Lakes Drive on both sides of IL 59	Waters of the US	0.27

The widening of IL Route 59 from four to six lanes with a 30' median and the construction of the diverging diamond interchange necessitates the impacts to three of the above wetland sites. Wetlands sites 4, 5, 16 and W1 are expected to be partially impacted for a total area of 0.64 acres.

- H. Provide a description of potentially erosive areas associated with this project:

Potentially high erosive areas located within the project limits include the following:

- Areas of embankment steeper than 1V:3H adjacent to the Diverging Diamond Interchange (Interstate 88 and IL Route 59)
- Areas of embankment associated with proposed retaining walls and earth berm
- Earth disturbing activity adjacent to flowing water including tree removal and clearing near Sta. 3958+50
- Areas of storm sewer installation near the proposed pump station

- I. The following is a description of soil disturbing activities by stages, their locations, and their erosive factors (e.g. steepness of slopes, length of slopes, etc.):

Advance Work - Tree Removal

Tree removal will take place adjacent to IL Route 59 on the east and west sides and on the side roads. This work will be limited to daytime and off-road operations with intermittent off-peak period lane closures. Clearing, grubbing and tree removal throughout the project will be subject to erosivity until temporary or permanent soil stabilization measures are established.

Advance Work - Pump Station 47 Replacement

Work in this contract includes the storm sewer, drainage structures, earthwork and proposed pump station will take place adjacent to IL Route 59 on the west side at the B.N.S.F. RR underpass. This work will be limited to daytime and off-road operations with intermittent off-peak period lane closures. Existing steep slopes (2:1) will be disturbed during construction of the pump station and retaining wall.

Advance Work - Retaining Walls

Work in this contract includes the construction of proposed retaining walls, structure excavation, concrete operations and grading will take place adjacent to IL Route 59 in five various locations. This work will be limited to daytime and off-road operations with intermittent off-peak period lane closures.

Roadway Reconstruction (New York St. / Aurora Ave. to North Aurora Road)

Roadway Reconstruction (North Aurora Road to Diehl Road)

Roadway and Interchange Reconstruction

Construction activities will include temporary pavement placement, existing raised median removal, installation of storm sewer and drainage structures, concrete curb and gutter, concrete pavement and corner islands, construction of proposed concrete and landscaped medians. Detailed staging plans for these contracts are currently being developed. See contract plans for these contracts for detailed soil disturbing activities and locations. The diverging diamond interchange construction will involve many steep slopes (2:1) adjacent to the proposed ramps and structures carrying Illinois Route 59 over Interstate 88. Proposed embankments placed throughout the project will be subject to erosion until temporary or permanent soil stabilization measures have been placed. In areas where foreslopes are steeper than 3:1, and as indicated on the plans, soil shall be stabilized with erosion control blanket or mulching.

- J. See the erosion control plans and/or drainage plans for this contract for information regarding drainage patterns, approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent offsite sediment tracking (to be added after contractor identifies locations), areas of soil disturbance, the location of major structural and non-structural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands) and locations where storm water is discharged to surface water including wetlands.

- K. Identify who owns the drainage system (municipality or agency) this project will drain into:

The drainage system for Illinois Route 59 within the project limits outfalls to Waubensee Creek and Ferry Creek Tributary. Waubensee Creek and Ferry Creek Tributary are under the jurisdiction of the US Army Corps of Engineers. Some parts of the drainage system discharge to the City of Naperville and City of Aurora municipal separate storm sewer systems. The drainage system at the IL Route 59 and I-88 interchange flows into the Illinois Tollway ditch system.

- L. 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:

Waubansee Creek ultimately discharges to the Fox River
Illinois Tollway Ditch discharges to Ferry Creek which ultimately discharges to West Branch Dupage River
Ferry Creek Tributary discharges to Ferry Creek which ultimately discharges to West Branch Dupage River

The receiving waters are not listed as Biologically Significant Streams nor are they listed on the 303d list for sediment/siltation, turbidity or total suspended solids. However, it should be noted that downstream sections of the West Branch DuPage River are impaired for sediment/siltation.

- M. 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.

Where the wetlands listed in Item I.G are adjacent to construction activities, no intrusion fencing shall be placed at the wetland boundaries prior to the start of construction to discourage intrusion into the non-impacted wetlands. Other areas which are to be protected and/or remain undisturbed are Waubansee Creek, Ferry Creek Tributary and Illinois Tollway ditches.

- N. 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 – McDonald Grove County Forest Preserve
(located downstream along the Ferry Creek and the unnamed tributary to Ferry Creek)

1. 303(d) Listed receiving waters (fill out this section if checked above):

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

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

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

- d. Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

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

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

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

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

O. 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 checked="" type="checkbox"/> Waste water from cleaning construction equipment |
| <input checked="" type="checkbox"/> Concrete Curing Compounds | <input checked="" type="checkbox"/> Other (specify) Organic / Landscape Material |
| <input checked="" type="checkbox"/> Solid Waste Debris | <input checked="" type="checkbox"/> Other (specify) Tree Debris |
| <input checked="" type="checkbox"/> Paints | <input checked="" type="checkbox"/> Other (specify) Hot Mix Asphalt |
| <input checked="" type="checkbox"/> Solvents | <input type="checkbox"/> Other (specify) |
| <input checked="" type="checkbox"/> Fertilizers / Pesticides | <input type="checkbox"/> Other (specify) |

II. Controls:

This section of the plan addresses the controls that will be implemented for each of the major construction activities described in I.I. 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

- Stabilized 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(A)(1)(a) and II(A)(3), stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than seven (7) days 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.

Where the initiation of stabilization measures by the seventh day after construction activity temporarily or permanently ceases is precluded by snow cover, stabilization measures shall be initiated as soon as practicable thereafter.

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

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

Mature vegetation which lines the existing ditches will be preserved and maintained where possible. The existing ditches outside the project limits will filter and convey runoff from the construction site before it reaches the outlet.

Temporary Erosion Control Seeding: Temporary seeding will be treated following the IDOT Standard Specifications for Road and Bridge Construction. The seed mixture will depend on the time of year it is applied. Winter wheat mix shall replace spring oats mix for temporary seed applied after July 31 and before November 15. All areas disturbed by construction will be stabilized within seven days of Temporary Erosion Control Seeding.

Erosion Control Blankets: Erosion control blankets will be installed over all temporary seed areas to protect from erosion and allow seeds to germinate. Specifically, erosion control blanket and seeding will be placed over fill slopes (3H:1V and steeper) and in temporary and permanent ditches.

Temporary Tree Protection: Shall consist of the following items: temporary fencing, tree trunk protection, tree root pruning and tree pruning as shown on the plans or as directed by the Engineer in accordance with Article 201.06 of the IDOT Standard Specifications for Road and Bridge Construction.

Geotextile fabrics shall be used to separate, reinforce, filter, protect and drain the proposed aggregate subgrades at the locations indicated on the plans.

Temporary mulching will be applied in disturbed areas on the project after September 30th or in the winter months when seeds will not germinate to provide protection until the following spring. Compost (Mulch Method 4) is to be utilized for temporary stabilization when temporary seed will not germinate, for example during midsummer drought or January thaw.

Permanent seeding shall be applied in accordance with the IDOT Standard Specifications for Road and Bridge Construction. As shown on the erosion control plans for the mainline roadway and interchange reconstruction contracts (60R30, 60R31 and 60I31), permanent stabilization in one stage shall be completed prior to beginning work in the subsequent stage. Seed will be placed as shown on the plans from April 1 to June 15 and August 1 to November 1 after the final grade is reached and no further soil disturbance is expected for at least a year. Within 24 hours from the time seeding has been performed, the seeded area shall be given a covering of mulch by methods as indicated on the plans. Under no circumstances shall the contractor prolong final grading and shaping so that the entire project can be permanently seeded at one time.

Dust control measures will be implemented in accordance with Article 107.36 of the *IDOT Standard Specifications for Road and Bridge Construction*.

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

Permanent Stabilization: All areas disturbed by construction activities will be stabilized with permanent seeding or sodding immediately following the finished grading. Erosion control blankets will be installed over seeded areas to protect from rill and gully erosion and to allow the seed to germinate properly.

2. **Structural Practices:** Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include but are not limited to: perimeter erosion barrier, earth dikes, drainage swales, sediment traps, ditch checks, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. The installation of these devices may be subject to Section 404 of the Clean Water Act.

The following structural practices will be used for this project:

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

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

In-Stream Work Plan: Contract 60R30 requires an US Army Corps of Engineers (ACOE) 404 permit. The permit issued to the Department does not cover the in-stream work by the Contractor. Therefore, after award, the Contractor will need to submit the work plan to IDOT's resident engineer for acceptance. The acceptable plan must be submitted to the ACOE prior to starting work. The ACOE will not be providing an approval, unless stated otherwise in the permit, and in-stream work can commence at the Contractor's discretion after the ACOE has been copied on the work plan acceptable to the Department. Guidelines on acceptable in-stream work can be found on the ACOE 404 approval letter in the Special Provisions.

Perimeter Erosion Barrier: Sediment control silt fence will be placed adjacent to areas of construction limits in areas where the ground slopes away from the project site to intercept waterborne silt and prevent it from leaving the project site. In locations where there is concentrated flow, temporary ditch checks should be used as perimeter erosion barrier.

Temporary Ditch checks will be placed in swales where runoff velocity is high or as directed by the Engineer in order to prevent downstream erosion. Temporary ditch checks will be constructed with urethane foam and/or geotextile ditch checks so that elevation of the toe in accordance with IDOT Standard 280001. For flat ditches the distance between successive ditch checks shall not exceed 400 feet.

Storm Drain Inlet Protection: Sediment filters will be placed in all inlets, catch basins and manholes during construction and will be maintained throughout the entire contract and will be cleaned regularly. Pipe and inlet protection will be in accordance with IDOT Standard 280001. Sediment filters will be cleaned on a regular basis as indicated in the special provisions. Straw bales will not be allowed for inlet and pipe protection; a combination of temporary ditch checks, temporary seed and erosion control blanket can be utilized for inlet and pipe protection.

Sediment Trap: See Attachment A - IDOT Guidance for the Construction of Temporary Sediment Traps.

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

Stone riprap will be utilized as protection at the discharge end of all culvert end sections to prevent downstream scouring and erosion.

Retaining walls: The project will have 4,969 feet of retaining soldier pile walls and 2,420 feet of cast-in-place walls to minimize wetland impacts and to maintain acceptable slopes to prevent erosion of adjacent soils to the roadway.

3. **Storm Water Management:** Provided below is a description of measures that will be installed during the construction process to control 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.

- a. Such practices may include but are not limited to: storm water detention structures (including wet ponds), storm water retention structures, flow attenuation by use of open vegetated swales and natural depressions, infiltration of runoff on site, and sequential systems (which combine several practices).

The practices selected for implementation were determined on the basis of the technical guidance in Chapter 41 (Construction Site Storm Water Pollution Control) of the IDOT Bureau of Design and Environment Manual. If practices other than those discussed in Chapter 41 are selected for implementation or if practices are applied to situations different from those covered in Chapter 41, the technical basis for such decisions will be explained below.

- b. 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 storm water management controls:

Storm water detention is being utilized for the proposed storm sewer outlets at the Waubensee Creek near the B.N.S.F. Railroad underpass. The Waubensee Creek is identified as a non-sensitive outlet because of none flooding history at this location. However, due to the history of flooding at the B.N.S.F. viaduct, detention was provided at this location to alleviate the problem.

The proposed storm sewer for the project will be oversized to provide in-line detention and controlled with restrictor manholes prior to release into the Waubensee Creek.

Restrictor controls on the outflow from the detention pond in the interchange infield prior to discharging water into the Tollway drainage ditch on the south side of I-88 will be installed.

Landscaped medians are being provided as a permanent BMP to help decrease the amount of new impervious surface.

All these permanent BMP systems are to remain in place during and after construction.

4. **Approved State or Local Laws:** The management practices, controls and provisions contained in this plan will be in accordance with IDOT specifications. Procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials shall be described or incorporated by reference in the space provided below. Requirements specified in sediment and erosion site plans, site permits, storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI, to be authorized to discharge under the Permit ILR10 incorporated by reference and are enforceable under this permit even if they are not specifically included in the plan.

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

All management practices, controls, and other provisions provided in this plan are in accordance with the current edition of the IDOT Standard Specifications for Bridge and Road Construction, IDOT Supplemental Specifications and Recurring Special Provisions and the Illinois Tollway Erosion and Sediment Control, Landscape Design Criteria.

5. **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.
- a. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:
- Approximate duration of the project, including each stage of the project
 - Rainy season, dry season, and winter shutdown dates
 - Temporary stabilization measures to be employed by contract phases
 - Mobilization timeframe
 - Mass clearing and grubbing/roadside clearing dates
 - Deployment of Erosion Control Practices
 - Deployment of Sediment Control Practices (including stabilized construction entrances/exits)
 - Deployment of Construction Site Management Practices (including concrete washout facilities, chemical storage, refueling locations, etc.)
 - Paving, saw-cutting, and any other pavement related operations
 - Major planned stockpiling operations
 - Timeframe for other significant long-term operations or activities that may plan non-storm water discharges such as dewatering, grinding, etc.
 - Permanent stabilization activities for each area of the project
- b. 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 – Discuss what BMPs will be used to prevent pollution of storm water from stockpiles.
- Waste Disposal – Discuss methods of waste disposal that will be used for this project.
- Spill Prevention and Control – Discuss steps that will be taken in the event of a material spill (chemicals, concrete curing compounds, petroleum, etc.)
- Concrete Residuals and Washout Wastes – Discuss the location and type of concrete washout facilities to be used on this project and how they will be signed and maintained.
- Litter Management – Discuss how litter will be maintained for this project (education of employees, number of dumpsters, frequency of dumpster pick-up, etc.).
- Vehicle and Equipment Fueling – Identify equipment fueling locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Vehicle and Equipment Cleaning and Maintenance – Identify where equipment cleaning and maintenance locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Additional measures indicated in the plan.

III. Maintenance:

When requested by the Contractor, the Resident Engineer will provide general maintenance guides to the Contractor for the practices associated with this project. The following additional procedures will be used to maintain, in good and effective operating conditions, the vegetation, erosion and sediment control measures and other protective measures identified in this plan. It will be the Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

Construction equipment shall be stored and fueled only at designated locations. All necessary measures shall be taken to contain any fuel or pollution runoff in compliance with environmental law and EPA Water Quality Regulations. Leaking equipment or supplies shall be immediately repaired or removed from the site. On a weekly basis, the Engineer shall inspect the project to determine that erosion control efforts are in place, effective, and whether any further measure is needed. Sediment collected during construction by the various temporary erosion control systems shall be disposed on site on a regular basis as directed by the Resident Engineer according to Article 202.03 of the *IDOT Standard Specification for Road and Bridge Construction*. All erosion and sediment control measures will be checked weekly and after each significant rainfall (1/2 inch or greater in a 24-hour period). During the winter months, all measures will be checked after each significant snowmelt.

The following items will be checked:

- Perimeter Erosion Barrier
- Temporary Ditch Check
- Storm Drain Inlet Protection
- Stabilized Construction Entrance/Exit
- Temporary Erosion Control Seeding
- Temporary Mulch
- Erosion Control Blanket
- Inlet and Pipe Protection
- Sediment Traps
- Temporary Ditch Checks
- Temporary Sediment Basins
- Permanent Seeding

Items shall be checked for structural integrity, sediment accumulation and functionality. Any damage or undermining shall be repaired immediately. Accumulated sediment shall be removed and properly disposed of in accordance with Article 202.03 of the *IDOT Standard Specifications for Road and Bridge Construction*. Stone at the sediment traps and riprap aprons shall be replaced due to washout. All erodible bare earth areas with temporary seeding will be inspected on a weekly basis and reseeded as necessary. Perimeter erosion barrier will be maintained at low lying areas throughout the length of the contracts; deteriorated fabrics shall be replaced, wire connections restored and fabric properly buried. All slope, berm or outlet erosion shall be repaired immediately following significant rainfall events. Sediment traps, sediment basins and sediment filter bags will be cleaned once silt fills 50% of their capacity. All maintenance measures will be carried out as specified in the current version of the *IDOT Standard Specifications for Road and Bridge Construction*.

All maintenance of the erosion control systems will be the responsibility of the contractor. All erosion and control devices need to be inspected several weeks prior to the anticipated beginning of the winter season to allow for clean out and restoration of the various devices. The inspection should determine whether:

- Sediment basins and sediment traps are in place and cleaned out
- Perimeter erosion barrier has been inspected, deteriorating fabric replaced, wire connection restored and fabric properly buried
- Ditch checks have been inspected, cleaned and replaced if necessary
- Riprap has been renewed with supplemental rock if necessary
- Erosion control blanket is in place and functioning properly
- Temporary mulching and/or temporary seeding has been applied where necessary
- Culvert and bridge sites are properly protected
- The contractor understands his obligations for maintenance and/or repairs and that equipment and personnel will be available during the winter months to maintain the project site.

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 that is 0.5 inch or greater or equivalent snowfall.

If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer shall notify the appropriate IEPA Field Operations Section office by email at: epa.swnoncomp@illinois.gov, telephone or fax within twenty-four (24) hours of the incident. The Resident Engineer shall then complete and submit an "Incidence of Non-Compliance" (ION) report for the identified violation within five (5) days of the incident. The Resident Engineer shall use forms provided by IEPA and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of non-compliance shall be signed by a responsible authority in accordance with Part VI. G of the Permit ILR10.

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

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

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.

ATTACHMENT A

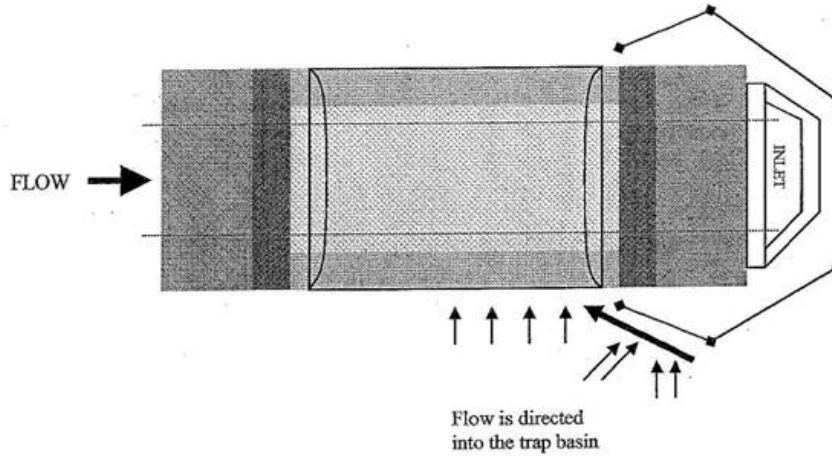
IDOT GUIDANCE FOR THE CONSTRUCTION OF TEMPORARY SEDIMENT TRAPS










Construction of a Sediment Trap
A Best Management Practice
Used for Jobsite Outfall Protection

This guide documents the implementation and use of the new preferred method of jobsite outfall protection. Silt fence is not an effective protection measure, because it is not permeable enough for a major outfall. A sediment trap is only effective with a suitable quantity of water in it. For this reason, it is encouraged that sediment traps be used to protect outfalls with a drainage area greater than 4,500 square feet (~.1 Acres) and less than 216,000 square feet (~5 Acres). Above 216,000 square feet, a sediment basin should be used to drain the area, or a diversion should be constructed to divert clean water from upstream around the construction site. On most IDOT projects, there isn't enough room on state right of way for a sediment basin, so a diversion is generally the solution for large drainage areas. In locations with drainage areas between .1 and 5 acres, sediment traps should be constructed on all current and new construction projects where practical, effective immediately. Remember, this is simply a new configuration of old pay items, so nothing should need to be added to the contract. For permanent sediment traps being constructed, contact Rick Wanner in the District One headquarters, Bureau of Maintenance office for evaluation and to ensure that maintenance is informed of the trap's existence.

Sediment Trap



LEGEND

-  Ditch Check (Stone, Triangular Silt Dike, Excelsior Roll)
-  Silt Fence
-  Water's path into the trap
-  Trap basin to allow sediment to settle
-  Erosion Control Blanket and seeding (on side slope)
-  Seeding only
-  Exterior flow protection (Protecting against shear stress)

PURPOSE:

A sediment trap is a containment area where sediment-laden runoff is temporarily detained under stagnant conditions, allowing sediment to settle out before the runoff is discharged. Sediment traps are formed by excavation of a small, shallow, long basin in a low drainage area, with a ditch check on the upstream and downstream side of the trap basin. The sediment trap is an effective ditch outfall or inlet/pipe protection system for drainage areas no greater than 216,000 sq. ft. (~5 acres) and no less than 4,500 square feet (~.1 acres).

IMPLEMENTATION:

- Construct prior to wet season and construction activities.
- Locate where sediment-laden runoff enters a storm drain or watercourse.
- Sediment traps are never to be located in live streams.
- Access to the sediment trap must be available for maintenance purposes.
- Consider whether the trap is needed as a long term or a temporary practice. Use permanent (stone) or temporary (excelsior rolls, triangular silt dikes) ditch checks accordingly.

DESIGN:

- Sediment traps generally release a slow flow that may be directed into a culvert, a sewer inlet or may simply be released to another sediment trap if there is a large drainage area.
- Sediment traps must have silt fence surrounding the acceptor to ensure water does not flow into the pipe unfiltered unless the acceptor is a ditch, in which case, no additional silt fence is needed. This silt fence should be positioned such that the water may still flow from the sides of the trap into the trap basin, and if possible, the silt fence should direct water into the trap basin, on the upstream side of the second ditch check.
- A ditch check must be located on both the upstream and downstream ends of the holding trap basin. These ditch checks may be triangular silt dikes or excelsior rolls for temporary sediment traps, or stone for permanent sediment traps. The ditch check on the downstream side of the trap must be contained within the silt fence if the acceptor is a culvert. Otherwise, for outlets, the ditch check must be located on the downstream side of the perimeter barrier.
- Temporary sediment traps should be built with the timeframe of the construction job in mind, or a single construction season. Temporary traps should be constructed using either triangular silt dikes or excelsior rolls.
- If the sediment trap is to remain functional as a permanent water quality feature, it should be constructed using stone ditch checks. Permanent sediment traps must be constructed in locations out of the sub-grade of the road, and out of the clear zone. Ditch checks in permanent sediment traps must have a 2:1 slope or flatter on both the upstream and the downstream side of the ditch check.
- A sediment trap can also be a semi-permanent feature. If the ditch checks are made of excelsior rolls, they will function for a while, but will eventually break down. This allows for the construction of a trap that will remain in place after construction, but will not permanently remain in place. This may allow for establishment of vegetation as the primary filtration method in place of the ditch check without blocking water unnaturally or permanently.
- The top of ditch checks are to be at least 1-½' higher than the bottom of the holding trap basin, and should be no less than 1' higher than the water's normal flowing height. Also, ditch checks should be spaced such that the bottom of the upstream ditch check is no higher than the top of the downstream ditch check. This will depend on the slope of the ditch.

- The holding trap basin should be excavated so that the cross-section looks like a 'U' (instead of a 'V'). This U-shaped ditch discourages erosion in the middle crook of the ditch and increases the capacity of the trap.
- The trap basin shall have a capacity of no less than 3600 cubic feet per acre of drainage area. This is enough space to hold 1 inch of water per acre. See Figure 1 for standard dimensions. If the drainage area is less than 4,500 sq. ft. (.1 acre), consider using an inlet filter or another BMP in place of the sediment trap.
- Under no circumstance shall a sediment trap or series of sediment traps cover a total drainage area of more than 5 acres. If this is the case, or an appropriate amount of land is available, a sediment basin should be constructed in place of a sediment trap.
- Stabilize any exposed soil in the sediment trap that could be subject to erosion from the flow of water, including the trap basin. A Turf Reinforcement Mat and permanent seeding works well for long term installations, but temporary seeding and/or an erosion control blanket will suffice as a temporary measure.
- An armored overflow must be constructed.
- Regardless of the type of acceptor (with the sole exception of a ditch), leave approximately 5 feet between the final ditch check and the acceptor. This allows the water flow to settle, which lowers the risk of disturbing sediment that may be in the acceptor. This gap should be protected against the effects of shear stress from the flowing water.
- On particularly steep slopes, it may be most effective to place multiple smaller sediment traps in rapid succession to cover the drainage area. In this case, it would be most cost-efficient to allow sediment traps to share ditch checks.
- Shear stress can cause sediment to be picked up by flowing water. Attention should be paid to the shear stress to ensure that the soil in the ditch before and after the sediment trap does not get eroded. These areas must be protected. See the Shear Stress page (6) for formulas and more information.

PLANS AND SPECIFICATIONS:

- The plans and specifications for sediment traps will show the following requirements:
 - Location of the sediment trap(s).
 - Size of the trap basin including width, length, and depth.
 - Minimum cross section of embankment.
 - Minimum profile through spillway.
 - Location of emergency spillway, if used.
 - Graduation and quality of stone.
 - The installation, inspection, and maintenance schedules with the responsible party identified.

INSPECTION/MAINTENANCE:

- Sediment traps are to be inspected by the resident engineer and contractor every 7 calendar days and after a storm event of ½" or greater (including snowfall) on a temporary basis. On a permanent basis, traps should be checked at least once every 2 years.
- The trap should be cleaned of silt when the trap becomes 50% filled. The material removed must be disposed of in accordance with good housekeeping practices, incorporated into the fill material, or disposed of in accordance with IEPA regulations.
- Inspect the outlet for erosion and any needed stabilization.
- Inspect the outlet for any sediment discharge and discolored water.
- If sediment is discharged or other pollutants are identified at the discharge point, other BMPs, such as sand filters, may be required to filter pollutants.
- Note that the first ditch check is primarily used to slow the water, while the second is primarily used to catch remaining sediment. Inspection of the first ditch check, therefore, is primarily a structural inspection, while the second is primarily a check for sediment clogging.

NOTES ON THE DIMENSIONS OF THE TRAP:

The volume of the trap may be calculated using the following formula (only applies on shallow slopes of 5% or less):

$$\text{Volume} = (\text{Depth of the trap}) * (\text{Length between ditch checks}) * (\text{Width of the ditch})$$

SEDIMENT TRAP DIMENSION MATRIX					
Depth	Length	Width	Capacity (cu. ft.)	Drainage Area Max. (sq. ft.)	Drainage Area Max. (acres)
1-1/2'	125'	10'	1,875	22,500	.52
1-1/2'	100'	10'	1,500	18,000	.417
1-1/2'	75'	10'	1,125	13,500	.3125
1-1/2'	50'	10'	750	9,000	.21
1-1/2'	25'	10'	375	4,500	.1
2'	100'	10'	2,000	24,000	.55
2'	80'	10'	1,600	19,000	.44
2'	60'	10'	1,200	14,500	.33
2'	40'	10'	800	9,600	.22
2'	30'	10'	600	7,250	.17
2'	25'	10'	500	6,000	.14

Figure 1

For reference, 1 Acre ~ 43200 sq. ft.

Shear Stress

STRAIGHT SECTIONS OF DITCHES

$$\tau_d = \gamma(dS)$$

where

τ_d = maximum shear stress, lb/ft² (Pa)
 γ = unit weight of water, 62.4 lb/ft³ (9810 N/m³)
 d = maximum depth of flow, ft (m)
 S = average bed slope or energy slope, ft/ft (m/m)

BENDS IN DITCHES

Flow around a channel bend imposes higher shear stresses on the channel boundaries. The maximum shear stress in a bend is a function of the radius of curvature and the bottom width of the channel and is given by:

$$\tau_b = K_b \tau_d$$

where

τ_b = maximum shear stress in a bend, lb/ft² (Pa)
 $K_b = 2.38 - 0.206 \left(\frac{R_c}{B} \right) + 0.0073 \left(\frac{R_c}{B} \right)^2$

where

K_b = bend coefficient - function of R_c/B
 R_c = radius to centerline of channel, ft (m)
 B = bottom width of channel, ft (m)

To determine which BMP to use to protect the ditch, calculate the Shear Stress and compare to the following values:

- < 3 psf (147 Pa) → Erosion Control Blanket and Seeding
- < 8 psf (392 Pa) → Turf Reinforcement Mat and Seeding
- > 8 psf (392 Pa) → Stone lining

RELEVANT PAY ITEMS:

- EARTH EXCAVATION
- PERIMETER EROSION BARRIER
- Stone size IDOT RR-4
- ROCKFILL IDOT CA-1
- TEMPORARY DITCH CHECKS
- TEMPORARY EROSION CONTROL SEEDING or SEEDING, CLASS 2A
- TEMPORARY EROSION CONTROL BLANKET



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.5 of the Storm Water Pollution Prevention Plan (SWPPP) which will be handled by the Contractor/subcontractor completing this form.

Route	<u>FAP 338</u>	Marked Rte.	<u>Illinois Route 59</u>
Section	<u>(112 & 113) WRS-5</u>	Project No.	<u>C-91-014-10</u>
County	<u>DuPage</u>	Contract No.	<u>60I31</u>

This certification statement is a part of the SWPPP for the project described above, in accordance with the General NPDES Permit No. ILR10 issued by the Illinois Environmental Protection Agency.

I certify under penalty of law that I understand the terms of the Permit No. ILR 10 that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

In addition, I have read and understand all of the information and requirements stated in the SWPPP for the above mentioned project; I have received copies of all appropriate maintenance procedures; and, I have provided all documentation required to be in compliance with the Permit ILR10 and SWPPP and will provide timely updates to these documents as necessary.

- Contractor
- Sub-Contractor

_____	_____
Print Name	Signature
_____	_____
Title	Date
_____	_____
Name of Firm	Telephone
_____	_____
Street Address	City/State/ZIP

Items which this Contractor/subcontractor will be responsible for as required in Section II.5. of the SWPPP:

BITUMINOUS MATERIALS COST ADJUSTMENTS (bde) (RETURN FORM WITH BID)

Effective: November 2, 2006
Revised: January 1, 2012

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 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. The adjustments shall not apply to bituminous prime coats, tack coats, crack filling/sealing, or joint filling/sealing.

The bidder shall indicate on the attached form whether or not this special provision will be part of the contract and submit the completed form with his/her bid. Failure to submit the form, or failure to fill out the form completely, shall make this contract exempt of bituminous materials cost adjustments.

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, \$/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: $Q, \text{ metric tons} = A \times D \times (G_{mb} \times 24.99) / 1000$. 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.

Return With Bid

**ILLINOIS DEPARTMENT
OF TRANSPORTATION**

**OPTION FOR
BITUMINOUS MATERIALS COST ADJUSTMENTS**

The bidder shall submit this completed form with his/her bid. Failure to submit the form, or failure to fill out the form completely, shall make this contract exempt of bituminous materials cost adjustments. After award, this form, when submitted, shall become part of the contract.

Contract No.: _____

Company Name: _____

Contractor's Option:

Is your company opting to include this special provision as part of the contract?

Yes No

Signature: _____ **Date:** _____

FUEL COST ADJUSTMENT (BDE) (RETURN FORM WITH BID)

Effective: April 1, 2009

Revised: July 1, 2009

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 on the attached form whether or not this special provision will be part of the contract and submit the completed form with his/her bid. Failure to submit the form or failure to indicate contract number, company name and sign and date the form shall make this contract exempt of fuel cost adjustments for all categories of work. 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 work added by adjusted unit price will be subject to fuel cost adjustment only when the category representing the added work was subject to the fuel cost adjustment. Added work paid for by time and materials 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, \$/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.

Progress Payments. 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.

Final Quantities. Upon completion of the work and determination of final pay quantities, an adjustment will be prepared to reconcile any differences between estimated quantities previously paid and the final quantities. The value for the balancing adjustment will be based on a weighted average of FPI_P and Q only for those months requiring the cost adjustment. The cost adjustment will be applicable to the final measured quantities of all applicable pay items.

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:

$$\text{Percent Difference} = \{(FPI_L - FPI_P) \div FPI_L\} \times 100$$

Return With Bid

**ILLINOIS DEPARTMENT
OF TRANSPORTATION**

**OPTION FOR
FUEL COST ADJUSTMENT**

The bidder shall submit this completed form with his/her bid. Failure to submit the form or properly complete contract number, company name, and sign and date the form shall make this contract exempt of fuel cost adjustments in all categories. Failure to indicate "Yes" for any category of work at the time of bid will make that category of work exempt from fuel cost adjustment. After award, this form, when submitted shall become part of the contract.

Contract No.: _____

Company Name: _____

Contractor's Option:

Is your company opting to include this special provision as part of the contract plans for the following categories of work?

- | | | |
|------------------------------------------------|-----|--------------------------|
| Category A Earthwork. | Yes | <input type="checkbox"/> |
| Category B Subbases and Aggregate Base Courses | Yes | <input type="checkbox"/> |
| Category C HMA Bases, Pavements and Shoulders | Yes | <input type="checkbox"/> |
| Category D PCC Bases, Pavements and Shoulders | Yes | <input type="checkbox"/> |
| Category E Structures | Yes | <input type="checkbox"/> |

Signature: _____ **Date:** _____

STEEL COST ADJUSTMENT (BDE) (RETURN FORM WITH BID)

Effective: April 2, 2004

Revised: April 1, 2009

Description. Steel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in steel prices when optioned by the Contractor. The bidder shall indicate on the attached form whether or not this special provision will be part of the contract and submit the completed form with his/her bid. Failure to submit the form or failure to indicate contract number, company name, and sign and date the form shall make this contract exempt of steel cost adjustments for all items of steel. Failure to indicate "Yes" for any item of work will make that item of steel exempt from steel cost adjustment.

Types of Steel Products. An adjustment will be made for fluctuations in the cost of steel used in the manufacture of the following items:

- Metal Piling (excluding temporary sheet piling)
- Structural Steel
- Reinforcing Steel

Other steel materials such as dowel bars, tie bars, mesh reinforcement, guardrail, steel traffic signal and light poles, towers and mast arms, metal railings (excluding wire fence), and frames and grates will be subject to a steel cost adjustment when the pay items they are used in has a contract value of \$10,000 or greater.

Documentation. Sufficient documentation shall be furnished to the Engineer to verify the following:

- (a) The dates and quantity of steel, in lb (kg), shipped from the mill to the fabricator.
- (b) The quantity of steel, in lb (kg), incorporated into the various items of work covered by this special provision. The Department reserves the right to verify submitted quantities.

Method of Adjustment. Steel cost adjustments will be computed as follows:

$$SCA = Q \times D$$

Where: SCA = steel cost adjustment, in dollars
Q = quantity of steel incorporated into the work, in lb (kg)
D = price factor, in dollars per lb (kg)

$$D = MPI_M - MPI_L$$

Where: MPI_M = The Materials Cost Index for steel as published by the Engineering News-Record for the month the steel is shipped from the mill. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

MPI_L = The Materials Cost Index for steel as published by the Engineering News-Record for the month prior to the letting. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

The unit weights (masses) of steel that will be used to calculate the steel cost adjustment for the various items are shown in the attached table.

No steel cost adjustment will be made for any products manufactured from steel having a mill shipping date prior to the letting date.

If the Contractor fails to provide the required documentation, the method of adjustment will be calculated as described above; however, the MPI_M will be based on the date the steel arrives at the job site. In this case, an adjustment will only be made when there is a decrease in steel costs.

Basis of Payment. Steel cost adjustments may be positive or negative but will only be made when there is a difference between the MPI_L and MPI_M in excess of five percent, as calculated by:

$$\text{Percent Difference} = \{(MPI_L - MPI_M) \div MPI_L\} \times 100$$

Steel cost adjustments will be calculated by the Engineer and will be paid or deducted when all other contract requirements for the items of work are satisfied. Adjustments will only be made for fluctuations in the cost of the steel as described herein. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, storage, etc.

The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

Attachment

Item	Unit Mass (Weight)
Metal Piling (excluding temporary sheet piling)	
Furnishing Metal Pile Shells 12 in. (305 mm), 0.179 in. (3.80 mm) wall thickness)	23 lb/ft (34 kg/m)
Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness)	32 lb/ft (48 kg/m)
Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness)	37 lb/ft (55 kg/m)
Other piling	See plans
Structural Steel	See plans for weights (masses)
Reinforcing Steel	See plans for weights (masses)
Dowel Bars and Tie Bars	6 lb (3 kg) each
Mesh Reinforcement	63 lb/100 sq ft (310 kg/sq m)
Guardrail	
Steel Plate Beam Guardrail, Type A w/steel posts	20 lb/ft (30 kg/m)
Steel Plate Beam Guardrail, Type B w/steel posts	30 lb/ft (45 kg/m)
Steel Plate Beam Guardrail, Types A and B w/wood posts	8 lb/ft (12 kg/m)
Steel Plate Beam Guardrail, Type 2	305 lb (140 kg) each
Steel Plate Beam Guardrail, Type 6	1260 lb (570 kg) each
Traffic Barrier Terminal, Type 1 Special (Tangent)	730 lb (330 kg) each
Traffic Barrier Terminal, Type 1 Special (Flared)	410 lb (185 kg) each
Steel Traffic Signal and Light Poles, Towers and Mast Arms	
Traffic Signal Post	11 lb/ft (16 kg/m)
Light Pole, Tenon Mount and Twin Mount, 30 - 40 ft (9 - 12 m)	14 lb/ft (21 kg/m)
Light Pole, Tenon Mount and Twin Mount, 45 - 55 ft (13.5 - 16.5 m)	21 lb/ft (31 kg/m)
Light Pole w/Mast Arm, 30 - 50 ft (9 - 15.2 m)	13 lb/ft (19 kg/m)
Light Pole w/Mast Arm, 55 - 60 ft (16.5 - 18 m)	19 lb/ft (28 kg/m)
Light Tower w/Luminaire Mount, 80 - 110 ft (24 - 33.5 m)	31 lb/ft (46 kg/m)
Light Tower w/Luminaire Mount, 120 - 140 ft (36.5 - 42.5 m)	65 lb/ft (97 kg/m)
Light Tower w/Luminaire Mount, 150 - 160 ft (45.5 - 48.5 m)	80 lb/ft (119 kg/m)
Metal Railings (excluding wire fence)	
Steel Railing, Type SM	64 lb/ft (95 kg/m)
Steel Railing, Type S-1	39 lb/ft (58 kg/m)
Steel Railing, Type T-1	53 lb/ft (79 kg/m)
Steel Bridge Rail	52 lb/ft (77 kg/m)
Frames and Grates	
Frame	250 lb (115 kg)
Lids and Grates	150 lb (70 kg)

Return With Bid

**ILLINOIS DEPARTMENT
OF TRANSPORTATION**

**OPTION FOR
STEEL COST ADJUSTMENT**

The bidder shall submit this completed form with his/her bid. Failure to submit the form or properly complete contract number, company name, and sign and date the form shall make this contract exempt of steel cost adjustments for all items of steel. Failure to indicate "Yes" for any item of work will make that item of steel exempt from steel cost adjustment. After award, this form, when submitted shall become part of the contract.

Contract No.: _____

Company Name: _____

Contractor's Option:

Is your company opting to include this special provision as part of the contract plans for the following items of work?

- | | | |
|------------------------------------------------------------|-----|--------------------------|
| Metal Piling | Yes | <input type="checkbox"/> |
| Structural Steel | Yes | <input type="checkbox"/> |
| Reinforcing Steel | Yes | <input type="checkbox"/> |
| Dowel Bars, Tie Bars and Mesh Reinforcement | Yes | <input type="checkbox"/> |
| Guardrail | Yes | <input type="checkbox"/> |
| Steel Traffic Signal and Light Poles, Towers and Mast Arms | Yes | <input type="checkbox"/> |
| Metal Railings (excluding wire fence) | Yes | <input type="checkbox"/> |
| Frames and Grates | Yes | <input type="checkbox"/> |

Signature: _____ **Date:** _____

PROJECT LABOR AGREEMENT - QUARTERLY EMPLOYMENT REPORT

Public Act 97-0199 requires the Department to submit quarterly reports regarding the number of minorities and females employed under Project Labor Agreements. To assist in this reporting effort, the Contractor shall provide a quarterly workforce participation report for all minority and female employees working under the project labor agreement of this contract. The data shall be reported on Construction Form BC 820, Project Labor Agreement (PLA) Workforce Participation Quarterly Reporting Form available on the Department's website <http://www.dot.il.gov/const/conforms.html>.

The report shall be submitted no later than the 15th of the month following the end of each quarter (i.e. April 15 for the January – March reporting period). The form shall be emailed to DOT.PLA.Reporting@illinois.gov or faxed to (217) 524-4922.

Any costs associated with complying with this provision 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.

Illinois Department of Transportation
PROJECT LABOR AGREEMENT

This Project Labor Agreement (“PLA” or “Agreement”) is entered into this _____ day of _____, 2013, by and between the Illinois Department of Transportation (“IDOT” or “Department”) in its proprietary capacity, and each relevant Illinois AFL-CIO Building Trades signatory hereto as determined by the Illinois AFL-CIO Statewide Project Labor Agreement Committee on behalf of each of its affiliated members (individually and collectively, the “Unions”). This PLA shall apply to Construction Work (as defined herein) to be performed by IDOT’s Prime Contractor and each of its subcontractors of whatever tier (“Subcontractor” or “Subcontractors”) on Contract No. **60I31** (hereinafter, the “Project”).

ARTICLE 1 - INTENT AND PURPOSES

- 1.1 This PLA is entered into in accordance with the Project Labor Agreement Act (“Act”, 30 ILCS 571). It is mutually understood and agreed that the terms and conditions of this PLA are intended to promote the public interest in obtaining timely and economical completion of the Project by encouraging productive and efficient construction operations; by establishing a spirit of harmony and cooperation among the parties; and by providing for peaceful and prompt settlement of any and all labor grievances or jurisdictional disputes of any kind without strikes, lockouts, slowdowns, delays, or other disruptions to the prosecution of the work. The parties acknowledge the obligations of the Contractors and Subcontractors to comply with the provisions of the Act. The parties will work with the Contractors and Subcontractors within the parameters of other statutory and regulatory requirements to implement the Act’s goals and objectives.
- 1.2 As a condition of the award of the contract for performance of work on the Project, IDOT's Prime Contractor and each of its Subcontractors shall execute a “Contractor Letter of Assent”, in the form attached hereto as Exhibit A, prior to commencing Construction Work on the Project. The Contractor shall submit a Subcontractor’s Contractor Letter of Assent to the Department prior to the Subcontractor’s performance of Construction Work on the Project. Upon request copies of the applicable collective bargaining agreements will be provided by the appropriate signatory labor organization consistent with this Agreement and at the pre-job conference referenced in Article III, Section 3.1.
- 1.3 Each Union affiliate and separate local representing workers engaged in Construction Work on the Project in accordance with this PLA are bound to this agreement by the Illinois AFL-CIO Statewide Project Labor Agreement Committee which is the central committee established with full authority to negotiate and sign PLAs with the State on behalf of all respective crafts. Upon their signing the Contractor Letter of Assent, the Prime Contractor, each Subcontractor, and the individual Unions shall thereafter be deemed a party to this PLA. No party signatory to this PLA shall, contract or subcontract, nor permit any other person, firm, company, or entity to contract or subcontract for the performance of Construction Work for the Project to any person, firm, company, or entity that does not agree in writing to become bound for the term of this Project by the terms of this PLA prior to commencing such work and to the applicable area-wide collective bargaining agreement(s) with the Union(s) signatory hereto.

- 1.4 It is understood that the Prime Contractor(s) and each Subcontractor will be considered and accepted by the Unions as separate employers for the purposes of collective bargaining, and it is further agreed that the employees working under this PLA shall constitute a bargaining unit separate and distinct from all others. The parties hereto also agree that this PLA shall be applicable solely with respect to this Project, and shall have no bearing on the interpretation of any other collective bargaining agreement or as to the recognition of any bargaining unit other than for the specific purposes of this Project.
- 1.5 In the event of a variance or conflict, whether explicit or implicit, between the terms and conditions of this PLA and the provisions of any other applicable national, area, or local collective bargaining agreement, the terms and conditions of this PLA shall supersede and control. For any work performed under the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, the National Agreement of the International Union of Elevator Constructors, and for any instrument calibration work and loop checking performed under the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, the preceding sentence shall apply only with respect to Articles I, II, V, VI, and VII.
- 1.6 Subject to the provisions of paragraph 1.5 of this Article, it is the parties' intent to respect the provisions of any other collective bargaining agreements that may now or hereafter pertain, whether between the Prime Contractor and one or more of the Unions or between a Subcontractor and one or more of the Unions. Accordingly, except and to the extent of any contrary provision set forth in this PLA, the Prime Contractor and each of its Subcontractors agrees to be bound and abide by the terms of the following in order of precedence: (a) the applicable collective bargaining agreement between the Prime Contractor and one or more of the Unions made signatory hereto; (b) the applicable collective bargaining agreement between a Subcontractor and one or more of the Unions made signatory hereto; or (c) the current applicable area collective bargaining agreement for the relevant Union that is the agreement certified by the Illinois Department of Labor for purposes of establishing the Prevailing Wage applicable to the Project. The Union will provide copies of the applicable collective bargaining agreements pursuant to part (c) of the preceding sentence to the Prime Contractor. Assignments by the Contractors or Subcontractors amongst the trades shall be consistent with area practices; in the event of unresolved disagreements as to the propriety of such assignments, the provisions of Article VI shall apply.
- 1.7 Subject to the limitations of paragraphs 1.4 to 1.6 of this Article, the terms of each applicable collective bargaining agreement as determined in accordance with paragraph 1.6 are incorporated herein by reference, and the terms of this PLA shall be deemed incorporated into such other applicable collective bargaining agreements only for purposes of their application to the Project.

- 1.8 To the extent necessary to comply with the requirements of any fringe benefit fund to which the Prime Contractor or Subcontractor is required to contribute under the terms of an applicable collective bargaining agreement pursuant to the preceding paragraph, the Prime Contractor or Subcontractor shall execute all "Participation Agreements" as may be reasonably required by the Union to accomplish such purpose; provided, however, that such Participation Agreements shall, when applicable to the Prime Contractor or Subcontractor solely as a result of this PLA, be amended as reasonably necessary to reflect such fact. Upon written notice in the form of a lien of a Contractor's or Subcontractor's delinquency from any applicable fringe benefit fund, IDOT will withhold from the Contractor's periodic pay request an amount sufficient to extinguish any delinquency obligation of the Contractor or Subcontractor arising out of the Project.
- 1.9 In the event that the applicable collective bargaining agreement between a Prime Contractor and the Union or between the Subcontractor and the Union expires prior to the completion of this Project, the expired applicable contract's terms will be maintained until a new applicable collective bargaining agreement is ratified. The wages and fringe benefits included in any new applicable collective bargaining agreement will apply on and after the effective date of the newly negotiated collective bargaining agreement, except to the extent wage and fringe benefit retroactivity is specifically agreed upon by the relevant bargaining parties.

ARTICLE II – APPLICABILITY, RECOGNITION, AND COMMITMENTS

- 2.1 The term Construction Work as used herein shall include all "construction, demolition, rehabilitation, renovation, or repair" work performed by a "laborer or mechanic" at the "site of the work" for the purpose of "building" the specific structures and improvements that constitute the Project. Terms appearing within quotation marks in the preceding sentence shall have the meaning ascribed to them pursuant to 29 CFR Part 5 and Illinois labor laws.
- 2.2 By executing the Letters of Assent, Prime Contractor and each of its Subcontractors recognizes the Unions signatory to this PLA as the sole and exclusive bargaining representatives for their craft employees employed on the jobsite for this Project. Unions who are signatory to this PLA will have recognition on the Project for their craft.
- 2.3 The Prime Contractor and each of its Subcontractors retains and shall be permitted to exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this PLA or by the terms and conditions of the applicable collective bargaining agreement.
- 2.4 Except to the extent contrary to an express provision of the relevant collective bargaining agreement, equipment or materials used in the Project may be pre-assembled or pre-fabricated, and there shall be no refusal by the Union to handle, transport, install, or connect such equipment or materials. Equipment or materials delivered to the job-site will be unloaded and handled promptly without regard to potential jurisdictional disputes; any such disputes shall be handled in accordance with the provisions of this PLA.

- 2.5 The parties are mutually committed to promoting a safe working environment for all personnel at the job-site. It shall be the responsibility of each employer to which this PLA applies to provide and maintain safe working conditions for its employees, and to comply with all applicable federal, state, and local health and safety laws and regulations.
- 2.6 The use or furnishing of alcohol or drugs and the conduct of any other illegal activity at the job-site is strictly prohibited. The parties shall take every practical measure consistent with the terms of applicable collective bargaining agreements to ensure that the job-site is free of alcohol and drugs.
- 2.7 All parties to this PLA agree that they will not discriminate against any employee based on race, creed, religion, color, national origin, union activity, age, gender or sexual orientation and shall comply with all applicable federal, state, and local laws.
- 2.8 In accordance with the Act and to promote diversity in employment, IDOT will establish, in cooperation with the other parties, the apprenticeship hours which are to be performed by minorities and females on the Project. IDOT shall consider the total hours to be performed by these underrepresented groups, as a percentage of the workforce, and create aspirational goals for each Project, based on the level of underutilization for the service area of the Project (together "Project Employment Objectives"). IDOT shall provide a quarterly report regarding the racial and gender composition of the workforce on the Project.

Persons currently lacking qualifications to enter apprenticeship programs will have the opportunity to obtain skills through basic training programs as have been established by the Department. The parties will endeavor to support such training programs to allow participants to obtain the requisite qualifications for the Project Employment Objectives.

The parties agree that all Contractors and Subcontractors working on the Project shall be encouraged to utilize the maximum number of apprentices as permitted under the terms of the applicable collective bargaining agreements to realize the Project Employment Objectives.

The Unions shall assist the Contractor and each Subcontractor in efforts to satisfy Project Employment Objectives. A Contractor or Subcontractor may request from a Union specific categories of workers necessary to satisfy Project Employment Objectives. The application of this section shall be consistent with all local Union collective bargaining agreements, and the hiring hall rules and regulations established for the hiring of personnel, as well as the apprenticeship standards set forth by each individual Union.

- 2.9 The parties hereto agree that engineering/architectural/surveying consultants' materials testing employees are subject to the terms of this PLA for Construction Work performed for a Contractor or Subcontractor on this Project. These workers shall be fully expected to objectively and responsibly perform their duties and obligations owed to the Department without regard to the potential union affiliation of such employees or of other employees on the Project.

- 2.10 This Agreement shall not apply to IDOT employees or employees of any other governmental entity.

ARTICLE III - ADMINISTRATION OF AGREEMENT

- 3.1 In order to assure that all parties have a clear understanding of the PLA, and to promote harmony, at the request of the Unions a post-award pre-job conference will be held among the Prime Contractor, all Subcontractors and Union representatives prior to the start of any Construction Work on the Project. No later than the conclusion of such pre-job conference, the parties shall, among other matters, provide to one another contact information for their respective representatives (including name, address, phone number, facsimile number, e-mail). Nothing herein shall be construed to limit the right of the Department to discuss or explain the purpose and intent of this PLA with prospective bidders or other interested parties prior to or following its award of the job.
- 3.2 Representatives of the Prime Contractor and the Unions shall meet as often as reasonably necessary following award until completion of the Project to assure the effective implementation of this PLA.
- 3.3 Any notice contemplated under Article VI and VII of this Agreement to a signatory labor organization shall be made in writing to the Local Union with copies to the local union's International Representative.

ARTICLE IV - HOURS OF WORK AND GENERAL CONDITIONS

- 4.1 The standard work day and work week for Construction Work on the Project shall be consistent with the respective collective bargaining agreements. In the event Project site or other job conditions dictate a change in the established starting time and/or a staggered lunch period for portions of the Project or for specific crafts, the Prime Contractor, relevant Subcontractors and business managers of the specific crafts involved shall confer and mutually agree to such changes as appropriate. If proposed work schedule changes cannot be mutually agreed upon between the parties, the hours fixed at the time of the pre-job meeting shall prevail.
- 4.2 Shift work may be established and directed by the Prime Contractor or relevant Subcontractor as reasonably necessary or appropriate to fulfill the terms of its contract with the Department. If used, shift hours, rates and conditions shall be as provided in the applicable collective bargaining agreement.
- 4.3 The parties agree that chronic and/or unexcused absenteeism is undesirable and must be controlled in accordance with procedures established by the applicable collective bargaining agreement. Any employee disciplined for absenteeism in accordance with such procedures shall be suspended from all work on the Project for not less than the maximum period permitted under the applicable collective bargaining agreement.
- 4.4 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, employment begins and ends at the Project site; employees shall be at their place of work at the starting time; and employees shall remain at their place of work until quitting time.

- 4.5 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, there shall be no limit on production by workmen, no restrictions on the full use of tools or equipment, and no restrictions on efficient use of manpower or techniques of construction other than as may be required by safety regulations.
- 4.6 The parties recognize that specialized or unusual equipment may be installed on the Project. In such cases, the Union recognizes the right of the Prime Contractor or Subcontractor to involve the equipment supplier or vendor's personnel in supervising the setting up of the equipment, making modifications and final alignment, and performing similar activities that may be reasonably necessary prior to and during the start-up procedure in order to protect factory warranties. The Prime Contractor or Subcontractor shall notify the Union representatives in advance of any work at the job-site by such vendor personnel in order to promote a harmonious relationship between the equipment vendor's personnel and other Project employees.
- 4.7 For the purpose of promoting full and effective implementation of this PLA, authorized Union representatives shall have access to the Project job-site during scheduled work hours. Such access shall be conditioned upon adherence to all reasonable visitor and security rules of general applicability that may be established for the Project site at the pre-job conference or from time to time thereafter.

ARTICLE V – GRIEVANCE PROCEDURES FOR DISPUTES ARISING UNDER A PARTICULAR COLLECTIVE BARGAINING AGREEMENT

- 5.1 In the event a dispute arises under a particular collective bargaining agreement specifically not including jurisdictional disputes referenced in Article VI below, said dispute shall be resolved by the Grievance/Arbitration procedure of the applicable collective bargaining agreement. The resulting determination from this process shall be final and binding on all parties bound to its process.
- 5.2 Employers covered under this Agreement shall have the right to discharge or discipline any employee who violates the provisions of this Agreement. Such discharge or discipline by a contractor or subcontractor shall be subject to Grievance/Arbitration procedure of the applicable collective bargaining agreement only as to the fact of such violation of this agreement. If such fact is established, the penalty imposed shall not be disturbed. Work at the Project site shall continue without disruption or hindrance of any kind as a result of a Grievance/Arbitration procedure under this Article.
- 5.3 In the event there is a deadlock in the foregoing procedure, the parties agree that the matter shall be submitted to arbitration for the selection and decision of an Arbitrator governed under paragraph 6.8.

ARTICLE VI –DISPUTES: GENERAL PRINCIPLES

- 6.1 This Agreement is entered into to prevent strikes, lost time, lockouts and to facilitate the peaceful adjustment of jurisdictional disputes in the building and construction industry and to prevent waste and unnecessary avoidable delays and expense, and for the further purpose of at all times securing for the employer sufficient skilled workers.

- 6.2 A panel of Permanent Arbitrators are attached as addendum (A) to this agreement. By mutual agreement between IDOT and the Unions, the parties can open this section of the agreement as needed to make changes to the list of permanent arbitrators.
- 6.3 The PLA Jurisdictional Dispute Resolution Process ("Process") sets forth the procedures below to resolve jurisdictional disputes between and among Contractors, Subcontractors, and Unions engaged in the building and construction industry. Further, the Process will be followed for any grievance or dispute arising out of the interpretation or application of this PLA by the parties except for the prohibition on attorneys contained in 6.11. All decisions made through the Process are final and binding upon all parties.

DISPUTE PROCESS

- 6.4 Administrative functions under the Process shall be performed through the offices of the President and/or Secretary-Treasurer of the Illinois State Federation of Labor, or their designated representative, called the Administrator. In no event shall any officer, employee, agent, attorney, or other representative of the Illinois Federation of Labor, AFL-CIO be subject to any subpoena to appear or testify at any jurisdictional dispute hearing.
- 6.5 There shall be no abandonment of work during any case participating in this Process or in violation of the arbitration decision. All parties to this Process release the Illinois State Federation of Labor ("Federation") from any liability arising from its action or inaction and covenant not to sue the Federation, nor its officers, employees, agents or attorneys.
- 6.6 In the event of a dispute relating to trade or work jurisdiction, all parties, including the employers, Contractors or Subcontractors, agree that a final and binding resolution of the dispute shall be resolved as follows:
- (a) Representatives of the affected trades and the Contractor or Subcontractor shall meet on the job site within two (2) business days after receiving written notice in an effort to resolve the dispute. (In the event there is a dispute between local unions affiliated with the same International Union, the decision of the General President, or his/her designee, as the internal jurisdictional authority of that International Union, shall constitute a final and binding decision and determination as to the jurisdiction of work.)
 - (b) If no settlement is achieved subsequent to the preceding Paragraph, the matter shall be referred to the local area Building & Construction Trades Council, which shall meet with the affected trades within two (2) business days subsequent to receiving written notice. In the event the parties do not wish to avail themselves of the local Building & Construction Trades Council, the parties may elect to invoke the services of their respective International Representatives with no extension of the time limitations. An agreement reached at this Step shall be final and binding upon all parties.

(c) If no settlement agreement is reached during the proceedings contemplated by Paragraphs "a" or "b" above, the matter shall be immediately referred to the Illinois Jurisdictional Dispute Process for final and binding resolution of said dispute. Said referral submission shall be in writing and served upon the Illinois State Federation of Labor, or the Administrator, pursuant to paragraph 6.4 of this agreement. The Administrator shall, within three (3) days, provide for the selection of an available Arbitrator to hear said dispute within this time period. Upon good cause shown and determined by the Administrator, an additional three (3) day extension for said hearing shall be granted at the sole discretion of the Administrator. Only upon mutual agreement of all parties may the Administrator extend the hearing for a period in excess of the time frames contemplated under this Paragraph. Business days are defined as Monday through Friday, excluding contract holidays.

6.7 The primary concern of the Process shall be the adjustment of jurisdictional disputes arising out of the Project. A sufficient number of Arbitrators shall be selected from list of approved Arbitrators as referenced Sec. 6.2 and shall be assigned per Sec. 6.8. Decisions shall be only for the Project and shall become effective immediately upon issuance and complied with by all parties. The authority of the Arbitrator shall be restricted and limited specifically to the terms and provisions of Article VI and generally to this Agreement as a whole.

6.8 The Arbitrator chosen shall be randomly selected based on the list of Arbitrators in Sec. 6.2 and geographical location of the jurisdictional dispute and upon his/her availability, and ability to conduct a Hearing within two (2) business days of said notice. The Arbitrator may issue a "bench" decision immediately following the Hearing or he/she may elect to only issue a written decision, said decision must be issued within two (2) business days subsequent to the completion of the Hearing. Copies of all notices, pleadings, supporting memoranda, decisions, etc. shall be provided to all disputing parties and the Illinois State Federation of Labor.

Any written decision shall be in accordance with this Process and shall be final and binding upon all parties to the dispute and may be a "short form" decision. Fees and costs of the arbitrator shall be divided evenly between the contesting parties except that any party wishing a full opinion and decision beyond the short form decision shall bear the reasonable fees and costs of such full opinion. The decision of the Arbitrator shall be final and binding upon the parties hereto, their members, and affiliates.

In cases of jurisdictional disputes or other disputes between a signatory labor organization and another labor organization, both of which is an affiliate or member of the same International Union, the matter or dispute shall be settled in the manner set forth by their International Constitution and/or as determined by the International Union's General President whose decision shall be final and binding upon all parties. In no event shall there be an abandonment of work.

6.9 In rendering a decision, the Arbitrator shall determine:

(a) First, whether a previous agreement of record or applicable agreement, including a disclaimer agreement, between National or International Unions to the dispute or agreements between local unions involved in the dispute, governs;

- (b) Only if the Arbitrator finds that the dispute is not covered by an appropriate or applicable agreement of record or agreement between the crafts to the dispute, he shall then consider the established trade practice in the industry and prevailing practice in the locality. Where there is a previous decision of record governing the case, the Arbitrator shall give equal weight to such decision of record, unless the prevailing practice in the locality in the past ten years favors one craft. In that case, the Arbitrator shall base his decision on the prevailing practice in the locality. Except, that if the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wages or by the use of vertical agreements, the Arbitrator shall rely on the decision of record and established trade practice in the industry rather than the prevailing practice in the locality; and,
 - (c) Only if none of the above criteria is found to exist, the Arbitrator shall then consider that because efficiency, cost or continuity and good management are essential to the well being of the industry, the interests of the consumer or the past practices of the employer shall not be ignored.
- 6.10 The Arbitrator shall set forth the basis for his/her decision and shall explain his/her findings regarding the applicability of the above criteria. If lower ranked criteria are relied upon, the Arbitrator shall explain why the higher-ranked criteria were not deemed applicable. The Arbitrator's decision shall only apply to the Project. Agreements of Record, for other PLA projects, are applicable only to those parties signatory to such agreements. Decisions of Record are those that were either attested to by the former Impartial Jurisdictional Disputes Board or adopted by the National Arbitration Panel.
- 6.11 All interested parties, as determined by the Arbitrator, shall be entitled to make presentations to the Arbitrator. Any interested labor organization affiliated to the PLA Committee and party present at the Hearing, whether making a presentation or not, by such presence shall be deemed to accept the jurisdiction of the Arbitrator and to agree to be bound by its decision. In addition to the representative of the local labor organization, a representative of the labor organization's International Union may appear on behalf of the parties. Each party is responsible for arranging for its witnesses. In the event an Arbitrator's subpoena is required, the party requiring said subpoena shall prepare the subpoena for the Arbitrator to execute. Service of the subpoena upon any witness shall be the responsibility of the issuing party.

Attorneys shall not be permitted to attend or participate in any portion of a Hearing.

The parties are encouraged to determine, prior to Hearing, documentary evidence which may be presented to the Arbitrator on a joint basis.

- 6.12 The Order of Presentation in all Hearings before an Arbitrator shall be
- I. Identification and Stipulation of the Parties
 - II. Unions(s) claiming the disputed work presents its case
 - III. Union(s) assigned the disputed work presents its case
 - IV. Employer assigning the disputed work presents its case
 - V. Evidence from other interested parties (i.e., general contractor, project manager, owner)
 - VI. Rebuttal by union(s) claiming the disputed work
 - VII. Additional submissions permitted and requested by Arbitrator
 - VIII. Closing arguments by the parties
- 6.13 All parties bound to the provisions of this Process hereby release the Illinois State Federation of Labor and IDOT, their respective officers, agents, employees or designated representatives, specifically including any Arbitrator participating in said Process, from any and all liability or claim, of whatsoever nature, and specifically incorporating the protections provided in the Illinois Arbitration Act, as amended from time to time.
- 6.14 The Process, as an arbitration panel, nor its Administrator, shall have any authority to undertake any action to enforce its decision(s). Rather, it shall be the responsibility of the prevailing party to seek appropriate enforcement of a decision, including findings, orders or awards of the Arbitrator or Administrator determining non-compliance with a prior award or decision.
- 6.15 If at any time there is a question as to the jurisdiction of the Illinois Jurisdictional Dispute Resolution Process, the primary responsibility for any determination of the arbitrability of a dispute and the jurisdiction of the Arbitrator shall be borne by the party requesting the Arbitrator to hear the underlying jurisdictional dispute. The affected party or parties may proceed before the Arbitrator even in the absence or one or more stipulated parties with the issue of jurisdiction as an additional item to be decided by the Arbitrator. The Administrator may participate in proceedings seeking a declaration or determination that the underlying dispute is subject to the jurisdiction and process of the Illinois Jurisdictional Dispute Resolution Process. In any such proceedings, the non-prevailing party and/or the party challenging the jurisdiction of the Illinois Jurisdictional Dispute Resolution Process shall bear all the costs, expenses and attorneys' fees incurred by the Illinois Jurisdictional Dispute Resolution Process and/or its Administrator in establishing its jurisdiction.

ARTICLE VII - WORK STOPPAGES AND LOCKOUTS

- 7.1 During the term of this PLA, no Union or any of its members, officers, stewards, employees, agents or representatives shall instigate, support, sanction, maintain, or participate in any strike, picketing, walkout, work stoppage, slow down or other activity that interferes with the routine and timely prosecution of work at the Project site or at any other contractor's or supplier's facility that is necessary to performance of work at the Project site. Hand billing at the Project site during the designated lunch period and before commencement or following conclusion of the established standard workday shall not, in itself, be deemed an activity that interferes with the routine and timely prosecution of work on the Project.

- 7.2 Should any activity prohibited by paragraph 7.1 of this Article occur, the Union shall undertake all steps reasonably necessary to promptly end such prohibited activities.
- 7.2.A No Union complying with its obligations under this Article shall be liable for acts of employees for which it has no responsibility or for the unauthorized acts of employees it represents. Any employee who participates or encourages any activity prohibited by paragraph 7.1 shall be immediately suspended from all work on the Project for a period equal to the greater of (a) 60 days; or (b) the maximum disciplinary period allowed under the applicable collective bargaining agreement for engaging in comparable unauthorized or prohibited activity.
- 7.2.B Neither the PLA Committee nor its affiliates shall be liable for acts of employees for which it has no responsibility. The principal officer or officers of the PLA Committee will immediately instruct, order and use the best efforts of his office to cause the affiliated union or unions to cease any violations of this Article. The PLA Committee in its compliance with this obligation shall not be liable for acts of its affiliates. The principal officer or officers of any involved affiliate will immediately instruct, order or use the best effort of his office to cause the employees the union represents to cease any violations of this Article. A union complying with this obligation shall not be liable for unauthorized acts of employees it represents. The failure of the Contractor to exercise its rights in any instance shall not be deemed a waiver of its rights in any other instance.
- During the term of this PLA, the Prime Contractor and its Subcontractors shall not engage in any lockout at the Project site of employees covered by this Agreement.
- 7.3 Upon notification of violations of this Article, the principal officer or officers of the local area Building and Construction Trades Council, and the Illinois AFL-CIO Statewide Project Labor Agreement Committee as appropriate, will immediately instruct, order and use their best efforts to cause the affiliated union or unions to cease any violations of this Article. A Trades Council and the Committee otherwise in compliance with the obligations under this paragraph shall not be liable for unauthorized acts of its affiliates.
- 7.4 In the event that activities in violation of this Article are not immediately halted through the efforts of the parties, any aggrieved party may invoke the special arbitration provisions set forth in paragraph 7.5 of this Article.
- 7.5 Upon written notice to the other involved parties by the most expeditious means available, any aggrieved party may institute the following special arbitration procedure when a breach of this Article is alleged:
- 7.5.A The party invoking this procedure shall notify the individual designated as the Permanent Arbitrator pursuant to paragraph 6.8 of the nature of the alleged violation; such notice shall be by the most expeditious means possible. The initiating party may also furnish such additional factual information as may be reasonably necessary for the Permanent Arbitrator to understand the relevant circumstances. Copies of any written materials provided to the arbitrator shall also be contemporaneously provided by the most expeditious means possible to the party alleged to be in violation and to all other involved parties.

- 7.5.B Upon receipt of said notice the Permanent Arbitrator shall set and hold a hearing within twenty-four (24) hours if it is contended the violation is ongoing, but not before twenty-four (24) hours after the written notice to all parties involved as required above.
- 7.5.C The Permanent Arbitrator shall notify the parties by facsimile or any other effective written means, of the place and time chosen by the Permanent Arbitrator for this hearing. Said hearing shall be completed in one session. A failure of any party or parties to attend said hearing shall not delay the hearing of evidence or issuance of an Award by the Permanent Arbitrator.
- 7.5.D The sole issue at the hearing shall be whether a violation of this Article has, in fact, occurred. An Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without a written opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The Permanent Arbitrator may order cessation of the violation of this Article, and such Award shall be served on all parties by hand or registered mail upon issuance.
- 7.5.E Such Award may be enforced by any court of competent jurisdiction upon the filing of the Award and such other relevant documents as may be required. Facsimile or other hardcopy written notice of the filing of such enforcement proceedings shall be given to the other relevant parties. In a proceeding to obtain a temporary order enforcing the Permanent Arbitrator's Award as issued under this Article, all parties waive the right to a hearing and agree that such proceedings may be ex parte. Such agreement does not waive any party's right to participate in a hearing for a final order of enforcement. The Court's order or orders enforcing the Permanent Arbitrator's Award shall be served on all parties by hand or by delivery to their last known address or by registered mail.
- 7.6 Individuals found to have violated the provisions of this Article are subject to immediate termination. In addition, IDOT reserves the right to terminate this PLA as to any party found to have violated the provisions of this Article.
- 7.7 Any rights created by statute or law governing arbitration proceedings inconsistent with the above procedure or which interfere with compliance therewith are hereby waived by parties to whom they accrue.
- 7.8 The fees and expenses of the Permanent Arbitrator shall be borne by the party or parties found in violation, or in the event no violation is found, such fees and expenses shall be borne by the moving party.

ARTICLE VIII – TERMS OF AGREEMENT

- 8.1 If any Article or provision of this Agreement shall be declared invalid, inoperative or unenforceable by operation of law or by any of the above mentioned tribunals of competent jurisdiction, the remainder of this Agreement or the application of such Article or provision to persons or circumstances other than those as to which it has been held invalid, inoperative or unenforceable shall not be affected thereby.

- 8.2 This Agreement shall be in full force as of and from the date of the Notice of Award until the Project contract is closed.
- 8.3 This PLA may not be changed or modified except by the subsequent written agreement of the parties. All parties represent that they have the full legal authority to enter into this PLA. This PLA may be executed by the parties in one or more counterparts.
- 8.4 Any liability arising out of this PLA shall be several and not joint. IDOT shall not be liable to any person or other party for any violation of this PLA by any other party, and no Contractor or Union shall be liable for any violation of this PLA by any other Contractor or Union.
- 8.5 The failure or refusal of a party to exercise its rights hereunder in one or more instances shall not be deemed a waiver of any such rights in respect of a separate instance of the same or similar nature.

Addendum A

IDOT Slate of Permanent Arbitrators

1. Bruce Feldacker
2. Thomas F. Gibbons
3. Edward J. Harrick
4. Brent L. Motchan
5. Robert Perkovich
6. Byron Yaffee
7. Glenn A. Zipp

Execution Page

Illinois Department of Transportation

Omer Osman, Director of Highways

Matthew Hughes, Director Finance & Administration

Michael A. Forti, Chief Counsel

Ann L. Schneider, Secretary

(Date)

Illinois AFL-CIO Statewide Project Labor Agreement Committee, representing the Unions listed below:

(Date)

List Unions:

****RETURN WITH BID****

Exhibit A - Contractor Letter of Assent

(Date)

To All Parties:

In accordance with the terms and conditions of the contract for Construction Work on [Contract No. 60I31], this Letter of Assent hereby confirms that the undersigned Prime Contractor or Subcontractor agrees to be bound by the terms and conditions of the Project Labor Agreement established and entered into by the Illinois Department of Transportation in connection with said Project.

It is the understanding and intent of the undersigned party that this Project Labor Agreement shall pertain only to the identified Project. In the event it is necessary for the undersigned party to become signatory to a collective bargaining agreement to which it is not otherwise a party in order that it may lawfully make certain required contributions to applicable fringe benefit funds, the undersigned party hereby expressly conditions its acceptance of and limits its participation in such collective bargaining agreement to its work on the Project.

(Authorized Company Officer)

(Company)

****RETURN WITH BID****

ILLINOIS DEPARTMENT OF LABOR

PREVAILING WAGES FOR 81 D5 ; 9 COUNTY EFFECTIVE MAY 2013

The Prevailing rates of wages are included in the Contract proposals which are subject to Check Sheet #5 of the Supplemental Specifications and Recurring Special Provisions. The rates have been ascertained and certified by the Illinois Department of Labor for the locality in which the work is to be performed and for each craft or type of work or mechanic needed to execute the work of the Contract. As required by Prevailing Wage Act (820 ILCS 130/0.01, et seq.) and Check Sheet #5 of the Contract, not less than the rates of wages ascertained by the Illinois Department of Labor and as revised during the performance of a Contract shall be paid to all laborers, workers and mechanics performing work under the Contract. Post the scale of wages in a prominent and easily accessible place at the site of work.

If the Illinois Department of Labor revises the prevailing rates of wages to be paid as listed in the specification of rates, the contractor shall post the revised rates of wages and shall pay not less than the revised rates of wages. Current wage rate information shall be obtained by visiting the Illinois Department of Labor web site at <http://www.state.il.us/agency/idol/> or by calling 312-793-2814. It is the responsibility of the contractor to review the rates applicable to the work of the contract at regular intervals in order to insure the timely payment of current rates. Provision of this information to the contractor by means of the Illinois Department of Labor web site satisfies the notification of revisions by the Department to the contractor pursuant to the Act, and the contractor agrees that no additional notice is required. The contractor shall notify each of its subcontractors of the revised rates of wages.

Du Page County Prevailing Wage for May 2013

(See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	C	Base	FRMAN	M-F>8	OSA	OSH	H/W	Pensn	Vac	Trng
=====	==	===	=	=====	=====	=====	===	===	=====	=====	=====	=====
ASBESTOS ABT-GEN		ALL		36.200	36.700	1.5	1.5	2.0	12.78	9.020	0.000	0.500
ASBESTOS ABT-MEC		BLD		34.160	36.660	1.5	1.5	2.0	10.82	10.66	0.000	0.720
BOILERMAKER		BLD		43.450	47.360	2.0	2.0	2.0	6.970	14.66	0.000	0.350
BRICK MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
CARPENTER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
CEMENT MASON		ALL		38.000	40.000	2.0	1.5	2.0	8.950	16.35	0.000	0.380
CERAMIC TILE FNSHER		BLD		34.440	0.000	2.0	1.5	2.0	9.700	6.930	0.000	0.610
COMMUNICATION TECH		BLD		32.650	34.750	1.5	1.5	2.0	9.250	14.46	0.400	0.610
ELECTRIC PWR EQMT OP		ALL		36.610	49.750	1.5	1.5	2.0	5.000	11.35	0.000	0.270
ELECTRIC PWR GRNDMAN		ALL		28.310	49.750	1.5	1.5	2.0	5.000	8.780	0.000	0.210
ELECTRIC PWR LINEMAN		ALL		43.830	49.750	1.5	1.5	2.0	5.000	13.58	0.000	0.330
ELECTRIC PWR TRK DRV		ALL		29.310	49.750	1.5	1.5	2.0	5.000	9.090	0.000	0.220
ELECTRICIAN		BLD		36.200	39.820	1.5	1.5	2.0	9.250	16.27	4.380	0.680
ELEVATOR CONSTRUCTOR		BLD		49.080	55.215	2.0	2.0	2.0	11.88	12.71	3.930	0.600
FENCE ERECTOR	NE	ALL		33.740	35.740	1.5	1.5	2.0	12.61	10.18	0.000	0.250
FENCE ERECTOR	W	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
GLAZIER		BLD		39.500	41.000	1.5	2.0	2.0	11.99	14.30	0.000	0.840
HT/FROST INSULATOR		BLD		45.550	48.050	1.5	1.5	2.0	10.82	11.86	0.000	0.720
IRON WORKER	E	ALL		40.750	42.750	2.0	2.0	2.0	13.20	19.09	0.000	0.350
IRON WORKER	W	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
LABORER		ALL		36.200	36.950	1.5	1.5	2.0	12.78	9.020	0.000	0.500
LATHER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
MACHINIST		BLD		43.550	46.050	1.5	1.5	2.0	6.130	8.950	1.850	0.000
MARBLE FINISHERS		ALL		29.700	0.000	1.5	1.5	2.0	9.550	11.75	0.000	0.620
MARBLE MASON		BLD		39.880	43.870	1.5	1.5	2.0	9.550	11.75	0.000	0.730
MATERIAL TESTER I		ALL		26.200	0.000	1.5	1.5	2.0	12.78	9.020	0.000	0.500
MATERIALS TESTER II		ALL		31.200	0.000	1.5	1.5	2.0	12.78	9.020	0.000	0.500
MILLWRIGHT		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
OPERATING ENGINEER		BLD	1	45.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	2	43.800	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	3	41.250	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	4	39.500	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	5	48.850	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	6	46.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		BLD	7	48.100	49.100	2.0	2.0	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	1	43.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	2	42.750	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	3	40.700	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	4	39.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	5	38.100	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	6	46.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
OPERATING ENGINEER		HWY	7	44.300	47.300	1.5	1.5	2.0	15.70	10.55	1.900	1.250
ORNAMNTL IRON WORKER	E	ALL		41.800	44.300	2.0	2.0	2.0	12.86	15.81	0.000	0.550
ORNAMNTL IRON WORKER	W	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
PAINTER		ALL		40.880	42.880	1.5	1.5	1.5	9.650	8.200	0.000	1.250
PAINTER SIGNS		BLD		33.920	38.090	1.5	1.5	1.5	2.600	2.710	0.000	0.000
PILEDRIVER		ALL		41.520	43.520	1.5	1.5	2.0	13.19	11.75	0.000	0.530
PIPEFITTER		BLD		41.200	43.200	1.5	1.5	2.0	9.750	16.34	0.000	1.710
PLASTERER		BLD		40.080	42.480	1.5	1.5	2.0	9.550	12.30	0.000	0.990
PLUMBER		BLD		41.200	43.200	1.5	1.5	2.0	9.750	16.34	0.000	1.710
ROOFER		BLD		38.350	41.350	1.5	1.5	2.0	8.280	8.770	0.000	0.430
SHEETMETAL WORKER		BLD		42.510	44.510	1.5	1.5	2.0	10.04	12.01	0.000	0.780
SPRINKLER FITTER		BLD		49.200	51.200	1.5	1.5	2.0	10.25	8.350	0.000	0.450
STEEL ERECTOR	E	ALL		40.750	42.750	2.0	2.0	2.0	13.20	19.09	0.000	0.350
STEEL ERECTOR	W	ALL		44.950	47.200	2.0	2.0	2.0	8.890	17.69	0.000	0.400
STONE MASON		BLD		40.680	44.750	1.5	1.5	2.0	9.550	12.00	0.000	0.970
TERRAZZO FINISHER		BLD		35.510	0.000	1.5	1.5	2.0	9.700	9.320	0.000	0.400

TERRAZZO MASON	BLD	39.370	42.370	1.5	1.5	2.0	9.700	10.66	0.000	0.550
TILE MASON	BLD	41.430	45.430	2.0	1.5	2.0	9.700	8.640	0.000	0.710
TRAFFIC SAFETY WRKR	HWY	28.250	29.850	1.5	1.5	2.0	4.896	4.175	0.000	0.000
TRUCK DRIVER	ALL 1	32.550	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER	ALL 2	32.700	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER	ALL 3	32.900	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER	ALL 4	33.100	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TUCKPOINTER	BLD	40.950	41.950	1.5	1.5	2.0	8.180	10.82	0.000	0.940

Legend:

RG (Region)

TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers)

C (Class)

Base (Base Wage Rate)

FRMAN (Foreman Rate)

M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri.

OSA (Overtime (OT) is required for every hour worked on Saturday)

OSH (Overtime is required for every hour worked on Sunday and Holidays)

H/W (Health & Welfare Insurance)

Pensn (Pension)

Vac (Vacation)

Trng (Training)

Explanations

DUPAGE COUNTY

IRON WORKERS AND FENCE ERECTOR (WEST) - West of Route 53.

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

TRAFFIC SAFETY - work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary lane markings, and the installation and removal of temporary road signs.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS TECHNICIAN

Low voltage installation, maintenance and removal of telecommunication facilities (voice, sound, data and video) including telephone and data inside wire, interconnect, terminal equipment, central offices, PABX, fiber optic cable and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area networks), LAN (local area networks), and ISDN (integrated system digital network), pulling of wire in raceways, but not the installation of raceways.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand

to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under; Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Spider Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Heavy Duty Self-Propelled Transporter or Prime Mover; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Operation of Tie Back Machine; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Laser Screed; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators (remodeling or renovation work); Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 4. Bobcats and/or other Skid Steer Loaders; Oilers; and Brick

Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall.

Class 7. Mechanics; Welders.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines: ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Spider Crane; Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dredges; Elevators, Outside type Rack & Pinion and Similar Machines; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Heavy Duty Self-Propelled Transporter or Prime Mover; Hydraulic Backhoes; Backhoes with shear attachments up to 40' of boom reach; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Snow Melters; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Operation of Tieback Machine; Tractor Drawn Belt Loader; Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Traffic Barrier Transfer Machine; Trenching; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; Hydro Excavating (excluding hose work); Laser Screed; All Locomotives, Dinky; Off-Road Hauling Units (including articulating) Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper - Single/Twin Engine/Push and Pull; Scraper - Prime Mover in Tandem (Regardless of Size); Tractors pulling attachments, Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.;

Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Vacuum Trucks (excluding hose work); Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. SkidSteer Loader (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders

Class 7. Dowell Machine with Air Compressor; Gradall and machines of like nature.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing,

grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.