

If you plan to submit a bid directly to the Department of Transportation

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.

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 124INT) 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.

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.

WHAT CONSTITUTES WRITTEN AUTHORIZATION TO BID?: When a prospective prime bidder submits a "Request for Authorization to Bid/or Not For Bid Status"(BDE 124INT) 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 a **Proposal Denial and/or Authorization Form**, approved by the Central Bureau of Construction, that indicates which items have been approved For Bidding. If **Authorization to Bid** cannot be approved, the **Proposal Denial and/or Authorization Form** will indicate the reason for denial.

ABOUT AUTHORIZATION TO BID: Firms that have not received an authorization form within a reasonable time of complete and correct original document submittal should contact the department as to status. This is critical in the week before the letting. These documents must be received three days before the letting date. 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.

ADDENDA AND REVISIONS: It is the contractor'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 will be placed with the contract number. 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 server e-mails 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 (217)524-1642 or Timothy.Garman@illinois.gov.

WHAT MUST BE INCLUDED WHEN BIDS ARE SUBMITTED?: Bidders need not return the entire proposal when bids are submitted. That portion of the proposal that must be returned includes the following:

1. All documents from the Proposal Cover Sheet through the Proposal Bid Bond
2. Other special documentation and/or information that may be required by the contract special provisions

All proposal documents, including Proposal Guaranty Checks or Proposal Bid Bonds, should be stapled together to prevent loss when bids are processed by IDOT personnel.

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

WHO SHOULD BE CALLED IF ASSISTANCE IS NEEDED?

Questions Regarding	Call
Prequalification and/or Authorization to Bid	217/782-3413
Preparation and submittal of bids	217/782-7806
Mailing of plans and proposals	217/782-7806

ADDENDUMS AND REVISIONS TO THE PROPOSAL FORMS

Planholders should verify that they have received and incorporated any addendum and/or revision prior to submitting their bid. Failure by the bidder to include an addendum or revision could result in a bid being rejected as irregular.

RETURN WITH BID

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Proposal Submitted By
Name
Address
City

Letting April 3, 2009

BIDDERS NEED NOT RETURN THE ENTIRE PROPOSAL
(See instructions inside front cover)

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.
(SEE INSTRUCTIONS ON THE INSIDE OF COVER)

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



**Illinois Department
of Transportation**

Springfield, Illinois 62764

Contract No. 60371
COOK County
Section 1919.2B
Route FAI 57
Project ESP-057-7(280)356
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 _____
Checked by _____ F

(Printed by authority of the State of Illinois)

INSTRUCTIONS

ABOUT IDOT PROPOSALS: All proposals issued by IDOT are potential bidding proposals. Each proposal contains all Certifications and Affidavits, a Proposal Signature Sheet and a Proposal Bid Bond required for Prime Contractors to submit a bid after written **Authorization to Bid** has been issued by IDOT's Central Bureau of Construction.

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. To request authorization, a potential bidder must complete and submit Part B of the Request for Authorization to Bid/or Not For Bid Status form (BDE 124 INT) and submit an original Affidavit of Availability (BC 57).

WHAT CONSTITUTES WRITTEN AUTHORIZATION TO BID?: When a prospective prime bidder submits a "Request for Proposal Forms and Plans" 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 a **Proposal Denial and/or Authorization Form**, approved by the Central Bureau of Construction, that indicates which items have been approved For Bidding. If **Authorization to Bid** cannot be approved, the **Proposal Denial and/or Authorization Form** will indicate the reason for denial. If a contractor has requested to bid but has not received a **Proposal Denial and/or Authorization Form**, they should contact the Central Bureau of Construction in advance of the letting date.

WHAT MUST BE INCLUDED WHEN BIDS ARE SUBMITTED?: Bidders need not return the entire proposal when bids are submitted. That portion of the proposal that must be returned includes the following:

1. All documents from the Proposal Cover Sheet through the Proposal Bid Bond
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Preparation and submittal of bids	217/782-7806
Mailing of CD-ROMS	217/782-7806

RETURN WITH BID



PROPOSAL

TO THE DEPARTMENT OF TRANSPORTATION

1. Proposal of _____

Taxpayer Identification Number (Mandatory) _____

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

**Contract No. 60371
COOK County
Section 1919.2B
Project ESP-057-7(280)356
Route FAI 57
District 1 Construction Funds**

Deck replacement and underpass lighting for the 115th Street Bridge over I-57 and approach roadway resurfacing, intersection improvements and traffic signal modernization along I-57 in Chicago.

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.

RETURN WITH BID

3. **ASSURANCE OF EXAMINATION AND INSPECTION/WAIVER.** The undersigned further declares that he/she has carefully examined the proposal, plans, specifications, 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	\$100,000
\$5,000	to \$10,000	\$300	\$3,000,000	to	\$5,000,000	\$150,000
\$10,000	to \$50,000	\$1,000	\$5,000,000	to	\$7,500,000	\$250,000
\$50,000	to \$100,000	\$3,000	\$7,500,000	to	\$10,000,000	\$400,000
\$100,000	to \$150,000	\$5,000	\$10,000,000	to	\$15,000,000	\$500,000
\$150,000	to \$250,000	\$7,500	\$15,000,000	to	\$20,000,000	\$600,000
\$250,000	to \$500,000	\$12,500	\$20,000,000	to	\$25,000,000	\$700,000
\$500,000	to \$1,000,000	\$25,000	\$25,000,000	to	\$30,000,000	\$800,000
\$1,000,000	to \$1,500,000	\$50,000	\$30,000,000	to	\$35,000,000	\$900,000
\$1,500,000	to \$2,000,000	\$75,000	over		\$35,000,000	\$1,000,000

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. **CERTIFICATE OF AUTHORITY.** The undersigned bidder, if a business organized under the laws of another State, assures the Department that it will furnish a copy of its certificate of authority to do business in the State of Illinois with the return of the executed contract and bond. Failure to furnish the certificate within the time provided for execution of an awarded contract may be cause for cancellation of the award and forfeiture of the proposal guaranty to the State.

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
 CONTRACT
 NUMBER - 60371

State Job # - C-91-276-97
 PPS NBR - 1-74651-0100
 County Name - COOK- -
 Code - 31 - -
 District - 1 - -
 Section Number - 1919.2B

Project Number
 ESP-0577/280/356

Route
 FAI 57

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
A2005036	T-GYMNOCCLA DIOE 1-3/4	EACH	11.000				
E20200G1	V-PARTHEN QUINQ 1G	EACH	100.000				
MX030208	CON ATS 65 GALVS PVC	METER	54.000				
MX030300	CON ATS 25 GALVS PVC	METER	132.000				
MX032016	BR APP PVT CON PCC SP	SQ M	73.000				
MX032178	TEMP INFO SIGNING	SQ M	14.000				
MX032198	MA STL MONOTUBE 12.19	EACH	3.000				
MX032309	E MAN 900X1.2X1.2 F&L	EACH	1.000				
MX032313	MA STL MONOTUBE 10.70	EACH	2.000				
MX032322	ADJ EX E MAN W/600F&L	EACH	6.000				
MX032324	MA STL MONOTUBE 9.10	EACH	1.000				
MX032634	PVC CON T 3-75 S80	METER	25.000				
MX032680	WEED CONTR PRE-EM GRN	KG	14.000				
MX032750	MA STL ST LT 3.66	EACH	2.000				
MX032760	ELEC HH 760D W/600F&L	EACH	2.000				

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MX032767	CONCRETE FOUND 500	METER	1.500				
MX032985	VIDEO TAPE STORM SEW	METER	698.000				
MX033100	REM ASB CEM CONDUIT	METER	228.000				
MX033364	TR & BKFIL 2-4 DUCTS	METER	82.000				
MX033367	PVC CON T 2-75 S80	METER	10.000				
MX033468	SS D I T2 200	METER	36.000				
MX033694	STR REP CON DP =< 125	SQ M	43.000				
MX033763	ELCBL C SIGNAL 12 10C	METER	140.000				
MX033764	ROD & CL DUCT EX COND	METER	440.000				
MX033765	LPS10.5MH 3.65M3 279D	EACH	1.000				
MX033766	MA STL ST LT 2.40	EACH	3.000				
MX033767	WET TEM PM TAP T3 L&S	SQ M	11.000				
MX703200	WET TEMP PM TAPE T3	METER	3,457.000				
MX830101	LPS10.5MH 3.65M7 254D	EACH	2.000				
MX830104	LPS10.5MH 3.65M3 318D	EACH	5.000				

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MX870010	ECA C EPRTC 2C 6 #8G	METER	627.000				
MZ037300	PAVT GROOVING	SQ M	103.000				
M2011000	TEMPORARY FENCE	METER	436.000				
M2011350	TREE PRUN OVER 250	EACH	3.000				
M2011700	SUPPLE WATERING	UNIT	8.000				
M2020010	EARTH EXCAVATION	CU M	65.000				
M2070400	POROUS GRAN EMB SPEC	CU M	86.000				
M2080150	TRENCH BACKFILL	CU M	15.000				
M2113100	TOPSOIL F & P 100	SQ M	132.000				
M2500210	SEEDING CL 2A	HA	0.100				
M2500400	NITROGEN FERT NUTR	KG	5.000				
M2500500	PHOSPHORUS FERT NUTR	KG	5.000				
M2500600	POTASSIUM FERT NUTR	KG	5.000				
M2510630	EROSION CONTR BLANKET	SQ M	333.000				
M2520110	SODDING SALT TOLERANT	SQ M	132.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
SCHEDULE OF PRICES
CONTRACT
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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
M2800250	TEMP EROS CONTR SEED	KG	4.000				
M2800400	PERIMETER EROS BAR	METER	338.000				
M3111100	SUB GRAN MAT B 100	SQ M	12.000				
M3530230	PCC BSE CSE 230	SQ M	12.000				
M4030200	BIT MATLS PR CT	M TON	1.700				
M4060300	AGG PR CT	M TON	11.000				
M4060400	MIX CR JTS FLANGEWYS	M TON	1.200				
M4060982	HMA SURF REM BUTT JT	SQ M	98.000				
M4060990	TEMPORARY RAMP	SQ M	164.000				
M4061005	HMA REPL OVER PATCH	M TON	21.000				
M4062135	LEV BIND MM N70	M TON	215.000				
M4063085	HMA BC IL-19.0 N70	M TON	223.000				
M4063340	HMA SC "D" N70	M TON	328.000				
M4200260	PCC PVT 260	SQ M	103.000				
M4205050	BR APPROACH PAVT SPL	SQ M	366.000				

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M4230200	PCC DRIVEWAY PAVT 200	SQ M	108.000				
M4240125	PC CONC SIDEWALK 125	SQ M	659.000				
M4245000	TEMP SIDEWALK	SQ M	109.000				
M4248000	DETECTABLE WARNINGS	SQ M	43.000				
M4400760	HMA SURF REM 60	SQ M	3,272.000				
M4401160	HMA RM OV PATCH 60	SQ M	232.000				
M4402000	PAVEMENT REM	SQ M	285.000				
M4402010	DRIVE PAVEMENT REM	SQ M	108.000				
M4402040	COMB CURB GUTTER REM	METER	416.000				
M4402050	SIDEWALK REM	SQ M	500.000				
M4402060	APPROACH SLAB REM	SQ M	234.000				
M4427020	CL C PATCH T1 225	SQ M	85.000				
M4427220	CL C PATCH T2 225	SQ M	69.000				
M4427320	CL C PATCH T3 225	SQ M	78.000				
M4430020	STRIP REF CR CON TR	METER	795.000				

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M5010240	CONC REM	CU M	30.300				
M5010570	PROTECTIVE SHIELD	SQ M	1,475.000				
M5020100	STRUCTURE EXCAVATION	CU M	136.000				
M5030350	CONC STRUCT	CU M	24.800				
M5030360	CONC SUP-STR	CU M	477.700				
M5030390	BR DECK GROOVING	SQ M	1,087.000				
M5030450	PROTECTIVE COAT	SQ M	2,218.000				
M5050405	F & E STRUCT STEEL	KG	6,520.000				
M5050410	STRUCT STEEL REMOV	KG	3,140.000				
M5080205	REINF BARS, EPOXY CTD	KG	56,600.000				
M5090520	BRIDGE FENCE RAILING	METER	145.500				
M5120900	TEMP SHT PILING	SQ M	28.400				
M5200225	PREF JT STRIP SEAL	METER	50.900				
M5504800	SS CLEANED	METER	698.000				
M5870300	CONCRETE SEALER	SQ M	37.000				

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M5900200	EPOXY CRACK INJECTION	METER	70.000				
M6060070	CONC CURB TB	METER	24.000				
M6060500	COMB CC&G TB15.30	METER	398.000				
M7030100	SHORT-TERM PAVT MKING	METER	176.000				
M7030210	TEMP PVT MK LTR & SYM	SQ M	8.000				
M7030220	TEMP PVT MK LINE 100	METER	964.000				
M7030240	TEMP PVT MK LINE 150	METER	61.000				
M7030270	TEMP PVT MK LINE 400	METER	12.000				
M7030280	TEMP PVT MK LINE 600	METER	50.000				
M7031000	WORK ZONE PAVT MK REM	SQ M	397.000				
M7040100	TEMP CONC BARRIER	METER	253.150				
M7040200	REL TEMP CONC BARRIER	METER	81.000				
M7800100	THPL PVT MK LTR & SYM	SQ M	1.000				
M7800105	THPL PVT MK LINE 100	METER	1,194.000				
M7800115	THPL PVT MK LINE 150	METER	191.000				

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M7800125	THPL PVT MK LINE 300	METER	61.000				
M7800130	THPL PVT MK LINE 400	METER	25.000				
M7800140	THPL PVT MK LINE 600	METER	55.000				
M7802000	POLYUREA PM T1 LTR&SY	SQ M	7.000				
M7802010	POLYUREA PM T1 LN 100	METER	313.000				
M7802015	POLYUREA PM T1 LN 150	METER	57.000				
M7802030	POLYUREA PM T1 LN 300	METER	65.000				
M7802060	POLYUREA PM T1 LN 600	METER	20.000				
M7830100	PAVT MARKING REMOVAL	SQ M	160.000				
M8080110	TEMP WP 12.19 CL4	EACH	2.000				
M8100070	CON T 65 GALVS	METER	73.000				
M8100260	CON T 50 PVC	METER	168.000				
M8100280	CON T 75 PVC	METER	17.500				
M8120230	CON EMB STR 50 PVC	METER	160.000				
M8130120	JBX SS AS 150X150X100	EACH	8.000				

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M8130185	JBX SS AS 300X250X150	EACH	4.000				
M8130220	JBX SS AS 400X300X150	EACH	4.000				
M8130645	JBX CI AS 250X250X150	EACH	4.000				
M8160400	UD 3#4 #6G EPRRHW 30	METER	150.000				
M8170415	EC C EPR RHW 1C 6	METER	56.000				
M8170425	EC C EPR RHW 1C 10	METER	483.000				
M8170435	EC C EPR RHW 2-1C 2	METER	80.000				
M8170470	EC C EPR RHW 3-1C 4	METER	56.000				
M8170820	EC C EPR USE 3-1C 2/0	METER	157.000				
M8180120	A CBL 3-1C2 MESS WIRE	METER	215.000				
M8180240	A CBL 4-1C8 MESS WIRE	METER	135.000				
M8190200	TR & BKFIL F ELECT WK	METER	140.000				
M8190302	TR & BKFIL W SCRNSND	METER	123.000				
M8360100	LIGHT POLE FDN 600	METER	8.400				
M8360200	LIGHT POLE FDN 750	METER	19.500				

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Route
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Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
M8731185	ELCBL C SIGNAL 12 19C	METER	307.000				
M8780500	CONC FDN SPL	METER	3.000				
M8950230	REM ELCBL FR CON	METER	800.000				
XX002293	REM RE OH SN BR MT	EACH	2.000				
XX005656	INLET FILTER CLEANING	EACH	16.000				
X0320564	SSPTC40C24IAI4CYSSTBC	EACH	2.000				
X0322424	TEMP UP LT INST/REMOV	L SUM	1.000				
X0322425	C BRK 1P 70/480 EXCT	EACH	2.000				
X0323574	MAINTAIN LIGHTING SYS	CAL MO	9.000				
X0324571	MAINT ST LTG SYS CHGO	L SUM	1.000				
X0324893	BREAKDOWN HAND/MAN	EACH	3.000				
X0329863	INTERCEPT EX CONDUIT	EACH	3.000				
X0329867	INST L P MA&L MAT PCC	EACH	6.000				
X0329888	REM EX ST LIGHT EQUIP	L SUM	1.000				
X0966500	SN MES ELEC ILLUM MAM	EACH	4.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
 CONTRACT
 NUMBER - 60371

State Job # - C-91-276-97
 PPS NBR - 1-74651-0100
 County Name - COOK- -
 Code - 31 - -
 District - 1 - -
 Section Number - 1919.2B

Project Number
 ESP-0577/280/356

Route
 FAI 57

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
X0966600	SN MESS ELEC ILLUM BM	EACH	4.000				
X0966705	JBX POLE/POST MT SPL	EACH	8.000				
X4022000	TEMP ACCESS- COM ENT	EACH	4.000				
X4023000	TEMP ACCESS- ROAD	EACH	1.000				
X6040220	FR & LIDS T1 OL CHGO	EACH	1.000				
X7011015	TR C-PROT EXPRESSWAYS	L SUM	1.000				
X8040100	ELECT CONN TO SIN STR	EACH	2.000				
X8210451	LUM SL HPS 400W 240V	EACH	11.000				
X8210454	LUM SL HPS 195W 240V	EACH	2.000				
X8950090	RELOC EX LIGHT CONTR	EACH	1.000				
Z0013798	CONSTRUCTION LAYOUT	L SUM	1.000				
Z0018500	DRAINAGE STR CLEANED	EACH	19.000				
Z0018940	DRILL EX MAN/HANDHOLE	EACH	1.000				
Z0030250	IMP ATTN TEMP NRD TL3	EACH	4.000				
Z0030350	IMP ATTN REL NRD TL3	EACH	2.000				

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Route
 FAI 57

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
Z0048665	RR PROT LIABILITY INS	L SUM	1.000				
Z0076600	TRAINEES	HOUR	1,000.000		0.800		800.000
20101200	TREE ROOT PRUNING	EACH	2.000				
28000510	INLET FILTERS	EACH	8.000				
50104720	REM EXIST CONC DECK	EACH	1.000				
50500715	JACK & REM EX BEARING	EACH	28.000				
50800515	BAR SPLICERS	EACH	714.000				
51500100	NAME PLATES	EACH	1.000				
52100010	ELAST BEARING ASSY T1	EACH	28.000				
60300305	FR & LIDS ADJUST	EACH	26.000				
60300310	FR & LIDS ADJUST SPL	EACH	15.000				
67000400	ENGR FIELD OFFICE A	CAL MO	12.000				
67100100	MOBILIZATION	L SUM	1.000				
70101800	TRAF CONT & PROT SPL	L SUM	1.000				
70103815	TR CONT SURVEILLANCE	CAL DA	100.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
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Route
 FAI 57

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
70106800	CHANGEABLE MESSAGE SN	CAL MO	4.000				
82107200	UNDERPAS LUM 100W HPS	EACH	8.000				
82107300	UNDERPAS LUM 150W HPS	EACH	8.000				
84200600	REM EX LT U NO SALV	EACH	12.000				
84400105	RELOC EX LT UNIT	EACH	3.000				
88010180	SH A 1F 3S BM	EACH	4.000				
88010190	SH A 1F 3S MAM	EACH	10.000				
88010220	SH A 1F 4S BM	EACH	2.000				
88010230	SH A 1F 4S MAM	EACH	2.000				
88100200	PED SH 1F BM	EACH	12.000				
89000100	TEMP TR SIG INSTALL	EACH	2.000				
89502375	REMOV EX TS EQUIP	EACH	2.000				
89502385	REMOV EX CONC FDN	EACH	5.000				

CONTRACT NUMBER 60371

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 Illinois Procurement Code establishes the duty of all State chief procurement officers, State purchasing officers, 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. By execution of the Proposal Signature Sheet, the bidder indicates that each of the mandated assurances has 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 termination of the contract and the suspension or debarment of the bidder.

II. ASSURANCES

A. 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. The Department may terminate the contract if it is later determined that the bidder rendered a false or erroneous assurance, and the surety providing the performance bond shall be responsible for the completion of the contract.

B. Felons

1. The Illinois Procurement 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 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. The bidder assures the Department that the award and execution of the contract would not cause a violation of Section 50-10.

C. Conflicts of Interest

1. The Illinois Procurement 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.

D. Negotiations

1. The Illinois Procurement 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.

E. Inducements

1. The Illinois Procurement 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.

F. Revolving Door Prohibition

1. The Illinois Procurement Code provides:

Section 50-30. Revolving door prohibition. Chief procurement officers, associate procurement officers, State purchasing officers, 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.

G. Reporting Anticompetitive Practices

1. The Illinois Procurement Code provides:

Section 50-40. Reporting anticompetitive practices. When, for any reason, any vendor, bidder, contractor, chief procurement officer, State purchasing officer, 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 chief procurement officer.

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.

H. Confidentiality

1. The Illinois Procurement Code provides:

Section 50-45. Confidentiality. Any chief procurement officer, State purchasing officer, 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

I. Insider Information

1. The Illinois Procurement Act 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

A. 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. The Department may terminate the contract if it is later determined that the bidder rendered a false or erroneous certification, and the surety providing the performance bond shall be responsible for completion of the contract.

B. Bribery

1. The Illinois Procurement 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 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, 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 shall contain a certification by the contractor that the contractor is not barred from being awarded a contract or subcontract under this Section. A contractor who makes a false statement, material to the certification, commits a Class 3 felony.

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

C. 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.

D. 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.

RETURN WITH BID

(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.

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.

E. 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.

F. 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

G. Debt Delinquency

1. The Illinois Procurement Code provides:

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

The contractor or bidder certifies that it, or any affiliate, is not barred from being awarded a contract under 30 ILCS 500. Section 50-11 prohibits a person from entering into a contract with a State agency 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 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 contractor further acknowledges that the contracting State agency may declare the contract void if this certification is false or if the contractor, or any affiliate, is determined to be delinquent in the payment of any debt to the State during the term of the contract.

H. Sarbanes-Oxley Act of 2002

1. The Illinois Procurement Code, Section 50-60(c), provides:

The contractor 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 for a period of five years prior to the date of the bid or contract. The contractor acknowledges that the contracting agency shall declare the contract void if this certification is false.

I. Addenda

The contractor or bidder certifies that all relevant addenda have been incorporated in to this contract. Failure to do so may cause the bid to be declared unacceptable.

J. Section 42 of the Environmental Protection Act

The contractor certifies in accordance with 30 ILCS 500/50-12 that the bidder or contractor is not barred from being awarded a contract under this Section which prohibits the bidding on or entering into contracts with the State of Illinois or a State agency 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 contractor acknowledges that the contracting agency may declare the contract void if this certification is false.

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

In accordance with the provisions of Section 30-22 (6) of the Illinois Procurement 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.**

NA - FEDERAL

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.

L. Executive Order Number 1 (2007) Regarding Lobbying on Government Procurements

The bidder hereby warrants and certifies that they have complied and will comply with the requirements set forth in this Order. The requirements of this warrant and certification are a material part of the contract, and the contractor shall require this warrant and certification provision to be included in all approved subcontracts.

RETURN WITH BID

M. Disclosure of Business Operations in Iran

Public Act 95-0616 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, offer or, 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 Act.

Failure to make the disclosure required by the Act 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.

N. Registration with the State Board of Elections.

Public Act 95-0971, amending the Illinois Procurement Code, 30 ILCS 500, adding new sections 20-160 and 50-37, and Executive Order 3 (2008) establish new requirements affecting contributions that contractors, consultants, vendors and bidders, including affiliated persons and entities, may make to state officeholders, declared candidates for state offices and political organizations established to benefit such officeholders and candidates. These provisions do not apply to federal-aid contracts.

By submission of a bid, the bidder acknowledges and agrees that it has read and understands the requirements of PA 95-0971 and Executive Order 3 (2008), including but not limited to, all reporting requirements and all restrictions on soliciting and making contributions to state officeholders, declared candidates for state offices and covered political organizations that promote the candidacy of an officeholder or declared candidate for office. In addition, the bidder makes the following certifications:

- (1) As to Executive Order 3 (2008), the bidder certifies that no contribution will be made that would violate the order, and that the bidder will report all contributions as required by the order.
- (2) As to PA 95-0971, the bidder shall check either of the following certifications that apply:

The bidder is not required to register as a business entity with the State Board of Elections.

The bidder has registered as a business entity with the State Board of Elections, and acknowledges a continuing duty to update the registration as required the Act. **A copy of the time-stamped certificate of registration is enclosed with the bid. The Department will not award this contract without the submission of a certificate of registration.**

In accordance with Article 101.09 of the Standard Specifications for Road and Bridge Construction, this certification shall be part of the contract. Compliance with PA 95-0971 and Executive Order 3 (2008) is a material part of the contract and any breach shall be cause to void the contract under Section 50-60 of the Illinois Procurement Code.

TO BE RETURNED 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 Department may terminate the contract if it is later determined that the bidder rendered a false or erroneous disclosure, 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 Illinois Procurement Code provides that all bids of more than \$10,000 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.

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 400 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.

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. Subject individuals should be covered each by one form. In addition, a second form (Disclosure Form B) provides for the disclosure of current or pending procurement relationships with other (non-IDOT) state agencies. **The forms must be included with each bid or incorporated by reference.**

C. Disclosure Form Instructions

Form A: For bidders that have previously submitted the information requested in Form A

The Department has retained the Form A disclosures submitted by all bidders responding to these requirements for the April 24, 1998 or any subsequent letting conducted by the Department. The bidder has the option of submitting the information again or the bidder may check the following certification statement indicating that the information previously submitted by the bidder is, as of the date of submission, current and accurate. Before checking this certification, the bidder should carefully review its prior submissions to ensure the Certification is correct. If the Bidder checks the Certification, the Bidder should proceed to Form B instructions.

CERTIFICATION STATEMENT

I have determined that the Form A disclosure information previously submitted is current and accurate, and all forms are hereby incorporated by reference in this bid. Any necessary additional forms or amendments to previously submitted forms are attached to this bid.

(Bidding Company)



Signature of Authorized Representative

Date

Form A: For bidders who have NOT previously submitted the information requested in Form A

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 400 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 the second page of 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 \$102,600.00? YES ___ NO ___
3. Does anyone in your organization receive more than \$106,447.20 of the bidding entity's or parent entity's distributive income? (Note: Distributive income is, for these purposes, any type of distribution of profits. An annual salary is not distributive income.) YES ___ NO ___
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 \$106,447.20? 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 on page 2 of Form A must be signed and dated by a person that is authorized to execute contracts for your company.

Form B: 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.

D. Bidders Submitting More Than One Bid

Bidders submitting multiple bids may submit one set of forms consisting of all required Form A disclosures and one Form B for use with all bids. Please indicate in the space provided below the bid item that contains the original disclosure forms and the bid items which incorporate the forms by reference.

- The bid submitted for letting item _____ contains the Form A disclosures or Certification Statement and the Form B disclosures. The following letting items incorporate the said forms by reference:

RETURN WITH BID/OFFER

**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 Illinois Procurement 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 \$10,000, 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.**

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 \$106,447.20 (60% of the Governor's salary as of 3/1/09). **(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 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 \$106,447.20, (60% of the Governor's salary as of 3/1/09) provide the name the State agency for which you are employed and your annual salary. _____

RETURN WITH BID/OFFER

- 3. If you are currently appointed to or employed by any agency of the State of Illinois, and your annual salary exceeds \$106,447.20, (60% of the Governor's salary as of 3/1/09) 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 the 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 \$106,447.20, (60% of the Governor's salary as of 3/1/09) are you and your spouse or minor children entitled to receive (i) more than 15% in aggregate of the total distributable income of your firm, partnership, association or corporation, or (ii) an amount in excess of 2 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 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 \$106,447.20, (60% of the Governor's salary as of 3/1/09) provide the name of the 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 \$106,447.20.00, (60% of the salary of the Governor as of 3/1/09) 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 the 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 \$106,447.20, (60% of the Governor's salary as of 3/1/09) are you and your spouse or any minor children entitled to receive (i) more than 15% in the aggregate of the total distributable income from your firm, partnership, association or corporation, or (ii) an amount in excess of 2 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 State 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/OFFER

(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 ___

APPLICABLE STATEMENT

This Disclosure Form A is submitted on behalf of the INDIVIDUAL named on previous page.

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

NOT APPLICABLE STATEMENT

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

RETURN WITH BID/OFFER

**ILLINOIS DEPARTMENT
OF TRANSPORTATION**

**Form B
Other Contracts &
Procurement 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 Illinois Procurement Act (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 \$10,000, 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

<input type="checkbox"/>	_____	_____
	Signature of Authorized Representative	Date

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. 60371
COOK County
Section 1919.2B
Project ESP-057-7(280)356
Route FAI 57
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.		APPREN-TICES		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								

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

BC 1256 (Rev. 12/11/08)

Note: See instructions on page 2

RETURN WITH BID

**Contract No. 60371
COOK County
Section 1919.2B
Project ESP-057-7(280)356
Route FAI 57
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 only 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

ADDITIONAL FEDERAL REQUIREMENTS

In addition to the Required Contract Provisions for Federal-Aid Construction Contracts (FHWA 1273), all bidders make the following certifications.

- A. By the execution of this proposal, the signing bidder certifies that the bidding entity has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action, in restraint of free competitive bidding in connection with the submitted bid. This statement made by the undersigned bidder is true and correct under penalty of perjury under the laws of the United States.
- B. CERTIFICATION, EQUAL EMPLOYMENT OPPORTUNITY:
1. Have you participated in any previous contracts or subcontracts subject to the equal opportunity clause. YES _____ NO _____
 2. If answer to #1 is yes, have you filed with the Joint Reporting Committee, the Director of OFCC, any Federal agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements of those organizations?
YES _____ NO _____

RETURN WITH BID

**Contract No. 60371
COOK County
Section 1919.2B
Project ESP-057-7(280)356
Route FAI 57
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.

(IF AN INDIVIDUAL) Firm Name _____
Signature of Owner _____
Business Address _____

(IF A CO-PARTNERSHIP) Firm Name _____
By _____
Business Address _____
Name and Address of All Members of the Firm: _____

(IF A CORPORATION) Corporate Name _____
By _____
Signature of Authorized Representative _____
Typed or printed name and title of Authorized Representative _____

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

(IF A JOINT VENTURE) Corporate Name _____
By _____
Signature of Authorized Representative _____
Typed or printed name and title of Authorized Representative _____

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 Article 102.09 of the "Standard Specifications for Road and Bridge Construction" in effect on the date of 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

(Company Name) (Company Name)

By _____ By: _____
(Signature & Title) (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 _____



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. 60371
COOK County
Section 1919.2B
Project ESP-057-7(280)356
Route FAI 57
District 1 Construction Funds**



Illinois Department of Transportation



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., April 3, 2009. 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. 60371
COOK County
Section 1919.2B
Project ESP-057-7(280)356
Route FAI 57
District 1 Construction Funds**

Deck replacement and underpass lighting for the 115th Street Bridge over I-57 and approach roadway resurfacing, intersection improvements and traffic signal modernization along I-57 in Chicago.

- 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

Gary Hannig,
Acting Secretary

INDEX
 FOR
 SUPPLEMENTAL SPECIFICATIONS
 AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2009

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS and frequently used RECURRING SPECIAL PROVISIONS.

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 1-1-07) (Revised 1-1-09)

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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, 2007,; the latest edition of the "Illinois 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 F.A.I. Route 57 (I-57 @ 115th Street), Project ESP-057-7 (280) 356, Section 1919.2B in Cook County, and in the case of conflict with any part or parts of said specifications, the said Special Provisions shall take precedence and govern.

F.A.I Route 57 (I-57 @115th Street)
Project ESP-507-7 (280) 356
State Section Number: 1919.2B
County: Cook
Contract Number: 60371

LOCATION OF PROJECT

This project begins at a point on the centerline of FAU Route 1584 (115th Street), approximately 4.18 km southwest of Illinois Route 1 (Halsted Street), within Cook County, in Calumet Township, located in the City of Chicago. The project extends approximately 156 meters east and 122 meters west of FAI 57. The gross length of the project is 278 meters.

DESCRIPTION OF PROJECT

The project consists of the removal and replacement of the concrete deck of the 115th Street Bridge over FAI 57, and bearing replacement with rehabilitation of the substructure. The proposed typical bridge cross section consists of two 3.3 meter lanes in each direction, one 3.3 meter shared turn lane and two 1.75 meter shoulders. The existing and proposed deck will measure 25.30 meters out-to-out. There will be associated roadway resurfacing of the intersection at 115th Street and Marshfield Avenue and the intersection at 115th Street and Ashland Avenue. The work to be performed under this contract consists of removal and replacement of the existing concrete deck in stages, cleaning and painting the existing steel superstructure, replacement of the existing bearings with elastomeric bearings, substructure repairs, replacement of the approach roadways, existing pavement widening and resurfacing, reconstruction of the curb and gutter and sidewalks, modernization of the traffic signals and underpass lighting and all incidental and collateral work necessary to complete the project as shown on the plans and specified herein.

BUREAU OF DESIGN SPECIAL PROVISIONS

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

Effective: January 30, 1987
 Revised: July 1, 1994

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

<u>Name of Utility</u>	<u>Type</u>	<u>Station</u>	<u>Estimated Dates for Start and Completion of Relocation or Adjustments</u>	
Commonwealth Edison	Hanging Duct	Bridge	During Construction	
	Manhole	2+288.7, 7.0m LT	During Construction	By ComEd
	Manhole	2+318.0, 5.3m RT	During Construction	By ComEd
	Manhole	2+437.0, 5.8m RT	During Construction	By ComEd
	Manhole	2+474.8, 8.3m RT	During Construction	By ComEd
	Manhole	2+476.6, 9.8m LT	During Construction	By ComEd
	NICOR	Valve	2+325.2, 5.9m RT	During Construction	By Nicor
Valve		2+485.6, 7.9m LT	During Construction	By Nicor

City of Chicago -
 Electric

Hanging Duct	Bridge	During Construction	By Contractor
Manhole	2+325.9,12.2m LT	During Construction	By Contractor
Manhole	2+327.5,10.1m RT	During Construction	By Contractor
Manhole	2+346.3,10.5m LT	During Construction	By Contractor
Manhole	2+347.1,11.6m RT	During Construction	By Contractor
Manhole	2+419.2,10.6m LT	During Construction	By Contractor
Manhole	2+419.6,10.3m RT	During Construction	By Contractor
Manhole	2+439.5,12.5m LT	During Construction	By Contractor
Manhole	2+441.7,11.7m RT	During Construction	By Contractor

City of Chicago –
 Water

Hydrant	2+330.7,16.9m LT	During Construction	By City of Chicago
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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.

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.

COMPLETION DATE PLUS WORKING DAYS

Effective: September 30, 1985

Revised: January 1, 2007

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

"When a completion date plus working days is specified, the Contractor shall complete all contract items and safely open all roadways to traffic by 11:59 PM on, October 30, 2009 except as specified herein.

The Contractor will be allowed to complete all clean-up work and punch list items within 5 working days after the completion date for opening the roadway to traffic. Under extenuating circumstances the Engineer may direct that certain items of work, not affecting the safe opening of the roadway to traffic, may be completed within the working days allowed for clean up work and punch list items. Temporary lane closures for this work may be allowed at the discretion of the Engineer.

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

RECLAIMED ASPHALT PAVEMENT FOR NON-POROUS EMBANKMENT AND BACKFILL

Effective: April 1, 2001

Revised: January 1, 2007

Add the following sentence to Article 1004.05 (a) of the Standard Specifications:

"Reclaimed Asphalt Pavement (RAP) may be used as aggregate in Non-porous Granular Embankment and Backfill. The Rap material shall be reclaimed asphalt pavement material resulting from the cold milling or crushing of an existing hot-mix bituminous concrete pavement structure, including shoulders. RAP containing contaminants such as earth, brick, concrete, sheet asphalt, sand, or other materials identified by the Department will be unacceptable until the contaminants are thoroughly removed.

Add the following sentence to Article 1004.05 (c)(2) of the Standard Specifications:

"One hundred percent of the RAP when used shall pass the 3 inch (75 mm) sieve. The RAP shall be well graded from coarse to fine. RAP that is gap-graded or single-sized will not be accepted."

AGGREGATE SURFACE COURSE FOR TEMPORARY ACCESS

Effective: April 1, 2001

Revised: January 2, 2007

Revise Article 402.10 of the Standard Specifications to read:

"**402.10 For Temporary Access.** The contractor shall construct and maintain aggregate surface course for temporary access to private entrances, commercial entrances and roads according to Article 402.07 and as directed by the Engineer.

The aggregate surface course shall be constructed to the dimensions and grades specified below, except as modified by the plans or as directed by the Engineer.

- (a) Private Entrance. The minimum width shall be 12 ft (3.6 m). The minimum compacted thickness shall be 6 in. (150 mm). The maximum grade shall be eight percent, except as required to match the existing grade.
- (b) Commercial Entrance. The minimum width shall be 24 ft (7.2 m). The minimum compacted thickness shall be 9 in. (230 mm). The maximum grade shall be six percent, except as required to match the existing grade.
- (c) Road. The minimum width shall be 24 ft (7.2 m). The minimum compacted thickness shall be 9 in. (230 mm). The grade and elevation shall be the same as the removed pavement, except as required to meet the grade of any new pavement constructed.

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

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

Add the following to Article 402.12 of the Standard Specifications:

"Aggregate surface course for temporary access will be measured for payment as each for every private entrance, commercial entrance or road constructed for the purpose of temporary access. If a residential drive, commercial entrance, or road is to be constructed under multiple stages, the aggregate needed to construct the second or subsequent stages will not be measured for payment but shall be included in the cost per each of the type specified."

Revise the second paragraph of Article 402.13 of the Standard Specifications to read:

"Aggregate surface course for temporary access will be paid for at the contract unit price per each for TEMPORARY ACCESS (PRIVATE ENTRANCE), TEMPORARY ACCESS (COMMERCIAL ENTRANCE) or TEMPORARY ACCESS (ROAD).

Partial payment of the each amount bid for temporary access, of the type specified, will be paid according to the following schedule:

- (a) Upon construction of the temporary access, sixty percent of the contract unit price per each, of the type constructed, will be paid.
- (b) Subject to the approval of the Engineer for the adequate maintenance and removal of the temporary access, the remaining forty percent of the pay item will be paid upon the permanent removal of the temporary access."

STORM SEWER ADJACENT TO OR CROSSING WATER MAIN

Effective: February 1, 1996

Revised: January 1, 2007

This work consists of constructing storm sewer adjacent to or crossing a water main, at the locations shown on the plans. The material and installation requirements shall be according to the latest edition of the "Standard Specifications for Water and Sewer Main Construction in Illinois", and the applicable portions of Section 550 of the Standard Specifications; which may include concrete collars and encasing pipe with seals if required.

Pipe materials shall meet the requirements of Sections 40 and 41-2.01 of the "Standard Specifications for Water and Sewer Main Construction in Illinois", except PVC pipe will not be allowed. Ductile-Iron pipe shall meet the minimum requirements for Thickness Class 50.

Encasing of standard type storm sewer, according to the details for "Water and Sewer Separation Requirements (Vertical Separation)" in the "STANDARD DRAWINGS" Division of the "Standard Specifications for Water and Sewer Main Construction in Illinois", may be used for storm sewers crossing water mains.

Basis of Payment: This work will be paid according to Article 550.10 of the Standard Specifications, except the pay item shall be STORM SEWER (WATER MAIN REQUIREMENTS), of the diameter specified.

BACKFILLING STORM SEWER UNDER ROADWAY

Effective: September 30, 1985

Revised: July 2, 1994

For storm sewer constructed under the roadway, backfilling methods two and three authorized under the provisions of Article 550.07 will not be allowed.

STORM SEWERS AND SEWER CONNECTIONS TO CITY OF CHICAGO SEWERS

Created: September 30, 1985

Revised: January 1, 2007

This work consists of constructing storm sewers or sewer connections to City of Chicago sewers, in accordance with Section 550 of the Standard Specifications and the details shown in the plans at the locations shown on the plans.

All storm sewers and sewer connections 21 inches (525 mm) in diameter and smaller shall be best quality tile socket pipe conforming to the specifications for Extra Strength Clay Pipe, ASTM C 700, except as otherwise specified on the plans. Sewer pipes shall be gasketed in such a manner as to produce a compression type joint conforming to the requirements of ASTM C 425.

All storm sewer 24 inches (600 mm) in diameter or larger shall be reinforced concrete pipe conforming to the requirements of C-76, Class-III, wall "B" with "O-Ring" joints. Joints for catch basin and inlet connections shall be packed with oakum, caulked and beveled off with portland cement mortar.

Basis of Payment. This work will be measured and paid for at the contract unit price per foot (meter) for STORM SEWER in accordance with Articles 550.09 and 550.10 of the Standard Specifications.

CLEANING EXISTING DRAINAGE STRUCTURES

Effective: September 30, 1985

Revised: January 1, 2007

All existing storm sewers, pipe culverts, manholes, catch basins and inlets shall be considered as drainage structures insofar as the interpretation of this Special Provision is concerned. When specified for payment, the location of drainage structures to be cleaned will be shown on the plans.

All existing drainage structures which are to be adjusted or reconstructed shall be cleaned in accordance with Article 602.15. This work will be paid for in accordance with Article 602.16.

All other existing drainage structures which are specified to be cleaned on the plans will be cleaned according to Article 602.15.

Basis of Payment. This work will be paid for at the contract unit price each for DRAINAGE STRUCTURES TO BE CLEANED, and at the contract unit price per foot (meter) for STORM SEWERS TO BE CLEANED.

FRAMES AND LIDS TO BE ADJUSTED (SPECIAL)

Effective: August 1, 1995

Revised: November 1, 1996

Add the following to Article 603.09 of the Standard Specifications:

"Removing frames and lids on drainage and utility structures in the pavement prior to milling, and adjusting to final grade prior to placing the surface course, will be paid for at the contract unit price each for FRAMES AND LIDS TO BE ADJUSTED (SPECIAL).

This work will not be paid for when drainage and utility structures are specified for payment as structure reconstruction."

WORK ZONE TRAFFIC CONTROL (LUMP SUM PAYMENT)

Effective: February 1, 1996

Revised: January 1, 2007

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.

Method of Measurement: All traffic control (except traffic control pavement marking) indicated on the traffic control plan details and specified in the Special Provisions will be measured for payment on a lump sum basis. Traffic control pavement markings will be measured per foot (meter).

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

SHORT TERM PAVEMENT MARKING, TEMPORARY PAVEMENT MARKING and PAVEMENT MARKING TAPE TYPE III will be paid for separately.

TRAFFIC CONTROL PLAN

Effective: September 30, 1985

Revised: January 1, 2007

Traffic Control shall be according to the applicable sections of the Standard Specifications, the Supplemental Specifications, the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways", any special details and 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	701106	701301	701306	701321	701400
701401					
701411	701446	701501	701601	701606	701701
701801					
701901					

DETAILS:

TC-8	TC-9	TC-10	TC-14	TC-16	TC-17
TC-22					
TC-23	TC-24				

SPECIAL PROVISIONS:

- Maintenance of Roadways
- Work Zone Traffic Control (Lump Sum Payment)
- Traffic Control Plan
- Type III Temporary Tape for Wet Conditions
- Keeping the Expressway Open to Traffic
- Failure to open Traffic Lanes to Traffic
- Traffic Control and Protection (Expressways)
- Temporary Information Signing
- Work Zone Traffic Control and Protection
- Work Zone Public Information Signs
- Notification of Reduced Width
- Personal Protective Equipment
- Reflective Sheeting on Channelizing Devices

EPOXY COATING ON REINFORCEMENT (DISTRICT ONE)

Effective: January 1, 2007

For work outside the limits of bridge approach pavement, all references in the Highway Standards and Standard Specifications for reinforcement, dowel bars, tie bars and chair supports for pavement, shoulders, curb, gutter, combination curb and gutter and median shall be epoxy coated, unless noted on the plan.

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) (DISTRICT ONE)

Effective: May 1, 2007

Revise Article 1003.03 (c) to read:

"Gradation. The fine aggregate gradation for all HMA shall be FA1, FA 2, FA 20, or FA 21. When Reclaimed Asphalt Pavement (RAP) is incorporated in the HMA design, the use of FA 21 Gradation will not be permitted.

TEMPERATURE CONTROL FOR CONCRETE PLACEMENT (DISTRICT ONE)

Effective: May 1, 2007

Delete the second and third sentences of the second paragraph of Article 1020.14(a) of the Standard Specifications.

BUREAU OF ELECTRICAL SPECIAL PROVISIONS

GENERAL ELECTRICAL REQUIREMENTS

Effective: January 1, 2007

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."

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 will be paid for separately"

Add the following to Section 801.11(a) of the Standard Specifications:

"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 and 3rd sentences of the second paragraph of Article 801.02 of the Standard Specifications to read:

"Unless otherwise indicated, materials and equipment shall bear the UL label, or an approved equivalent, whenever such labeling is available for the type of material or equipment being furnished."

UNDERPASS LUMINAIRE, HPS, STAINLESS STEEL HOUSING

Effective: January 1, 2007

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:

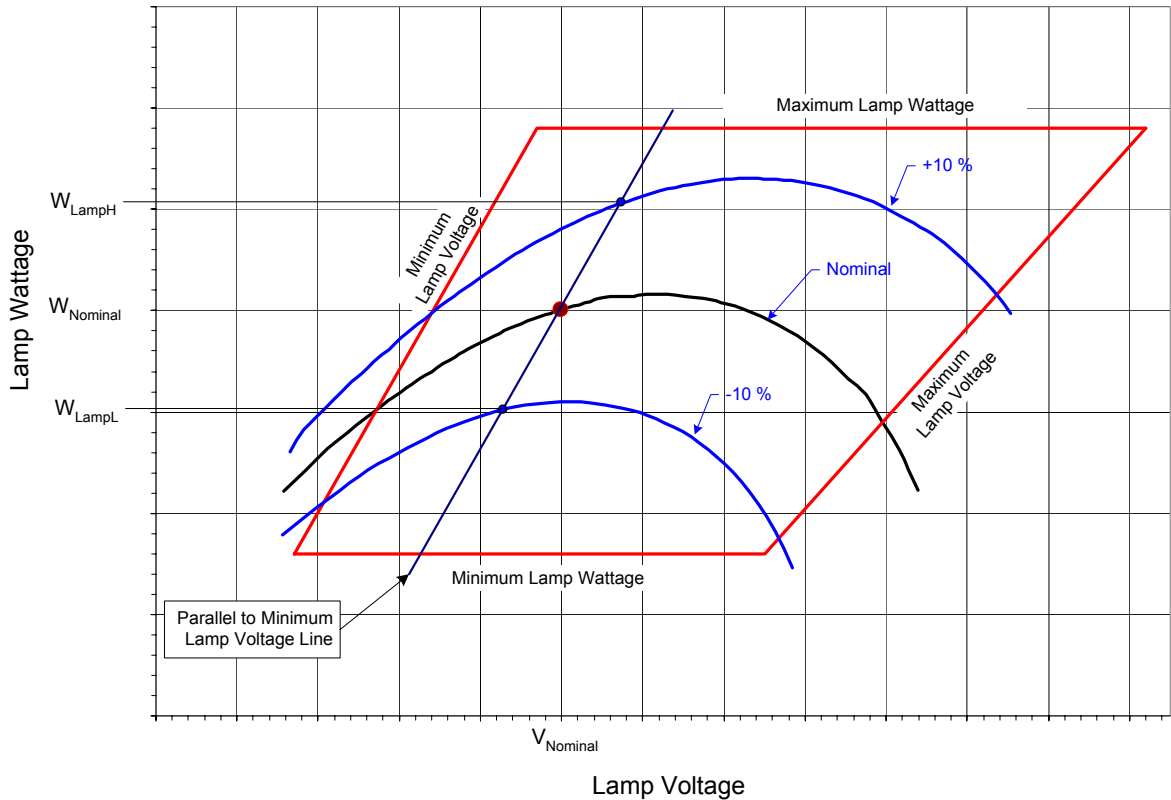
- 8.1 Lens and Lens Frame. The lens shall be made of crystal clear, impact and heat resistant tempered glass a minimum of 6.35 mm (0.25") thick. The lens shall be held in such a manner as to allow for its expansion and contraction, due to temperature variation. The lens shall be a flat glass design.
- 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 240 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 216 to 264 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 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	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 (264v)

W_{LampL} = lamp watts at -10% line voltage (216v)

W_{LampN} = lamp watts at 240v"

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

Nominal Ballast Wattage	Maximum Ballast Losses
750	16.0%
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 240v

W_{lamp} = lamp watts at 240v

- 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 240v.
- 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. Acceptable programs to perform the calculations are: Micro-Site-Lite, Lumen Micro, and AGI32. The program used to perform the calculations shall be identified on the submittal. The submittal data shall also include all photometric calculations files (for either Micro-Site-Lite, Lumen Micro or AGI32) 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 3.5" diskette or CD ROM in the IES format as specified in IES publication LM-63.

IDOT DISTRICT 1 LUMINAIRE PERFORMANCE TABLE

GIVEN CONDITIONS		
ROADWAY DATA	Pavement Width	14.6m
	Number of Lanes	4
	I.E.S. Surface Classification	R3
	Q-Zero Value	.07
LIGHT POLE DATA	Mounting Height	4.88m
	Mast Arm Length	0 m
	Pole Set-Back From Edge of Pavement	0.60m
LUMINAIRE DATA	Lamp Type	100W HPS
	Lamp Lumens	9,500
	I.E.S. Vertical Distribution	Medium
	I.E.S. Control Of Distribution	Noncutoff
	I.E.S. Lateral Distribution	IV
	Total Light Loss Factor	0.65
LAYOUT DATA	Spacing	13.72m
	Configuration	Opposite
	Luminaire Overhang over edge of pavement	-0.60m

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	Ave. Horizontal Illumination, E_{AVE}	18 Lux
	Uniformity Ratio, E_{AVE}/E_{MIN}	3:1
LUMINANCE	Average Luminance, L_{AVE}	1.2 Cd/m ²
	Uniformity Ratio, L_{AVE}/L_{MIN}	3:1
	Uniformity Ratio, L_{MAX}/L_{MIN}	5:1
	Veiling Luminance Ratio, L_V/L_{AVE}	0.30:1

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 appurtenant 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 acceptance 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, 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, STAINLESS STEEL HOUSING** which shall be payment in full for the material and work described herein.

MAINTENANCE OF LIGHTING SYSTEMS

Effective: January 1, 2007

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 prior to this contract. 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 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, 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.

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 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
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 the cost of the Contract. 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. 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.

Basis of Payment. Maintenance of lighting systems shall be paid for at the contract unit price per calendar month or fraction thereof for **MAINTENANCE OF LIGHTING SYSTEM**, which shall include all work as described herein.

EXPOSED RACEWAYS

Effective: January 1, 2007

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 810.03(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."

Revise Article 1088.01(a) of the Standard Specifications to read:

"Couplings and fittings shall meet ANSI Standard C80.5 and U.L. Standard 6. Elbows and nipples shall conform to the specifications for conduit. All fittings and couplings for rigid conduit shall be of the threaded type. All conduit hubs shall be gasketed and watertight with an integral O-ring seal.

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 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 meter (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.**"

UNDERGROUND RACEWAYS

Effective: January 1, 2007

Revise Article 810.03 of the Standard Specifications to read:

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

Add the following to Article 810.03 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.

TEMPORARY WOOD POLE, INSTALL ONLY

Effective: January 1, 2007

1. DESCRIPTION

This item shall consist of furnishing material and labor necessary for installation of a wood pole shown on the Contract Drawings, including all necessary hardware and accessories required for the intended temporary use of the pole.

2. MATERIAL

- 2.1 PREVIOUSLY USED POLES AND APPURTENANT ITEMS WILL BE ACCEPTABLE UNDER THIS ITEM, upon physical inspection and approval by the Engineer.
- 2.2 Wood poles shall be preservative-treated in conformance with the American Wood Preservation Standard C4 and designated per Standard M6. Wood poles shall be fabricated in conformance with the ANSI Standard Specifications and Dimensions for Wood Poles, ANSI publication 05.1. Poles shall be marked or have other documentation acceptable to the Engineer to confirm compliance with this requirement as well as the class designation as defined in the referenced standard.
- 2.3 Poles shall be in good condition as acceptable to the Engineer and shall be in conformance with the applicable ANSI requirements for sweep, crook, defects and mechanical damage. Poles deemed unacceptable by the Engineer shall be removed from the jobsite.

- 2.4 Hardware shall be as indicated on the drawing, or as specified herein. Hardware shall also be made available for inspection by the Engineer and hardware deemed defective by the Engineer shall be removed from the job site. Hardware shall include cable hardware as well as pole hardware including insulators, cable supports, guy anchors, guy wires and the like.
- 2.5 Poles shall also be subject to the following requirement of ANSI 05.1:
- "Mechanical Damage. Poles are not acceptable if they contain indentations attributed to loading or handling slings that are 6.35 mm (1/4 inch) or more deep over 20% or more of the pole circumference, or more than 12.7 mm (1/2 inch) deep at any point. Other indentations or abrasions, for example, forklift damage, chain-saw damage, etc., shall not be more than 1/10 the pole diameter at the point of damage up to a maximum of 25.4 mm (1 inch). Such damage is permitted in an oversized section, where the excess of wood shall be taken into consideration in evaluating the effects of the damage. In any case, the circumference for a given class is still required to be not less than the specification minimum."
- 2.6 As a minimum, pole guying shall be provided where indicated on the plans and at every dead-end pole and at any pole having non-offsetting cable support stresses, i.e. non-symmetrical cable attachments.
- 2.7 Where mast arm equipment is indicated, the equipment shall be structurally sound and of the length and type specified or indicated. The Contractor shall obtain inspection and approval by the Engineer for any mast arm equipment. Where two luminaires are indicated as mounted on a common mast arm, a suitable duplex tenon adapter, complete with any required additional bracing shall be provided, incidental to this item.

3. INSTALLATION

- 3.1 Poles shall be stored and handled in conformance with the requirements of ANSI 05.1, summarized as follows:
- a. Storage stacking shall not produce pole distortion.
 - b. Poles shall be stored at least 1-foot above grade.
 - c. Poles shall not have vegetation thereon or decaying wood below.
 - d. Poles shall not be dragged along the ground.
- 3.2 The method of installation shall be as indicated on the plans.
- 3.3 Unless otherwise indicated, removal of all material and equipment furnished under this item shall not be included in this item.

4. BASIS OF PAYMENT

This work shall be paid for at the contract unit price each for **TEMPORARY WOOD POLE**, of the length, class, mast arm quantity, and length indicated, which shall be payment in full for furnishing and installing a wood pole with appurtenant as specified herein.

TRENCH AND BACKFILL FOR ELECTRICAL WORK

Effective: January 1, 2007

Revise the first sentence of Article 819.03(a) of the Standard Specifications to read:

"Trench. Trenches shall have a minimum depth of 30 in. (760 mm) or as otherwise indicated on the plans, and shall not exceed 12 in. (300 mm) in width without prior approval of the Engineer."

UNIT DUCT

Effective: January 1, 2007

Revise the second paragraph of Article 816.03(a) to read:

"The unit duct shall be installed at a minimum depth of 760 mm (30-inches) 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, 2007

Revise the second sentence of the first paragraph of Article 1066.02(a) to read:

"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 second paragraph of Article 1066.02(b) to read:

"Uncoated conductors shall be according to ASTM B3, ICEA S-95-658/NEMA WC70, and UL Standard 44. Coated conductors shall be according to ASTM B 33, ASTM B 8, ICEA S-95-658/NEMA WC70 and UL Standard 44."

Revise the third paragraph of Article 1066.02(b) to read:

"All conductors shall be stranded. Stranding meeting ASTM B 8, ICEA S-95-658/NEMA WC70 and UL Standard 44. Uncoated conductors meeting ASTM B 3, ICEA S-95-658/NEMA WC70 and UL Standard 44."

Revise the first sentence of Article 1066.03(a)(1) to read:

"General. Cable insulation designated as XLP shall incorporate cross-linked polyethylene (XLP) insulation as specified and shall meet or exceed the requirements of ICEA S-95-658, NEMA WC70, U.L. Standard 44."

Add the following to Article 1066.03(a)(1) of the Standard Specifications:

"The cable shall be rated 600 volts and shall be UL Listed Type RHH/RHW/USE."

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

Revise the first paragraph of Article 1066.03(b) to read:

"EPR Insulation. Cable insulation shall incorporate ethylene propylene rubber (EPR) as specified and the insulation shall meet or exceed the requirements of ICEA S-95-658, NEMA Standard Publication No. WC70, and U.L. Standard 44, as applicable."

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."

Revise Article 1066.08 to read:

"Electrical Tape. Electrical tape shall be all weather vinyl plastic tape resistant to abrasion, puncture, flame, oil, acids, alkalis, and weathering, conforming to Federal Specification MIL-I-24391, ASTM D1000 and shall be listed under UL 510 Standard. Thickness shall not be less than 0.215 mm (8.5 mils) and width shall not be less than 20 mm (3/4-inch)."

UNDERPASS LUMINAIRE, 150 WATT, HIGH PRESSURE SODIUM VAPOR

Description: This item shall cover the requirements of the Illinois Department of Transportation for a temporary 150 watt high pressure sodium underpass luminaire.

Materials: Materials shall be in accordance with applicable sections of Section 1067 of the Standard Specification and as described herein. The luminaire shall be a Holophane Module 600 series, catalog number MW 15AHP 24 G, or approved equal.

General Requirements: General requirements shall be in accordance with Section 801 of the Standard Specifications.

Luminaire Optical Performance: The luminaires utilized in this Contract have been selected based on published photometric data of Holophane. All luminaires shall have optics as defined by Holophane Photometric Test No. 33429. Luminaires of other manufacturers will be considered upon review of photometric performance by the Engineer.

IDOT DISTRICT 1 LUMINAIRE PERFORMANCE TABLE

150W HPS Temporary Underpass Luminaire

GIVEN CONDITIONS		
ROADWAY DATA	Pavement Width	14.6 (m)
	Number of Lanes	4
	I.E.S. Surface Classification	R3
	Q-Zero Value	.07
LIGHT POLE DATA	Mounting Height	4.0 (m)
	Mast Arm Length	NA
	Pole Set-Back From Edge of Pavement	2.79 (m)
LUMINAIRE DATA	Lamp Type	150W HPS
	Lamp Lumens	16000
	I.E.S. Vertical Distribution	Short
	I.E.S. Control Of Distribution	Noncutoff
	I.E.S. Lateral Distribution	Type IV
	Total Light Loss Factor	0.60
LAYOUT DATA	Spacing	17.00 (m)
	Configuration	Opposite
	Luminaire Overhang over edge of pavement	-2.79 (m)

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	Ave. Horizontal Illumination, E_{AVE}	12 Lux
	Uniformity Ratio, E_{AVE}/E_{MIN}	3.00 (Max)
LUMINANCE	Average Luminance, L_{AVE}	0.80 Cd/m ²
	Uniformity Ratio, L_{AVE}/L_{MIN}	3.00 (Max)
	Uniformity Ratio, L_{MAX}/L_{MIN}	5.00 (Max)
	Veiling Luminance Ratio, L_V/L_{AVE}	0.30 (Max)

Photometric Data: All luminaires supplied under this Contract shall meet or exceed the manufacturer's published photometric data as of January 1990.

Submittal Information: The Contractor shall provide complete submittal information to Department personnel in accordance with Article 1067 of the Standard Specification. The cost of this information shall be included in this item and separate payment will not be made.

Inspection and Testing: The Contractor shall make provisions for factory inspection and testing of the luminaires by Department personnel in accordance with Article 1067 of the Standard Specification. The cost of these provisions shall be included in this item and separate payment will not be made.

Installation: The luminaires shall be surface mount and attached to the face of pier to serve as temporary lighting as shown on the plans and as directed by the Engineer. Installation shall be as described in Article 821 of the Standard Specifications.

Method of Measurement: Each luminaire (complete with lamp, component parts, and appurtenances) that is furnished and installed as indicated shall be counted as a unit for payment.

Basis of Payment: This work shall be paid for at the contract unit price each for UNDERPASS LUMINAIRE, 150 WATT, HIGH PRESSURE SODIUM VAPOR, which shall be payment in full for performing the work described herein.

TEMPORARY UNDERPASS LIGHTING INSTALLATION AND REMOVAL

Description: This item shall consist of furnishing, installing, maintaining, and removing a temporary underpass lighting installation at the 115th Street underpass at I-57 as herein specified and as shown in the contract plans. The temporary underpass lighting system shall consist of the following components:

Temporary Underpass Lighting Luminaire, as described under special provision item: UNDERPASS LUMINAIRE, 150 WATT, HIGH PRESSURE SODIUM.

Aerial Cable, 3-1/C NO. 8, Aluminum, with Messenger Wire, as described under Section 818 of the Standard Specifications.

Temporary Wood Pole, as described under special provision item: TEMPORARY WOOD POLE, 12.19 METER, CLASS 4.

Installation: All work shall be done in accordance with the applicable portions of Sections 801, 818, and 821 of the Standard Specifications and as directed by the Engineer. The Contractor shall notify the Engineer at least 48 hours in advance when the temporary underpass lighting installation is ready to be turned on. Representatives of the Department will then inspect the installation. After approval by the Department, the maintenance of the temporary underpass lighting installation shall become the responsibility of the Contractor until removal as directed by the Engineer. After removal of the temporary installation, the equipment and materials (except the 150W HPS underpass luminaires) furnished by the Contractor shall remain property of the Contractor.

Removal: The temporary underpass lighting installation shall be removed when the permanent lighting becomes fully operational and as directed by the Engineer. Components, other than the 150W HPS underpass luminaires, comprising the temporary underpass lighting installation shall become the property of the Contractor and shall be removed from the limits of the project. The contractor shall pack the 150W HPS underpass luminaires into original boxes and deliver them to the IDOT District 1 maintenance facility, as directed by the Engineer.

Basis of Payment: This work shall be paid for at the contract unit price as lump sum for TEMPORARY UNDERPASS LIGHTING INSTALLATION AND REMOVAL as shown on the plans, which shall be payment in full for furnishing, installing, maintaining, modifying, and removing the entire temporary underpass lighting installation including all necessary equipment and appurtenances required to complete the work described herein and as directed by the Engineer.

ROADSIDE DEVELOPMENT SPECIAL PROVISIONS

INLET FILTER CLEANING

Effective: February 7, 2007

Description. This work shall consist of cleaning sediment from each assembled inlet filter. The Engineer will designate the need for cleaning based on the rate of debris and silt collected at each inlet filter location.

Cleaning of the inlet filter shall consist of inspecting and cleaning (includes removal and proper disposal of debris and silt that has accumulated in the filter fabric bag) by vactoring, removing and dumping or any other method approved by the Engineer.

Method of Measurement. Cleaning of the inlet filter shall be measured for payment each time that the cleaning work is performed at each of the inlet filter locations.

Basis of Payment. The work will be paid for at the contract unit price per each for INLET FILTER CLEANING.

WEED CONTROL, PRE-EMERGENT GRANULAR HERBICIDE

Effective: July 29, 2002

Revised: February 7, 2007

Description: This work shall consist of spreading a pre-emergent granular herbicide in place of weed barrier fabric 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.

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. Mulch shall not be in contact with the base of the trunk.

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.

BUREAU OF TRAFFIC SPECIAL PROVISIONS

TYPE III TEMPORARY TAPE FOR WET CONDITIONS

Effective: February 1, 2007

Description. This work shall consist of furnishing, installing, maintaining and removing Type III Temporary Pavement Marking Tape for Wet Conditions.

Type III Temporary Tape shall meet the requirements of Article 1095.06 of the Standard Specifications. 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 shall be verified by a visual inspection method performed by the Department. The surface of the material shall provide an average skid resistance of 50 BPN when tested according to ASTM E 303.

Prior to application a surface preparation adhesive shall be applied to a clean, dry road surface. The pavement marking tape shall have a pre-coated pressure sensitive adhesive and shall require no activation procedures.

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 LETTERS AND SYMBOLS.

KEEPING THE EXPRESSWAY OPEN TO TRAFFIC

Effective: March 22, 1996

Revised: February 9, 2005

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 Provisions, the Standard Specifications, the State Standards and the District Freeway details. All Contractors' personnel shall be limited to these barricaded work zones and shall not cross the expressway.

The Contractor shall request and gain approval from the Illinois Department of Transportation's Expressway Traffic Operations Engineer (847-705-4151) twenty-four (24) hours in advance of all daily lane, ramp and shoulder closures and seventy-two (72) hours in advance of all permanent and weekend closures on all Freeways and/or Expressways in District One. This advance notification is calculated based on workweek of Monday through Friday and shall not include weekends or Holidays.

LOCATION: 115th Street at FAI 57

WEEK NIGHT	TYPE OF CLOSURE	ALLOWABLE LANE CLOSURE HOURS	
		INBOUND	OUTBOUND
Sunday thru Thursday	One Lane	8:00PM to 5:00AM	9:00PM to 6:00AM
	Two Lanes	10:00PM to 5:00AM	11:59PM to 6:00AM
Friday	One Lane	8:00PM (Fri) to 9:00AM (Sat)	9:00PM (Fri) to 10:00AM (Sat)
	Two Lanes	11:00PM (Fri) to 6:00AM (Sat)	11:59PM (Fri) to 7:00AM (Sat)
Saturday	One Lane	8:00PM (Sat) to 10:00AM (Sun)	9:00PM (Sat) to Noon (Sun)
	Two Lanes	11:00PM (Sat) to 8:00AM (Sun)	11:59PM (Sat) to 9:00AM (Sun)

In addition to the hours noted above, temporary shoulder and partial ramp closures are allowed weekdays between 9:00 A.M. and 3:00 P.M.

Narrow lanes and permanent shoulder closures will not be allowed between Dec. 1st and April 1st.

Full Expressway Closures will only be permitted for a maximum of 15 minutes at a time during the low traffic volume hours of 1:00 A.M. to 5:00 A.M. Monday thru Friday and from 1:00 A.M. to 7:00 A.M. on Sunday. During Full Expressway Closures, the Contractor will be required to close off all lanes except one, using Freeway Standard Closures. Police forces should be notified and requested to close off the remaining lane at which time the work item may be removed or set in place. The District One Traffic Operations Department **shall be** notified (847-705-4151) at least 3 working days (weekends and holidays DO NOT count into this 72 hours notification) in advance of the proposed road closure and will coordinate the closure operations with police forces.

All stage changes requiring the stopping and/or the pacing of traffic shall take place during the allowable hours for Full Expressway Closures and shall be approved by the Department.

All daily lane closures shall be removed during adverse weather conditions such as rain, snow, and/or fog and as determined by the Engineer.

Additional lane closure hour restrictions may have to be imposed to facilitate the flow of traffic to and from major sporting events and/or other events.

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.

The Contractor will be required to cooperate with all other contractors when erecting lane closures on the expressway. All lane closures (includes the taper lengths) without a three (3) mile gap between each other, in one direction of the expressway, shall be on the same side of the pavement. Lane closures on the same side of the pavement with a half (1/2) mile or less gap between the end of one work zone and the start of taper of next work zone should be connected. The maximum length of any lane closure on the project and combined with any adjacent projects shall be three (3) miles. Gaps between successive permanent lane closures shall be no less than two (2) miles in length.

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 the locations approved by the Engineer.

FAILURE TO OPEN TRAFFIC LANES TO TRAFFIC

Effective: March 22, 1996

Revised: February 9, 2005

Should the Contractor fail to completely open and keep open all the traffic lanes to traffic in accordance with the limitations specified under the Special Provisions for "Keeping the Expressway Open to Traffic", the Contractor shall be liable to the Department for the amount of:

One lane or ramp blocked = \$ 3,000

Two lanes blocked = \$ 6,000

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. Such damages may be deducted by the Department from any monies due the Contractor. These damages shall apply during the contract time and during any extensions of the contract time.

TRAFFIC CONTROL AND PROTECTION (EXPRESSWAYS)

Effective: 3/8/96

Revised: 1/1/07

This work shall include furnishing, installing, maintaining, replacing, relocating, and removing all traffic control devices used for the purpose of regulating, warning, or directing traffic. Traffic control and protection shall be provided as called for in the plans, applicable Highway Standards, District One Expressway details, Standards and Supplemental Specifications, these Special Provisions, or as directed by the Engineer.

General.

The governing factor in the execution and staging of work for this project is to provide the motoring public with the safest possible travel conditions on the expressway through the construction zone. The Contractor shall arrange his operations to keep the closing of lanes and/or ramps to a minimum.

The Contractor shall be responsible for the proper location, installation, and arrangement of all traffic control devices. Special attention shall be given to existing warning signs and overhead guide signs during all construction operations. Warning signs and existing guide signs with down arrows shall be kept consistent with the barricade placement at all times. The Contractor shall immediately remove, completely cover, or turn from the motorist's view all signs which are inconsistent with lane assignment patterns.

The Contractor shall coordinate all traffic control work on this project with adjoining or overlapping projects, including barricade placement necessary to provide a uniform traffic detour pattern. When directed by the Engineer, the Contractor shall remove all traffic control devices that were furnished, installed, or maintained by him under this contract, and such devices shall remain the property of the Contractor. All traffic control devices shall remain in place until specific authorization for relocation or removal is received from the Engineer.

Signs.

Prior to the beginning of construction operations, the Contractor will be provided a sign log of all existing signs within the limits of the construction zone. The Contractor is responsible for verifying the accuracy of the sign log. Throughout the duration of this project, all existing traffic signs shall be maintained by the Contractor. All provisions of Article 107.25 of the Standard Specifications shall apply except the third paragraph shall be revised to read: "The Contractor shall maintain, furnish, and replace at his own expense, any traffic sign or post which has been damaged or lost by the Contractor or a third party. The Contractor will not be held liable for third party damage to large freeway guide signs".

Exit Gore Signs.

The exit gore signs as shown in Standard 701411 shall be a minimum size of 48 inch by 48 inch with 12 inch capital letters and a 20 inch arrow.

Rough Grooved Surface Signs.

The Contractor shall furnish and erect "Rough Grooved Surface" signs (W8-1107) on both sides of the expressway, 1000' in advance of any milled area. These signs shall be erected on all ramps that enter the milled area. All signs shall be mounted at a minimum clearance height of 5'.

Drums/Barricades.

Check barricades shall be placed in work areas perpendicular to traffic every 1000', one per lane and per shoulder, to prevent motorists from using work areas as a traveled way. Check barricades shall also be placed in advance of each open patch, or excavation, or any other hazard in the work area, the first at the edge of the open traffic lane and the second centered in the closed lane. Check barricades, either Type I or II, or drums shall be equipped with the flashing light.

To provide sufficient lane widths (10' minimum) for traffic and also working room, the Contractor shall furnish and install vertical barricades with steady burn lights, in lieu of Type II or drums, along the cold milling and asphalt paving operations. The vertical barricades shall be placed at the same spacing as the drums.

Vertical Barricades.

Vertical barricades shall not be used in lane closure tapers, lane shifts, and exit ramp gores. Also, vertical barricades shall not be used as patch barricades or check barricades. Special attention shall be given, and ballast provided per manufacture's specification, to maintain the vertical barricades in an upright position and in proper alignment.

Temporary Concrete Barrier Wall.

Prismatic barrier wall reflectors shall be installed on both the face of the wall next to traffic, and the top of all sections of the temporary concrete barrier wall. The color of these reflectors shall match the color of the edgelines (yellow on the left and crystal or white on the right). If the base of the temporary concrete barrier wall is 12 inches or less from the travel lane, then the lower slope of the wall shall also have a 6 inch wide temporary pavement marking edgeline (yellow on the left and white on the right).

Method of Measurement.

This item of work will be measured on a lump sum basis for furnishing, installing, maintaining, replacing, relocating, and removing traffic control devices required in the plans and these Special Provisions. Traffic control and protection required under Standards 701101, 701400, 701401, 701411, 701426, 701446 and District details TC-8, TC-9, TC-17, TC-18 and TC-25 will be included with this item.

Basis of Payment.

This work will be paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (EXPRESSWAYS). This price shall be payment in full for all labor, materials, transportation, handling, and incidental work necessary to furnish, install, maintain, replace, relocate, and remove all Expressway traffic control devices required in the plans and specifications.

In the event the sum total value of all the work items for which traffic control and protection is required is increased or decreased by more than ten percent (10%), the contract bid price for Traffic Control and Protection will be adjusted as follows:

$$\text{Adjusted contract price} = .25P + .75P [1+(X-0.1)]$$

Where "P" is the bid unit price for Traffic Control and Protection:

Difference between original and final sum total
value of all work items for which traffic

Where "X" = control and protection is required.

Original sum total value of all work items for which
traffic control and protection is required.

The value of the work items used in calculating the increase and decrease will include only items that have been added to or deducted from the contract under Article 104.02 of the Standard Specifications and only items which require use of Traffic Control and Protection.

The Engineer may require additional traffic control be installed in accordance with standards and/or designs other than those included in the plans. In such cases, the standards and/or designs will be made available to the Contractor at least one week in advance of the change in traffic control. Payment for any additional traffic control required will be in accordance with Article 109.04 of the Standard Specifications.

Revisions in the phasing of construction or maintenance operations, requested by the Contractor, may require traffic control to be installed in accordance with standards and/or designs other than those included in the plans. Revisions or modifications to the traffic control shown in the contract shall be submitted by the Contractor for approval by the Engineer. No additional payment will be made for a Contractor requested modification.

Temporary concrete barrier wall will be measured and paid for according to Section 704. Impact attenuators, temporary bridge rail, and temporary rumble strips will be paid for separately.

All temporary pavement markings will be measured and paid for according to Section 703 and Section 780.

All pavement marking removal will be measured and paid for according to Section 703 or Section 783.

Temporary pavement marking on the lower slope of the temporary concrete barrier wall will be measured and paid for as TEMPORARY PAVEMENT MARKING, 6".

All prismatic barrier wall reflectors will be measured and paid for according to Section 782.

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.

CITY OF CHICAGO

STREET LIGHTING
AND

TRAFFIC SIGNAL SPECIFICATIONS

(Specifications may contain standard and/or metric units.)

DETAILED UNDERGROUND CONSTRUCTION SPECIFICATIONS FOR THE EXTENSION AND IMPROVEMENT OF ELECTRIC STREET LIGHT AND TRAFFIC SIGNAL SYSTEMS OF THE DEPARTMENT OF STREETS AND SANITATION OF THE CITY OF CHICAGO

PROCEDURE

1. (a) Investigation of Site and Work. The Contractor shall make all necessary investigations in order to become thoroughly informed of the site, of the character and magnitude of the work contemplated, and of any and all difficulties that may be encountered in the performance of the work. No plea on the part of the Contractor or ignorance of conditions that exist, or may hereafter exist, or of difficulties that may be encountered in the performance of the work, will be accepted as a sufficient excuse for a failure of work, omission on the part of the Contractor to fulfill in every detail all the requirements of the contract, or as a basis for any claims whatsoever for extra compensation.
- (b) Program of Contractor. The Contractor shall submit with his proposal a statement outlining his program for starting the work, his order of procedure, and a schedule showing the number of working days necessary for completing the work contemplated in the plans and these specifications, after award of contract.

DESCRIPTION OF THE PROJECT

2. All within the corporate limits of the City of Chicago, an extension and improvement of the electric street lighting and traffic signal control systems is contemplated. Plans showing the work to be done in conformity with these specifications will be furnished.

SCOPE OF THE WORK

3. The scope of the work to be done shall include furnishing all necessary materials, labor, trucks, tools, equipment, and appurtenances necessary to install all items indicated on the plans in conformity with these specifications.

CONTRACTOR'S MATERIAL

4. The Contractor shall supply all needed materials, which shall be required to complete the installations specified herein. The materials to be furnished by the Contractor shall include, but shall not be restricted to, the following materials:

Frames and covers for handholes and manholes
Sand, stone, and cement
Anchor bolts, washers, and nuts
Conduit, rigid galvanized steel
Conduit elbows, rigid galvanized steel

Conduit, PVC and Conduit Elbows, PVC
Reinforcing Rod Cages
Controllers
Poles & Mast Arms
Luminaires
Junction Boxes
Wire and Cable
Breaker and Fuses

UNITS OF WORK

5. The unit quantities of work designated in the accompanying proposal are approximate and are to be used solely for the purpose of comparing the proposals, determining the low bidder(s), and establishing the amount of bond that shall be provided. It is contemplated that the scope of the work will be plus or minus ten percent (10%) of the quantities indicated. However, the amount of work performed may be increased or decreased in any quantity as determined and directed by the Engineer. The quantities on which payments to the Contractor will be made are to be determined by measurements of the work actually performed by the Contractor as specified in the contract.

SPECIAL PROVISIONS

6.
 - (a) Intent of Drawings and Specifications. The standard drawings included in the Plans are drawings issued by the Department. The drawings and these specifications are cooperative so that details included in the specifications and omitted from the specifications shall be interpreted as though included in both. Coordination of plans and specifications shall concur with Section 105.05 of the State of Illinois Standard Specifications for Road and Bridge Construction. In details for which the specifications of the American Society for Testing and Materials are cited by A.S.T.M. designation number, the most recently published revisions shall govern.
 - (b) Authority. Wherever in these specifications an order, authorization or approval is required, such order, authorization or approval shall be interpreted to mean a written communication to the Contractor signed by the Engineer or his authorized representative in charge of the work.
 - (c) Permits. All permits for street openings shall be obtained by the Contractor from the Bureau of Street, of the Department of Streets and Sanitation of the City of Chicago.
 - (d) Schedule Notification. The Contractor shall present to the Engineer or his authorized representative, a schedule of proposed work 72 hours in advance of the starting time.
 - (e) Definition of Parkway. For the purpose of these specifications the term parkway shall be considered to mean that portion of the public way, whether earth, driveway or sidewalk, extending from the curb to the adjacent property line.

- (f) Relations with Others. The Contractor shall inform himself of the locations of all structures and facilities which may be affected by his work. He shall make provision for owner-approved adequate support, maintenance, and protection of such structures and facilities during the course of his work, and also for the repair of any damage caused thereto by his construction operations. Whether such repair work can be done by his forces, or whether the owners of the affected facilities required the work to be done by their forces and paid for by the Contractor, the provision for such work shall be included in the unit prices bid, and no extra payment therefor will be made. Should the Contractor be unable to secure exact locations of underground facilities, or should such locations obtained prove erroneous, no claim for extra payment for such reason will be allowed.
- (g) Cleaning Site. The site of the work and adjacent premises shall be kept as free from accumulations of waste material, debris and rubbish as practicable. All barricades, implements, materials, debris and rubbish connected with or caused by the work shall be promptly removed upon completion of the work. Upon the completion of his construction work, the Contractor shall leave the work and premises in a clean, neat, and workmanlike condition satisfactory to the Engineer or his authorized representative.
- (h) Utility Companies' Construction Standards. The Contractor shall adequately familiarize himself with the construction standards of the utility companies involved, so that if he shall perform his work on utility property, either singly or jointly used, with due regard to, and in compliance with, the rights of such utility companies, the expected quality of his construction work, and the safety measures and precautions required by such utility companies.

EXCAVATION

- (a) Trench Defined. Wherever trenching is specified in this specification, or the proposal, it shall be understood to mean all necessary excavation, performed in the manner specified herein, required to provide a complete trench or opening.
- (b) Pavements and Sidewalks. When excavating through street, alley or driveway pavements and through paved sidewalks, the surface pavement shall be carefully cut through and removed and kept separate from other excavated material. The pavement foundation shall also be carefully removed and kept separate from earth excavation. In cutting through pavements, proper tools shall be used and the cutting done in manner such that the pavement around the excavated area shall not be disturbed. Sidewalks and pavements shall be scored and cut by a mechanical saw prior to breaking out so that, when a portion of sidewalk or pavement is removed, there shall remain a neat and workmanlike finishing line when the sidewalk pavement is restored. No pavement or sidewalks shall be cut without the approval of the Engineer.
- (c) Lawns and Parkways. When making an excavation in sodded lawns and parkways, the sod shall be carefully cut in rectangular pieces and removed with suitable tools, using care to prevent the soil from dropping away from its root. The sod shall be carefully piled and protected until restored. Every necessary precaution shall be taken of the sod removed, and of the entire lawn of the parkways, to prevent unnecessary damage to same, and to restore and leave it in as nearly its original condition as practicable.

- (d) Trees and Shrubs. Special care shall be exercised to prevent damage to trees and shrubs in parkways during the progress of work. The Contractor shall be responsible for the damage to such, and shall replace all damaged trees and shrubs.
- (e) Limits of Sidewalk Cuts. Except where definite order is received from the Engineer permitting deviation, the limits of sidewalk cuts shall conform to the following:
 - (1) Where the entire parkway from curb to property is paved sidewalk on solid fill, no more of the sidewalk shall be removed than is necessary for the trench.
 - (2) Where the sidewalk is normal width, comprising only a part of the parkway, with adjacent lawn or earthfill of adequate width for the trench, required cutting of the sidewalk shall be restricted to whole flags. Contractor shall not remove a portion of a flag of such a sidewalk.
- (f) Trench Opening and Excavated Material. Trenches may be opened either manually or mechanically. After removal of the pavement or sod, while the trenches or other excavations such as jack holes are continued to the proper depth, the excavated material shall be piled along the edges of the opening or nearby in a manner to least obstruct public thoroughfares and private driveways until the backfill shall have been made and surplus material removed.
- (g) Payment for Excavation. Excavation, whether in earth parkway or paved sidewalks, streets, alleys and driveways, shall be made in the manner described herein including trenching, backfilling, and pavement restoration, and payment therefor shall be included in the unit prices bid for appropriate work items requiring such excavation. Separate payment will not be made for excavation.

BACKFILL AND PAVEMENT RESTORATION

- 7. (a) Backfill and Surplus Material Disposal. All trenches and excavations shall be backfilled and tamped in such a manner that the original grade shall be permanently restored. All sod shall be replaced, tamped and watered. Surplus excavated material shall be promptly hauled away and disposed of at the sole cost of the Contractor. Care shall be taken when backfilling the black top soil is replaced last and seeded, so that lawns and parkways may be restored as closely as practicable to the condition existing prior to trenching.
- (b) Pavement and Walk Restoration. The Contractor shall repair the pavements, sidewalks and driveways necessarily cut, restoring them to a condition at least equal to the surrounding areas, in a manner subject to approval. When a pavement, sidewalk, or a driveway is to be cut, the Contractor shall notify the Engineer of the location, the kind of pavement, and the total area necessary to be removed.

TIME OF COMPLETION

- 8. All the work to be done under these specifications shall be completed within the time stated in the Special Provisions, award of contract, or written notification to proceed with the work.

TRAFFIC CONTROL PLAN

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

At the preconstruction meeting the Contractor shall furnish the name of the individual in his direct employ who is to be responsible for the installation and maintenance of the traffic control for this project. If the actual installation and maintenance are to an accomplished subcontractor, consent shall be requested of the Engineer at the time of the preconstruction meeting in accordance with Article 108.01 of the Standard Specifications for Road and Bridge Construction. This shall not relieve the Contractor of the foregoing requirement for a responsible individual in his direct employ. The Department will provide the Contractor the name of its representative who will be responsible for the administration of the Traffic Control Plan.

Special attention is called to Article 107.09 and 107.14 of the Standard Specifications for Road and Bridge Construction and the following Highway Standards, Details, Mimeographed Supplemental Specification and Special Provisions contained therein, relating to traffic control.

ACCEPTANCE BY THE ENGINEER

10. General. Within 72 hours after notification by the Contractor of the completion of all street light installations on each construction plan drawing, the Engineer shall make an inspection to determine the operating condition of these installations. Based on this inspection, the Engineer will approve for payment those installations made in accordance with these specifications and operating properly. The Contractor will be required to rework or replace all installations made by him which fail to meet these specifications or do not operate properly. Approval of repayment will be withheld until correction is made. However, if inspection is not made within 72 hours of notification indicated above, and at the time of inspection an installation is not operative, the Engineer will determine if that condition is due to material furnished by the Contractor. This Contractor shall be responsible for defective material furnished by him or workmanship furnished by him, and shall make the necessary replacements.

GUARANTEE

11. General. The Contractor shall guarantee all the materials furnished by him, and the workmanship performed by him under this contract against defects, deficiencies or faults. This guarantee shall be for a period of not less than 18 months following the acceptance of the work, unless otherwise specified.

Liability of Contractor. The Contractor shall replace or repair every part of the work found to be defective, deficient or fault within twenty-four (24) hours of being notified during the guarantee period.

OPERATION OF TRAFFIC SIGNALS

Existing traffic control signal installations and/or any electrical facilities at certain intersections included in this Section may be altered or reconstructed totally or partially as part of the work on this Section. 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, or the Municipality in which they are located.

The Contractor is further advised that the existing traffic signals, or the existing temporary installation, must remain in operation during all construction stages except for the most essential down time. Any shutdown of the installation, for a period to exceed fifteen (15) minutes, must have the prior approval of the Engineer. Such approval will generally only be granted during the period extending from 10:00 a.m. to 3:00 p.m. on weekdays. Any other traffic signal shutdown, either for periods in excess of one (1) hour or outside of the 10:00 a.m. to 3:00 p.m. weekday period must have prior approval of the Engineer.

The Contractor, prior to the commencement of his work, shall notify the State Electrical Maintenance Contractor or the concerned Municipality, of his intent to perform his work. Upon request from the Contractor, the State Electrical Maintenance or the concerned Municipality will locate any buried conduit or other electrical facility which may interfere with the Contractor's operations without charge to him. This shall in no way relieve the Contractor's responsibility to repair and/or replace electrical facilities damaged by his operations.

Any known or suspected damage to the electrical facility shall be reported immediately to the Engineer. The Contractor will be held fully responsible for the repair and/or temporary, if, in sole opinion of the Engineer, such damage was caused by the negligence of the Contractor, his agents, or employees. The State, at its own discretion, may call upon the State's Electrical Maintenance Contractor or the concerned Municipality to make any such repair and/or replacements at the total expense of the Contractor for this Section.

No part of this Special Provision shall be construed as exempting the Contractor from his duty to follow careful construction practices, including all standard provisions in the "Standard Specifications for Road and Bridge Construction".

The intent of this Special Provision is to prescribe a procedure wherein a Contractor may obtain formal approval of a traffic signal installation at a given intersection, and a release from maintenance responsibility for the new materials installed, in order to be permitted to disconnect and remove the old traffic signal equipment.

When the road is open to traffic, except under conditions where existing traffic signals are being maintained or when a temporary traffic signal installation has been installed, the Contractor may request a turn-on and inspection of the completed traffic signal installation at each location. This request must be made to the Engineer a minimum of three (3) working days prior to the time of the requested inspection. 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 into 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.

TRAFFIC SIGNAL, TURN ON

The intent of this Special Provision is to prescribe a procedure wherein a Contractor may obtain formal approval of a traffic signal installation at a given intersection, and a release from maintenance responsibility for the new materials installed, in order to be permitted to disconnect and remove the old traffic signal equipment.

When the road is open to traffic, except under conditions where existing traffic signals are being maintained or when a temporary traffic signal installation has been installed, 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 Engineer a minimum of three (3) working days prior to the time of the requested inspection. Upon demonstration that the signals are operating and all work is completed in accordance with the contract and to the satisfaction of the Engineer will then allow the signals to be placed into 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.

MAINTENANCE OF STREET LIGHTING SYSTEM (CITY OF CHICAGO)

Scope. The Contractor shall maintain the existing City of Chicago street lighting system within the limits of the improvement. The maintenance shall commence at a time after contract award that is mutually agreed upon by the Contractor, the City, and the State. Existing lighting shall be used as temporary lighting during Stage I of the Maintenance of Traffic, and a combination of existing and new lighting during Stage II of the Maintenance of Traffic. The provision and use of temporary aerial cable, controllers, luminaires, and poles shall be the responsibility of the Contractor and shall be incidental to this pay item. Maintenance shall continue in force until the new lighting is accepted by the City and the State. If the lighting installation is not completed and accepted within the time allotted for the project, the lighting must be maintained by the Contractor at no additional cost to the State or the City.

A properly operating lighting system shall be maintained by the Contractor until such date as the new lighting system shall be accepted for operation and maintenance by the City for the **115th** Street lighting.

Any known or suspected damage to the electrical facility shall be reported immediately to the State. The Contractor will be held responsible for the repair, if, in the opinion of the State, such damage was caused by the Contractor. The State, at its own discretion, may call upon the City to make any necessary repairs, at the Contractor's expense.

Maintenance Procedures. The Contractor shall be responsible for maintaining the street lighting installation in proper operating condition. The Contractor shall perform the following maintenance procedures:

- (a) Patrol and inspect the lighting installation at least once every two weeks for proper alignment of luminaires, lamp outages, and general operating conditions.
- (b) Provide immediate corrective action to replace burned-out lamps or damaged sockets with new approved lamps or sockets. At the time of replacement, the reflector and lens shall be cleaned.

- (c) Respond to emergency calls within two hours after notification and provide immediate corrective action. The contractor shall maintain in stock a sufficient amount of material and equipment to provide temporary and permanent repairs. Any damage to the lighting installation from any cause whatsoever shall be repaired or replaced by the Contractor at his own expense. The Contractor may institute action to recover damages from a responsible third party.

If, at any time, the Contractor fails to perform any work deemed necessary by the Engineer to keep the street lighting in proper operating condition, the Department reserves the right to have other electrical contractors perform the needed work. The cost of such work will be deducted from the amount due the Contractor.

Basis of Payment. This work will be paid for at the contract lump sum price for MAINTENANCE OF STREET LIGHTING SYSTEM (CITY OF CHICAGO), which price shall be payment in full for all materials, equipment, and labor necessary for the maintenance of temporary street lighting for 115th Street as shown on the plans or directed by the Engineer, and to maintain the same until the new lighting is placed in operation.

REMOVE EXISTING STREET LIGHTING EQUIPMENT

Work under this item shall be performed in accordance with Section 800 of the Standard Specification.

Description: This work shall consist of removing all obsolete street lighting equipment at various locations shown on the Plans or as directed by the Commissioner.

General Requirements: Contractor Specifications, Bureau of Electricity Standards and the City of Chicago Electrical Code, except as herein modified shall make sure that sufficient street lighting is available during all stages of construction before starting the work of removing existing street lighting equipment. The Commissioner shall be the sole judge that sufficient street lighting is provided.

Street lighting poles (anchor base or embedded), ballast housing base, mast arms, luminaires, controllers and secondary racks are to be removed and remain the property of the City of Chicago. Embedded poles shall be removed by means other than burning where possible. The Contractor shall deliver the above obsolete street lighting equipment to the City of Chicago Yard at 4100 South Cicero, Chicago, Illinois. Twenty-four hours advance notice is necessary before delivery. Street lighting cable shall be removed as indicated on the Plans, and become property of the Contractor to be disposed of by him, outside the right of way, at his sole expense. All anchor base pole foundations shall be broken down a minimum of eighteen inches (18") below grade. All street light controller foundations shall be broken down in a like manner. All concrete embedment around poles shall be removed. Concrete removal shall not be paid for separately but considered incidental to this item.

The Contractor shall provide three (3) copies of a list of equipment that is to remain the property of the City, including model and serial numbers where applicable. He shall also provide a copy of the Contract plan or special provisions showing the quantities and type of equipment. The Contractor shall be responsible for the condition of the street lighting equipment from the time of removal until the acceptance of a receipt drawn by the City indicating that the items have been returned in good condition.

Method of Measurement: This item shall be measured on a lump sum basis.

Basis of Payment: This work shall be paid for at the Contract Lump Sum price for REMOVE EXISTING STREET LIGHTING EQUIPMENT at the various locations shown on the Plans. This price shall be payment in full for removing the equipment and disposing of it as required. The salvage value of the cable retained by the Contractor shall be reflected in this Contract Lump Sum price. Removal of embedment around poles shall be considered incidental to this work.

TEMPORARY TRAFFIC SIGNAL INSTALLATION

Description. This work shall consist of furnishing, installing, maintaining and removing a temporary traffic signal installation at two locations: Marshfield/115th Street at I-57 and at Ashland/115th street at I-57.

Installation Requirements. The Contractor shall notify the Engineer at least 48 hours in advance when the temporary signal installation is ready to be turned on. Representatives of the Department will then inspect the installation. After approval by the Department, the maintenance of the temporary signal installation, including all energy charges, shall become the responsibility of the Contractor until removal is directed by the Engineer. After removal of the temporary installation, the equipment and materials furnished by the Contractor shall remain the property of the Contractor.

Maintenance Procedures. The Contractor shall be responsible for maintaining the traffic signal installation in proper operating condition. The Contractor shall perform the following maintenance procedures:

- (a) Patrol and inspect the signal installation at least once every two weeks for proper alignment of signal heads, lamp outages, and general operation of the traffic signals.
- (b) Provide immediate corrective action to replace burned-out lamps or damaged sockets with new approved lamps or sockets. At the time of replacement, the reflector and lens shall be cleaned.
- (c) Respond to emergency calls within two hours after notification and provide immediate corrective action. The Contractor shall maintain in stock a sufficient amount of material and equipment to provide temporary and permanent repairs. Any damage to the signal installation from any cause whatsoever shall be repaired or replaced by the Contractor at his own expense. The Contractor may institute action to recover damages from a responsible third party.

The Contractor shall install STOP (R1-1-3636) signs on all approaches to the intersection as a temporary means of regulating traffic during the time of repair when required by the Engineer.

- (d) The Contractor shall provide the Engineer the names and telephone number of two persons who will be available 24 hours a day, 7 days a week, to perform any necessary work on the signal installation. If, at any time, the Contractor fails to perform any work deemed necessary by the Engineer to keep the traffic signals in proper operating condition, or if the Engineer finds it impossible to contact the designated persons to perform any work, the Department reserves the right to have other electrical contractors perform the needed work. The cost of such work will be deducted from the amount due the Contractor.

Basis of Payment. This work will be paid for at the contract unit per price per each location for TEMPORARY TRAFFIC SIGNAL INSTALLATION, which price shall be payment in full for all materials, equipment, and labor necessary for the installation and removal of the temporary traffic signals, including the investigation for proper placement, excavation and backfill, concrete and asphalt removal and replacement and other restorations at two locations: Marshfield/115th Street at I-57 and at Ashland/115th Street at I-57, and maintain the same until the new signals are placed in operation.

REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT

This work shall consist of removing all the existing traffic signal equipment at the intersections listed on the plans.

The traffic control items, except for traffic signal cable, are to be removed and remain the property of the City of Chicago. The Contractor, with the approval of the Engineer, shall deliver the obsolete traffic signal equipment to the City of Chicago Yard at 4100 South Cicero Avenue, Chicago, Illinois. Twenty-four hour advance notice is necessary before delivery. The traffic signal cable shall be removed and become the property of the Contractor and shall be disposed of by him, outside the right-of-way, at his sole expense.

The Contractor shall provide three (3) copies of a list of equipment that is to remain the property of the City, including model and serial numbers where applicable. He shall also provide a copy of the contract plan, or special provisions, showing the quantities and type of equipment. The Contractor shall be responsible for the condition of the traffic control equipment from the time of removal until its acceptance by a receipt drawn by the Engineer indicating that the items have been returned in good condition.

Basis of Payment.

This work will be paid for at the contract unit price per each intersection for REMOVE EXISTING TRAFFIC SIGNAL EQUIPMENT. This price shall be payment in full for removing the equipment and disposing of it as required, The salvage value of the cable retained by the Contractor shall be reflected in this contract price.

March 21, 1995

REMOVE EXISTING CONCRETE FOUNDATION

The concrete foundation shall be removed to a level of at least 900mm (3 ft.) below the adjacent grade, backfilled with approved material, and the surface reconstructed to match the adjoining area. The foundation shall be disposed of outside the right of way. If the concrete foundation is located in the sidewalk area, the entire sidewalk square or squares where the concrete foundation is located shall be replaced with new sidewalk.

Basis of Payment: This work shall be paid for at the contract unit price each for REMOVE EXISTING CONCRETE FOUNDATION.

ELECTRIC CABLE ASSEMBLY IN CONDUIT, 600V (EPR – TYPE TC) 2/C NO. 6, AND NO. 8 GROUND

1. Description. This work shall consist of furnishing, installing, and testing electric cable that is triplexed. The cable shall be rated at 600 volts and shall consist of two number 6 conductors and one number 8 conductor. The cable will be installed in conduit underground.

2. Material The cable shall meet all requirements of Material Specification 1440 of the Bureau of Electricity, City of Chicago.

3. Construction Method All cables shall be installed with care to prevent damage to the cable. Any defects found in the cable shall be reported to the Engineer. Damaged cable shall be replaced.

The cable shall be pulled into the conduit with a minimum of dragging on the ground or pavement. This shall be accomplished by means of reels mounted on jacks or other suitable devices located for unreeling cable directly into duct. Lubricants shall be used to facilitate installation if deemed necessary by the contractor. Bends in the cable shall conform to the recommended minimum radius as outlined in the National Electric Code.

Cable passing through manholes shall be trained and racked around the sides of the manhole into a permanent position. If racks are non-existent or in poor condition, the contractor shall install racks. The material shall be approved by the Engineer. Any material and labor involved in training and racking the cable shall be considered incidental to the cost of this pay item.

Where cable runs continue from manhole to manhole without tapping within a light pole, they shall be continuous without splices unless authorized by the Engineer.

The cable installation shall be color coded so that each lead of all circuits may be easily identified and lighting units connected to the proper leg as indicated on the plans. The equipment grounding conductor (no. 8) shall be color coded green.

All wire or cable in the distribution panels and control cabinets shall be properly trained and have sufficient slack provided for any rearrangement of equipment or future additions. There shall be at least two feet of slack in a street light pole base or street light controller base. A handhole shall have at least five feet of slack and a manhole at least ten feet of slack.

4. Method of Measurement The length of triplex cable furnished and installed will be measured as the length of conduit plus three feet for cable entering and leaving a light pole or street light control cabinet, plus any slack in manholes or handholes.

5. Basis of Payment This work shall be paid for at the contract unit price per lineal meter for ELECTRIC CABLE ASSEMBLY IN CONDUIT, 600V (EPR – TYPE TC) 2/C NO. 6, AND NO. 8 GROUND. The price shall be payment in full for furnishing, installing, and testing the cable, and shall include all material, labor, and incidentals necessary to complete the work as per the contract plans.

ELECTRIC CABLE, AERIAL, 3-1/C-#6, SELF SUPPORTING

ELECTRIC CABLE, AERIAL, 3-1/C-#2, SELF SUPPORTING

Description. This item shall consist of furnishing and installing an electrical cable, designed for and designated 'self supporting', consisting of two insulated color coded conductors spirally wrapped around one bare conductor. The cable shall be strung between poles and attached to cable supports on these poles. The conductors shall be connected to other wires or cables for the purpose of extending electric power from a Commonwealth Edison Company power pole to a City electric power pole as shown on the plans, as specified herein, or as directed by the Engineer.

Material. The material shall consist of three-single conductor stranded copper wires, #4 AWG or other size as stated, with the finished cable meeting the requirements of Standard Specification for Self-Supporting secondary cable.

Installation Requirements. The cable shall be installed with a nominal tension adequate to produce a sag of approximately 9 inches in a 60 ft. span. The cable shall be attached to a line pole by means of a suitable clamp which holds the neutral conductor. The clamp shall be supported by a clamp support device appropriate for the type of pole in use. The cable shall be dead ended at the City pole as part of a different pay item, and shall be dead ended by the Commonwealth Edison Company on their pole. Ten feet of additional cable shall be coiled and attached to the Commonwealth Edison Company pole for final connections.

Basis of Payment. This work will not be paid for separately, but shall be paid for as part of the contract unit price per lump sum for TEMPORARY STREET LIGHTING INSTALLATION, which shall be payment in full for furnishing and installing this cable.

MATERIAL SPECIFICATION

Specification for Self-Supporting Cable

WIRE, AERIAL, 1/C - NO. 6.

Description. This item shall consist of furnishing and installing electrical wire strung between poles, attached to secondary wire racks on the poles, and connected to other wires or cables for the purpose of extending street lighting circuits as shown on the plans, as specified herein, or as directed by the Engineer.

Materials. The material shall be single conductor No.6 AWG, neoprene covered, medium hard-drawn copper, aerial wire, meeting the requirements of Specification 1441 for medium hard-drawn copper aerial wire.

Installation Requirements. The wire shall be installed with a nominal tension of 150 pounds to produce a sag of approximately 6 inches in an 85 foot span. Through wire shall be attached to the side of the insulator away from the pole and secured with four turns of a tie wire close wrapped. Dead ends shall have two wraps of the wire around the insulator and then six close turns of the wire around the wire under tension, or by the use of an approved automatic bail deadend device. Where necessary, wire lengths shall be spliced together by means of an approved automatic wedge-type, straight line splicing device. Each splice shall be given two wrappings of friction tape and coated with insulating paint. Connections to lamp leads, or other conductors not under tension, shall be made with approved split-bolt connectors and wrapped with three layers half-lapped of plastic, electrical tape and coated with insulating paint.

Basis of Payment: This work will be paid for at the contract unit price per lineal foot for WIRE, AERIAL, 1/C NO. 6, installed in place and connected, which price shall be payment in full for furnishing, installing and connecting 1/C No. 6 AWG aerial line wire in place.

WIRE, AERIAL, 1/C NO. 6 used for TEMPORARY STREET LIGHTING INSTALLATION will not be paid for separately, but shall be paid for as part of the contract unit price per lump sum for TEMPORARY STREET LIGHTING INSTALLATION, which shall be payment in full for furnishing and installing this cable.

MATERIAL SPECIFICATION 1441
October 1, 1986

CONCRETE FOUNDATION (SPECIAL)

General. The Contractor shall install a concrete foundation for a base mounted traffic signal controller type "M" cabinet, as shown on City of Chicago Drawing Number 854 and 11825.

The foundation will have a minimum depth of at least 40" below grade and shall have large radius conduit elbows in quantity, size and type shown. The elbow ends above ground shall be capped with standard conduit bushings. The Contractor shall furnish anchor bolts, hardware, conduit elbows, and all other material shown on the foundation construction drawing. Ready mix concrete shall be furnished in accordance with latest revision of City of Chicago Specification "READY-MIXED CONCRETE". Ground rods shall be in accordance with Material Specification 1465; and conduit shall be in accordance with Material Specification 1462.

Basis of Payment. Unit price shall include cost of all material and labor required to install this foundation, as per applicable construction plans and these Detail Specifications. The conduit elbows shall be considered as part of the foundation and will not be paid for as a separate item or as part of the conduit laterals leading to the foundation. All necessary excavation and restoration of parkway to the original condition shall be included in the unit price. This work will be paid for at the Contract Unit Price of per meter of depth for CONCRETE FOUNDATION (SPECIAL).

March 21, 1995

SOLID STATE PRETIMED CONTROLLER, 40 CIRCUIT, 24 INTERVAL, WITH ACTUATION INPUTS WITH FOUR CYCLE SOLID STATE TIME BASE COORDINATOR IN BASE INTO CABINET

1. Description: This work shall consist of furnishing and installing a pretimed controller and related equipment in a cabinet onto a pad foundation.
2. Materials: Materials shall meet the requirements of Specification Number 1469. Bus feed tracks shall be capable of carrying sixty (60) amperes continuously at a temperature of 74 degrees C. (165 degrees F. The board and track shall be sufficiently derated to insure maximum life under conditions of maximum power dissipation at maximum ambient temperature. A sixty (60) ampere main breaker inserted in series with the line.

The cabinet shall be equipped and wired for either a 12 load bay switch setup or a 16 load bay switch setup, as per the plans. The cabinet shall be 50 inches high by 30 inches wide by 17 inches deep.

3. Installation Requirements: The pretimed controller shall be enclosed in a housing and installed in a completely wired cabinet. The model and serial number of the controller shall be affixed on the front of the housing and readily visible.

Electric cables inside the controller cabinet shall be neatly trained along the base and back of the cabinet. Each conductor used shall be connected individually to the proper terminal, and the spare conductors shall be insulated and bound into a neat bundle. Each cable shall be marked with suitable identification and recorded on a copy of the plans for the intersection and submitted to the Engineer. The pretimed controller shall provide the sequence of operation shown on the plans. Signal indications for each direction shall be wired to a separate circuit whether or not the signal plan calls for a split movement. Maximum load per signal circuit not to exceed 700 watts. Final offset timing of time base coordinator cabinet shall be sealed with a pliable waterproof material.

4. Basis of Payment: This work will be paid for at the contract unit price each for PRETIMED CONTROLLER of the types specified, which price shall be payment in full for furnishing and installing the controller complete with the necessary connections for proper operation.

MATERIAL SPECIFICATION 1469

LIGHT POLE FOUNDATION, 600MM DIAMETER

Description. The foundation shall be 24" in diameter, with a 15" bolt circle and 1 1/4" diameter anchor rods.

General. Every foundation shall be installed at the location designated and in the manner herein specified or in special cases as specifically directed. From time to time, it may be required to locate foundations at places other than shown on drawings furnished this Contractor. The Engineer reserves the right to make such relocations as he may deem necessary or required, and when directed to do so, this Contractor shall locate foundations as indicated by the Engineer.

Concrete Foundations in Solid Fill. Foundations constructed in solid fill shall conform to drawing number 818. Top surface of these foundations shall be at an elevation of 2' above grade or as required by the Engineer. Care shall be taken to install a level foundation and to ensure adequate anchor rod projections for double-nut installation. The foundations shall be centered back from the face of the curb in accordance with dimensions shown on construction plans. Foundation raceways shall consist of large radius conduit elbow(s) in quantity size and type specified on the construction plans. The elbow ends above ground shall be capped with standard conduit bushings. The Contractor shall furnish anchor rods, hardware, conduit elbow(s) and all other material shown on applicable foundation construction drawings. Depth of foundation shall be as noted on construction plans. Ready mix concrete shall be furnished in accordance with Material Specification "Ready-Mix Concrete".

Foundation Anchor Rods. Anchor Rods shall be fabricated from steel meeting the requirements of the latest revisions of ASTM A400, Class R-2 and have a minimum yield point of 55,000 P.S.I. Anchor rods shall be set in accordance with applicable construction plans so that when poles are mounted on the foundations, the street lighting mast arm shall be properly oriented as indicated on the construction plans. The anchor rods shall be set by means of a metal template which shall be submitted for approval before any foundation work is begun. The template shall hold the rods vertical, and in proper position, and shall serve as a form for the top 6" of the periphery of the foundation. Anchor rods shall conform in all respects to City of Chicago drawing number 811.

Basis of Payment. Payment will be made for foundations installed in place, including elbows, in accordance with construction drawings 793A, 811, 818, 828, 837, construction plans, Material Specifications "Ready-Mix Concrete" and number 1467, and these Detail Specifications. All necessary excavation and restoration of pavement, sidewalk and fill to their original conditions shall be included in the unit price. This work will be paid for at the contract unit price per lineal meter of depth for LIGHT POLE FOUNDATION, 600MM DIAMETER.

March 21, 1995

LIGHT POLE FOUNDATION, 750MM DIAMETER

Description. The foundation shall be 30" diameter, with a 17 1/4" bolt circle and 1 1/4" diameter anchor rods.

General. Every foundation shall be installed at the location designated and in the manner herein specified or in special cases as specifically directed. From time to time, it may be required to locate foundations at places other than shown on drawings furnished this Contractor. The Engineer reserves the right to make such relocations as he may deem necessary or required, and when directed to do so, this Contractor shall locate foundations as indicated by the Engineer.

Concrete Foundations in Solid Fill. Foundations constructed in solid fill shall conform to drawing number 816. Top surface of these foundations shall be at an elevation of 2" above grade or as required by the Engineer. Care shall be taken to install a level foundation and to ensure adequate anchor rods projections for double-nut installation. The foundations shall be centered back from the face of the curb in accordance with dimensions shown on construction plans. When the foundation is in a solid sidewalk area, the foundation shall be installed as shown on Drawing 828. When the foundation is centered four feet from face of curb, the top of the anchor rods shall be 7 1/8" above the proposed curb grade, and the concrete shall be struck off approximately 3" below the curb grade to permit sidewalk construction which will envelop the top of the foundation to create a consolidated, unified structure.

Foundation raceways shall consist of large radius conduit elbow(s) in quantity size and type specified on the construction plans. The elbow ends above ground shall be capped with standard conduit bushings. The Contractor shall furnish anchor rods, hardware, conduit elbow(s) and all other material shown on applicable foundation construction drawings. Depth of foundation shall be as noted on construction plans. Ready mix concrete shall be furnished in accordance with latest revision of City of Chicago Material Specification "Ready Mix Concrete". Ground rods shall be manufactured by the Copperweld Steel Company, or an approved equal.

Foundation Anchor Rods. Anchor Rods shall be fabricated from steel meeting the requirements of the latest revisions of ASTM A400, Class R-2 and have a minimum yield point of 55,000 P.S.I. Anchor rods shall be set in accordance with applicable construction plans so that when poles are mounted on the foundations, the street lighting mast arm shall be properly oriented as indicated on the construction plans. The anchor rods shall be set by means of a metal template which shall be submitted for approval before any foundation work is begun. The template shall hold the rods vertical, and in proper position, and shall serve as a form for the top 6" of the periphery of the foundation. Anchor rods shall conform in all respects to City of Chicago drawing 811.

Foundation in Vaulted Walk. Foundations constructed in vaulted walks shall conform to Drawing Number 812. Foundation for street light poles shall extend from the top of the sidewalk to the floor of the basement and abut the retaining wall. Foundations shall be secured to the retaining wall by anchor rods firmly imbedded in the foundation and in the retaining wall, and in every case shall be adequate to provide proper bearing surface and proper spacing for anchor rods.

Construction Requirements in Vaulted Walks. An opening for a foundation in a vaulted walk shall not be larger than is necessary to allow for placing concrete. Prior to making this opening, the contractor shall provide whatever temporary support is necessary to prevent damage or collapse of the paved walk surrounding the opening. Shoring, or the required foundation form suitably braced, may be used for this purpose. The foundation shall be of adequate size to provide not less than a 3" wide shoulder or bearing surface, all around the opening for permanent support of the surrounding walk.

Basis of Payment. Unit price shall include cost of all materials and labor required to install foundations in parkway or in a vaulted walk, in accordance with construction drawings 793 A, 811, 812, 816, 828, 837, construction plans, Material Specifications "Ready-Mix Concrete" and 1467, and these detail specifications. All necessary excavation and restoration of parkway or vaulted walks to their original conditions shall be included in the unit price. This work will be paid for at the contract unit price per lineal meter of depth for LIGHT POLE FOUNDATION, 750MM DIAMETER.

MATERIAL SPECIFICATION
Ready-Mixed Concrete
1467

March 21, 1995

SIGNAL HEAD, ALUMINUM, 1-FACE, 3-SECTION, BRACKET MOUNTED

SIGNAL HEAD, ALUMINUM, 1-FACE, 4-SECTION, BRACKET MOUNTED

1. Description. This item shall consist of furnishing and installing a traffic signal head or combination of heads on a street light pole, a traffic signal pole, or a traffic signal post as shown on the plans, as specified herein, or as directed by the Engineer. Specific installations and configurations are shown on Drawing Numbers 834 and 835, entitled "Standard Traffic Signal Mounting Details" approved by the Engineer.

The type of installation specified shall indicate the number of signal faces, the number of signal sections in each signal face, any dual-indication sections, and the method of mounting. The sizes of the lenses shall be as indicated on the plans.

Each signal face shall be pointed in the direction of the approaching traffic that it is to control and shall be aimed to have maximum effectiveness for an approaching driver located at a distance from the stop equal line to the normal distance traversed while stopping. The optically programmed signal face shall be veiled in accordance with the visibility requirements at the direction of the Engineer.

During construction and until the installation is placed in operation, all signal faces shall be hooded. The hooding material shall be securely fastened so it will not be disturbed by normal inclement weather or wind.

2. Head, Signal Materials. The traffic signal head construction shall meet the requirements of Specification 1425 for a "Traffic Signal: Twelve-Inch, Three or Single Section, One-Way," for a non-programmed signal.
3. Installation Requirements.
The signals shall be mounted using pole mounting brackets Leitelt Brothers Number LB-ULB-1, banded to the pole with two strips of 3/4" stainless steel banding single wrapped, one at the top and one at the bottom of the brackets, each secured with a stainless steel banding clip. The mounting configuration connecting the signals to the mounting bracket shall consist of sections of 1 1/2" steel conduit of precise lengths, as indicated on the standard drawing, to create the designated structure, connected with cross fittings per Standard Drawing 741, Leitelt Brothers Number LB-ULB5X, A, B, or C, as required.

When the signals are to be mounted on a square pole of flat surface, the bracket used will be number LB-ULB-1F, bolted to the flat pole or surface using a 3/8" drive stud where permissible or using a 3/8" stud in a tapped hole. The bottom mounting bracket shall be accurately located to cover an opening 1" in diameter, for cable entrance, drilled into the pole or standard at a calculated height to position the bottom signal face at a standard height of 10', or a height indicated on the plans. The opening shall be reamed or filed to remove all sharp edges or burrs which might damage cable during installation, or through vibration when the signals are in operation.

4. Cable. The Contractor shall provide and install a length of 8/C #18 AWG, as per Specification 1472, flexible electrical cord, medium duty, of sufficient length to extend without strain or stress from the terminal strip in the "Green" section of the signal head to the terminal strip in the junction box mounted on the pole. The number of conductors in the cord, and the color coding of the conductors, shall be sufficient to match the requirements of the signal head being installed, and shall be so connected in accordance with Detail Requirements, paragraph 3 (o), "Wiring" of Specification 1425 for "Traffic Signal Twelve-Inch Three or Single Section, One-Way". Both ends of the cable length shall be carefully stripped of 6" of jacket and 1" of insulation, and each conductor properly tinned. The cord shall be attached to the terminal block in the junction box in accordance with the terminal strip connector schematic, Drawing Number 12268-A.

The service cable from the signal heads shall enter the pole through the bottom ULB-1 mounting bracket and enter the long sweep elbow to terminate by attachment to the terminal strip in the junction box in accordance with connector schematic, Bureau of Electricity Drawing Number 12268-A

5. Lamp Requirements.
The contractor shall supply and install one incandescent lamp for each signal face of a non-optically programmed signal. The lamp shall have a nominal 1,500 lumen rating at 133 watts with an average rated life of not less than 8000 hours, and a 3" light center length.
6. Painting.
The signal head housings, the pole mounting brackets, and the crosses are painted by the manufacturer with green, baked on, enamel. When the signals are already mounted on the pole, the mounting hardware is painted as part of the pole which will be painted with either green or gray paint as specified on the plans, or as directed by the engineer. The housing of the signal heads shall not be painted with the pole paint.

7. Basis of Payment.

This work will be paid for at the contract unit price for each SIGNAL HEAD, ALUMINUM, 1-FACE, 3-SECTION, BRACKET MOUNTED, OR SIGNAL HEAD, ALUMINUM, 1-FACE, 4-SECTION, BRACKET MOUNTED which price shall be payment in full for furnishing and installing the signal head complete.

March 21, 1995

SIGNAL HEAD, ALUMINUM, 1-FACE, 3-SECTION, MAST ARM MOUNTED

SIGNAL HEAD, ALUMINUM, 1-FACE, 4-SECTION, MAST ARM MOUNTED

1. Description. This item shall consist of furnishing and installing a traffic signal head on a traffic signal monotube mast arm, as shown on the plans, as specified herein, or as directed by the Engineer. Specific installations and configurations are shown on Drawing 834 entitled "Standard Traffic Signal Mounting Details" approved by the Engineer.

The type specified shall indicate the number of signal faces, the number of signal sections in each face, and the method of mounting. The size of the lenses shall be indicated on the plans.

Each signal face shall be pointed in the direction of the approaching traffic that it is to control and shall be aimed to have maximum effectiveness for an approaching driver at a distance from the stop equal line to the normal distance traversed while stopping. The optically programmed signal face shall be veiled in accordance with the visibility requirements at the direction of the Engineer.

During construction, and until the installation is placed in operation, all signal faces shall be hooded. The hooding material shall be securely fastened so it will not be disturbed by normal inclement weather or wind.

2. Head, Signal Materials.
The traffic signal head construction shall meet the requirements of Specification 1425 for a "Traffic Signal: Twelve-Inch, Three or Single Section; One-Way, for a non-programmed signal.
3. Installation Requirements. The signal shall be mounted on the mast arm using an "Astro-Brac" mounting device at the position on the mast arm as indicated on the drawing in the manner shown on Drawing 834. The programmed signals shall be mounted using an "VEPED Traffic Controls, Incorporated Astro Bracket, Cat. Number AB-103, for a 3-section signal.

The non-programmed signals shall be mounted using a bracket meeting the requirements of Specification 1463, and the Bracket shall be banded to the mast arm with the 5/8" banding as shown on Drawing Number 834.

The Bracket shall be banded to the mast arm with 5/8" banding and located over a hole drilled into the mast arm for the installation of cable. The hole shall be reamed or filed to remove any sharp edges to burrs which might damage cable during installation, or through vibration when the signals are in operation.

4. Cable. The contractor shall provide and install a length of 8/C #18 flexible electrical cord, as per Specification 1472, of sufficient length to extend without strain or stress from the terminal strip in the "Green" section of the signal head to the terminal strip in the junction box mounted on the pole. The number of conductors in the cord, and the color coding of the conductors, shall be sufficient to match the requirements of the signal head being installed, and shall be connected in accordance with Detail Requirements, paragraph 3 (o), "Wiring", of Specification 1425, for the "Traffic Signal Twelve-Inch Three or Single-Section, One-Way". Both ends of the cable length shall be carefully stripped of 6" of jacket and 1" of insulation, and each conductor properly tinned. The service cable from the signal heads shall enter the traffic signal mast arm through the hole from the mounting bracket, whence it shall continue and enter the pole through the hole for mast arm wiring, then extend downward through the pole to enter the long sweep elbow to terminate by attachment to the terminal strip in the junction box in accordance with the terminal strip connector schematic, Bureau of Electricity Drawing Number 12268-A.
5. Lamp Requirements. The contractor shall supply and install one incandescent lamp for each signal face of a non-optically programmed signal. The lamp shall emit approximately 1500 lumens at 133 watts, have an average rated life of not less than 8000 hours, and have a 3" light center length.
6. Painting. The signal head housings, the pole mounting brackets, and the crosses are painted by the manufacturer with green, baked on, enamel. When the signals are mounted on the pole, the mounting hardware is painted as part of the pole which will be painted with either green or gray paint as specified on the plans, or as directed by the Engineer. The housing of the signal heads shall not be painted with the pole paint.
7. Basis of Payment. This work will be paid for at the contract unit price each for SIGNAL HEAD, ALUMINUM, 1-FACE, 3-SECTION, MAST ARM MOUNTED, OR SIGNAL HEAD, ALUMINUM, 1-FACE, 4-SECTION, MAST ARM MOUNTED, which price shall be payment in full for furnishing and installing the signal head, or the optically programmed signal head, complete.

March 21, 1995

PEDESTRIAN SIGNAL HEAD, 1 FACE, BRACKET MOUNTED

1. Description. This item shall consist of furnishing and installing a pedestrian signal on a street light pole, a traffic signal pole or a traffic signal post as shown on the plans, as specified herein, or as directed by the Engineer. The signal may be installed as a single unit on a pole or in combination with other pedestrian signals or with traffic signals of various types and sizes. Specific installations and configurations are shown on Drawing Numbers 834 and 835 entitled "Standard Traffic Signal Mounting Details" approved by the Bureau of Electricity and the Illinois Department of Transportation for installation on Federal-Aid Highway Projects and on Illinois Department of Transportation Projects.

The method of mounting and the size of the lenses shall be indicated on the plans. Each signal face shall be pointed in the direction of the marked cross-walk area for the pedestrians it is intended to control.

During construction and until the installation is placed in operation, all signal faces shall be hooded. The hooding material shall be securely fastened so it will not be disturbed by normal inclement weather or wind

2. Signal Materials. The pedestrian signal head materials shall be consistent with the requirements of Bureau of Electricity Specification 1448. All housing units shall be made of aluminum.
3. Installation Requirements. The signal shall be mounted using pole mounting brackets Leitelt Brothers number LB-ULB-1, banded to the pole with two strips of 3/4" stainless steel banding, single wrapped, one at the top and one at the bottom of the bracket, each secured with a stainless steel banding clip. The mounting configuration connecting the signals to the mounting bracket shall consist of sections of 1-1/2" steel conduit of precise lengths as indicated on the standard drawing to create the designated structure, connected with cross fittings per Standard Drawing 741, Leitelt Brothers number LB-ULB5XA, A, B, or C as required.

The bottom mounting bracket shall be accurately located to cover a hole 1" in diameter for cable entrance drilled into the pole or standard at a height calculated to position the bottom signal face at a standard height of 10', or a height indicated on the plans. The hole shall be reamed or filed to remove all sharp edges or burrs which might damage cable during installation, or through vibration when the signals are in operation.

When the pedestrian signal is attached below a traffic signal head, the separate opening for cable may be omitted to eliminate additional weakening of the pole and the pedestrian signal cord shall be installed using the same opening as the traffic signal cord.

4. Cable. The Contractor shall provide and install a length of 8/C #18 AWG flexible electric cord, per specification 1472, of sufficient length to extend without strain or stress from the terminal strip in the "WALK" section of the signal head to the terminal strip in the junction box mounted on the pole. The number of conductors in the cord, and the color coding of the conductors, shall be sufficient to match the requirements of the signal head being installed, and shall be so connected in accordance with Detail Requirements, paragraph 3 (e) "Wiring for Pedestrian Traffic Control Signals". Both ends of the cable shall be carefully stripped of 6" of jacket and 1" of insulation, and each conductor properly tinned. The cord shall be attached to the terminal block in the junction box in accordance with the terminal strip connector schematic, Bureau of Electricity Drawing Number 12268-A

The service cord from the signal heads shall enter the pole through the bottom ULB-1 mounting bracket and enter the long sweep elbow to terminate by attachment to the terminal strip in accordance with the terminal strip connector schematic, Bureau of Electricity Drawing Number 12268-A.

5. Lamp Requirements. The contractor shall furnish and install an incandescent lamp for each face of the signal to be installed. The lamp shall be a traffic signal lamp, 120 volt, 116 watts, 2 7/16" light center length with rated life of 8000 hours.
6. Painting. The signal head housings, the pole mounting brackets, and the crosses shall be painted by the manufacturer with green, baked on, enamel. When the signals are already mounted on the pole, the mounting hardware is painted as part of the pole which will be painted with either green or gray paint as specified on the plans or as directed by the engineer. The housing of the signal heads shall not be painted with the pole paint.
7. Basis of Payment This work will be paid for at the contract unit price each for PEDESTRIAN SIGNAL HEAD, 1 FACE, BRACKET MOUNTED, which price shall be payment in full for furnishing and installing the signal head complete.

MATERIAL SPECIFICATION DRAWING
1448 12268-A
 741

March 21, 1995

DRILL EXISTING MANHOLE OR HANDHOLE

DESCRIPTION This work shall consist of drilling a hole in an existing handhole or manhole for the installation of a new conduit. The size of the hole shall be as close as possible to the size of the conduit. A conduit of the size required shall be installed in the drilled hole. A bushing shall be provided at the end of the conduit. The space between the conduit and the handhole or manhole shall be caulked with a waterproof grout.

BASIS OF PAYMENT This work will be paid for at the contract unit price each for DRILL EXISTING MANHOLE OR HANDHOLE, which price shall be payment in full for drilling the hole, furnishing and installing the conduit and bushing, including all necessary excavation and backfilling outside of the handhole or manhole.

DRAWING 814
March 21, 1995

ADJUST EXISTING ELECTRICAL HANDHOLE WITH 600MM FRAME AND LID

1. Description. This item shall consist of the adjustments to an existing concrete manhole or handhole and installing a new 2' circular cast iron frame and lid.
2. Location. Each manhole or handhole shall be adjusted at locations directed by the Engineer.
3. Installation. Contractor shall carefully excavate all necessary pavement, sidewalk and soil to expose existing manhole or handhole. Existing frame and lid shall be salvaged and returned to City storeroom. Before any adjustment is made to the manhole or handhole, cables in manhole or handhole shall be protected by providing a timber covering of a type and by a method approved by the Engineer. New adjustments are to be made in conformance with City of Chicago Drawings No. 729, 732, or 733, whichever is applicable.
4. Materials. The Contractor shall furnish all materials, equipment and labor for a complete adjustment to an existing manhole or handhole in accordance with the detail specifications, construction drawings, and construction plans.
4. Basis of Payment. The unit price for adjusting a manhole or handhole shall include all necessary excavation, backfilling, and restoration of parkway or pavement in accordance with the foregoing specifications. No additional payment will be allowed for excavation, restoring parkway or removal and restoration of sidewalk or pavement. The work will be paid for at the contract unit price each to ADJUST EXISTING ELECTRICAL HANDHOLE WITH 600MM FRAME AND LID.

LIGHT POLE, STEEL, 10.5M M.H., 3.65M M.A., 7 GA. 254MM DIA., 381MM B.C., 31.75MM ANCHOR RODS

LIGHT POLE, STEEL, 10.5M M.H., 3.65M M.A., 3 GA. 279MM DIA., 438MM B.C., 31.75MM ANCHOR RODS

LIGHT POLE, STEEL, 10.5M M.H., 3.65M M.A., 3 GA. 318MM DIA., 419MM B.C., 38.1MM ANCHOR RODS

Description. This item shall consist of furnishing and installing and setting plumb a steel anchor base pole as illustrated on Drawing number 808, to which equipment may be attached for the extension of the City street light, fire alarm, and traffic signal systems.

Material. The material of the pole shall meet the requirements of Specification 1418 for the 10" diameter poles, Specification 1420 for the 11" diameter pole, and Specification 1419 for the above 12 1/2" diameter pole.

Installation. The pole shall be installed on the concrete foundation designed for the particular pole usage as indicated on the plans and as illustrated on Drawing Number 837 and Drawing Number 828 using double-nut construction. To obtain adequate ventilation for rust prevention the bottom of the pole base shall be set elevated above the concrete foundation. On the side away from the curb, this elevation shall be a distance of 2 3/8" above the calculated sidewalk grade or above the level of a finished foundation per Drawing 816, 817 or 818. In an installation made under the conditions required by Drawing 828, the top of the lower washer on one rear anchor rod shall be set at 3 5/8" below the top of the anchor rod, and the pole shall be installed using this washer as the controlling elevation. Any exposed portions of anchor rods extending above the nuts which interfere with the installation of the bolt covers shall be cut off with a saw to provide the necessary clearance. The excess shall not be burned off. The pole shall be set secure and plumb using the nuts and washer provided with the anchor bolts per Specifications 1394 and 1467 with all appurtenances attached for the final plumb check. The bolt covers, handhole cover, and pole cap shall be securely attached.

Painting. The pole and mast arm shall be delivered completely finished with a factory applied powder coat paint system. The contractor shall utilize non-abrasive slinging materials and shall otherwise exercise due care in erecting the pole and mast arm to minimize any possible damage to the finish. When necessary, the contractor shall utilize, at his own expense, factory approved touch-up materials and methods to restore the finish to like new appearance and durability.

Basis of Payment. This work will be paid for at the Contract unit price each for a LIGHT POLE, STEEL, 10.5M M.H., 3.65M M.A., 7 GA. 254MM DIA., 381MM B.C., 31.75MM ANCHOR RODS, LIGHT POLE, STEEL, 10.5M M.H., 3.65M M.A., 3 GA. 279MM DIA., 438MM B.C., 31.75MM ANCHOR RODS, LIGHT POLE, STEEL, 10.5M M.H., 3.65M M.A., 3 GA. 318MM DIA., 419MM B.C., 38.1MM ANCHOR RODS, which shall be payment in full for furnishing and installing the pole complete in place. Light standard foundations and anchor rods shall not be included in this pay item but shall be paid for separately.

REMOVE ELECTRIC CABLE FROM CONDUIT

Description: This work shall consist of the removal of electric cable for the construction of new street lighting.

Construction Requirements: An existing electric cable shall be removed, as shown on the plans and as directed by the Engineer, from a conduit. The conduit shall be cleaned and swabbed prior to reinstallation of the cable.

Method of Measurement: Removal of existing electric cable will be measured for payment in place in meters. If two or more cables in a conduit are to be removed, each cable will not be measured for payment separately but will be considered as one cable.

Basis of Payment: Removal of an existing electric cable will be paid for at the contract unit price per meter for REMOVE ELECTRIC CABLE FROM CONDUIT.

JUNCTION BOX, POLE OR POST MOUNTED, SPECIAL

1. Description. This item shall consist of furnishing and installing a Junction Box on each traffic signal post, traffic signal pole, or street light pole on which a signal head is mounted, as shown on the plans, specified herein, or directed by the Engineer. The junction box, 16" high, 6" Wide and 4" deep shall be installed with appurtenances as shown on Standard Drawing 834 and as described herein.
2. Materials and Assembly. The Junction Box shall conform to the requirements of Specification Number 1407, Detail Specification for a Junction Box, and shall be mounted above and attached by four (4) #10-24 x 3/4" stainless steel screws, to a long sweep elbow, Leitelt Brothers Company Item Number LB-16-64-A-2. A stainless steel, sign mounting, banding bracket, Drawing Number 11984, shall be attached to the center of the back of the box with a (5/16" x 1") stainless steel machine screw. The box shall contain a 20 conductor terminal strip, Marathon Special Products Corporation Catalog Number 36002, securely fastened to an Aluminum Terminal Block "Z" Bracket, Leitelt Brother Company Item Number LB-16-6-4B, mounted with two Number 8-24 x 1/2" stainless steel machine screws in tapped holes in the mounting bosses, and located 3/4" from the right side facing the open box.
3. Installation Requirements. The box and elbow shall be mounted on the side of the pole away from the roadway. The center of the box shall be located approximately 58" above the adjacent sidewalk. The long sweep elbow shall be properly positioned over a hole 1 1/2" in diameter drilled in the pole approximately 48" above the sidewalk, for the installation of the cable. The hole shall be reamed or filed to remove all sharp edges or burrs which might damage cable during installation, or through vibration when the signals are in operation. The box and elbows shall be banded to the pole with three (3) 3/4" stainless steel bands, one through the banding bracket and one each at the top and bottom of the elbow.
4. Basis of Payment. This work will be paid for at the contract unit price each for a JUNCTION BOX, POLE OR POST MOUNTED, SPECIAL, which price shall be payment in full for furnishing and installing the junction box complete with its component parts and appurtenances. Connection of cables and wires to the terminal strip will not be part of the cost of the junction box but will be considered part of the installation of the underground cable and the installation of signal heads.

MATERIAL SPECIFICATION
1407

DRG. NO
832
11984

MAST ARM, STEEL, MONOTUBE, 9.10 METER

MAST ARM, STEEL, MONOTUBE, 10.70 METER

MAST ARM, STEEL, MONOTUBE, 12.19 METER

1. Description:

This item shall consist of furnishing and installing a steel, monotube, mast arm for the purpose of supporting traffic signals, and/or illuminated or painted signs, or other types of related equipment on an anchor-base pole at the locations shown on the plans, as specified herein, or as directed by the Engineer. The length of the mast arm and the angular orientation of the arm relative to the center line of the roadway shall be as indicated on the plans.

A mast arm shall be installed only on a 3 gauge pole, and the length of the mast arm shall govern the minimum base diameter of the pole on which the arm is to be installed, in accordance with the following chart:

MAST LENGTH	ARM GAUGE	POLE BASE DIAM. INCHES	POLE GAUGE
(16) 4.87m	7 GA.	(10)	3 GA.
(20) 6.09m	7 GA.	(10)	3 GA.
(26) 7.92m	7 GA.	(10)	3 GA.
(30) 9.144m	7 GA.	(11)	3 GA.
(35) 10.66m	7 GA.	(12 1/2)	3 GA.
(40) 12.19m	7 GA.	(12 1/2)	3 GA.

2. Material

The material of the mast arm shall meet the requirements of the mast arm depicted on Drawing No. 99 for (16) 4.87m, (20) 6.09m, (26) 7.92m, (30) 9.144m, (35) 10.66m and (40) 12.19m long traffic signal mast arms.

3. Installation Requirements.

The mast arm shall be mounted on the pole at the height specified on Drawing 834, or at a different height only if specified on the plans. A 1" diameter opening for the installation of cable shall be field drilled in the pole in line with the orientation of the mast arm.

The hole shall be reamed or filed to remove all sharp edges or burrs which might damage cable during installation, or through vibration when the signals are in operation. A neoprene grommet shall be inserted into the finished hole prior to the installation of cable.

Two holes shall be field drilled in the pole at 180 degrees relative to the orientation of the pole for installation of locator shear pins, provided with the back plate, to prevent rotation of the mast arm. These holes shall be drilled after the mast arm is in place in order that the position of the holes shall match the location of the locator bushings attached to the back half of the clamp.

All appurtenant signals and/or electric signs, indicators, or other electronic equipment must be attached in the correct relative position to the mast arm, with the service cord in place, prepared to be installed on the pole, prior to the attachment of the mast arm to the pole. The installation of the cord in the pole shall be coordinated with the attachment of the mast arm to the pole. The clamp bolts shall be tightened securely so that there is no slippage of the mast arm either upward or downward to exert a vertical force on the shear pins. The end cap shall be secured in place with the attachment screws provided.

4. Painting.

The pole and mast arm shall be delivered completely finished with a factory applied powder coat paint system. The contractor shall utilize non-abrasive slinging materials and shall otherwise exercise due care in erecting the pole and mast arm to minimize any possible damage to the finish. When necessary, the contractor shall utilize, at his own expense, factory approved touch-up materials and methods to restore the finish to like new appearance and durability.

5. Basis of Payment

This work shall be paid for at the Contract unit price for each MAST ARM, STEEL, MONOTUBE, 9.10 METER, MAST ARM, STEEL, MONOTUBE, 10.70 METER or MAST ARM, STEEL, MONOTUBE, 12.19 METER and shall be payment in full for furnishing and installing a steel monotube traffic signal mast arm in place. Attachment of signals, signs, equipment or the cost of the attachments shall not be a part of this pay item, but shall be paid for at their separate unit cost prices detailed elsewhere in these specifications.

MATERIAL SPECIFICATION

DRAWING

1423

870

834

March 21, 1995

TRENCH AND BACKFILL WITH SCREENINGS OR SAND

DESCRIPTION This work will consist of excavating a trench for the installation of conduit and backfilling with limestone screenings as a portion of the total backfill of the trench, all as shown in Bureau of Electricity Standard Drawings No. 579 and No. 813. This work must meet all applicable requirements of Article 819 of the Standard Specifications.

MATERIAL Underground Cable Marking Tape must meet the requirements of Section 1066.05 of the Standard Specifications. Backfill must meet the requirements of Section 1003.04 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS The trench must be deep enough to provide thirty inches (30") of cover over the conduit to be installed. The trench must not exceed twelve inches (12") in width unless approved by the Resident Engineer. The bottom of the trench must be tamped, and the trench inspected by the Resident Engineer before conduit is installed. All trenches must be backfilled as soon as possible after the installation of the conduit or cable. Any material excavated from the trenches that in the opinion of the Resident Engineer is satisfactory backfill, may be used for backfill above the layer of screenings. The limestone screenings must be used to fill the bottom of the trench to a depth of one foot above the top of the conduit or duct encasement. Cinders, rocks, or other inappropriate materials will not be permitted to be used as backfilling material.

Backfilling material, beginning with limestone screenings must be deposited in the trench in layers not to exceed six inches (6") in depth, and must be thoroughly compacted with a mechanical tamper before the next layer is deposited in the trench. All trenches for conduit must be backfilled as per this specification. Unsuitable material must be disposed of according to the requirements of Section 202.03 of the Standard Specifications. Underground cable marking tape must be installed twelve inches (12") below the finished grade for all conduit runs.

METHOD OF MEASUREMENT: This work will be measured in meters along the centerline of the trench. Trench and backfill will not be measured for payment for conduit which is installed by pushing or by directional boring. Where more than one (1) conduit is installed in a single trench, only one run will be measured for payment.

BASIS OF PAYMENT This work will be paid for at the contract unit price per lineal meter, measured with conduit in place, for TRENCH AND BACKFILL WITH SCREENINGS. Such price will include the cost of all excavation, furnishing and placing all backfill material, and disposal of all surplus excavated material. If sidewalk, driveway pavement or pavement must be removed and replaced, such work will be paid for separately.

MATERIAL SPECIFICATION

DRAWINGS

813

579

January 1, 2002

TRENCH AND BACKFILL FOR 2 TO 4 DUCTS

DESCRIPTION This work will consist of excavating a trench for the installation of a two 3 inch or a two 4 inch or a four 3 inch or a four 4 inch duct conduit package, encased in concrete, and backfilling with limestone screenings as a portion of the total backfill of the trench. This work will meet all applicable requirements of Article 819 of the Standard Specifications.

MATERIAL Underground Cable Marking Tape must meet the requirements of Section 1066.05 of the Standard Specifications. Backfill must meet the requirements of Section 1003.04 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS The trench must not be less than three feet ten inches (3'10") deep to provide a minimum thirty inches (30") of cover over the concrete encased conduit to be installed in the trench. The trench must be between eighteen and twenty-four inches (18"-24") in width and must not exceed twenty-four inches (24") in width unless approved by the Resident Engineer. The bottom of the trench must be tamped, and the trench inspected by the Resident Engineer before conduit is installed. All trenches must be backfilled as soon as possible after the installation of the conduit. Any material excavated from the trenches that in the opinion of the Resident Engineer is satisfactory backfill, may be used for backfill above the layer of screenings. The limestone screenings must be used to fill the bottom of the trench to a depth of one foot above the top of the conduit or duct encasement. Cinders, rocks, or other inappropriate materials will not be permitted to be used as backfilling material. Backfilling material, beginning with limestone screenings will be deposited in the trench in layers not to exceed six inches (6") in depth, and must be thoroughly compacted with a mechanical tamper before the next layer is deposited in the trench.

All trenches for conduit must be backfilled as per this specification. Unsuitable material must be disposed of according to the requirements of Section 202.03 of the Standard Specifications. Underground cable marking tape must be installed twelve inches (12") below the finished grade for all conduit runs.

METHOD OF MEASUREMENT This work will be measured in meters along the centerline of the trench. Trench and backfill will not be measured for payment for conduit which is installed by pushing or by directional boring. Only one measurement will be made for the trench regardless of the number of conduit in the trench.

BASIS OF PAYMENT This work will be paid for at the contract unit price per lineal meter, measured with duct in place, for TRENCH AND BACKFILL FOR 2 TO 4 DUCTS. Such price will include the cost of all excavation, furnishing and placing all backfill material, and disposal of all surplus excavated material. Conduit and encasement will be paid for separately and are not included in this pay item. If sidewalk, driveway pavement or pavement must be removed and replaced, such work will be paid for separately.

April 2, 2001

INTERCEPT EXISTING CONDUIT

DESCRIPTION This item will consist of intercepting an existing city conduit or conduits for the purpose of installing a new foundation, a new manhole or handhole, or making a connection to a new conduit.

CONSTRUCTION Work under this item will be performed in accordance with Article 800 of the Standard Specifications, Bureau of Electricity Standards and the City of Chicago Electrical Code, except as herein modified.

The contractor must carefully cut the conduit so that the cut conduit ends will be flush with the inside walls of the new manhole or handhole. Where existing cables are in service in the conduit(s) being intercepted, conduit(s) must be carefully split so that all working cables are not interrupted. If conduit(s) are concrete encased, such concrete must be removed as required. Any concrete encasement damaged during installation must be restored as needed.

METHOD OF MEASUREMENT This work will be measured on a per each basis for each conduit end cut.

BASIS OF PAYMENT This work will be paid for at the contract unit price per each for INTERCEPT EXISTING CONDUIT, which price will include all necessary excavation, backfilling, and restoration of a parkway. No additional compensation will be made for removal or placement of concrete. This item will include all work necessary to bring the conduit into the manhole, handhole, or foundation, or to make the necessary connection to a new conduit. The contractor will furnish all materials for a complete installation

PVC CONDUIT IN TRENCH 50MM (SCHEDULE #40)

CONDUIT IN TRENCH, 50MM DIA., PVC, SCHEDULE 80

PVC CONDUIT EMBEDDED IN STRUCTURE, 50MM (SCHEDULE #40)

CONDUIT IN TRENCH, 65MM DIA., GALVANIZED STEEL

PVC CONDUIT IN TRENCH 75MM (SCHEDULE #40)

PVC CONDUIT IN TRENCH 2-75MM (SCHEDULE #80)

PVC CONDUIT IN TRENCH 3-75MM (SCHEDULE #80)

Description. - This work shall consist of furnishing and installing a conduit lateral of the type and size specified.

Materials. - Galvanized rigid steel conduit shall conform to the requirements of the Specifications for RIGID STEEL CONDUIT, ZINC COATED, which is made part of these Detail Construction Specifications and material specification 1462.

Polyvinyl chloride (PVC) conduit shall conform to the requirements of National Electrical Manufacturers Association Standard, Publication Number TC2 for EPC-40.

Definition of Laterals. - A lateral shall mean a conduit raceway extending from one sub-surface location to another sub-surface location, and in every case intended to encase electric circuit cable under paved surfaces, or in unpaved parkway, street or alley, where specifically designated.

Locations. - Laterals shall be installed at the locations shown on the construction plans. Laterals shall be installed in the shortest practicable line between points of termination, or under adverse conditions, as directed by the Engineer. Laterals not shown on the drawing, but necessary to be installed, will be paid for at the unit price bid for laterals as additional units of construction.

Installation Requirements. - Galvanized rigid steel conduit may be installed in a trench, pushed underground, or attached to a structure. PVC conduit shall normally be installed in a trench or attached to a structure. The Contractor shall exercise care in installing the conduit to ensure that it is smooth, free from sharp bends or kinks, and has the minimum practicable number of bends. Crushed or deformed conduit will not be accepted. All conduit and fittings shall have the burrs and rough places smoothed, and all conduit runs shall be cleaned and swabbed before installation of electric cables. The excavation for pushing conduit shall be located at least two feet (2') from the edge of pavement. All underground conduit shall have a minimum depth of two feet six inches (2'-6") below grade.

When multiple laterals in a common trench are required, no more than three (3) three inch (3") or smaller conduit laterals shall be laid on a single, horizontal level.

Four or more conduit laterals shall be installed on two (2) levels in accordance with instructions of the Engineer.

Conduit laterals attached to a structure shall be flush to the structure where possible. Clamps or hangers shall be used at a minimum interval of 1.5m or five feet (5') to hold the conduit rigidly in place. Expansion couplings shall be used at locations where the conduit crosses expansion joints in the structure.

Conduit laterals installed under vaulted walks shall be securely attached to the retaining wall by means of galvanized clamps and clamp backs held in place by anchor bolts. Laterals shall be fastened as close to the underside of the sidewalk as possible, and securing clamps installed every 1.5m or five feet (5'). Laterals shall be continuous through party walls.

Threaded fittings and bends of the same material as conduit shall be furnished and installed as required. Threadless couplings may be used only for splicing existing conduit. All conduit splicings, where required, shall be considered incidental to the contract.

Method of Measurement. - The length paid for shall be the number of lineal meter of conduit installed and accepted, measured in place. The length for measurement shall be the distance horizontally between changes in the direction of the conduit plus the conduit vertically attached to structures.

Basis of Payment. - This work will be paid for at the contract unit price per lineal meter for CONDUIT of the type and size as specified, which price shall be payment in full for furnishing and installing the conduit and fittings complete. Trench and backfill will be paid for separately. No additional payment will be allowed for pushing under pavements or jack holes for conduit laterals

ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 12 10C

ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 12 19C

1. Description.
This work shall consist of furnishing and installing electric cable of the type, size and number of conductors as specified on the plans. The cable shall be rated 600 volts and comply with the following requirements.
2. Traffic Signals Cable.
All cable shall conform to the requirements of specification number 1470, Detail Specification for Traffic Signal Cable.
3. Installation of Cable.
All cable shall be installed in conduit, as indicated on the plans, with care to prevent damage to the insulation or cable. Suitable devices shall be used in pulling the cable, and only approved lubricants shall be used. All cables installed in conduit will be from the power source to the traffic signal controller, from the traffic controller to the City traffic signal junction box, or from junction box to junction box. Cables that terminate in a traffic signal controller or traffic signal junction box shall extend two inches (2") above the bottom of the box, or cabinet, and the following procedure shall be followed:

a. Controllers.

1. Remove 36" of neoprene jacket.

- 2.Wrap vinyl electrical tape on (2") of the neoprene jacket and 2" on the exposed conductors.
- 3.Remove 1" of insulation and scrape copper conductor.
- 4.Train cables neatly along the base and back of cabinet.
- 5.Connect conductors to proper terminal lugs.

b. Traffic Signal Junction Box.

1. Remove 24" of neoprene jacket.
2. Wrap vinyl electrical tape on 2" of neoprene jacket and 2" on the exposed conductors.
3. Remove 1" of insulation and scrape copper conductor.
4. Train cables neatly along the side and back of the box.
5. Connect all conductors to terminal strip.

4. Slack Cable.

The length of cable slack shall be provided in accordance with the following schedule:

<u>Location</u>	<u>Length of Slack Cable</u>
Base of Controller Post	1'
Detector, Junction Box	1'
Base of Traffic Signal Post or Traffic Signal Pole	2'
City Handhole	6'
City Manhole	12'
Commonwealth Edison Manhole	25'

5. Cable Splices.

Cable splices shall be made ONLY for magnetic detector leads, detector loops or interconnect cable (7/C) which will be indicated on the plans. Detailed Splicing procedures for Detector Leads, Detector Loops, is described in Section 847 of the standard specifications. For splicing interconnect cable (7/C) the following procedure shall be followed:

- a. Remove all outer cable coverings, leaving 4" of insulated wire exposed.
- b. Remove insulation for about 1" and scrape copper conductor.

- c. The conductors may be connected either by twisting together and soldering or by the use of pressure type, solderless connectors.
- d. Waterproof the point where conductors emerge from covered cable by wrapping end of outer covering between and around conductors with rubber or vinyl electrical tape.
- e. Wrap each conductor separately with rubber or vinyl electrical tape, starting about 2" from the ends of the wires and working back to about 2" beyond the end of the outer covering.
- f. Wrap two layers of rubber or vinyl electrical tape around each conductor. Apply 2 layers of friction tape over the rubber tape, if used. Squeeze each layer with fingers.
- g. Warm all exposed tape slightly and press tape into a solid mass around each conductor.
- h. Paint entire surface of splice with insulating paint.

6. Method of Measurement.

The length of measurement shall be the distance horizontally measured between changes in direction, including slack cable. All vertical cables will not be measured for payment. Lengths of slack cable required will be paid for at the contract unit price per lineal meter for "Traffic Signal Electrical Cable, in Conduit".

7. Basis of Payment.

This work will be paid for at the contract unit price per lineal meter for ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 12 10C, or ELECTRIC CABLE IN CONDUIT, SIGNAL, NO. 12 19C. This price shall be payment in full for furnishing, installing, connecting, splicing, and testing of cable, and shall include all labor, materials, equipment, tools, and incidentals necessary to complete the work, as specified herein, and as shown on the plans.

MATERIAL SPECIFICATION

DRAWING

March 21, 1995

CIRCUIT BREAKER, 1-POLE, 70 AMPERE, 480 VOLT IN EXISTING STREET LIGHTING CONTROLLER

Description. This item shall consist of furnishing and installing a single pole thermal-magnetic circuit breaker in an existing arterial street light controller at the designated location creating a controlled power source to supply a proposed traffic signal controller or other electrical device or circuit.

Material. The material of the circuit breaker shall meet the requirements of Specification 1428.

Installation. The circuit breaker shall be mounted on a 3/8" thick phenolic linen base bakelite panel 3" x 8" which shall be attached on the inside of the lower left hand side of the controller cabinet with 4-1/4"-20 x 7/8" brass screws in holes which shall be drilled and tapped into the side of the cabinet for this purpose. The ends of any screws protruding through the side of cabinet wall shall be filed or ground off flush with the face of the cabinet. The bakelite panel shall be set out from the wall of the controller cabinet using four 1/4" bakelite spacer washers, one at each mounting screw position.

The line side terminal of the circuit breaker shall be connected to one of the line side terminals of the main circuit breaker with a 1/C - #4 - 600V - 90 degree C. - insulated copper cable trained around the cabinet in a neat and workman like manner. This cable shall be a part of the installation of the circuit breaker and shall not be a separate pay item. The installation and connection of the load side cables servicing the traffic signal controller shall be a part of the installation of service cable and not a part of the installation of the circuit breaker.

Basis of Payment. This item shall be paid for at the contract unit price each for a CIRCUIT BREAKER, 1-POLE, 70 AMPERE, 480 VOLT IN EXISTING STREET LIGHT CONTROLLER complete in place which shall constitute payment in full for furnishing, installing and making line side connections of the circuit breaker.

MATERIAL SPECIFICATION 1428
March 21, 1995

LUMINAIRE, STREET LIGHTING, HIGH PRESSURE SODIUM VAPOR, 195 WATT, 240 VOLT

LUMINAIRE, STREET LIGHTING, HIGH PRESSURE SODIUM VAPOR, 400 WATT, 240 VOLT

Description: This item shall consist of furnishing and installing a 150 and 400 watt street lighting luminaire complete with internal ballast, electronic starting component and 150 and 400 watt high pressure sodium vapor lamp, on a street light mast arm attached to a street light pole, and connecting the unit to either an underground cable distribution system or an aerial wire distribution system at the location shown on the plans.

Material: The 150 and 400 watt lamp shall meet the requirements of Specification 1360 and 1357. The 150 watt, 240 volt luminaire shall be the Catalog Item Number C729G031 as manufactured by the General Electric Company. All other materials used in the installation of the units are identical and shall be as specified in the installation section.

Installation. The installation of the 150 and 400 watt luminaire shall be identical in procedure and type of materials. The luminaire shall be securely installed on a mast arm in the manner shown on Drawing 848 for the 150 and 400 watt unit. The vertical axis of the luminaire shall be in a vertical plane, and the longitudinal axis shall be leveled as specified in shop drawings supplied by the manufacturer to produce the desired distribution pattern with the lamp socket secured in the required position for that distribution. For the 150 and 400 watt luminaire, the lampholder shall be positioned to produce a "Modified Type I" distribution with 2-way control.

For an aerial distribution system, the primary wiring to the ballast shall consist of 2 1/C #12 AWG wires, with 150 degree C. irradiated polyolefin insulation, connected to the terminal board "line" terminals. They shall extend through the mast arm and exit from the mast arm through the grommet in the hole provided for this purpose, and extend further forming a drip loop and connect with aerial circuit wires as shown on Drawing B. Connection to the aerial circuit wires shall be made with a split bolt type pressure connector for a No. 6 solid copper wire and the connection so formed shall be wrapped with two layers of an approved electrical tape. A cartridge type fuse, type KTK, rated at 10 amperes shall be installed in each of the fuse holders.

For an underground distribution system, the fuseholders in the luminaire shall be shorted. The primary wiring to the ballast shall consist of 2 1/C No. 12 AWG wires with 150 degree C. irradiated polyefin, insulation connected to the terminal board "line" terminals. They shall extend through the mast arm raceway and down the inside of the pole to the pole base where they shall be spliced to the underground feeder cables with an approved, field applied, fused connector kit. Sufficient wire shall be supplied to extend the wires outside of the pole through the access handhole to permit splicing work to be performed outside the pole.

The splice kit shall be composed of a waterproof fuseholder which when installed, shall give fuse protection to ballast and lamp circuits and associated equipment.

The fuse holder shall completely enclose the fuse (cartridge type FNM 13/32" by 1-1/2") and protect it against damage from water, weather and salt spray. The fuseholder body shall be made of molded plastic in two (2) sections; a line-side section and a load-side section. The load-side section shall have a captive nut and a waterproofing "O" ring. The nut threads on the load-side captive nut, when attached to the line-side and tightened, shall make the fuse-holder body vapor and waterproof. The fuseholder line and load-side shall each have a crimp type tubular sleeve to accommodate the standard cable it will be attached to. An insulating sleeve shall be attached to the body so that it will cover each tubular terminal from the holder body to within about 1/8" of the terminal end. Approved insulation boots shall be slipped over both line and load connections to the fuseholder.

Inspection and Testing. All splices, tapes and grounding connections shall be inspected by the Engineer's authorized representative before wires are permanently trained in the light pole.

Current, insulation resistance, and voltage readings shall be taken and tabulated by the Contractor for each circuit. These readings are to be witnessed by the Engineer's authorized representative. Any indication of grounds, open, or crossed conductors shall be thoroughly investigated and remedied before acceptance of the installation. Line voltage shall be taken at any in-line fused location, within the pole designated by the Engineer's authorized representative. Locations and voltage shall be tabulated as directed. Three (3) copies of the tabulated voltage insulation resistance, and current readings shall be submitted to the Engineer's authorized representative. Maximum voltage drop shall not exceed 10% of nominal source voltage. The insulation resistance shall not be less than 2 megohms, when tested to ground with 500 volts a.c.

The Contractor shall submit the manufacturer's certified test reports on all materials used on this project. Any material deemed defective shall be removed and disposed of by the Contractor at his sole cost.

After the lighting installation has been completed and satisfactory current and voltage readings recorded, a field test shall be made to insure that all lighting and control equipment are in proper operating condition. This field test shall be witnessed by the Engineer.

The Contractor shall furnish special test devices, tools and miscellaneous items that shall be required for the testing of cables and control equipment, all as herein specified.

Basis of Payment. This work will be paid for at the contract unit price each for a LUMINAIRE, STREET LIGHTING, HIGH PRESSURE SODIUM VAPOR, 195 WATT, and 240 VOLT, LUMINAIRE, STREET LIGHTING, HIGH PRESSURE SODIUM VAPOR, 400 WATT, 240 VOLT which shall be payment in full for furnishing, installing, connecting and testing the unit complete in place.

MATERIAL SPECIFICATION	DRAWING
1382	846
	847
1357	848
1359	
1360	

October 1, 1986

FUSE, IN LINE, 10 AMPERES

Description. This item shall consist of furnishing and installing an in-line fuse to isolate faults in street light fixtures from the branch lighting circuit.

Material. The material to be used is a fast acting fuse (type KTK or equal) rated for this application; installed in a water-tight, in-line fuse holder equal to a type "HEB" as manufactured by Buss Fuse Company.

Installation. The incoming and outgoing branch circuit wires shall be inserted into the barrel of the fuse holder and crimped with a burndy hypress of the proper size. The pole wire shall be similarly connected to the other end. Both connections shall be taped with a vinyl all-weather tape to insure isolation of the electrical connection. The fuse shall be inserted and the fuse holder properly closed.

Basis of Payment. This work shall not be paid for separately, but shall be incidental to the contract unit price per each LUMINAIRE, STREET LIGHTING of the type specified, which price shall be payment in full for furnishing and installing the luminaire and in-line fuse.

MATERIAL SPECIFICATION 1464

INSTALL LIGHT POLE MAST ARM & LUMINAIRE (MATERIAL PROVIDED BY CITY OF CHICAGO)

Description. This item shall consist of retrieving from City of Chicago storage and installing a 9.9m (32'-6") M.H. black steel light pole, 3.65m (12') steel mast arm and 400W HPS luminaire, or a 10.5m (32'-6") M.H. black steel light pole, 3.65m (12') steel mast arm and 400W HPS luminaire as specified herein, and as indicated on the Plans. It shall be the responsibility of the Contractor to transport the steel light pole, mast arm and luminaire from the storage site to the job site.

CONSTRUCTION REQUIREMENTS

Inspection and Acceptance: The Contractor shall examine the steel light pole, steel davit mast arm and luminaire in the presence of the Engineer. After accepting them, the Contractor shall be held responsible for preservation of the condition of each steel light pole, steel mast arm and luminaire, as it was at the time of acceptance, until the Final Acceptance Inspection.

Transportation. The Contractor shall transport, handle and store (as applicable) the steel light pole, steel mast arm and luminaire in the complete conformance with the manufacturer's recommendations. The Contractor shall make arrangements to transfer the street lighting equipment from the City of Chicago's storage facility located at 4100 South Cicero Avenue, Chicago, IL to the job site. This shall be done on weekdays between the hours of 8:00a.m. and 4:00p.m., excluding City holidays. Twenty-four hours advance notice is necessary before pickup of the street lighting equipment.

Installation. Installation shall be in accordance with City of Chicago Bureau of Electricity Standards and as described in Articles 821 and 877.

Method Measurement. The steel light pole, steel mast arm and luminaires shall be counted as each installed.

Basis of Payment. This item shall be paid at the contract unit per EACH for INSTALL LIGHT POLE, MAST ARM AND LUMINAIRE (MATERIAL PROVIDED BY CITY OF CHICAGO) size and type as noted, which shall be payment in full for the light standard installation.

BREAKDOWN HANDHOLE OR MANHOLE

DESCRIPTION. Work under this item shall include breaking down an existing handhole or manhole and filling in the affected area to grade.

CONSTRUCTION. This work shall consist of removing the frame and cover of an existing handhole or manhole, breaking down the handhole/manhole walls, removing large debris, and backfilling the hole with screenings or other approved material. Backfill shall be installed in 150mm (6") layers and tamped. If the handhole/manhole is in a parkway, the hole shall be filled level to the existing grade. The top 150mm (6") of fill shall be of an approved soil mixture. If the handhole/manhole is in sidewalk or in pavement, the sidewalk or pavement shall be restored under a different pay item. If the frame or cover is deemed re-useable by the resident engineer, the frame and/or cover shall be delivered to the Bureau of Electricity at a location identified by the resident engineer. Any debris, including the frame and cover shall be disposed of off-sight in an approved manner. The contractor shall pay for all disposal fees.

BASIS OF PAYMENT. This work shall be paid for at the contract unit price per each for BREAKDOWN HANDHOLE, OR MANHOLE which price shall be payment in full for all labor and materials necessary to complete the work as described herein.

ELECTRIC MANHOLE 900MM X 1.2M X 1.2M WITH 600MM FRAME AND LID

DESCRIPTION. This item shall consist of furnishing and installing an electrical manhole of the dimensions indicated with a 600mm (24") frame and lid.

MATERIAL. The frame and lid shall meet the requirements of Material Specification 1458. A 600mm (24") frame and lid shall meet the requirements of Standard Drawing 872. The ground rod shall meet the requirements of Material Specification 1465. Bricks shall meet the requirements of Section 1021 of the Standard Specifications. All other materials used shall meet the appropriate material requirements of the Standard Specifications.

METHOD OF CONSTRUCTION. The manhole shall be a precast concrete structure, or, if conditions merit, a cast in place concrete structure, complete with cast iron frame and lid. A 0.9m X 1.2m X 1.2m (3'X4'X4') manhole with a 600mm (24") frame and lid shall conform to the requirements of Drawing 730. The number and size of conduit openings shall be as shown on the construction plans.

Each manhole shall be installed in paved sidewalk, earth parkway, or in pavement at the location specified on the construction plans or at a location as directed by the Resident Engineer.

The area where the manhole is to be placed shall be properly excavated. All disposable material shall be properly disposed of per Article 202.03 of the Standard Specifications. Each manhole shall be set or constructed to conform to the appropriate City of Chicago drawings, except that the number and size of conduit openings shall be in accordance with the construction plans. The frame casting shall be accurately set on a full bed of mortar to the finished elevation so that no subsequent adjustment will be necessary. Mortar shall be mixed in a proportion of one (1) part cement to three (3) parts sand by volume of dry materials. After entering laterals have been installed in place in the manhole, the openings in the wall shall be plugged in an approved manner flush with the inner surface. If backfill is required, screenings shall be used and properly compacted. Parkway shall be restored to the proper grade. Pavement shall be restored to the correct grade. Patching of the pavement shall be done with high early strength concrete meeting the requirements of Articles 1001 and 1020 of the Standard Specifications. Sidewalks shall be restored to the proper grade using a 125mm (5") thickness of concrete. The inside of the manhole shall be clean of all debris.

Replacing Handhole with Manhole. When a present handhole is to be replaced with a new manhole, the handhole shall be broken down and all debris removed. This shall be paid for as a separate pay item. The present laterals and cables shall be maintained during breakdown of present handhole and construction of new manhole. Present laterals shall be cut back to terminate at required distance from inner face of manhole wall. Cost of cutting back present laterals shall be included in cost of new manhole. New laterals terminating in the manhole shall be included in cost of installing new lateral. The new manhole shall be installed in accordance with the appropriate City of Chicago drawings. All other work associated with this replacement shall be considered included in the cost of this pay item.

METHOD OF MEASUREMENT. This item shall be paid for at the contract unit price per each unit installed.

BASIS OF PAYMENT. The unit price for installing manholes shall include necessary excavation, backfilling and restoration of parkway and pavement in accordance with the foregoing specifications. No additional payment will be allowed for restoring parkway or the restoration of sidewalk or pavement. Removal of sidewalk or pavement shall be covered by separate pay items. The unit cost shall be for complete installation for each unit for ELECTRIC MANHOLE 900MM X 1.2M X 1.2M WITH 600MM FRAME AND LID.

RELOCATE EXISTING LIGHTING UNIT

DESCRIPTION This item shall consist of relocating an existing lighting unit where designated on the plans and as directed by the Engineer.

The lighting unit may vary in pole shaft length, mast arm length and luminaire type and wattage. The Contractor shall determine in the field the components comprising each respective lighting unit in the presence of the Engineer and shall relocate accordingly to the satisfaction of the Engineer.

PREPARATION The Contractor shall install a proposed light pole foundation, 1.6m (5'-6") in back of the proposed curb and in locations as designated by the Engineer. The foundation location and ultimate pole location must conform to current City of Chicago ADA, NESC and ComEd clearance requirements. The foundation shall match the anchor bolt diameter and anchor bolt circle as determined in the field and required for the light pole base being relocated and have appropriate diameter and depth of the foundation determined from an appropriate City of Chicago Standard Drawing, for these parameters.

The Contractor shall furnish and install a 50mm (2") diameter, Schedule 40, Polyvinyl Chloride (PVC) conduit in trench connecting continuously from foundation to foundation. The PVC conduit shall comply with the requirements of National Electrical Manufacturers Association Standard, Publication Number TC2 for EPC- 40 and EPC- 80.

The Contractor shall furnish and install a 3TC type electric cable from pole to pole matching the existing size of cable or as directed by the Engineer. The 3TC type electric cable shall comply with the requirements of Section 800, and 844 of the Standard Specifications, Bureau of Electricity Standards and the City of Chicago Electrical Code, the City of Chicago Material Specification No.1440 dated January, 1991.

The Contractor shall construct a trench to accommodate the proposed PVC conduit in trench. The trench and backfill with screening and /or sand materials shall comply with the requirements of Articles 819.03, 819.05 1003.04 and 1066.05 of the Standard Specifications.

REMOVAL Before removal of the existing lighting unit the Contractor, in the presence of the Engineer, shall record the condition of all component parts comprising the lighting unit. Then the Contractor shall carefully disconnect and remove the existing lighting unit from the existing foundation.

RESPONSIBILITY Any damage sustained to lighting unit during the removal and installation operations shall be the sole responsibility of the Contractor and no extra compensation shall be allowed for restoration of the pole to the original condition.

INSTALLATION The Contractor shall immediately install the lighting unit on the proposed foundation, wire it to the proposed electric cable and have it ready for operation the following evening so that the respective roadway will be lighted at all times to the satisfaction of the Engineer.

The Contractor shall make alternate arrangements to have the respective roadway lighted at all times in the event the transfer of the lighting unit would become prolonged. Any extra cost for alternate arrangements mentioned above and any incidental materials and labor required shall be included in this pay item and no extra compensation allowed.

BASIS OF PAYMENT This work will be paid for at the contract unit price each for RELOCATE EXISTING LIGHTING UNIT as described above, which shall be payment in full for furnishing, installing and performing work required to relocate existing lighting unit.

SIGN, MESSAGE, ELECTRICALLY ILLUMINATED, BRACKET MOUNTED

DESCRIPTION This item shall consist of furnishing and installing a single faced, permanently illuminated, incandescent or fiber optic sign, bracket mounted on a street light or traffic signal pole, or on a traffic post at the location shown on the plans or as authorized by the Commissioner. The sign may be installed as a single unit or in combination with traffic or pedestrian signals. Specific installations and configurations are shown on Standard Drawings 834 and 835.

MATERIAL The sign shall meet the requirements of Material Specification 1518 for the particular sign specified. The mounting brackets shall meet Material Specification 1495. The cable shall meet the applicable requirements of Material Specification 1475.

INSTALLATION Each sign shall be faced in the direction of the traffic it is intended to control. During construction and until the installation is placed in operation, the sign face shall be hooded. The hooding material shall be securely fastened so it will not be disturbed by inclement weather or wind. The sign shall be mounted using pole mounting brackets meeting Material Specification 1495, banded to the pole with two strips of 19 mm (3/4") stainless steel banding wrapped, one at the top and one at the bottom of the brackets, each secured with a stainless steel banding clip. The mounting configuration connecting the sign to the mounting bracket shall consist of sections of 38mm (1 1/2") conduit of precise lengths, as indicated on the standard drawing, to create the designated structure, connected with cross fittings per Standard Drawing 741, as required.

When the sign is to be mounted on a square pole or flat surface, the bracket will be bolted to the flat pole or surface using a 9.5mm (3/8") drive stud where permissible or using a 9.5mm (3/8") stud in a tapped hole.

The bottom mounting bracket shall be accurately located to cover an opening 25mm (1") in diameter, for cable entrance, drilled into the pole or standard at a calculated height to position the bottom sign face at a standard height of fourteen feet and eight inches (14'-8"), or a height indicated on the plans. The opening shall be reamed or filed to remove all sharp edges or burrs which might damage cable during installation, or through vibration when the sign is in operation.

The Contractor shall provide and install a length of flexible electrical cord meeting Material Specification 1475, except that the cable shall be two-conductor. The cable shall be of sufficient length to extend without strain or stress from the sign head to the terminal strip in the junction box mounted on the pole. Both ends of the cable length shall be carefully stripped of six inches (6") of jacket and one inch (1") of insulation, and each conductor properly tinned.

The service cable from the sign shall enter the pole through the bottom mounting bracket and enter the long sweep elbow to terminate by attachment to the terminal strip in the junction box in accordance with connector schematic, Bureau of Electricity Drawing Number 12268-A.

Lamp Requirements. The contractor shall supply and install one 25 watt, 120 volt incandescent lamp for each of the eight sockets in the sign.

Painting. The sign housing, the pole mounting bracket, and the crosses are to be factory painted by the manufacturer with baked on enamel. Matte black shall be the color unless directed otherwise.

BASIS OF PAYMENT This work will be paid for at the contract unit price for each SIGN, MESSAGE, INTERNALLY ILLUMINATED, BRACKET MOUNTED of the type specified, which price shall be payment in full for furnishing and installing the sign complete.

SPECIFICATIONS	DRAWINGS
1471	834
1475	835
1495	741
1518	12268A

April 24, 2001

SIGN, MESSAGE, ELECTRICALLY ILLUMINATED MAST ARM MOUNTED

DESCRIPTION: This item shall consist of furnishing and installing a single faced, permanently illuminated, incandescent or fiber optic sign, mounted on a traffic signal mast arm at the location shown on the plans or as authorized by the Commissioner. The sign may be installed as a single unit or in combination with traffic signals. Specific installations and configurations are shown on Standard Drawings 834 and 835.

MATERIAL: The sign shall meet the requirements of Material Specification 1518 for the particular sign specified. The mounting bracket shall meet Material Specification 1463. The cable shall meet the applicable requirements of Material Specification 1475.

INSTALLATION: Each sign shall be faced in the direction of the traffic it is intended to control. During construction and until the installation is placed in operation, the sign face shall be hooded. The hooding material shall be securely fastened so it will not be disturbed by inclement weather or wind. The sign shall be mounted on the mast arm using mast arm mounting brackets meeting Material Specification 1463, banded to the mast arm with 15.9mm (5/8") stainless steel banding secured with a stainless steel banding clip, as shown on Standard Drawing 834. The bracket shall be placed over a 25mm (1") hole drilled into the mast arm for the installation of cable. The hole shall be drilled at the location indicated on the plans. The hole shall be reamed or filed to remove any sharp edges or burrs which might tend to damage cable during installation, or through vibration.

The Contractor shall provide and install a length of flexible electrical cord meeting Material Specification 1475, except that the cable shall be two-conductor. The cable shall be of sufficient length to extend without strain or stress from the sign head to the terminal strip in the junction box mounted on the pole. Both ends of the cable length shall be carefully stripped of six inches (6") of jacket and one inch (1") of insulation, and each conductor properly tinned.

The service cable from the sign shall enter the mast arm through the hole in the mast arm, whence it shall continue and enter the pole through the hole for mast arm wiring, then extend downward through the pole to enter the long sweep elbow to terminate at the terminal strip in the junction box in accordance with connector schematic, Bureau of Electricity Drawing Number 12268-A.

Lamp Requirements. The contractor shall supply and install the required lamps of the correct wattage and voltage.

Painting. The sign housing, the pole mounting bracket, and the crosses are to be factory painted by the manufacturer with baked on enamel. Matte black shall be the color unless directed otherwise.

BASIS OF PAYMENT This work will be paid for at the contract unit price for each SIGN, MESSAGE, INTERNALLY ILLUMINATED, MAST ARM MOUNTED of the type specified, which price shall be payment in full for furnishing and installing the sign complete.

SPECIFICATIONS	DRAWINGS
1463	834
1471	835
1475	12268A
1518	

April 24, 2001

ROD AND CLEAN DUCT IN EXISTING CONDUIT SYSTEM

DESCRIPTION AND SCOPE This work shall consist of inserting a duct rod or electrical fish rod or tape of sufficient length and rigidity into an electrical conduit opening in one electrical manhole or handhole, and pushing the said rod through the conduit to emerge at the next or subsequent manhole in the conduit system at the location shown on the plans. The duct rod may be inserted and removed by any standard construction method which causes no damage to the conduit system. The size of the conduit may vary from two inch (2") to four inch (4"), but there shall be no differentiation in cost for the size of the conduit.

The conduit system which is to be rodded and cleaned may exist with various amounts of standing water in the manholes. The contractor shall pump the water or sufficient water from the manholes to drain the conduit and to afford compatible working conditions for the installation of the duct rods and/or cables. The pumping of the manholes shall be incidental to the work or rodding and cleaning of the conduit and shall not become a separate pay item.

Any manhole which, in the opinion of the Resident Engineer contains excessive debris, dirt or other materials to the extent that conduit rodding and cleaning is not feasible, shall be cleaned at the Engineer's order and payment approval as a separate pay item, and not a part of this specification.

Prior to removal, of the duct rod, a duct cleaning attachment such as a properly sized wire brush or cleaning mandrel shall be attached to the duct rod, which by removal of the duct rod shall be pulled through the conduit to remove sand, grit, or other light obstructions from the duct to provide a clean, clear passage for the installation of cable. Whenever the installation of cables is not performed as an adjunct to or immediately following the cleaning of the duct, a light weight pulling line such as a 1/8" polyethylene line or conduit measuring tape shall be placed and shall remain in the conduit to facilitate future work. When great difficulty of either inserting the duct rod or removal of the cleaning mandrel is encountered, the duct may require further cleaning by use of a compressed air gun, or a low pressure water hose. In the case of a broken duct line, the conduit must be excavated and repaired. The existence and location of breaks in the duct line may be determined by rodding, but the excavation and repair work required shall not be a part of this construction specification.

METHOD OF MEASUREMENT This work shall be measured per lineal meter for each conduit cleaned. Measurements shall be made from point to point horizontally. No vertical rises shall count in the measurement.

BASIS OF PAYMENT This work shall be paid for at the contract unit price per lineal meter for ROD AND CLEAN DUCT IN AN EXISTING CONDUIT SYSTEM for the installation of new electric cables. Such price shall include the furnishing of all necessary tools, equipment, and polyethylene line as required to prepare a conduit for the installation of cable. When the number of cables to be installed require the use of more than one conduit in the same run, each additional conduit required shall be rodded and cleaned as a separate unit and paid for at the contract unit price.

CONCRETE FOUNDATION 500MM DIAMETER

DESCRIPTION This foundation will be for structural support of a traffic signal post, or other pedestal mounted equipment. The foundation must be poured in place and must be 20" in diameter, with a 13" bolt circle, 3/4" diameter anchor rods, and must be 5 feet in depth.

MATERIAL Concrete must be Portland cement concrete meeting the requirements of Article 1020 of the Standard Specifications for SI Class concrete. Anchor rods must meet the requirements of Material Specification 1467 and the ground rod must meet the requirements of Material Specification 1465. Conduit must be PVC meeting the requirements of Material Specification 1533.

CONSTRUCTION Foundations must conform to Drawing Number 709. Top surface of these foundations will be at an elevation of two inches (2") above grade or as required by the Resident Engineer. Care must be taken to install a level foundation and to ensure adequate anchor rod projections for double-nut installation. The foundation top must be chamfered 3/4 of an inch. The foundation must be centered back from the face of the curb in accordance with dimensions shown on the construction plans. When the foundation is in a solid sidewalk area, the foundation must be installed level, with the height of the foundation as close to the height of the sidewalk as possible, or as directed by the Engineer. A proper expansion joint must be installed between the sidewalk and the foundation.

Foundation raceways must consist of large radius conduit elbow(s) in quantity, size and type specified on Drawing 709 or as indicated on the construction plans. Elbows, in excess of those shown on Drawing 709, will be paid for separately under an additional pay item. The elbow ends above ground must be capped with standard conduit bushings. The Contractor must furnish anchor rods, hardware, conduit elbow(s) and all other material shown on applicable foundation construction drawings. Depth of foundation will be as noted on Drawing 709.

The anchor rods will be set by means of a metal template which must be submitted for approval before any foundation work is begun. The template must hold the rods vertical, and in proper position.

All excavation and restoration of parkway will be considered as part of this item. If the foundation is in sidewalk, an expansion joint will be required between the sidewalk and the foundation.

METHOD OF MEASUREMENT The measurement will be based on each meter of foundation depth installed complete.

BASIS OF PAYMENT Payment will be made for foundations installed in place including an elbow in accordance with construction plans and these specifications. All necessary excavation and restoration of parkway, or sidewalk and expansion joint will be included in the unit price. This work will be paid for at the contract unit price per lineal meter, as designated in the contract, for CONCRETE FOUNDATION 500MM DIAMETER.

MATERIAL SPECIFICATION			DRAWING		
1465	1467	1533	709	844	11825

August 8, 2006

BUREAU OF ELECTRICITY
MATERIAL
SPECIFICATIONS
SPECIFICATION 1357
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
MARCH 1, 1973

LAMP: 400 WATT, HIGH PRESSURE SODIUM TYPE LU 400/BD

SUBJECT

1. This specification states the requirements for the 400 watt high pressure sodium lamp, base down to horizontal burning, for street lighting service.

PHYSICAL REQUIREMENTS

2. The lamp shall conform to the following physical characteristics:

Base Designation	Mogul
Bulb Designation	E-18
Bulb Material	Lead borosilicate glass
Bulb finish	Clear
Bulb diameter	2.25"
Maximum Overall Length	9.75"
Light Center Length	5.75"
Arc Length	3.42"
Maximum bulb temperature	400° C.
Maximum base temperature	210° C.
Arc Tube Material	Polycrystalline Aluminum Oxide

ELECTRICAL REQUIREMENTS

3. The lamp shall conform to the following electrical characteristics:

Nominal Lamp Watts	400
Nominal Lamp Volts (RMS)	100
Nominal Lamp Current (RMS)	4.7 amps.
Max. Current Crest Factor	1.8
Max. Starting Current	7 amps.
Ballast Open Circuit Volts (Min.)	195

Starting Characteristics:

Pulse Peak Voltage (Min.)	2,500
Pulse Peak Voltage (Max.)	4,000
Pulse Width at 90° Peak (min.)	1 micro-sec.
Pulse per second (Min.)	50
Pulse Peak Current (Min.)	0.2 amps.

PERFORMANCE REQUIREMENTS

4. The lamp shall conform to the following performance characteristics:

Initial Lumens	47,000
Percent Mean Lumens	90
Rated Life	
10 hour Duty Cycle	15,000 hours
Continuous Burning	20,000 hours
Apparent Color Temperature	2,100° K
C.I.E. Chromaticity	x=.512 y=.420
Warm-up time	3-4 minutes
Restart time	1 minute

GUARANTEE

5. The supplier will be required to replace with new rated life lamps, without cost to the City, on an adjusted life basis, the unrealized portion of the lamp life of all lamps failing to operate satisfactorily for the specified 15,000 hour rated life.

Any lamps failing to operate for at least 500 hours shall be replaced with a new, operable, rated life lamp without charge to the City.

SPECIFICATION 1360
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
JANUARY 30, 1974

LAMP: 150 WATT, HIGH PRESSURE SODIUM

SUBJECT

This specification states the requirements for the 150 watt High Pressure Sodium lamp for street lighting service.

PHYSICAL REQUIREMENTS

The lamp shall conform to the following physical characteristics:

Base designation	Mogul
Bulb designation	E-23-1/2
Bulb material	Lead borosilicate glass
Bulb finish	Clear
Bulb diameter	3"
Maximum overall length	7-3/4"
Light center length	5"
Arc gap length	1.6"
Maximum bulb temperature	400°C
Maximum base temperature	210°C
Arc tube material	Polycrystalline alumina

ELECTRICAL REQUIREMENTS

The lamp shall conform to the following electrical characteristics:

Nominal lamp watts	150 watts
Nominal lamp volts (rms)	55 volts
Nominal lamp current (rms)	3.3 amperes
Max. current crest factor	1.8
Max. starting current	5.0
Ballast open-circuit voltage	110 volts
Initial lamp voltage range (100 hour values)	45-65

Starting Characteristics:

Pulse peak voltage (min.)	2500 volts
Pulse peak voltage (max.)	4000 volts
Pulse width at 90% magnitude (min.)	1 microsecond
Pulse peak current (min.)	0.2 amperes
Pulses per second (min.)	50

PERFORMANCE REQUIREMENTS

The lamp shall conform to the following performance characteristics:

Initial lumens	16,000 lumens
Percent mean lumens (at 10 hours per start)	90%
Rated life	24,000+hours
Color temperature	2100°K
Warm-up time	3-4 minutes
Re-start time	1 minute

GUARANTEE

All lamps shall carry the standard manufacturer's published warranty for life and service with the following exceptions:

All High Intensity Discharge Lamps shall be unconditionally guaranteed against all defects in material and workmanship for a minimum period of at least one (1) year from date of installation. The contractor agrees to replace, without charge to the City, any lamps failing to operate satisfactorily during this initial guarantee period. After the first year, if the failure rate of the lamps furnished under this contract exceeds the percentage shown at any point on the table included in City of Chicago Specification No. 9-85-2A, the contractor is required to replace the lamps in excess of this percentage with new, rated life, lamps without charge to the City.

SPECIFICATION 1382
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
REVISED MAY 10, 1979

LUMINAIRE: WITH INTEGRAL BALLAST FOR 400 WATT, HIGH PRESSURE SODIUM LAMP; I.E.S. TYPE II/TYPE III DISTRIBUTION

SUBJECT

1. This specification states the requirements for a street lighting luminaire, with integral ballast and electronic starter, to provide base down to horizontal burning of 50,000 lumen, 400 watt, Type LU400 high pressure sodium lamp.

GENERAL

2. (a) Information Required. Each bidder must submit with his proposal the following information relative to the luminaires he proposes to furnish:
1. Outline drawing.
 2. Complete description and weight.
 3. Candlepower distribution curve showing the light distribution in the 70 degree cone and in a vertical plane through the maximum beam.
 4. Isolux curves for the various socket positions.
 5. Utilization efficiency charts.
 6. Luminaire efficiency.
 7. Projected area in square feet.
 8. Manufacturer's name and catalogue designation of the luminaire.
 9. IES formatted photometric curve on diskette.
- (b) Sample. One completely assembled luminaire of the manufacture intended to be furnished, must be submitted upon request of the Purchasing Agent and within fourteen (14) business days of such request.
- (c) Assembly. Each luminaire must be delivered completely assembled, wired, and ready for installation; with or without the lamp, as indicated in the order. It must consist of aluminum housing, aluminum reflector, glass refractor, refractor holder, lamp holder assembly, terminal board-fuse block, ballast-door panel, ballast components, gaskets, slip fitter, and all necessary hardware.
- (d) Warranty. The contractor must warrant the performance and construction of these luminaires to meet the requirements of this specification, and must warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of one (1) year after the luminaire has been placed in service. This will be interpreted particularly to mean compatible performance of ballast with lamps of various manufacture, failure of any ballast component, loss of reflectivity of reflecting surface, and discolorations or fogging of the refractor impairing the transmission of light.

Any luminaire or part thereof, not performing as required, or developing defects within this period must be replaced by the contractor without expense to the City.

CONSTRUCTION

3. (a) Weight and Area. The net weight of this luminaire with ballast must be not more than 60 pounds. The projected area must not exceed 3.1 square feet.
- (b) Housing. The housing must be a precision molded aluminum die casting. The wall thickness must be substantial and adequate to withstand the strains likely to be imposed on the housing when installed and in service.
- (c) Slip Fitter. The slip fitter must be suitable for attachment over the end of a two (2) inch steel pipe with an approved means of clamping it firmly in place, and must provide a built-in pipe-stop. It may be integral with, or may be attached to, the housing. The slip fitter must be designed to permit adjustment of not less than three (3) degrees above and below the axis of the mounting bracket. The slip fitter must contain an approved shield around the pipe entrance to block entry of birds.
- (d) Lamp Holder Assembly. The lamp holder must be fully adjustable to accurately position the lamp. It must be a mogul, porcelain enclosed socket having lamp grips, and must be high quality commercial product, subject to approval. The socket support bracket must provide both horizontal and vertical adjustments to achieve a broad range of light distribution patterns. Each adjustment position must be clearly marked, and the socket must be positively secured in each position. The lamp holder and its bracket must be assembled in the optical system, in a manner which provides a completely sealed, moisture and dust tight optical system.
- (e) Reflector. The reflector must be made of aluminum and polished to a highly specular "Alzak process" finish with suitable means for attachment to the housing. It must be of such design as to give proper re-direction of the light striking it with minimum reflection through the outer bulb of the lamp and must distribute the reflected light uniformly over the refractor surface.
- (f) Refractor. The refractor must be pressed crystal clear, heat-resistant, boro-silicate glass, well annealed, homogeneous, and free from imperfections and striations. It must contain prisms pressed on the inside surface and where necessary on the outside surface, and must be optically designed to redirect by reflection and refraction the light from the lamp to produce vertical and lateral light distribution patterns conforming substantially with both I.E.S. Type II and Type III light distributions. For diffusion of the light and good appearance, a pattern of continuous and adjoined flutes or configurations must be pressed on the outside surface. In the event the refractor can fit into its holder in two (2) positions, the refractor must be clearly embossed with the designations "street side" and "house side" to insure proper orientation.

- (g) Refractor Holder. The refractor holder must be hinged to the luminaire housing and must open approximately 90 degrees to allow servicing of lamp and reflector. The refractor must be securely held in the refractor holder. In the closed position the refractor holder must cause the refractor to seat against the reflector gasket. The refractor holder must permit simple removal and replacement of the refractor without the use of tools. The hinge must prevent the refractor holder from disengaging and dropping in case it should swing open.
- (h) Latch. An approved latch must be provided for latching the refractor holder to the housing. The latch must be located opposite a suitable hinge, and in conjunction with the hinge must compress the gasket between the reflector and refractor. The latch must be a firm-gripping, easy opening, single action, positive latching type requiring no tools.
- (i) Ballast Door-Panel. The ballast components must be completely assembled and mounted on a die-cast aluminum door-panel. The door-panel must be hinged to the luminaire housing, suitably latched and fastened at the closing end; and it must be rapidly and simply removable. The hinge and fastening devices must be captive parts which will not become disengaged from the door panel.
- (j) Gaskets. Wherever necessary, in order to make a completely dustproof optical assembly, gaskets of silicone rubber or other specifically approved material must be provided. The reflector gasket must fit around and over the flange of the reflector.
- (k) Hardware. all machine screws, locknuts, pins and set screws necessary to make a firm assembly, and for its secure attachment to the mast arm, must be furnished in place. All hardware must be of stainless steel, copper silicon alloy or other non-corrosive metal, and where necessary must be suitably plated to prevent electrolytic action by contact with aluminum.
- (l) Fiberglass Tubing. Two lengths of fiberglass tubing with silicone varnish coating meeting requirements of National Electrical Manufacturers' Association insulation classification HC-2, Size 2 (0.263" I.D.), must be provided to permit proper thermal insulation of conductors ("LINE" leads) within the luminaire. They must be sufficiently long to extend from the terminal block to a point 6 inches beyond the end of the slip fitter.
- (m) Terminal Board-Fuse Block. A terminal board of molded phenolic plastic of the barrier type must be mounted within the housing in a readily accessible location. It must provide all terminals needed to completely prewire all luminaire components. The terminal board must either incorporate a barrier isolated section with fuse clips to take two "small-dimension" (13/32" x 1 1/2") cartridge fuses, or a separate barrier protected fuse block must be provided therefore. The fuses are not required to be furnished with this luminaire. The fuse block must be wired to the appropriate terminals. the terminal board-fuse block must have plated copper or plated brass, clamp-type pressure terminals of an approved type for "line" connections, to accommodate wire sizes from #12 to #8 A.W.G. The terminals for connection of internal components must either be the screw-clamp or quick disconnect type.

- (n) Filter. The optical system must contain a charcoal "breathing" filter, of adequate size to provide effective filtering of particulate and gaseous contaminants.
- (o) Finish. The luminaire must have a baked on enamel finish. Surface texture and paint quality will be subject to approval. Color must be gloss black or gray Munsell No. 5BG 7.0/0.4 (designated A.S.A. No. 70) as specified in the order. A paint chip must be submitted as a sample upon request.

BALLAST

- 4. (a) General. The integral ballast must be a voltage tapped, high power factor, linear type, low loss reactor. It must be designed to furnish proper electrical characteristics for starting and operating a 400 watt high pressure sodium lamp at temperatures as low as minus 40°F. The ballast winding must be adequately impregnated and treated for protection against the entrance of moisture, insulated with Class G insulation, and able to withstand the NEMA standard dielectric test. The ballast must include an electronic starting component.
- (b) Lamp Operation. The ballast must provide positive lamp ignition at an input voltage of 191 volts. It must operate the lamp over a range of input voltage from 191 to 220 volts without damage to the ballast for the 208 volt tap connection and 220 to 254 volts for the 240 volt tap connection. It must provide lamp operation within lamp specifications for rated lamp life at input voltage between 198 volts and 218 volts for the 208 volt tap connection and between 228 volts and 252 volts for the 240 volt tap connection.
- (c) Rating. The ballast must have properly coded wire leads for taps at rated input voltage of either 208 or 240 volts at 60 cycles, which must drive a nominal 100 volt lamp at 400 watts. The design range of input voltage for this ballast must be from +6% to -8% of the nominal voltage.
- (d) Lamp Current. The ballast must supply approximately 4.7 amperes to a 400 watt, 100 volt high pressure sodium lamp during operation, and not more than 7.0 amperes at starting.
- (e) Power Factor. The power factor of the ballast over the design range of input voltages specified above must not be less than 90%.(f) Line Current. With nominal input voltage applied, the input current under starting, short circuit or open circuit condition, must not exceed 4.7 amperes rms.
- (g) Lamp Wattage. The ballast must deliver 400 watts to a nominal 100 volt lamp when operating at the nominal input voltage. Wattage input to the nominal lamp must not vary more than a total of 37% over the input voltage design range of 191 volts to 254 volts with the supply connected to the proper ballast tap.
- (h) Ballast Loss. Wattage loss of the ballast must not exceed 43 watts when delivering 400 watts to a nominal lamp at the nominal input voltage of 208 or 240 volts.

- (i) Electronic Starter. The starter component must be comprised of solid state devices capable of withstanding ambient temperatures of 100°C. The starter must provide timed pulsing with sufficient follow-thru current to completely ionize and start all lamps. Minimum amplitude of the pulse must be 2,500 volts, with a width of one (1) microsecond at 2,250 volts, and must be applied within 20 electrical degrees of the peak of the open circuit voltage wave with a repetition rate of once each half cycle of the 60 cycle wave. The lamp peak pulse current must be a minimum of 0.5 amps. Proper ignition must be provided over a range of input voltage from 191 to 254 volts. The starter component must be field replaceable and completely interchangeable with no adjustment necessary for proper operation. The starter component must have push-on type electrical terminations which must provide good electrical and mechanical integrity with ease of replacement. the starter circuit board must be treated in an approved manner to provide a water and contaminant resistant coating.
- (j) Crest Factor. Maximum crest factor must be no greater than 1.65 over the input voltage range of 191 to 254 volts for a nominal vertical burning lamp.
- (k) Mounting. The ballast components must be mounted and fastened on the luminaire ballast door panel in a manner such that the components will remain secure and capable of withstanding the vibrations and shocks likely to occur when installed and in service. These components must be readily removable for replacement.
- (l) Wiring. The lamp holder and ballast components must be completely wired, with connections made to a terminal board that is suitable for both copper or aluminum supply conductors to provide the 208/240 volts tap connections. The reactor and capacitor leads must not be smaller than #16 gauge conductors. These must be insulated with an approved 125°C insulation. all leads must be coded in an approved manner for proper identification. A complete wiring diagram must be displayed at an easy to read location on the interior of the luminaire.
- (m) Capacitor. The capacitor must be a non-PCB, a-c power type. The capacitor can must be coated with a moisture resisting paint, or must be fabricated of non-corrosive material.
- (n) Ballast. the ballast must be tapped linear reactor device incorporating a molded polyester-glass bobbin structure having a precision wound, insulated, magnetic wire coil with bobbin mounted push-on type electrical terminations. These terminations must provide good electrical and mechanical integrity as well as easy ballast replacement. the ballast must be treated in an approved manner to provide electrical and mechanical protection.
- (o) Wiring Connection. The ballast panel wiring must be "plug" connected to lamp and line leads for easy disconnect in removing the ballast.

PACKAGING

- 5. (a) Packing. Each luminaire assembly must be packed in a suitable carton so secure that it must not be damaged in shipment and handling.

- (b) Marking. Each carton containing a luminaire must be clearly marked on the outside in letters not less than three-eighths (3/8) inch tall with the legend: "LUMINAIRE W/BALLAST, 400 WATT HP-SODIUM, IES TYPE II/TYPE III", the appropriate City Commodity Code Number, the name of the manufacturer, and the contract number under which the luminaire is furnished.

DETAILED SPECIFICATION 1407

CAST ALUMINUM JUNCTION BOXES

SCOPE

The contractor shall furnish and install cast aluminum junction boxes in accordance with these General and Detail Specifications. This specification states the requirements for cast aluminum junction boxes to be used as enclosures for traffic signal and fire alarm multiple cable terminals.

GENERAL

- (a) Specifications: The junction boxes shall conform in detail to the requirements herein stated, to the Federal Standard cited by number, and to the Specifications and Methods of Test of the American Society for Testing Materials cited by ASTM Designation Number, of which the most recently published revisions shall govern.
- (b) Drawing: The drawing mentioned herein is a drawing of the Department of Streets and Sanitation, Bureau of Electricity, and shall be interpreted as part of these specifications cooperating to state necessary requirements.
- (c) Acceptance: Junction boxes not conforming to this specification will not be accepted.
- (d) Sample: One complete junction box of the manufacture intended to be furnished shall be submitted within seventy two (72) hours after request by the Engineer for a sample to be provided. If the Contractor supplying the sample is awarded a contract, the delivered sample shall be credited as part of the order if it meets all the requirements of the specification. The sample shall be delivered to a location designated by the Engineer.
- (e) Workmanship: All junction boxes shall be free of casting flaws and shall have neat, smooth exterior surfaces. All holes shall be accurately located and drilled to ensure interchangeability of all components.

DESIGN

- (a) Drawing. The junction box shall conform in detail to the dimensions and requirements shown on drawing number 832.
- (b) Material. The body door and plate shall be castings of non-heat treated aluminum silicon alloy conforming to ANSI alloy 443.0 of ASTM B26.

DETAIL REQUIREMENTS

- (a) Assembly. Each junction box shall consist of the body, door with its gasket, flat plate with its gasket, terminal block mounting bracket and bottom gasket with its stainless steel hardware furnished as described below, all completely assembled, painted and ready for installation.
- (b) Body. The body shall be cast as shown in drawing number 832. The top and bottom sides of the box where flat plates, or other fittings, will be attached, shall be identically cast, machined flat, and drilled and tapped in accordance with dimensions shown. All fittings which fit on the top side must fit on the bottom side.
- (c) Door. The door shall be cast as shown in drawing number 832. The door shall be hinged at the left with stainless steel hinge pins and shall open not less than 180 degrees to permit complete access to interior of the junction box. Two stainless steel allen head machine screws, undercut and held captive, shall hold the door closed and maintain positive pressure against a sponge neoprene gasket cemented in place completely around the door jamb. The door shall be finished and painted prior to cementing the gasket into its groove in the door.
- (d) End Plate. A flat end plate shall be furnished with each body casting. The plate shall be drilled to align with tapped holes in the body casting and have a flush match with the periphery of the top and bottom body casting pads. The plate shall have a properly fitted gasket and be held in place by four (4) stainless steel machine screws.
- (e) Mounting Bracket. A terminal block mounting bracket, as shown on drawing number 832, shall be furnished and installed in each junction box. The bracket shall be cast from ANSI alloy 443.0 per ASTM B26.
- (f) Gaskets. The gasketing between the body and the door shall be of sponge neoprene and shall be cemented in place after painting of the door. A cork gasket, 1/8 inch thick, shall be used between the end plate and the body of the junction box on the top end and held in place by four (4) stainless steel screws. An identical cork gasket and four (4) stainless steel screws shall be placed in a 6" x 4" metal fold kraft envelope, 32 sub., and placed within the box before shipping. This gasket with its screws will be used with the fitting used on the bottom end of the box.
- (g) Hardware. The hinge pins and all screws required for assembly of this junction box shall be of stainless steel.
- (h) Painting. The exterior surfaces of the junction box shall be properly cleaned and given one (1) coat of zinc chromate primer containing ten percent (10%) iron oxide, and one (1) coat of green enamel. The color of the enamel shall be green number 14110 of Federal Standard number 595. The primer and enamel shall be of an approved grade and quality.
- (i) Packing. After the paint is thoroughly dry, and the junction boxes have been assembled, they shall be suitably packed to prevent damage to painted surfaces during shipping and handling. All shipments shall be fastened to, and shipped on, 48" x 48" hardwood, 4 way, non-returnable pallets. Total height shall not exceed 64" and total weight shall not exceed 2,200 pounds.

INSPECTION

The final inspection shall be made at the point of delivery. Any junction boxes rejected shall be removed and disposed of by the contractor at his sole expense.

SPECIFICATION 1423
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO

TRAFFIC SIGNAL MAST ARMS

ARM

The traffic signal mast arm shall be a tapered, truss-type, aluminum arm with lengths and mounting clamp diameters as shown in Table I. There shall be thirty inches (30") between the center lines of the upper and lower mounting brackets. The ends of the mast arms shall be designed to accept a standard 2" I.D. mast arm plumbizer. Arms shall be similar in design to Pfaff and Kendall VT series, Hapco Design Nos. B-59440, B-59441 and B-59442, or Union Metal Mfg. Co. Design Nos. 50130-Y28, 50130-Y29 and 50130-Y30.

LOAD REQUIREMENTS

The load requirements for the mast arms to be furnished under this specification are as follows:

Fifteen Foot (15') Mast Arm: One 3-section 12" traffic signal at the end of the arm, rigidly mounted with an elevator plumbizer.

Twenty and Twenty-Five Foot (20' & 25') Mast Arms: One 4-section 12" traffic signal at the end of the arm, rigidly mounted with an elevator plumbizer, and a 3-section 12" traffic signal rigidly mounted at the midpoint of the arm.

The above requirements are for traffic signals without back plates.

CLAMP

The mast arm clamp shall be either an extrusion or a casting of aluminum. The extrusion shall utilize the aluminum alloy 6005-T5 as per the chemical composition and mechanical properties shown in ASTM B221-74, or latest revision thereof. the cast aluminum clamp shall be fabricated from Alloy 356-T6 per ASTM B-26-75. any equivalent alloy recommended shall be approved by the Commissioner of Streets and Sanitation or his duly authorized representative.

PACKING

All mast arms shall be shipped with the back clamp and hardware assembled on the mast arm. Assembly and packing shall be in such a manner that no damage shall be sustained by any of the assembled parts.

TABLE I
 I.D. OF MOUNTING CLAMP

<u>LENGTH OF ARM</u>	<u>UPPER</u>	<u>LOWER</u>	<u>QUANTITY</u>
15'	5-1/2"	5-7/8"	20
15'	6-5/16"	6-11/16"	30
20'	5-1/2"	5-7/8"	60
20'	6-5/16"	6-11/16"	100
25'	5-1/2"	5-7/8"	80
25'	6-5/16"	6-11/16"	180

SPECIFICATION 1425
 BUREAU OF ELECTRICITY
 DEPARTMENT OF STREETS AND SANITATION
 CITY OF CHICAGO
 FEBRUARY 8, 1989

**TRAFFIC SIGNAL: TWELVE-INCH
 THREE OR SINGLE-SECTION, ONE-WAY**

SUBJECT

1. This specification states the requirements for one-way, twelve-inch, three-section and single-section, adjustable electric traffic signals for use in the traffic control system of the City of Chicago.

GENERAL REQUIREMENTS

2. (a) Specifications. The traffic signals shall conform in detail to the requirements stated herein, to the Specifications and methods of Tests of the American Society for Testing and Materials cited by ASTM Designation Number, to Federal Standard Number 595 where and as cited, to the Technical Report No. 1 of the Institute of Transportation Engineers entitled "Adjustable Face Traffic Control Signal Head Standards" where and as cited and hereinafter referred to as the ITE Standard, in which the most recently published revisions shall govern.

- (b) Inspection. The signals shall be subject to inspection at the discretion of the Engineer. Final inspection shall be made at point of delivery. Any signal rejected shall be removed and disposed of by the contractor at his sole cost.
- (c) Sample. One complete signal, fully assembled and wired, of the manufacture proposed to be furnished shall be submitted within seventy-two (72) hours upon request of the Engineer. The sample shall be delivered to, upon the approval of the Engineer: Engineer of Electricity, Bureau of Electricity, 2451 South Ashland Avenue, Chicago, Illinois 60608.
- (d) Drawing. The drawing mentioned herein is a drawing of the Department of Streets and Sanitation, Bureau of Electricity, and shall be construed as part of this specification cooperating to state necessary requirements.
- (e) Warranty. The contractor shall warrant the signals to meet the requirements of this specification, and shall warrant all equipment, components, parts and appurtenances against defective design, material and workmanship for a period of one (1) year from date of acceptance. In the event defects and failures become apparent during this period, the Contractor shall repair or replace such defects and failures at no expense to the State or City. This warranty shall be evidenced by a letter or certificate of warranty submitted to the Engineer at the time final delivery is made.

DETAIL REQUIREMENTS

- 3. (a) Design. The traffic signals shall be designed and constructed to permit sections to be assembled together, one above the other, forming a weatherproof and dust-tight unit. The housing of each section shall be a one piece die casting with integrally cast top, bottom and sides. Individual signal sections shall be fastened together by bolts and clamping rings.
- (b) Assembly. A traffic signal section shall be comprised of, but not limited to, the housing, hinged door, visor, lens, reflector, lampholder and all necessary gaskets and hardware. The three section, one-way, traffic signal shall be comprised of three (3) single (1) sections assembled together, containing an internally mounted terminal block. Arrow indications shall be shipped as single sections.
- (c) Height. The overall height of an assembled traffic signal shall be forty-two (42) inches plus or minus one (1) inch for a three-section signal.
- (d) Mounting. The traffic signal shall be designed for mounting with standard traffic signal brackets using 1-1/2 inch pipe size fittings.
- (e) Positioning Device. Each traffic signal shall have a serrated-ring positioning device either integrally cast or indexed to the housing by means of mating bosses and recesses. When integrally cast, one (1) positioning lock ring as shown on Drawing 11793-A shall be provided with each traffic signal; otherwise two (2) lock rings shall be furnished with each signal.
- (f) Casting Alloy. The housing body and door shall be die cast of corrosion resistant aluminum alloy per ASTM B85, Alloy S12A, with full 12% silicon.

- (g) Housing. The signal housing shall be sectional; one section for each optical unit. The sections shall mate properly to form a neat, straight unit. Two (2) hinge lugs on the left side and two (2) latch screw lugs centered on the right side, as viewed from the front of the signal, shall be cast integrally on each housing section.
- (h) Door. The door shall be a one piece aluminum alloy die casting. Two (2) hinge lugs on the left side and two (2) sets of latch screw jaws centered on the right side, as viewed from the front of the signal, shall be integrally cast with the housing door. The door shall be hinged to the housing with two (2) 18-8 type 304 stainless steel 1/4 inch hinge pins, drive fitted. Two (2) stainless steel latch screws and wing nut and washer assemblies on the latch side of the housing body shall provide for opening and closing the door without the use of tools, or the door may be secured by two (2) cam-type lever catches. The door shall have four (4) holes drilled and tapped for stainless steel machine screws to secure the visor.
- (i) Visor. Each traffic signal shall have a visor for each signal indication (section). The visor shall be the tunnel type, nine and one-quarter inches (9-1/4") long, fabricated of sheet aluminum not less than No. 18 U.S. Gauge. The visor shall fit tightly against the door and not permit any light leakage between the door and visor. All hardware necessary for, but not limited to, attachment of visor shall be of stainless steel.
- (j) Optical Unit. The optical unit consists of the lens, reflector and lamp holder. The optical unit and visor shall be designed as a whole so as to eliminate the return of outside rays entering the unit from above the horizontal (known as sun phantom). The optical unit shall be designed and assembled so that no light can escape from one indication to another.
- (k) Lenses. The red, yellow and green or polycarbonate lenses shall be round with a nominal twelve (12) inch diameter and shall conform to all requirements set forth under the heading "Traffic Signal Lenses" in the ITE standard. The green or yellow arrow lens shall be round with a nominal twelve (12) inch (12") diameter and the outside surface shall be covered, except for the arrow, with a dull or dark gray opaque material of a thickness sufficient to totally hide the light from a 2000-lumen lamp placed behind it operating at rated voltage. The opaque material shall be hard and durable and shall be bonded such that it will not peel or flake when subject to the heat of a signal lamp or when the lens is washed. The shape and size of the arrow shall be of an approved design with a minimum stroke of fifteen-sixteenths (15/16") inch. The arrow shall appear uniformly illuminated when viewed from angles usually encountered in service, whatever may be the angular position of the lens in the signal section. The color of the lenses shall match the colors of samples available for inspection at 2401 South Ashland Avenue, Chicago, Illinois. The lenses shall be mounted in an endless accordion type gasket completely encompassing the edge of the lens and providing a cushion and positive seal between the lens and housing door. The gasketed lens shall be secured to the housing door by four (4) corrosion resistant clips and machine screws, such as brass, stainless steel, or an approved equal.
- (l) Lens Placement. Placement of the colored lenses in the three (3) section signal shall be red, yellow and green, top to bottom.

- (m) Reflector. The reflector shall be fabricated of high-purity, clad-type aluminum sheet formed to a parabolic shape and cut to fit in a circular cast aluminum, hinged frame for rigid mounting within the housing. The circular rim of the reflector shall be mounted in such a way as to seal the internal optical system by being compressed against the lens gasket when the signal door is closed. The reflecting surface shall be an "ALZAK" class SI specular finish having a minimum reflectivity of eighty-two (82) percent and a protective oxide coating of 7.5 milligrams per square inch, minimum. The reflectivity shall be determined with a Taylor-Baugartner Reflectometer, and the weight of the protective oxide coating by the method of test outlined in ASTM B 137. The reflecting surface shall be tested for proper sealing by applying one (1) drop of a water solution (1 gram per 50 cc) of Anthraquinone Violet R at a room temperature. After five (5) minutes, the dye shall be washed from the surface with running water. No stain shall remain after the surface is lightly rubbed with a soft cloth wet with mild soap and water, and rinsed with water. The reflector shall have an opening in the back to accommodate the lamp holder.
- (n) Lamp Holder. The lamp holder shall have a heat, moisture and weatherproof molded phenolic housing designed to accommodate a standard 133 watt, 3 inch light center length, incandescent lamp. The lamp holder shall be so designed that it can be readily rotated and positively positioned to provide proper lamp filament orientation and focus. The inner brass shell, or ferrule, of the lamp holder shall have a grip to prevent the lamp from working loose due to vibration. A gasket shall be furnished at the junction of the lamp holder and the reflector.
- (o) Wiring. Each lamp holder shall be furnished with two (2) leads color coded as follows:
- | | |
|-----------------------------|---------------------------|
| White | Common |
| Red | Red Lens Section |
| Yellow | Yellow Lens Section |
| Green | Green Lens Section |
| Green with
Black Tracer | Green Arrow Lens Section |
| Yellow with
Black Tracer | Yellow Arrow Lens Section |

The lead shall be type TEW No. 18 AWG stranded copper wire with 2/64 inch thick, 600 volt, 105 degree centigrade rated, thermo-plastic insulation meeting MIL-W-76A specifications. The lead shall connect to the terminal strip without being spliced. The ends of the lamp leads shall be stripped of one-half inch (") of insulation and tinned.

- (p) Terminal Strip. A six-terminal, 12-point, barrier type terminal strip with a solid base and pressure plate type connectors (Marathon Special Products Corporation Catalog No. TB-305-SP, or equal) shall be securely attached at both ends to the housing body inside the "Green" section.

- (q) Cable. One, eleven foot (11') length of flexible electric cord, medium duty, type SO, 5-conductor No. 16 AWG stranded copper, color coded rubber insulated, neoprene jacketed, shall be furnished with each three-section signal. Both ends of each cable length shall be carefully stripped of six inches (6") of jacket and one inch (1") of insulation, and each conductor properly tinned.
- (r) Gaskets. Wherever necessary to make a completely dustproof, moistureproof and weatherproof assembly of the housing and optical system, approved type gaskets of neoprene or silicone rubber shall be provided.
- (s) Finish. All interior and exterior surfaces of the housing, door, and visor shall be either prime coated with a high quality infrared oven baked paint per Federal Specifications TT-P-636, or treated with a high quality chromated aluminum oxide coating process (Bonderite 721, or equal) per MIL-C-5541 specifications. All exterior surfaces, except visors, shall be finish coated with a high quality infrared oven baked enamel per Federal Specification TT-E-489 and green color No. 14110 of Federal Standard No. 595. The finish coat for the visor interior and exterior surfaces shall be an alkyd urea black synthetic baking enamel, urea zero (0) gloss-reflectance, meeting MIL-E-5557 specifications for heat resisting glyceryl phthalate enamel, type 4, instrument black. Stainless steel hardware shall not be painted.
- (t) Hardware. All hardware such as screws, nuts, bolts, washers, etc. shall be stainless steel and machine thread type, except where noted otherwise.

PACKAGING

- 4. (a) Packing. Each traffic signal assembly shall be packed in a suitable carton so secured that the signal shall not be damaged during shipment, handling or storage.
- (b) Marking. Each carton containing a traffic signal shall be clearly marked on the outside in letters not less than three-eighths (3/8) inch tall with the legend: "Traffic Signal, Adjustable, Twelve-Inch, One-Way, Three Section or Single Section," as required, the name of the manufacturer, the pertinent Contract Number and the appropriate City Commodity Code Number.

SPECIFICATION 1428
DEPARTMENT OF STREETS AND SANITATION
BUREAU OF ELECTRICITY
CITY OF CHICAGO
SEPTEMBER 11, 1989

THERMAL MAGNETIC CIRCUIT BREAKER

SUBJECT

- 1. This specification covers the requirements for thermal-magnetic circuit breakers capable of providing complete over-current protection for street lighting branch-load and service circuits.

GENERAL REQUIREMENTS

2. (a) Sample. One complete circuit breaker of each type and size, and of the manufacture intended to be furnished shall be submitted upon request of the Engineer within forty-eight (48) hours after the execution of the contract. If the contractor supplying the sample(s) delivered is awarded the contract, the sample(s) shall be credited as part of the order. The sample(s) shall be delivered, upon the approval of the Engineer, to the General Superintendent of Construction, Bureau of Electricity, 2451 South Ashland Avenue, Chicago, Illinois 60608.
- (b) U.L. Approval. Circuit breakers furnished under this specification shall be listed and approved by Underwriter's Laboratories, Inc.
- (c) Applicable Specifications. Where reference is made to applicable requirements of Underwriter's Laboratories, Inc., Bulletin #489, entitled "Standard for Branch Circuit and Service Circuit Breakers," hereinafter cited as the U.L. Standards, the most recently published revision shall govern.
- (d) Assembly. Each circuit breaker shall have the thermal-magnetic trip installed, calibrated and sealed within its insulated housing.
- (e) Instructions. Complete installation instructions, details on wiring, and information on operation shall be furnished with each circuit breaker, except as otherwise indicated.
- (f) Packing. Each circuit breaker shall be packed in a suitable manner so that it will not be damaged in shipping or handling.

TYPES AND SIZES

3. Circuit breakers furnished under this specification shall consist of the following types and sizes:
 - (a) EHD Frame Circuit Breakers. For use on A-C Systems with a 100-ampere frame; minimum interrupting rating of 18,000 R.M.S. symmetrical amperes at 240 volts A.C.
 1. Single pole, 240 or 480 volts A.C., ampere rating from 15 to 100.
 2. Double pole, 240 or 480 volts A.C., ampere rating from 15 to 100.
 - (b) FDB Frame Circuit Breakers. For use on A-C Systems with a 150 ampere frame; minimum interrupting capacity of 18,000 R.M.S. symmetrical amperes at 240 volts A-C.
 - (1) Double pole, 240, 480 or 600 volts A-C, ampere rating from 15 to 150.
 - (2) Triple pole, 240, 480 or 600 volts A-C, ampere rating from 15 to 150.

- (c) JDB Frame Circuit Breakers. For use on A-C Systems with a 250 ampere frame; minimum interrupting current of 65,000 R.M.S. symmetrical amperes at 240 volts A-C.
- (1) Double pole, 240, 480 or 600 volts A-C, ampere ratings from 70 to 250.
 - (2) Triple pole, 240, 480 or 600 volts A-C, ampere ratings from 70 to 250.

DESIGN AND CONSTRUCTION

4. Circuit breakers furnished under this specification shall include the following design and construction features: (1) molded insulating housing, (2) thermal-magnetic trip mechanism, (3) silver alloy contacts, (4) corrosion-resistant internal parts, (5) trip-free, indicating handle, and (6) pressure-type terminals.

DETAIL REQUIREMENTS

5. (a) Thermal-Magnetic Trip Mechanism. The breaker shall be activated on current overload by means of a thermal-magnetic trip mechanism. This mechanism shall be non-adjustable, non-interchangeable, and factory calibrated and sealed. Instantaneous tripping as controlled by the magnetic trip setting, and time delay tripping accomplished by thermal action shall be in accordance with the manufacturer's published characteristic curves for these breakers or with calibration requirements of the U. L. Standards, as applicable.
- (b) Contact Mechanism. The contacts shall be spring loaded and provide a quick-make, quick-break non-teasing action. The contact mechanism shall be such that the breaker will trip open even if the handle is held or locked in the ON position.
- (c) Calibration. Rating and performance of these breakers shall be based on calibration at an ambient temperature of 40° C. (104°F.).
6. (d) Rated Current. Each breaker shall be capable of carrying 100% rated current continuously in its calibrated ambient temperature without tripping and without exceeding the temperature limits specified in the U. L. Standards.
- (e) Contacts. The contacts shall be made of a non-welding silver alloy or equivalent, subject to approval.
- (f) Internal Parts. All internal parts of these circuit breakers shall be corrosion resistant material.
- (g) Terminals. Solderless, pressure type terminals of copper construction shall be provided for both line and load connections.
- (h) Handle Indication. The handle shall indicate clearly whether the circuit breaker is on the ON, OFF, or TRIPPED position.

- (i) Mounting. Breakers furnished under this specification shall have drilled and counter bored holes for front mounting which shall conform to spacings shown on Department of Streets and Sanitation Drawings numbered 677, 678 and 865.
- (j) Test Requirements. These breakers shall be capable of meeting the following sequence of test requirements as specified in the U. L. Standards.
 - (1) Endurance test.
 - (2) Calibration test at 200% and 125% of rated current.
 - (3) Short circuit tests
 - (4) Calibration test at 500% rated current.
 - (5) Dielectric strength test.

GUARANTEE

- 6. Circuit breakers furnished under this specification shall be guaranteed against defects in materials or workmanship for a period of one year after installation. During this period, should a failure occur, repair or replacement shall be made without cost to the State or City.

SPECIFICATION 1432
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
APRIL 24, 1990

SELF-SUPPORTING SECONDARY CABLE

SCOPE

- 1. This specification describes preassembled, reverse twist, secondary cable consisting of one (1) bare conductor used as a messenger and neutral in combination with two (2) or three (3) cross-linked polyethylene covered, stranded, copper conductors. Cable will be used on distribution circuits operated at a maximum voltage to ground of 600 volts. conductor temperatures are not to exceed 95°C (203°F) for the insulated conductors.

WIRES

- 2. (a) MESSENGER. The messenger shall be bare hard drawn, copper wire meeting the requirements of the latest revision of ASTM B1.
- (b) COVERED CONDUCTOR. The covered conductors shall be stranded, soft drawn, copper meeting the requirements of the latest revision of ASTM B3.

- (c) LAY. The lay of the stranded conductors shall meet the requirements of the latest revision of ASTM B8, Class B.
- (d) JOINTS. No welds are permitted in the messenger. The stranded conductors may be welded, but a welding in one strand must be at least fifty feet (50') from any other weld in the same wire or any other wire in the conductor.

SEPARATOR

- 3. A separator of mylar, or any other equivalent material, shall be inserted between the conductor and the covering with the color contrasting with the conductor. The conductor covering shall be of such consistency that linemen shall be able to cut and strip the covering with normally used line tools. Any conductor received which does not meet the cutting and stripping requirements will be returned at supplier's expense.

INSULATION

- 4. (a) Compound. The insulation shall be black cross-linked polyethylene in accordance with the physical and electrical requirements detailed herein, and determined by the test procedures of ASTM D-470, except as otherwise specified.
 - (b) Thickness. The outside diameter of the insulating covering shall be circular and extruded concentrically over the conductor. It shall have an average thickness as shown in these specifications, and a minimum thickness of not less than 95% of the average.
 - (c) Physical Properties - Initial Value.
- 5.
- (a) Tensile Strength 1800 psi min,
 - (b) Elongation at Rupture 350% min.
 - (d) Physical Properties - After Aging.
 - (a) After oven exposure at $121^{\circ} \pm 1^{\circ}\text{C}$ for 168 hours:
 - (1) Tensile strength, min%
of unaged value 80
 - (2) Elongation, min % of
unaged value at rupture 80
 - (e) Moisture Resistance. When tested in accordance with the procedure given in ASTM D-470, except that the water shall be maintained in $75^{\circ}\text{C} \pm 1^{\circ}\text{C}$, the insulation shall meet the following moisture resistance requirements:
 - (1) Gravimetric Method:

- | | |
|---|-----|
| Water absorption, maximum
(Mg. per sq. in) | 5.0 |
|---|-----|
- (2) Electrical Method:
- | | |
|---|-----|
| Specific inductive capacitance-
one day (Max.) | 4.0 |
|---|-----|
- Percent (%) change in SIC:
- | | |
|--------------------|-----|
| 1 - 14 days (Max.) | 3.0 |
| 7 - 14 days (Max.) | 2.0 |
- Percent (%) change in Power
Factor - 1 day (Max.)
- | | |
|--|-----|
| | 1.5 |
|--|-----|
- Stability Factor (Max.)
- | | |
|--|-----|
| | 1.0 |
|--|-----|
- (f) Electrical Characteristics:
- (1) Dielectric Strength. Each length of insulated conductor shall withstand an alternating current potential as shown in Table I for an exposure period of five (5) minutes when tested in accordance with ASTM D-470.
- (2) Insulation Resistance. The insulation resistance of the insulated conductor shall not be less than that corresponding to a constant of 25,000 at 15.6°C (60°F).
- (g) Cold Bend Test Requirement. The insulated conductor shall pass the "Cold-Bend, Long-Time Voltage Test on Short Specimens" of ASTM D-470 except that the test shall be at minus 55°C.

CABLE ASSEMBLY

5. (a) ABLING. The insulated conductors shall be reverse twisted about the messenger one (1) to one and one quarter (1-1/4) revolutions in each direction so that each conductor occupies all of the positions on the periphery of the circle periodically with an approximate distance between reversals of four feet (4').
- (b) BINDING OF CABLE. The insulated conductors shall be bound to the messenger without fillers. The binder wire or tape shall have sufficient strength to support the assembly, but in no case shall it be smaller than a #10 AWG equivalent. The binder shall be flat without sharp edges. Its strength must be suitable for installation by the use of stringing blocks and shall not itself tear, nor cut, or otherwise damage the conductor insulation. The binder wire shall be applied with a left hand lay of five and one-half inches (5-1/2") \pm one half inch (1/2").

SIZE OF SECONDARY CABLE

6. The size and number of the individual conductors (including the bare messenger) in the secondary cable shall be as follows:

<u>No. of Conductors</u>	<u>AWG Size</u>	<u>Insulation Thickness (in.)</u>	<u>Reel Length (ft.)</u>
3	#6	0.060	2,800
3	#4	0.060	2,700
3	#2	0.060	1,700
4	#6	0.060	2,000
4	#4	0.060	1,700
4	#2	0.060	1,400

All the above conductors shall be seven (7) strand. All stranding to be standard round or compressed only. compacted stranding will not be acceptable.

TESTING

7. (a) GENERAL. Tests shall be performed on insulation and completed cables in accordance with applicable standards as listed in these specifications. Where standards are at variance with each other or with other portions of this specification, the most stringent requirements, as determined by an engineer from the Bureau of Electricity, shall apply. All tests shall be conducted on cable produced for this order. Where cable insulation thickness precludes obtaining samples of sufficient size for testing, special arrangements shall be made with the engineer to obtain samples of unprocessed materials directly from the extrusion feed bins which will be separately processed and prepared for tests.
- (b) NUMBER OF TESTS. Insulation tests shall be conducted on samples taken every 25,000 feet or fraction thereof of each conductor size. In no case shall samples be taken closer than 15,000 feet apart.
- (c) WITNESS TESTS. Where the quantity of cable on a single purchase order is 250,000 feet or more, all insulation tests shall be witnessed by an engineer from the Bureau of Electricity. In addition to these tests, the engineer shall also witness tests on completed cables for approximately five percent (5%) of the cable. Included in these tests will be a 70,000 BTU per hour flame test in accordance with IEEE 383. Reels to be tested will be selected at random by the engineer. The contractor shall include in his bid, the cost of travel, food and lodging for one (1) engineer. Travel for 150 miles or greater shall utilize a major airline. Lodging accommodations shall be equal to those provided at a Holiday Inn. The engineer shall be given ten (10) working day notice of all travel arrangements.
- (d) TEST REPORTS. No cable may be shipped until certified copies of all factory tests, including witness tests where applicable, have been reviewed and approved by the engineer.

- (e) ACCEPTANCE. Where the cable fails to conform to any of the tests specified herein, the following shall apply:
1. INSULATION OR JACKET TESTS. Samples shall be taken from each reel and shall successfully conform to all tests specified herein. Reels from which samples fail to conform, will be rejected.
 2. COMPLETED CABLE (REEL) TESTS. Any reel which fails to conform to testing will be rejected. Where a reel fails during witness testing, the engineer will select five (5) additional reels to witness test.
 3. Where five percent (5%) or more of the reels are rejected for any reason, the entire cable order will be rejected.

PACKING AND SHIPPING

8. (a) REELS. The cables shall be shipped on non-returnable reels which shall be capable of withstanding, without damage, shipping, outside storage and handling during installation. "City of Chicago" shall be clearly printed on one (1) outside reel flange, and the insulated conductors on the beginning end shall not protrude beyond the reel flange. The bare neutral shall be securely stapled on the outside of the flange. The dimension of the reel flange shall not be larger than thirty-eight inches (38") in diameter, the drum sixteen inches (16") in diameter, and eighteen inches (18") inside traverse. If reels are to be shipped on flange side, they must have two inch (2") spacers separating them for accessibility to fork lift trucks.
- (b) LENGTH. The cable shall be shipped in lengths shown above with a zero plus (+) tolerance and a ten percent (10%) minus (-) tolerance. Lengths shorter than minus ten percent (-10%) shall not be shipped as they will not be accepted.

IDENTIFICATION

9. (a) MANUFACTURER'S IDENTIFICATION. A thread or other suitable marker shall be included in the finished conductor for identification of the manufacturer.
- (b) PHASE CONDUCTOR IDENTIFICATION. On the three conductor cable, indelible markings reading "600 volt -1" and "600 volt -2" shall be imprinted on each phase conductor respectively at approximately two foot (2') intervals. On the four conductor cable, "600 volt -3" shall be imprinted on the additional conductor with the phase identification on the other phase conductors to remain the same. The markings shall have minimum height of one-eighth inch (1/8").
- (c) REEL MARKING. Each reel shall be tagged on both the inside and outside of one reel flange with the following information which shall be indelibly imprinted on a 2" x 4" brass tag: Purchaser's name and address, wire description, Purchase, or Contract, order number, size designation, net length, manufacturer's name, date of manufacture and gross weight.

SPECIFICATION 1440
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
JANUARY 10, 1991

**CABLE: SINGLE-CONDUCTOR, COPPER 600 VOLT ETHYLENE
PROPYLENE INSULATION AND A HYPALON JACKET**

SUBJECT

1. This specification states the requirements for cables intended to be used as conductors in 120/240 VAC, 60 cycle, single phase, street lighting circuits. The cables will either be installed in underground ducts or directly buried.

GENERAL

2. (a) SPECIFICATIONS. The cable shall conform in detail to the requirements herein stated, and to the applicable portions of the latest revisions of the specifications and methods of test of the following agencies:
 - (1) ICEA Specification S-68-516
 - (2) IEEE Standard 383-1974
 - (3) ANSI-ASTM Standard E662-79
 - (4) ASTM Standard D-470-81
 - (5) U.L. 44
 - (6) U.L. 854
- (b) ACCEPTANCE. Cable not in accordance with this specification will not be accepted.
- (c) REELS. The cable shall be shipped on non-returnable reels. Reels shall be packaged with cardboard or other suitable material to prevent damage during shipping.
- (d) WARRANTY. The manufacturer shall warrant the cable to be first class material throughout. In lieu of other claims against them, if the cables are installed within twelve (12) months of date of shipment, the manufacturer shall replace any cable failing during normal and proper use within two years of date of installation. All replacements under this warranty shall be made free of charge F.O.B. delivery point of the original contract. Lengths of cable having been replaced shall become the property of, and shall be returned to, the manufacturer F.O.B., City of Chicago.

CONSTRUCTION

3. This cable shall consist of a round copper conductor with a tight fitting, free stripping, concentric layer of Ethylene Propylene insulation and a concentric Hypalon jacket extruded in tandem with, and bonded to, the insulation. The cable shall be rated for continuous duty at 90 degree C operating temperature, 130 degree C emergency overload temperature and 250 degree C short circuit temperature.

CONDUCTOR

- 4. (a) MATERIAL. The conductor shall either be soft or annealed round copper wire.
- (b) SPECIFICATIONS. The conductor shall meet the requirements of ASTM B3, B8 or B258, as applicable.
- (c) SIZES. The conductor size shall be as stated in the PROPOSAL and in accordance with all requirements in Table A of this specification.
- (d) STRANDING. The number of strands, shall be as indicted in Table A. Stranding shall meet the requirements of ASTM B8, Class B.

INSULATION

- 5. (a) TYPE. The insulation shall be Ethylene Propylene compound meeting the physical and electrical requirements specified herein.
- (b) THICKNESS. The insulation shall be circular in cross-section, concentric to the conductor, and shall have an average thickness not less than that set forth in Table A of this specification, and a spot thickness not less than ninety percent (90%) of the average thickness.
- (c) INITIAL PHYSICAL REQUIREMENTS:
 - 1. Tensile strength, min., psi. 1,200
 - 2. Elongation at rupture, min. % 250
- (d) AIR OVEN EXPOSURE TEST. After conditioning in an air oven at 121 + 1°C for 168 hours using methods of test described in ASTM-D 573:
 - Tensile strength, minimum percent of unaged value.....75
 - Elongation at rupture, minimum percent of unaged value.....75
- (e) MECHANICAL WATER ABSORPTION:
 - 1. GRAVIMETRIC METHOD. after 168 hours in water at 70+ 1°C: water absorption, maximum, milligrams per square inch.....5.0
- (f) COLD BEND TEST REQUIREMENTS. The completed cable shall pass the "Cold-Bend, Long-Time Voltage Test on Short Specimens" of ASTM D-470 except that the test temperature shall be minus (-) 25°C.
- (g) ELECTRICAL REQUIREMENTS
 - 1. VOLTAGE TEST. The completed cable shall meet an A.C. and D.C. voltage test in accordance with ASTM D-470 and D-2655.

2.INSULATION RESISTANCE. The completed cable shall have an insulation resistance constant of not less than 20,000 when tested in accordance with methods shown in ASTM D-470.

JACKET

6. (a) TYPE. The jacket shall be a Hypalon (Chlorosulfonated Polyethylene) compound meeting the physical and electrical requirements specified herein.
- (b) THICKNESS. The jacket shall be circular in cross-section, concentric with the insulation, shall have an average thickness not less than that set forth in Table A of this specification and a spot thickness not less than ninety percent (90%) of the average thickness.
- (c) INITIAL PHYSICAL REQUIREMENTS:
- | | |
|--|------|
| 1.Tensile strength minimum PSI | 1800 |
| 2.Elongation at rupture, minimum percent | 300 |
- (d) AIR OVEN EXPOSURE TEST. After conditioning in an air oven at 121 + 1°C for 168 hours:
- | | |
|---|----|
| 1. Tensile strength, minimum percent of unaged value | 75 |
| 2. Elongation at rupture, minimum percent of unaged value | 60 |
- (e) MECHANICAL WATER ABSORPTION. After 168 hours at 70 + 1°C:
- | | |
|--|----|
| 1. Milligrams per square inch, maximum | 20 |
|--|----|

TESTING

7. (a) GENERAL. Tests shall be performed on insulation, jacket and completed cables in accordance with applicable standards as listed in these specifications. Where standards are at variance with each other or with other portions of this specification, the most stringent requirements, as determined by the Engineer, shall apply. All tests shall be conducted on cable produced for this order. Where cable insulation and/or jacket thickness preclude obtaining samples of sufficient size for testing, special arrangements shall be made with the engineer to obtain samples of unprocessed materials directly from the extrusion feed bins which will be separately processed and prepared for tests.
- (b) NUMBER OF TESTS. Insulation and jacket tests shall be conducted on samples taken every 25,000 feet or fraction thereof of each conductor size. In no case shall samples be taken closer than 15,000 feet apart.
- (c) WITNESS TESTS. Where the quantity of cable on a single purchase order is 250,000 feet or more, all insulation and jacket tests shall be witnessed by the Engineer or his authorized representative. In addition to these tests, the engineer shall also witness tests on completed cables for approximately five percent (5%) of the cable. Included in these tests will be a 70,000 BTU per hour flame test in accordance with IEEE 383. Reels to be tested will be selected at random by the engineer.

- (d) TEST REPORTS. No cable may be shipped until certified copies of all factory tests, including witness tests where applicable, have been reviewed and approved by the engineer.
- (e) ACCEPTANCE. Where the cable fails to conform to any of the tests specified herein, the following shall apply:
1. INSULATION OR JACKET TESTS. Samples shall be taken from each reel and shall successfully conform to all tests specified herein. Reels from which samples fail to conform, will be rejected.
 2. COMPLETED CABLE (REEL) TESTS. Any reel which fails to conform to testing will be rejected. Where a reel fails during witness testing, the engineer will select five (5) additional reels to witness test.
 3. Where five percent (5%) or more of the reels are rejected for any reason, the entire cable order will be rejected.

PACKAGING

8. (a) CABLE MARKING. The cable shall be identified by a permanently inscribed legend in white lettering as follows:
- 1/c No. (conductor size) AWG-600V-90°C-EP/Hypalon
- The legend shall be repeated at approximately eighteen (18) inch intervals on the outside surface of the cable parallel to the longitudinal axis of the conductor. A sequential footage marking shall be located on the opposite side from the legend.
- (b) When three conductors (3/C) are specified, the smaller of the conductors shall have a green colored jacket and the three conductors shall be triplexed with a 16"-18" lay. The jacket color shall not be unduly affected by cable installation, or prolonged exposure to either direct sunlight or moisture. Where the quantity of 3/C cable exceeds 80,000 feet, witness testing as outlined in section 7(c) shall apply.
- (c) REELS. The completed cable shall be delivered on sound substantial, non-returnable reels. Both ends of each length of cable shall be properly sealed against the entrance of moisture and other foreign matter by the use of clamp-on cable caps, such as the Reliable Electric Company neoprene cable cap No. 1405, or equal. The ends shall be securely fastened so as not to become loose in transit. Before shipment, all reels shall be wrapped with cardboard or other approved wrapping.
6. (d) FOOTAGE. Each reel shall contain the length of cable as set forth in Table A of this specification. A tolerance limit of plus or minus five percent (+5%) shall be adhered to.
- (e) REEL MARKING. A metal tag shall be securely attached to each reel indicating the reel number, contract number, date of shipment, gross and tare weights, description of the cable, the total footage, and the beginning and ending sequential footage numbers. Directions for unrolling the cable shall be placed on the reel with an approved permanent marking material such as oil-based paint or a securely attached metal tag.

TABLE "A"

CONDUCTOR STRANDING	THICKNESS	INSULATION THICKNESS	VOLTAGE	JACKET LENGTH	A-C TEST	REEL	SIZE
AWG OR MCM	NO. OF STRANDS	MILS	MILS		VOLTS	FEET	
8	7	45	15		5,500	2,000	
6	7	45	30		5,500	2,000	
4	7	45	30		5,500	2,000	
2	7	45	30		5,500	1,000	
0	19	55	45		7,000	1,000	
00	19	55	45		7,000	1,000	
000	19	55	45		7,000	1,000	
0000	19	55	45		7,000	1,000	
250	37	65	65		8,000	1,000	

SPECIFICATION 1441
 BUREAU OF ELECTRICITY
 DEPARTMENT OF STREETS AND SANITATION
 CITY OF CHICAGO
 JANUARY 22, 1991

**CABLE: SINGLE CONDUCTOR AERIAL, #6 AWG
 WEATHERPROOFED WITH POLYETHYLENE JACKET**

SUBJECT

1. This specification states the requirements for cable intended to be used as aerial conductors in 120/240 VAC, 60 cycle, single phase, street lighting circuits.

GENERAL

2. (a) **SPECIFICATIONS** . The cable shall conform in detail to the requirements herein stated, and to the Specification and Methods of Test of the American Society for Testing and Materials, cited by ASTM Designation Number, in which the most recently published revision shall govern.
- (b) **ACCEPTANCE** . Cable not conforming to this specification will not be accepted.
- (c) **REELS** . All cable shall be supplied in 1000' coils. Cost of special packaging, shall be included in the cable bid price.

- (d) **WARRANTY** . The manufacturer shall warrant the cable to be first class material throughout. In lieu of other claims against them, if the cable is installed within six months of date of shipment, the manufacturer shall replace any cable failing during normal and proper use within two years of date of installation. All replacements under this warranty shall be made free of charge F.O.B. delivery point of the original contract. Lengths of cable having been replaced shall become the property of, and shall be returned to, the manufacturer F.O.B., City of Chicago.

CONSTRUCTION

- 3. This cable shall have a copper conductor with a tight fitting concentric layer of polyethylene.

CONDUCTOR

- 4. (a) **MATERIAL** . The conductor shall be made up of medium hard drawn, solid, round copper wire.
- (b) **SPECIFICATIONS** . The conductor shall be in accordance with ASTM B-2.
- (c) **SIZES** . Each conductor shall be No. 6 AWG.

JACKET

- 5. (a) **TYPE** . The jacket shall be polyethylene meeting the physical and electrical requirements specified herein when tested in accordance with ASTM Standards.
- (b) **THICKNESS** . The jacket shall be circular in cross-section, concentric to the conductor, and shall have an average thickness of 2/64". The minimum thickness at any cross section shall not be less than ninety percent (90%) of the average thickness.
- (c) **INITIAL PHYSICAL REQUIREMENTS :**
 - 1. Tensile strength, min., psi. 2,400
 - 2. Elongation at rupture, min. % 500
- (d) **AGED PHYSICAL REQUIREMENTS :**
 - 1. After air oven exposure test at 100± 1°C for 48 hours in accordance with test methods of ASTM D470 and D573, as applicable:

Tensile strength, minimum percent
of unaged value.....80

Elongation at rupture, minimum
percent of unaged value.....80

(e) **ACCELERATED WATER ABSORPTION REQUIREMENTS :**

1. **GRAVIMETRIC METHOD .** After 168 hours in water at 70+ 1°C:

water absorption, maximum, milligrams per
square inch.....1.0

(f) **COLD BEND TEST REQUIREMENTS .** The insulated conductor shall pass the Cold-Bend Test of ASTM D470. After observing that there are no visible cracks, the coil shall then be placed in water and tested at 3500 VAC for one (1) minute.

(h) **ELECTRICAL REQUIREMENTS**

1. **INSULATION RESISTANCE_** The insulated conductor shall have an insulation resistance value of not less than corresponding to a constant of 500,000 at 15.6°C (60°F). When the temperature of the water in which the insulation is tested differs from 15.6°C (60°F), the measured value obtained shall be multiplied by the proper correction factor from Table I of ASTM D470, using the coefficient furnished by the manufacturer for his particular compound as previously determined by the method set forth in ASTM D740.

TESTING

6. (a) **GENERAL** . Tests shall be performed on jacket material and completed cables in accordance with applicable standards as listed in these specifications. Where standards are at variance with each other or with other portions of this specification, the most stringent requirements, as determined by an engineer from the Bureau of Electricity, shall apply. All tests shall be conducted on cable produced for this order. Where cable insulation and/or jacket thickness preclude obtaining samples of sufficient size for testing, special arrangements shall be made with the engineer to obtain samples of unprocessed materials directly from the extrusion feed bins which will be separately processed and prepared for tests.
- (b) **NUMBER OF TESTS .** Jacket tests shall be conducted on samples taken every 75,000 feet or fraction thereof of each conductor size. In no case shall samples be taken closer than 25,000 feet apart.
- (c) **WITNESS TESTS .** Where the quantity of cable on a single purchase order is 350,000 feet or more, jacket tests shall be witnessed by an engineer from the Bureau of Electricity. In addition to these tests, the engineer shall also witness tests on completed cables for approximately five percent (%) of the cable. Reels to be tested will be selected at random by the engineer. The contractor shall include in his bid, the cost of travel, food and lodging for one (1) engineer.

Travel for 150 miles or greater shall utilize a major airline. Lodging accommodations shall be given ten (10) working day notice of all travel arrangements.

7.

(d) **TESTS REPORTS** . No cable may be shipped until certified copies of all factory tests, including witness tests where applicable, have been reviewed and approved by the engineer. Test data required is:

1. Initial and Aged Physical Characteristics
2. Accelerated Water Absorption Requirements
3. Cold Bend Test
4. Insulation Resistance
5. Jacket Thickness (average and minimum)

(e) **ACCEPTANCE** Where the cable fails to conform to any of the tests specified herein, the following shall apply:

1. **JACKET TESTS** . Samples shall be taken from 10,000 foot batches and shall successfully conform to all tests specified herein. Batches from which samples fail to conform, will be rejected.
2. Where five percent (%) or more of the batches are rejected for any reason, the entire cable order will be rejected.

PACKAGING

7. (a) **CABLE MARKING** . The cable shall be identified by a permanently inscribed legend in white lettering as follows:

1/c No. 6 AWG - Weatherproofed Aerial PE

The legend shall be repeated at approximately eighteen (18) inch intervals on the outside surface of the cable parallel to the longitudinal axis of the conductor. A sequential footage marking shall be located on the opposite side from the legend.

(b) **REELS** The completed cable shall be delivered in lengths of 1000 feet in coils with a nominal 21 inch eye opening. Both ends of each length of cable shall be properly sealed against the entrance of moisture and other foreign matter by the use of clamp-on cable caps, such as the Reliable Electric Company neoprene cable cap No. 1405, or equal. The ends shall be securely fastened so as not to become loose in transit.

Before shipment, heavy cardboard or plastic wrapping shall be applied to all coils. Coils shall then be fastened to 48 inch by 48 inch hardwood 4-way non-returnable pallets for shipment. Total height of each pallet shall not exceed 64 inches. Total weight of each pallet shall not exceed 2200 pounds.

- (c) **MARKING** A metal tag shall be securely attached to each pallet indicating the coil number, contract number, date of shipment, gross and tare weights, City Commodity Code number 31-4931-8250/280-908-7190, footage, and a description of the cable. Directions for unrolling the cable and any other pertinent information shall be placed on each coil package with an approved permanent marking material such as oil-based paint or a securely attached metal tag.

SPECIFICATION NO 1447
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
AUGUST 9, 1991

POLE: ANCHOR BASE, 3 AND 7 GAUGE, TAPERED TUBULAR STEEL, WITH HANDHOLE ENTRY

SUBJECT

1. This specification states the requirements for tapered, tubular, 3 gauge and 7 gauge steel anchor base poles with mast arm supports. They will support street light luminaries and/or Traffic Signal Mast Arms and will be served by underground cables.
2. (a) Specifications. The poles shall conform in detail to the requirements herein stated, and to the Specifications and Methods of Test of the American Society for Testing and Materials cited by ASTM Designation Number of which the most recently published revisions shall govern.
(b) Acceptance. Poles not conforming to this specification will not be accepted.
(c) Contractor Drawings. The Contractor shall submit detailed full size scale drawings of the mast arm support (s) proposed to be used on the standard. The drawings shall show every dimension necessary to show how all parts will fit each other and be properly held in assembly.
(d) Drawings. The drawings mentioned herein are drawings of the Department of Streets and Sanitation being an integral part of this specification cooperating to state necessary requirements.

STANDARDS

3. (a) Assembly. Each anchor base pole shall consist of a steel mast with handhole entry, entry door with machine screws, grounding nut, mast base, top for mast, two (2) mast arm supports, bolt covers, and all necessary hardware required for complete assembly of these parts, ready for assembly, without special tools.

- (b) Interchangeability. Members of each pole type shall be mutually interchangeable for assembly, so that no reworking will be required to make any member fit properly in the place of any other similar member of any other similar pole.
- (c) Design. Each pole type shall conform in design and dimensions to the pertinent drawing(s) listed in Table "A".

MASTS

- 4. (a) Mast Size. The outside diameters of the mast of each pole type shall be as listed in Table A.
- (b) Material. The mast shall be fabricated from one length of No. 3 or No. 7 Standard gauge as specified in the proposal, low alloy high strength steel, which, after fabrication, shall possess an ultimate tensile strength of not less than 70,000 psi and a yield strength of not less than 50,000 psi, in accordance with ASTM A595, Grade C, ASTM A588, or ASTM A606. Chemistry of the steel shall be such as to insure resistance to atmospheric corrosion superior to that of ordinary copper bearing steel. It must include in its analysis not less than 0.30% copper, and may contain chromium, nickel, phosphorus or titanium in combination with copper, in quantities not less than 50% of the maximum amount required by the above ASTM specifications. Manufacturer's steel meeting the specified physical and chemical requirements, and approved by the Engineer, will be accepted.
- (c) Fabrication. The mast shall be fabricated with not more than one (1) longitudinal weld. The weld shall be ground smooth so that it is virtually invisible. There shall be no lateral welds in the masts other than where the masts are welded to the steel bases. The completed, unpainted masts shall have smooth external surfaces free from protuberances, dents, cracks or other imperfections marring their appearance. Each mast shall be straight and centered on its longitudinal axis.
- (d) Base. The mast base shall be a steel plate, of low alloy, high strength steel noted in Par. 4 (b).
 - (1) Plate Base. The base plate for each pole type shall be as listed in Table "A". It shall be fabricated from the same low alloy, high strength steel as is used for the mast. The mast shall be inserted into the base to a maximum depth which will still allow for an adequate weld to be made between the bottom of the mast and the plate. A circumferential weld shall be made between the mast and the base at both the top and underside of the plate. Removable bolt covers which completely cover the anchor bolts and nuts shall be provided. This cover shall enclose the anchor bolts and be secured in an approved manner. The base shall be attached to the mast so that the bearing surface of the base is at right angles to the longitudinal axis of the mast. The vertical center line of the seam shall be positioned 135 degrees counter-clockwise from the vertical center line of the mast arm support plates.

- (2) Anchor Rod Openings. All anchor rod openings for each pole type shall have a nominal diameter as listed in Table "A".
- (e) Mast Arm Support Plates. The mast arm support plates shall be made of cast steel conforming to the requirements for Grade 65-35 cast steel of ASTM A27, or equivalent, subject to approval. They shall neatly fit the external surface of the mast. The upper mast arm support plate shall have a hollow protuberance, the hole of which shall be approximately equivalent to two (2) inches in diameter, extending into the interior of the pole providing a smooth surface for the lamp cables to rest upon. The mast arm support plates shall be designed so that they will carry the mast arm and hold it in the proper position for fastening the mast arm to the mast. The design of the mast arm support plates shall be a two (2) bolt type as shown on Drawing No. 659.
- (f) Provision for Ground. a 1/2" - 13 square nut shall be welded to the inside of the mast on the handhole entry frame for a ground connection.
- (g) Entry. A vertical doorframe carrying a removable door providing access to the interior of the mast shall be welded into a close fitting opening centered approximately 15 inches above the bottom of the base. The doorframe shall be formed and welded of steel with cross section not less than one and one-half (1-1/2) inches wide by one-quarter (1/4) inch thick so as to adequately reinforce the opening of the mast. The internal horizontal clearance of the doorframe shall be four (4) inches; its internal vertical height shall be eight (8) inches. Its upper and lower ends shall be semi-circular meeting its straight sides tangentially. The vertical center line of the entry shall be at a right angle clockwise from the vertical center line of the mast arm supports. The frame shall be drilled and tapped top and bottom to accept 1/4"-20 Allen head stainless steel machine screws.
- (h) Door. The removable door shall be formed of sheet steel approximately one-eighth (1/8) inch thick. It shall fit the doorframe closely and be dished so that it will stay in proper position even if its locking screws shall be slightly loosened. The door shall be drilled top and bottom to accept the 1/4"-20 Allen head stainless steel machine screws which will fasten the door to the doorframe. Half sections of three-eighths (3/8) inch by one (1) inch tubing shall be welded to the door concentric with the drilled holes to prevent removal of machine screws after installation. Alternate methods shall be subject to approval by the Commissioner or his duly authorized representative.
- (i) Locking Device. Any other door locking device, other than the one outlined above in (g) and (h), must be approved by the Commissioner or his duly authorized representative.
- (j) Tag. To each pole shall be attached, by mechanical means and not by adhesive, a stainless steel tag with a stamped or embossed legend which shall include the pole outside diameter at the base, the overall length, and the gauge; i.e., 12.5" X 34'-6" X 3 gauge.

TOP

5. (a) Design. The mast top shall be essentially conical with a globe-shaped upper-end and having a minimum wall thickness throughout of not less than 5/32 inches. The cone portion shall meet the skirted portion of the top in a smooth fillet, the skirt shall enclose the top 7/8" inches of the mast. Three stainless steel, or other similar approved material, set screws not less than 5/16 inches long shall be equally spaced in tapped holes around the skirt and shall hold the top securely in place atop the mast. The design of the top shall be similar to one shown on Drawing #11420A.
- (b) Material. The top shall be of cast iron of strength equal to or greater than the requirements for Class No. 20 gray iron of ASTM A48 or aluminum alloy 356-F per ASTM B108. It shall have smooth surfaces, neat edges and corners and be free from fins, holes or other casting flaws.
- (c) Finish. Tops shall be painted as herein specified.

HARDWARE

6. All the hardware necessary to complete the assembly of the pole shall be furnished. All hardware shall be stainless steel, or equal corrosion-resistant metal, subject to approval.

WELDING

7. (a) General. Every welded joint shall be made in conformity with the proper interpretation of the standard welding symbols of the American Welding Society as indicated on the drawings; however, each bidder shall submit with his proposal a drawing showing the sizes and types of welds, shall state the type of electrode, and shall describe the welding methods, he proposes to use in fabricating the pole.
- (b) Testing. All welds of five percent (5%) of the poles in every lot shall be inspected for penetration and soundness of the welds by the magnetic particle inspection method or by radiography. Acceptance or rejection shall be governed by the same conditions as in par. 10 (b). If the magnetic inspection process is to be used, then the dry method with the direct current shall be employed. All transverse welds shall be magnetized by the "prod" (Circular magnetization) method. Longitudinal welds may be magnetized by either circular or longitudinal magnetization.

PAINTING

8. (a) Oil and Grease Removal. All metal surfaces shall be washed with an alkaline detergent to remove any oils or grease.
- (b) Metal Cleaning. All exterior metal surfaces shall be cleaned by blasting with a combination of shot and grit to remove all dirt, mill scale, rust, corrosion, oxides and foreign matter and provide a "near white" surface in accordance with SSPCS-SP10. Included in this process shall be the interior base section of the mast to a minimum height of twelve (12) inches.

- (c) Chemical Pretreatment. The cleaned metal surfaces shall then be treated with a hot, pressurized iron phosphate wash and shall be dried by convection heat.
- (d) Exterior Coat. A thermosetting, weathering, Polyester powder coat shall be applied electrostatically to all cleaned and treated surfaces to a uniform eight (8) mil thickness in a one coat application. This powder coat shall be cured in a convection oven at a minimum temperature of 400°F to form a high molecular weight fusion bonded finish.
- (e) Alternate Methods. Alternate powder coat methods may be reviewed and tested on a case by case basis. However, no coating method will be accepted unless the Engineer judges such alternate to be equal to the coating herein specified.
- (f) Interior Coat. The interior metal surfaces shall be powder coated with a thermoplastic hydrocarbon resin containing corrosion inhibitors. The resin shall be formulated for application over untreated metal surfaces. The resin shall be applied at a temperature of approximately 200°F to a minimum thickness of three (3) mils. The interior thermoplastic coat shall overlap the interior, thermosetting base coat by approximately six (6) inches. Alternate interior coatings may be used subject to prior approval of the Engineer.
- (g) Durability. Both the exterior and interior coats shall be capable of passing 1,000 hours of salt spray exposure as per ASTM B117 in a five percent (5%) Na Cl (by weight) solution at 95°F and 95% relative humidity without blistering. Before test, the panel shall be scribed with an "X" down to bare metal.
- (h) Coating Measurement. Measurement of coating thickness shall be done in accordance with SSPC-Pa 2-73T, "Measurement of Dry Paint Thickness with Magnetic Gauges," except that the lowest "single spot measurement" in an area of two square inches shall be not less than 7.0 mils.
- (i) Color. Color shall be equal to green #14110 of Federal Standard 595. A color sample shall be submitted for approval prior to fabrication.

MAST TEST

- 9. (a) General. All completed masts shall be available for testing for maximum deflection and set. AASHTO wind loading of 80 M.P.H. and luminaire weight of 75 pounds with a 3.3 square foot area shall apply. Unless specifically authorized in writing, all tests shall be made at the works of the manufacturer. A record of every test shall be made and a certified copy of the test record shall be submitted to the Engineer before the masts are shipped. The Engineer shall be present during the testing procedures.
- (b) Lot. Tests for deflection and set shall be made upon five (5%) percent of all the masts in every lot (two (2) min.). If any of the masts in any lot fail to meet the test, an additional three (3%) percent of the masts of the same lot shall be tested (two (2) min.). If any of these masts fail to meet the test requirements, the entire lot shall be subject to rejection, except that the manufacturer may subject each mast in the lot to the test, and those which fulfill the requirement will be accepted. After testing, each base weld shall be inspected by the magnetic particle method to determine that the welds have not been affected.

- (c) Requirements. With base rigidly anchored, a test load as indicated in Table A shall be applied at a point approximately two feet (2'0") from the free end. The load shall be applied at right angles to the center line of the mast and in the same vertical plane. The deflection shall not be greater than that indicated in Table A. Within one (1) minute after the test load is released, measurement shall be made of the set taken by the mast. This set shall not be greater than that indicated in Table A. The deflection measurement device shall be reset to zero and the test load shall be reapplied. The deflection shall not change from the deflection noted in the first test by more than +5%. No measurable set shall be noted within one (1) minute after test load is released.

TESTING MAST ARM SUPPORTS

10. (a) General. the integrity of the welds between mast arm supports and mast shall be tested.
- (b) Lot. Tests shall be made on five (5%) percent of the masts in every order. Acceptance and rejection shall be governed by the same conditions given for "Mast Test".
- (c) Requirement. With an appropriate mast arm firmly attached to the mast, a test load of 300 pounds shall be applied to the mast arm as a side pull at a point seven (7) feet from the mast. After the test, the mast arm support welds shall be tested by the magnetic particle method to determine that they have not been affected.

PACKAGING

11. (a) General. The poles shall be shipped in twelve (12) pole bundles. Each pole shall be individually wrapped so that the pole can be bundled for shipping and unbundled for delivery to the jobsite without damaging the pole or its finish.
- (b) Bundles. The bundles shall consist of twelve (12) poles laid base to top to form an approximately rectangular cylinder. Materials such as lumber (2" x 4" min.), non-marring banding, and other appropriate bundling materials shall be used to make a rigid, long lasting, bundle capable of being handled, shipped and stored without shifting of contents or breaking, subject to approval. Any bundles, in which either poles or packaging is received broken, damaged or with contents shifted, will not be accepted and it will be the responsibility of the supplier to return the bundle to its original destination at no cost to the State or City of Chicago. The bundles should be capable of being stacked two (2) high without breaking, or shifting of the contents. Each bundle shall be capable of being lifted by a fork lift truck or crane and the bundles shall be shipped on a flat bed truck to facilitate unloading.
- (c) Hardware. The bolt covers and their attachment devices shall be shipped with each bundle and packaged in twenty-five (25) sets of four (4) each. The package shall be placed in a prominent position to facilitate accessibility, but shall be attached to, or within, the bundle in such a manner as to assure safe delivery. Payment will be withheld for any bundle delivered without the accompanying hardware. Pole caps shall be attached at the manufacturer's facilities, or be packed separately in a manner similar to the bolt covers, and the same payment conditions will prevail. Cracked, broken or shipped parts will be considered as an incomplete delivery as regards payment.

INSPECTION

12. The Engineer or his Authorized Representatives shall have free entry at all times, while the work on the contract is being performed, to all parts of the manufacturer's works which shall concern the manufacture of poles. The manufacturer shall afford the Engineer, without charge, all reasonable facilities to satisfy him that the poles are being furnished in accord with these specifications. The final inspection shall be made at point of deliver. Any poles rejected as defective shall be removed and disposed of by the contractor at his sole cost.

SPECIFICATION 1448
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
AUGUST 26, 1991

SIGNAL: PEDESTRIAN TRAFFIC, TWELVE INCH, WITH SYMBOLIC WALK/DON'T WALK LENSES

SUBJECT

1. This specification states the requirements for a pedestrian signal with symbolic messages on nominal twelve inch square lenses illuminated by incandescent lamps and enclosed in a two-section housing; one section shall display the symbolic "Walk" message and the other section shall display the symbolic "Don't Walk" message.

GENERAL REQUIREMENTS

2. (a) SPECIFICATIONS. The pedestrian signal shall conform to the requirements herein set forth, and to other Specifications cited herein, of which the most recently published revisions shall govern.

(b) INSPECTION. The pedestrian signal shall be subject to inspection at the discretion of the Engineer. Final inspection shall be made at point of delivery. Any pedestrian signal rejected shall be removed and disposed of by the contractor at his sole cost.

(c) SAMPLE. One complete pedestrian signal, fully assembled and wired, of the manufacture intended to be furnished shall be submitted within seventy-two (72) hours after the execution of the contract, upon the request of the Commissioner. The sample shall be delivered, upon the approval of the Engineer, to the General Superintendent of Construction, Department of Streets and Sanitation, Bureau of Electricity, 2451 S. Ashland Avenue, Chicago, Illinois 60608.

(d) DRAWING. The drawing mentioned herein is a drawing of the Department of Streets and Sanitation, Bureau of Electricity, and shall be construed as part of this Specification cooperating to state necessary requirements.

- (e) SYMBOLIC MESSAGES. Symbols for "Walk" (Man) and "Don't Walk" (Hand) shall conform in style and color to those of the "Institute of Transportation Engineers" (I.T.E.).

GENERAL REQUIREMENTS

2. (a) WARRANTY. The contractor shall warrant the pedestrian signals to meet the requirements of this specification and shall warrant all equipment, components, parts and appurtenances against defective design, material and workmanship for a period of three (3) years from date of acceptance. In the event defects and failures become apparent during this period, the contractor shall repair or replace such defects and failures at no expense to the City. This warranty shall be evidenced by a letter or certificate of warranty submitted to the Engineer at the time final delivery is made.

DETAIL REQUIREMENTS

3. (a) ASSEMBLY. The pedestrian signal unit shall consist of two (2) signal sections attached together, one above the other. Each signal section shall be comprised of, but not limited to, a housing body, reflector, lampholder, lens, housing door, visor and miscellaneous supports, fittings, parts and electrical components, all as hereinafter specified, completely assembled and wired, fully painted and ready for installation and operation. Incandescent lamps shall not be furnished.

- (b) DESIGN. The signal sections shall be designed and constructed to permit two sections to be attached together one above the other, or permit one section to be mounted singly. The upper section of each unit shall display the symbolic "Don't Walk" message, and the lower section shall display the symbolic "Walk" message. To provide for easy and simple installation and maintenance, all components shall be readily accessible from front of signal when housing is opened. Overall dimensions shall be approximately 28 inches high, 14 inches wide, and 9 inches deep without visor.

(c) MATERIALS.

- (1) CASTING ALLOY. The housing body and door shall be die cast of corrosion resistant aluminum alloy per ASTM B85, alloy S12A, with full 12% silicon composition.

(d) HOUSING BODY

- (1) CAST ALUMINUM HOUSING. The housing body of each section shall be a one piece aluminum alloy, die cast, enclosure. Two (2) hinge lugs on the left side and two (2) latch screw lugs on the right side, as viewed from the front of the signal, shall be integrally cast with the housing body. The top and bottom of the housing body shall have openings to accommodate standard 1 - 1/2 inch pipe brackets.

- (2) CAST ALUMINUM DOOR. The housing door shall be a one piece, aluminum alloy, die casting. Two (2) hinge lugs on the left side, and two (2) sets of latch screw jaws on the right side, as viewed from the front of the signal, shall be integrally cast with the housing door. The housing door shall be hinged to the reflector housing with two 18-8 type 304 stainless steel 1/4 inch hinge pins, drive fitted. Stainless steel latch screw, wing nut, and washer assemblies on the latch side of the housing body shall provide for opening and closing the housing door without the use of tools. A gasket groove on the inside of the housing door shall be fitted with a weatherproof and mildewproof, aired cored, resilient neoprene gasket which, when the housing door is latched closed, shall compress against a raised bead on the housing body making a positive, weatherproof and dust-tight seal. The housing door shall have a minimum of six (6) holes drilled and tapped for stainless steel machine screws to secure the visors.
- (3) GASKETING. A groove, or other type retaining section, shall be cast or molded along the perimeter on the inside of the door to accommodate a weatherproof and mildewproof, closed cell, resilient, neoprene or silicone rubber gasket which shall make a positive seal when compressed against the housing during closing. The gasket shall encompass the entire perimeter of the groove without any gaps or openings.
- (e) OPTICAL UNITS. The optical unit shall consist of a lens, reflector and lamp holder. All units shall form a neat compact unit within the housing body with no light leakage between the door and the housing body, and the signal indication and the visor.
- (1) LENSES. The lenses shall be approximately 12 inches square and display the "Don't Walk" and "Walk" symbols. The back surface of each lens shall be "frosted" in an approved manner to diffuse the light; the front surface shall be smooth. The symbols shall be screened on the lens front surface with opaque ceramic material fired to form a permanent bond that will not crack or peel. The symbols shall be applied in such a manner as to provide an opaque background and illuminated legends. The symbols shall be not less than nine and one-half inches (9 1/2") tall with proportional width. The "Don't Walk" symbol shall be Portland Orange, low expansion glass or polycarbonate conforming to the specifications of the Institute of Transportation Engineers Technical Report Number 1 and the American Standards Association D 10.0 - 1958 UDC 656.057, where applicable. The "Walk" symbol shall be of clear, low expansion, glass or polycarbonate with the symbolic lens centered. The lenses shall be mounted in an endless neoprene gasket completely encompassing the outer, side, and top and bottom, edges of the lens providing a cushion and positive seal between the lens and housing door, and the lens and reflector. The gasketed lens shall be secured to the housing door by a minimum of four stainless steel clips and machine screws.
- (2) LAMP HOLDER. The lamp holder shall have a heat, moisture, and weatherproof molded phenolic housing designed to accommodate all standard 100 to 116 watt traffic signal lamps with a two and seven-sixteenth (2-7/16) inch light center length. The lamp holder shall be so designed that it can be readily rotated and locked into position to provide proper lamp filament orientation and focus. The inner brass shell, or ferrule, of the lamp holder shall have a lamp grip to prevent the lamp from working loose due to vibration. A neoprene gasket shall be furnished between the flange of the lamp holder and the reflector.

- (3) REFLECTOR. The reflector shall be fabricated of high purity, clad-type, aluminum sheet formed to a parabolic shape and cut to fit in a circular, cast aluminum, hinged frame for rigid mounting within the housing. The reflecting surface shall be an "ALZAK" class SI specular finish having a minimum reflectivity of eighty-two (82) percent and a protective oxide coating of 7.5 milligrams per square inch, minimum. The reflectivity shall be determined with a Taylor-Baumgartner Reflectometer, and the weight of the protective oxide coating by the method of test outlined in ASTM B 137. The reflecting surface shall be tested for proper sealing by applying one (1) drop of water solution (1 gram per 50 cc) of Anthraquinone Violet R at room temperature. After five minutes, the dye shall be washed from the surface with running water. No stain shall remain after the surface is lightly rubbed with a soft cloth wet with mild soap and water, and rinsed with water. The reflector shall have an opening in the back to accommodate the lamp holder. The reflector shall be rigidly mounted within the housing by an aluminum frame which shall be hinged to allow the reflector to be turned out of, or rigidly positioned within, the housing body.
- (f) VISOR. The visor shall be a tunnel type, 8 3/4 inches long, encompassing the top and sides of the signal face, and attached by six (6) stainless steel machine screws, two (2) each on the top and sides. The visor shall be fabricated from 3006-h16 aluminum alloy sheet not less than 0.060 inches thick. The lower outside corners of the visor shall be rounded.
- (g) WIRING. Each lamp holder shall have two (2) leads color coded as follows:
- | | | |
|-------|---|----------------------|
| White | - | Common |
| Red | - | "Don't Walk" Section |
| Green | - | "Walk" Section |
- The leads shall be TEW, number 18 AWG, stranded copper wire with 2/64 inch thick, 600 volt, 105 degree C, thermo-plastic insulation meeting MIL-W-76A specifications. The ends of the lamp leads shall be stripped of one-half inch (1/2") of insulation and tinned. The leads shall be splice-free and connected to one side of the terminal strip.
- (h) TERMINAL STRIP. A four terminal, eight point, barrier type terminal strip with solid base and pressure plate type connectors, such as Marathon Special Products Corporation Catalog Number TB-304-SP, shall be securely attached at each end to the housing body inside the walk section.
- (i) CABLE. One eleven foot (11') length of flexible electric cord, medium duty, type SO, 3-conductor No. 16 AWG stranded copper, color coded, rubber insulated, neoprene jacketed, shall be furnished with each two (2) section signal. Both ends of each cable length shall be carefully stripped of six inches (6") of jacket and one inch (1") of insulation, and each conductor properly tinned.
- (j) FINISH. All interior and exterior surfaces of the cast housing, housing door, and visor shall be either prime coated with a high quality infrared oven baked paint per Federal Specifications TT-P-636, or treated with a high quality chromated aluminum oxide coating process (Bonderite 721 or equal) per MIL-C-5541 specifications. All exterior surfaces, except visors, shall be finish coated with a high quality infrared oven baked green per Federal Specifications TT-E-489 and green color #14110 of Federal Standard Number 595.

The finish coat for the visor interior and exterior surfaces shall be an alkyd urea black synthetic baking enamel, with zero (0) gloss-reflectance, meeting MIL-E-5557 Specifications for heat resisting glyceryl phthalate enamel, type 4, instrument black. Stainless steel hardware shall not be painted.

PACKAGING

4. (a) PACKING. Each pedestrian signal assembly shall be packed in a suitable carton so secured that the signal shall not be damaged during shipment, handling, or storage.
- (b) MARKING. Each carton containing a pedestrian signal shall be clearly marked on the outside in letters not less than three-eighths inch (3/8") tall with the legend: "PEDESTRIAN SIGNAL, TWELVE-INCH, SYMBOLIC WALK-DON'T WALK", the appropriate City Commodity Code Number, the name of the manufacturer, and the pertinent contract number.

**SPECIFICATION 1450
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
AUGUST 28, 1991**

MAST ARMS: 4-, 8-, 12-, AND 15-FOOT: STEEL

SUBJECT

1. This specification covers the requirements for 4-, 8-, 12-, and 15-foot steel mast arms for supporting street light luminaires.

GENERAL

- (a) Specifications. The mast arms shall conform in detail to the requirements herein stated and to the Specifications and Methods of Test of the American Society for Testing and Materials cited by ASTM Designation Number of which the most recently published revision shall govern.
- (b) Acceptance. Mast arms not conforming to this specification will not be accepted.
- (c) Drawings. The drawings mentioned herein are drawings of the Department of Streets and Sanitation. They are integral parts of this specification cooperating to state necessary requirements.
- (d) Contractor Drawings. The Contractor shall submit detailed scale drawings of the mast arms and attachments proposed to be welded to the mast arms as the means for attaching these mast arms to poles. The drawings shall give every dimension necessary to show how the parts will fit each other and be properly held in assembly.

- (e) Sample. One complete mast arm of each size and of the manufacture intended to be furnished shall be submitted within 15 calendar days upon request of the Engineer.

DESIGN

3. (a) 4-Foot Mast Arm. Each 4-foot mast arm shall be fabricated from a continuous, single piece, two (2) inch "extra strong" steel pipe conforming to the requirements of ASTM A53, Table X2. It shall conform in detail with the mast arm shown on Drawing Number 661.
- (b) 8-Foot Mast Arm. Each 8-foot mast arm shall be fabricated from a continuous, single piece, two (2) inch "extra strong" steel pipe conforming to the requirements of ASTM A53, Table X2. It shall conform in detail with the mast arm shown on Drawing Number 654.
- (c) 12-Foot Mast Arm. Each 12-foot mast arm shall be fabricated from two (2) continuous, single piece, two (2) inch "standard" steel pipes conforming to the requirements of ASTM A53, Table X2. It shall conform in detail with the mast arm shown on Drawing Number 839.
- (d) 15-Foot Mast Arm. Each 15-foot mast arm shall be fabricated from two (2) continuous, single piece, two (2) inch "standard" steel pipes conforming to the requirements of ASTM A53, Table X2. It shall conform in detail with the mast arm shown on Drawing Number 840.
- (e) Mast Arm Attachment. The mast arm attachment to be welded to all mast arms shall be a steel forging per ASTM A668, Class D, or cast steel conforming to the requirements for Grade 65-35 cast steel of ASTM A27, or can be fabricated from corrosion resistant steel plate such as "Cor-Ten" or approved equal. It shall be so designed that it may be fitted over the mast arm supports on the pole and be held by the mast arm supports in proper position without other support. Provision shall be made for fastening the attachment to each mast arm support by two special screws and washers as noted in paragraph 7.
- (f) Entryway for Wires. A drilled opening lined with a neoprene grommet having inserted therein a neoprene plug shall be provided on the underside of the upper member of all arms approximately three inches from the point of attachment. The clear opening shall not be less than 5/8 inch in diameter. Its design shall be submitted for approval by the Engineer or his authorized representative.
- (g) Mast Arm Members. All mast arm members shall conform with the type of steel required for the arm specified. The members shall be continuous lengths of pipe cut to the proper size to fabricate the mast arm lengths requested. No butt welded, swaged and welded or other pieced together configurations of pipe lengths will be accepted. The outer and inner surfaces of the pipes shall be smooth and even without protrusions, nicks, holes or other imperfections.

PAINTING

4. (a) Oil and Grease Removal. All metal surfaces shall be washed with an alkaline detergent to remove any oils or grease.

- (b) Metal Cleaning. All exterior metal surfaces shall be cleaned by blasting with a combination of shot and grit to remove all dirt, mill scale, rust, corrosion, oxides and foreign matter and provide a "near white" surface in accordance with SSPCS-SP10. Included in this process shall be one to two inches of the interior section of the mast.
- (c) Chemical Pretreatment. The cleaned metal surfaces shall be treated with a hot, pressurized iron phosphate wash and shall be dried by convection heat.
- (d) Exterior Coat. A Thermosetting, polyester powder coat shall be applied electrostatically to all cleaned and treated surfaces to a uniform eight (8) mil thickness in a one coat application. This powder coat shall be cured in a convection oven at a minimum temperature of 400°F to form a high molecular weight fusion bonded finish.
- (e) Alternate Methods. Alternate powder coat methods may be reviewed and tested on a case by case basis. However, no coating method will be accepted unless the Engineer judges such alternate to be equal to the coating herein specified.
- (f) Interior Coat. The interior metal surfaces shall be powder coated with a thermoplastic hydrocarbon resin containing corrosion inhibitors. The resin shall be formulated for application over untreated metal surfaces. The resin shall be applied at a temperature of approximately 200°F to a minimum thickness of three (3) mils. The interior thermoplastic coat shall overlap the interior, thermosetting base coat by approximately one (1) inch. Alternate interior coatings may be used subject to prior approval of the Engineer.
- (g) Durability. Both the exterior and interior coats shall be capable of passing 1,000 hours of salt spray exposure as per ASTM B117 in a five percent (5%) NaCl solution at 95°F and 95% relative humidity without blistering.
- (h) Coating Measurement. Measurement of coating thickness shall be done in accordance with SSPC-PA 2-73T, "Measurement of Dry Paint Thickness with Magnetic Gauges," except that the lowest "Single spot measurement" in an area of two square inches shall be not less than 7.0 mils.
- (i) Color. Color shall be equal to bridge deck gray, color chip #16-40 of Federal Standard 595. A color sample shall be submitted for approval prior to fabrication.

WELDING

- 5. (a) Standards. Every weld shall be made in conformity with the proper interpretation of the standard welding symbols of the American Welding Society as indicated on the drawings; however, each bidder shall submit with his proposal a drawing showing the sizes and types of welds, shall state the type of electrode, and shall describe the welding methods he proposes to employ in fabricating the mast arm.
- (b) Testing. The welds shall be inspected for penetration and soundness by the magnetic particle inspection method or by radiography. If the magnetic inspection process is used, the dry method with direct current shall be employed.

SCREWS

6. Two (2) special 1/2" - 13 NC x 1-1/2" long stainless steel cap screws, and two (2) stainless steel flat washers, shall be provided for each mast arm attachment.

MAST ARM TESTS

7. (a) General. Five (5) percent of the mast arms of each size in every order shall be tested for integrity of the welds.

(b) 4-Foot Mast Arm. The 4-foot mast arm, when securely attached to a suitable and proper supporting structure, shall withstand a side pull of not less than three hundred (300) pounds applied at a point three feet six inches (3'-6") from the connection to the supporting structure without failure of welds.

(c) 8-Foot Mast Arms. The 8-foot mast arm, when securely attached to a suitable and proper supporting structure, shall withstand a side pull of not less than three hundred (300) pounds applied at a point seven (7) feet from the connection to the supporting structure without failure of the welds.

(d) 12-Foot and 15-Foot Mast Arms. The 12-foot mast arm and the 15-foot mast arm, when securely attached to a suitable and proper supporting structure, shall withstand a side pull of 300 pounds applied at a point seven (7) feet from the connection to the supporting structure without failure of the welds.

(e) Rejection. If any of the mast arms in any lot fail to meet the test, an additional three (3) percent of the mast arms in the same lot shall be tested. If any of these mast arms fail to meet the test requirements the entire lot shall be subject to rejection, except that the manufacturer may subject each mast arm in the lot to the test, and those which meet the requirements will be accepted.

(f) The Engineer shall be present during the testing procedures. .

SPECIFICATION 1458
DEPARTMENT OF STREETS AND SANITATION
BUREAU OF ELECTRICITY
CITY OF CHICAGO
APRIL 28, 1992

ROUND MANHOLE FRAMES AND COVERS / 24 INCH AND 30 INCH DIAMETER

SCOPE

The Contractor shall furnish and deliver F.O.B., to the Engineer, 24" and 30" Circular MANHOLE FRAMES AND COVERS all in accordance with the Standard Specifications, Drawings 872 , 874 and 10927 and Detailed Specifications.

GENERAL REQUIREMENTS

Conformance: The manhole frames and covers shall conform with every detail of the requirements herein stated and to the Specifications and Methods of Test of the American Society for Testing Materials cited by ASTM Designation Number in which the most recently published revision shall govern.

Acceptance: Frames and covers not conforming to this specification will not be accepted.

Drawings: The drawings mentioned herein are drawings of the Department of Streets and Sanitation, Bureau of Electricity, and shall be interpreted as part of these specifications. The FRAMES AND COVERS shall each conform in detail to the design shown on Drawings 872, 874 and 10927.

Weight: Each frame and cover shall weigh approximately as shown on the drawings.

Machining: The bearing surfaces of both the COVER and the FRAME shall be machine finished as indicated on the drawings.

Workmanship: The frames and covers shall be mutually interchangeable size for size, so that each lid will fit every frame neatly without jamming and with only such clearance as the drawings indicates. In addition, 24" & 30" covers shall fit existing 24" & 30" frames, as shown on drawings 872, 874 and 10927. The castings shall be neat, true to pattern and free from cracks and casting flaws. No welding of defective castings will be permitted nor shall the castings be painted.

SAMPLE

Upon request, one complete manhole frame and cover of the manufacture intended to be furnished shall be submitted within fourteen (14) days after the Execution of the Contract. The Contractor supplying the approved samples shall have the approved samples credited as part of the order. The samples shall be delivered, upon approval of the Engineer, to the Bureau of Electricity Storeroom, 4101 South Cicero Avenue, Chicago, Illinois.

MATERIAL

The frames and covers shall be made of Class 30 Cast Iron described in the specifications for Gray Iron Castings of ASTM A48. No plugging of defective castings will be permitted.

TESTS

Test bars of the metal used for the castings shall be made and tested for tensile and transverse strength in accordance with ASTM A48. The Metal shall be tested at the works of the manufacturer. The manufacturer shall furnish a certified copy of all test data sheets to the Engineer prior to delivery of the castings. Where the number of castings on a single order exceeds four hundred (400), the Engineer or his Authorized Representative shall witness these tests. Frames and covers shall each be considered a separate casting for determining the requirement of witness testing.

SPECIFICATION 1462
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
AUGUST 7, 1992

RIGID STEEL CONDUIT / (HOT DIPPED GALVANIZED)

SCOPE

This specification describes Rigid Steel Conduit, Zinc Coated.

GENERAL REQUIREMENTS

Rigid steel conduit shall be of one grade, zinc coated by the hot-dip process. Conduit shall be furnished in 10 foot lengths, threaded on each end and with one coupling attached to one end and a protective cap at the other end.

STANDARDS

The conduit shall be listed by Underwriters Laboratories in accordance with standard U.L. - 6 and shall conform to ANSI C 80.1. In addition, conduit shall be recognized as an equipment grounding conductor as per N.E.C. article 250-91 b.

STEEL

Conduit shall be formed from steel suitable for use as an electrical raceway. It shall be structurally sound so that it will hang straight and true when supported by hangers in accordance with Chicago electrical code requirements and shall be capable of being field bent without deformation of the walls.

Conduit shall have a circular cross section sufficiently accurate to permit the cutting of threads in accordance with Table 2 and shall provide a uniform wall thickness throughout. All surfaces shall be smooth and free of injurious defects. The dimensions and weights of rigid steel conduit shall be in accordance with Table 1.

THREADING AND CHAMFERING

Each length of conduit, and each nipple, elbow and bend shall be threaded on both ends, and each end shall be chamfered to remove burrs and sharp edges.

The number of threads per inch, and the length of the threaded portion at each end of each length of conduit, nipple and elbow shall be as indicated in Table 2. The perfect thread shall be tapered for its entire length, and the taper shall be 3/4 inch per foot.

ZINC COATING

After all cutting threading and chamfering all conduit surfaces shall be thoroughly cleaned before application of zinc. The cleaning process shall leave the interior and exterior surfaces of the conduit in such a condition that the zinc will be firmly adherent and smooth.

The conduit shall be hot dipped galvanized both inside and out to provide approximately two (2) ounces of zinc per square foot. This is equivalent to 3.4 mils of zinc coating. An additional interior coating to aid in the installation of wires is desirable.

COUPLINGS

Couplings shall comply with the following requirements:

- (a) The outside surface of couplings shall be protected by means of a zinc coating. The zinc content of the coating on the outside surface shall be equivalent to a minimum thickness of 0.0008 inch.
- (b) Couplings shall be so made that all threads will be covered when the coupling is pulled tight on standard conduit threads.
- (c) Both ends of the coupling shall be chamfered to prevent damage to the starting threads.
- (d) The outside diameter, length and weight of coupling shall be as indicated in Table 3.
- (e) Couplings shall be straight tapped, except that the 2 1/2 inch and larger sizes may be taper-tapped.

PACKING AND IDENTIFICATION

The pipe shall be delivered in bundles. Each length of conduit shall be marked with the manufacturer's name or trademark. Securely attached to each bundle at two (2) locations on the bundle shall be a weather resistant tag containing the following information:

- 1) conduit size
- 2) footage of bundle
- 3) gross weight of bundle
- 4) commodity code # as per table 4

Precaution shall be taken by the contractor in handling during shipment or delivery of conduit, and any conduit found to be damaged will not be accepted.

TEST AND INSPECTION

Conduit shall be capable of being bent cold into a quarter of a circle around a mandrel, the radius of which is four times the nominal size of the conduit, without developing cracks at any portion and without opening the weld.

The protective coatings used on the outside and inside surfaces of rigid steel conduit shall be sufficiently elastic to prevent their cracking or flaking off when a finished sample of 1/2 inch conduit is tested within one year after the time of manufacture, by bending it into a half of a circle around a mandrel, the radius of which is 3 1/2 inches.

Tests on sizes other than 1/2 inch may be conducted within one year after the time of manufacture. If such tests are conducted, the conduit shall be bent into a quarter of a circle around a mandrel, the radius of which is six times the nominal size of the conduit.

One of the following three test methods shall be employed for measuring the thickness or extent of the external zinc coating on conduit:

- (a)Magnetic test.
- (b)Dropping test.
- (c) Preece test (Material which will withstand four 1-minute immersions shall be considered as meeting requirements as follows; the zinc content of the coating on the outside surface shall be equivalent to a minimum thickness of 0.0008 inch).

All tests and inspections shall be made at the place of manufacture prior to shipment unless otherwise specified, and shall be so conducted as not to interfere with normal manufacturing processes.

Each length of conduit shall be examined visually both on the outside and inside to determine if the product is free from slivers, burrs, scale or other similar injurious defects (or a combination thereof), and if coverage of the coating is complete.

If any samples of rigid steel conduit tested as prescribed in this specification should fail, two additional samples shall be tested, both of which shall comply with the requirements of the specification.

All pipe which may develop any defect under tests, or which may before testing or on delivery be found defective, or not in accordance with these specifications, shall be removed by the Contractor at his own expense; and such pipe so removed by the Contractor shall be replaced by him within ten (10) days of such rejection with other pipe which shall conform to these specifications.

TABLE 1

Design Dimension and Weights of Rigid Steel Conduit

Nominal or Trade Size of Conduit (Inches)	Inside Diameter (Inches)	Outside Diameter (Inches)	Wall Thickness (Inches)	Length Without Coupling (Feet & Inches)	Minimum Weight of Ten Unit Lengths with Couplings Att. (Pounds)
1/2	0.622	0.840	0.109	9-11 1/4	79.00
3/4	0.824	1.050	0.113	9-11 1/4	105.0
1	1.049	1.315	0.133	9-11	153.0
1 1/4	1.380	1.660	0.140	9-11	201.0
1 1/2	1.610	1.900	0.145	9-11	249.0
2	2.067	2.375	0.154	9-11	334.0
2 1/2	2.469	2.875	0.203	9-10 1/2"	527.0
3	3.068	3.500	0.216	9-10 1/2"	690.0
3 1/2	3.548	4.000	0.226	9-10 1/4"	831.0
4	4.026	4.500	0.237	9-10 1/4"	982.0

NOTE: The applicable tolerances are:

Length: + 1/4 inch (without coupling)

Outside diameter + 1/64 inch or -1/32 inch for the 1 1/2 inch and smaller sizes,
 \pm 1 percent for the 2-inch and larger sizes.

Wall thickness: - 12 1/2 percent

TABLE 2
Dimensions of Threads

Nominal or Trade Size of Conduit (Inches)	Threads per Inch	Pitch Diameter at end of Thread (Inches) <u>Tapered</u> 3/4 Inch per foot	Length of Thread (Inches)	
			Effective L2	Overall L4
1/2	14	0.7584	0.53	0.78
3/4	14	0.9677	0.55	0.79
1	11 1/2	1.2136	0.68	0.98
1 1/4	11 1/2	1.5571	0.71	1.01
1 1/2	11 1/2	1.7961	0.72	1.03
2	11 1/2	2.2690	0.76	1.06
2 1/2	8	2.7195	1.14	1.57
3	8	3.3406	1.20	1.63
3 1/2	8	3.8375	1.25	1.68
4	8	4.3344	1.30	1.73

NOTE: The applicable tolerances are:

Threaded Length (L₄ Col 5): Plus or minus one thread
 Pitch Diameter (Col 3): Plus or minus one turn is the maximum variation permitted from the gaging face of the working thread gages. This is equivalent to plus or minus one and one half turns from basic dimensions, since a variation of plus or minus one half turn from basic dimensions is permitted in working gages.

TABLE 3

Designed Dimensions and Weights of Couplings

Nominal or Trade Size of Conduit <u>(INCHES)</u>	Outside Diameter <u>(INCHES)</u>	Minimum Length <u>(INCHES)</u>	Minimum Weight <u>(POUNDS)</u>
1/2	1.010	1-9/16	0.115
3/4	1.250	1-5/8	0.170
1	1.525	2	0.300
1 1/4	1.869	2-1/16	0.370
1 1/2	2.155	2-1/16	0.515
2	2.650	2 1/8	0.671
2 1/2	3.250	3-1/8	1.675
3	3.870	3-1/4	2.085
3 1/2	4.500	3-3/8	2.400
4	4.875	3-1/2	2.839

TABLE 4

COMMODITY CODE NUMBERS

1/2"	285-26-14-035
3/4"	285-26-14-027
1"	285-26-14-019
1 1/4"	285-26-14-044
1 1/2"	285-26-14-053
2"	285-26-14-068
2 1/2"	285-26-14-085
3"	285-26-14-100
3 1/2"	285-26-14-117
4"	285-26-14-132

THIS SPECIFICATION SHALL NOT BE ALTERED

SPECIFICATION 1463
DEPARTMENT OF STREETS AND SANITATION
BUREAU OF ELECTRICITY
CITY OF CHICAGO
SEPTEMBER 18, 1992

TRAFFIC SIGNAL MOUNTING BRACKETS / THREE AND FIVE SECTION

1. SUBJECT

This specification states the requirements for mounting brackets which will be used to be used to secure traffic signals, and illuminated signs to steel monotube mast arms.

2. GENERAL

- (a) Specifications. The mounting brackets shall conform in detail to the requirements herein stated and to the specifications and methods of test of the American Society for Testing and Materials cited by ASTM Designation number of which the most recently published revision shall govern
- (b) Acceptance. Mounting brackets not conforming to these specifications will not be accepted.
- (c) Sample. One complete mounting bracket shall be submitted within five (5) working days upon request of the Engineer. It shall be delivered, upon the approval of the Engineer, to the Engineer of Electricity, 2451 South Ashland Avenue, Chicago, Illinois 60608.
- (d) Experience. Traffic signal mounting brackets supplied under this specification shall have been in successful use with similar traffic signals for a minimum of five (5) years. The contractor shall furnish documented proof of product application upon request of the Engineer.

3. DESIGN

- (a) General. The mounting bracket shall be designed such that no portion of the bracket is put into tension when it is attached to either the mast arm or to the signal support tube.
- (b) Set Screws. All components of the mounting brackets shall be held firmly in place without the use of set screws.
- (c) Adjustments. Bracket shall allow for mounting and adjustment of signal faces in any direction desired on a fixed mast arm. Adjustments shall be made using standard tools. Neither mounting nor adjusting the bracket shall require the use of a torque wrench.
- (d) Signal Mounting. Mounting hardware shall be available for use with standard two, three and five signal head configurations; for use with 3M optically programmed signals heads; and with signs.

- (e) Service Life. Bracket design shall provide for a minimum twenty five (25) year service life. All materials used in the fabrication of the mounting brackets shall be corrosion resistant and shall be designed so that they are structurally sound. During the service life, no observed deterioration of hardware or alignment will be permitted.
- (f) Wiring. Bracket design shall allow for ease of installation of components and wiring. All wiring troughs and nipples shall provide smooth, burr-free surfaces and adequate space for facile movement of nominal " diameter cable between the mast arm and the signal face.
- (g) Banding. Where banding is used to attach the mounting bracket to the mast arm, the banding shall be 3/4" x 42" stainless steel.
- (h) Castings. Where castings are used for the brackets, they shall be smooth and free of defects.

4. TESTING

- (a) General. One Percent (1%) of the traffic signal mounting brackets in each order shall be tested for rigidity and structural integrity.
- (b) Resection. If any mounting bracket fails any portion of the test, an additional three percent (3%) of the brackets shall be tested. If an additional bracket fails, the entire lot shall be rejected.
- (c) Witness Tests. All tests shall be witnessed by the Engineer or his authorized representative.
- (d) Tests.
 - 1. With five (5), twelve inch (12") signal attached to the bracket, the assembly shall be mounted to a suitable and proper supporting structure.
 - 2. Using a calibrated dynamometer, a one hundred pound force shall be applied for sixty seconds at the center of the bracket in the horizontal plane. At the completion of the test, there shall be no movement of the assembly or deterioration of the bracket or appurtenant hardware

Movement of the assembly shall have been observed and there shall be no cracking of the castings or deterioration of the appurtenant hardware.

- 3. Using a calibrated dynamiter, a one hundred pound force shall be applied to the top signal head for sixty seconds in a direction which will pull the head away from the mounting post in the mounting post plane. During this time period, the mounting bracket castings shall be struck ten times with an eight ounce flat head hammer at the point(s) which appear to be most vulnerable to stress. At the completion of the test, no movement of the assembly shall have been observed and there shall be no cracking of the castings or deterioration of the appurtenant hardware.
- 4. The above test shall be repeated except for that the force shall be applied in a plane which is perpendicular to the mounting post plane.

5. INSPECTION

The Engineer or his authorized representative shall have free entry at all times while the work on the contract is being performed, to all parts of the manufacturer's works which shall concern the manufacture of these mounting brackets. The manufacturer shall inform the Engineer, without charge, all reasonable facilities to satisfy him that the mounting brackets are being furnished in accord with this specification. The final inspection shall be made at point of delivery. Any mounting brackets rejected as defective shall be removed and disposed of by the contractor at his sole cost.

SPECIFICATION 1464
DEPARTMENT OF STREETS AND SANITATION
BUREAU OF ELECTRICITY
CITY OF CHICAGO
NOVEMBER 24, 1992

IN-LINE FUSES FOR STREET LIGHTING

1. SUBJECT

This specification covers the requirements for fuses to be used to protect street lighting circuits and luminaries.

2. DESIGN

- (a) Fuses shall be especially related for H.I.D. Ballast and street lighting protection
- (b) Fuses shall be fast acting, high interrupting capacity and current limiting.
- (c) Fuses shall be rated for 10A, 600 VAC and 100,000 AMPS symmetrical interrupting.
- (d) Fuse dimensions shall be 13/32" x 1-1/2"
- (e) Fuses shall be U.L. listed.
- (f) Fuses shall be Buss fuse type KTK; Littlefuse type KLK; Gould (Chase-Shawmut) type CTK; or approval equal.

SPECIFICATION 1465
DEPARTMENT OF STREETS AND SANITATION
BUREAU OF ELECTRICITY
CITY OF CHICAGO
NOVEMBER 28, 1995

GROUND RODS

1. SUBJECT

This specification states requirements for ground rods to be used for ground connections in street lighting, traffic signal, fire alarm, and miscellaneous electrical circuits.

2. GENERAL

- (a) Ground Rods shall be copper clad, steel rods suitable for driving into the ground without deformation of the rod scoring, separation or other deterioration of the copper cladding.
- (b) Acceptable ground rod manufacturer shall have been successfully producing copper-clad ground rods for the electrical industry for a minimum of five (5) years.

3. DESIGN

- (a) Ground rods shall be made of mild steel core suitable for driving into the earth without deformation.
- (b) A heavy, uniform covering of electrolytic copper shall be metallurgically bonded to the steel core to provide a corrosion resistant, inseparable bond between the steel core and the copper overlay.
- (c) The rod shall be processed to work harden the copper providing a scar resistant surface.
- (d) The finished rod shall be of uniform cross-section; straight, and free of nicks, cuts or protuberances.
- (e) The rod shall be pointed at one end and chamfered at the other end.
- (f) All ground rods shall be three-quarter inches (3/4") in diameter. The length shall be as specified elsewhere. The length of the rod shall be clearly and permanently marked near the top of the rod (chamfered end).
- (g) All ground rods shall conform to U.L. 467 and shall be listed as such.

4. ACCEPTANCE

- (a) The contractor shall furnish one sample of the ground rod proposed to be furnished. The approved sample shall be the standard, in all respects, to which all ground rods furnished shall conform. The accepted ground rod will be credited as part of the order.
- (b) The sample ground rod shall be delivered, upon the approval of the Engineer, to the engineer of electricity, 2451 S. Ashland Avenue, Chicago, Illinois 60608.
- (c) Ground rods not accepted shall be removed at the sole expense of the contractor.

**SPECIFICATION 1467
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
MAY 12, 1993**

ROD: ANCHOR, STEEL, WITH HARDWARE

SUBJECT

- 1. This Specification states the requirements for steel anchor rods with hardware for the street light pole foundations.

GENERAL

- 2. (a) Specifications. The anchor rods shall conform in detail to requirement herein stated, and to the specifications of the American Society for Testing Materials cited by ASTM Designation Number, of which the most recently published revision shall govern.
- (b) Drawing. The drawings mentioned herein are issued by the Department of Streets and Sanitation, and are an integral part of this specification.

ANCHOR ROD

- 3. (a) Fabrication. Each anchor rod shall be fabricated in conformity with City of Chicago drawings numbered 806, 811, 830 and 844.
- (b) Material. The rods shall be fabricated from cold rolled carbon steel bar meeting the requirements of ASTM Specification A-36, except that the Specification shall be modified to provide a minimum yield point of 55,000 psi (379 MPa).
- (c) Thread. The straight end of each rod shall be threaded as shown on City of Chicago drawing for that size rod, and shall be American Standard, National Course.

HARDWARE

4. Hardware furnished with the anchor rod shall be as shown on the applicable drawing. It shall include two (2) hexagonal nuts, American Standard Regular, two (2) flat washers, type B, series W, and any other hardware shown on the applicable drawings. The nuts shall have a Class 2 or 3 fit.

FINISH

5. (a)Galvanizing. The threaded end of each rod shall be hot dipped galvanized for the distance shown on the applicable drawing. The thickness of the galvanized coating shall be not less than 0.0021 inches. Each hexagonal nut and washer shall be galvanized to the minimum thickness required by ASTM A-153, Class C, or ASTM B-454, Class 50. After galvanization, each anchor rod and nut shall have a mating fit equivalent to the American Standard Class 2 or 3 fit for nuts and bolts.

(b)Rust Inhibitor. With the hardware in place on the end of the bolt, the galvanized portion of the bolt shall be coated with heavy No-Ox-Id or equal rust inhibiting greasy compound.

TESTS

6. At the discretion of the Engineer, anchor rods and hardware furnished under this specification shall be subject to testing to determine compliance with the materials physical requirements.

INSPECTION

7. Final inspection shall be made at point of delivery. Any anchor rods and hardware rejected shall be removed by the Contractor at his sole expense.

**SPECIFICATION 1469
DEPARTMENT OF STREETS AND SANITATION
BUREAU OF ELECTRICITY
CITY OF CHICAGO
FEBRUARY 28, 1997**

**CONTROLLER
TRAFFIC SIGNAL, PRETIMED, SOLID STATE
LOCAL AND MASTER - LOCAL TYPES**

I. OVERVIEW

- a. These specifications state the requirements for Pre-Timed, Solid State, traffic signal control equipment for use in the City of Chicago.

- b. Controllers shall provide twenty-four (24), or more, user defined intervals, and forty eight (48), or more, user defined and individually programmable signal outputs. No N.E.M.A. function four (4) or eight (8) phase controller operating in recall or phase recycle will be accepted as Pre-Timed.
- c. Controllers shall be able to operate, but not be limited to, the following modes:
 - Eight (8) separate cycles (dials), four (4) separate splits per cycle (dial), eight (8) separate signal plans, five (5) offsets.
- d. Apart from the inputs for the previously mentioned modes, controllers shall accept and respond to, without external packages or circuit boards, a minimum of the following inputs:
 - Five (5) Pre-Emption inputs, eight (8) actuation (detector) inputs, M.U.T.C.D. flash, manual advance.
- e. Time Base Coordinators (T.B.C.'s) shall be an internal function of the controller, and provide an "absolute zero" offset reference. The T.B.C. shall be capable of eight (8) separate cycle lengths. Each Controller shall, through the use of a master interconnect relay panel, be able to operate as a system master (seven (7) wire interconnect) or operate in an isolated "stand alone" mode.
- f. Each unit shall, through the use of a local interconnect relay panel, be able to operate as a secondary (seven (7) wire interconnect) controller.
- g. Conflict Monitors shall be separate from the controller, and be a N.E.M.A. "plus" or expanded function, twelve (12) channel type. Conflict monitors shall provide storage of a minimum of ninety nine (99) conflict events.
- h. Within two (2) working days after the Execution of the Contract to the bid opening, the contractor shall provide a sample to the Engineer. The sample shall consist of the controller, cabinet, load switches, conflict monitor and all appurtenant wiring and equipment completely assembled as a working unit. This sample shall be regarded as a finished production sample and conformance or non-conformance of the bid to these specifications shall be based on the sample submitted. No subsequent modifications to the production sample will be allowed.
- i. All tests as outlined herein shall be regarded as minimum requirements. The contractor shall submit his testing procedure for approval prior to performing any testing functions. Upon successful completion of all testing, certified test reports shall be submitted for each unit. Units not successfully passing these tests or lacking proper documentation shall be rejected.
- j. All cabinets shall be provided with Factory installed 1 1/8" x 1/2" deep channels. Four channels shall be provided for each cabinet side and back. All shelves, panels and individual equipment items shall be mounted to these channels using 1.0" channel nuts with 1/4-20 bolts. All items mounted on panels shall be securely fastened by bolting into drilled and tapped holes. No pop rivet or similar fastening methods will be accepted.

II. CONTROLLER

- a. Power Source. The controller shall operate on 120 volt, 60 cycle, single phase, alternating current.
- b. Packing. Each controller, with all its component parts, shall be suitably packed in a single container in such a manner as to prevent damage to the contents in shipment and handling.
- c. Instructions. One (1) complete set of up to date instructions providing complete information on installation, adjustment, operation and maintenance, including both up to date "Logic Schematics" and "Electronic Circuit" diagrams, of these controllers, shall be furnished to the Engineer for approval prior to the first shipment of controllers. All information, including photos and schematics, shall reference to the controller being furnished on this contract and shall be a high quality, completely legible reproduction. Upon approval, one complete set of data shall be furnished with each controller.
- d. Approval. Approval shall mean approval in writing by the Engineer, or his duly authorized representative.
- e. Spare Parts. Bids on a "spare parts" contract to maintain these controllers shall be taken as a separate item in the PROPOSAL, and shall include a spare parts list, a list price for each item, and the discount, if any. The contract shall have a term of one (1) year from date of award of Traffic Signal Controller contract(s). This bid requirement shall be waived where a spare parts contract now exists.
- f. Sample. As described above, one complete sample shall be supplied for evaluation of the contractor's conformance to these specifications. The sample shall become the property of the City of Chicago with a suitable credit issued to this contract.
- g. Warranty. The contractor shall warranty the performance and construction of these traffic signal controllers to meet the requirements of this specification, and shall warranty all parts, components, and appurtenances against defects in design, material, and workmanship for a period of one (1) year after installation on moving parts, and for a period of five (5) years after installation on non-moving parts. In the event of defects or failures during these periods, the contractor shall repair and/or replace all defective or failed parts or appurtenances at no expense to the City within sixty (60) days from the date of shipment by the City.
- h. Pre Shipment Testing. The manufacturer of the pretimed solid state controller shall perform at his manufacturing facilities a one hundred (100) hour burn-in test on every controller, conflict monitor unit, and appurtenant devices. This test period shall be certified by the manufacturer with supportive documentation and shall include the device serial number, dates and times of test periods, and results. Any failed, or nonconforming components shall be replaced at this time. The 72 hour function test described in this specification, shall be performed on each complete controller system. After each of the components has passed the burn-in test, they may be used in the assembly of the complete controller unit. Each completed unit shall be subjected to the 72 hour function test as described in this specification. Should the controller fail to complete this test for any reason, the failed portion(s) of the unit shall be replaced and the test repeated in its entirety. Certification of these tests shall be attached to the outside of the shipping container. Any containers without this attached certification will be returned to the manufacturer at his sole expense. This certification is in addition to any other documentation and/or testing required by these specifications.

- i. Manufacturer. The manufacturer of these controllers shall have been manufacturing and furnishing acceptable pretimed traffic signal controllers to State or Local units of Government for a minimum of ten (10) years prior to this bid. Certification to this effect must be provided at time of bid.

III. CONTROLLER TIMING

- a. Controller timing shall be accomplished with solid state digital timing referenced to a 60 Hertz power source.
- b. The time cycle shall remain constant and accurate within a voltage range of 95 to 135 VAC, and within a temperature range of minus(-) 30 degrees F. to plus (+) 165 degrees F., (-34 degrees C. to 74 degrees C.), without the use of heater elements or cooling means.
- c. The cycle length shall be capable of operating to 255 seconds.
- d. The controller shall provide consecutive divisions of the time cycle hereinafter termed "intervals", during which combinations of signal indications do not change.
- e. The controller shall provide a minimum of 24 consecutive intervals.
- f. Interval set times shall be provided in both one-tenth (1/10) second steps and in one (1) second steps.
- g. Offsets shall be set in one (1) second steps.
- h. Separate time settings shall be available for each of the eight (8) cycle lengths, each of the five (5) offsets per cycle, and each of the twenty-four (24), or more, intervals per cycle. Multiple splits four (4) within an interval shall be provided.
- i. The front panel of the controller shall contain a display which shall show the interval number, interval time, and offset for any dial as well as the currently active dial, depending upon the keyboard selection.
- j. All timing entries shall be made from a keyboard mounted on the controller front panel. It shall be arranged such that a security access code is required before timing entries can be initiated. Two (2) security access by-pass codes shall also be provided, one of which will initiate and the other negate this requirement.
- k. Offset Correction. The controller shall be capable of offset correction by both the dwell and short way methods. When the dwell method is used, the controller shall be capable of a dwell time of up to 1/2 of the cycle length. Dwell time shall be programmable. When the short way method is used, it shall be possible to exclude intervals from timing variation.
- l. Manual Operation. Operation of the controller by manual control shall provide the same sequence of outputs as the current cycle, split, and signal plan called for by the interconnect or T.B.C. with no momentary undesirable indications appearing. It shall also be possible to guarantee that certain user defined intervals shall time out as normal before advancing to the next interval.

- m. Housing. The controller shall be enclosed in a rigid, dust and moisture resistant housing with front panel indicator to show which cycle, offset and interval are in effect. The timing of each interval, cycle and offset which is in, or not in, effect shall be available for viewing by the use of front panel switches. Individual plug-in circuit boards and "mother" boards shall be "Conformal" coated or made moisture resistant in an approved manner.
- n. Replacement. The controller shall be capable of being replaced with an identical unit by the use of a standard M.S. type connector.
- o. Marking. The circuit reference designation for each component on each printed circuit board shall be clearly marked immediately adjacent to the component. Each board shall have a unique serial number for identification purposes.

IV. SIGNAL CIRCUIT SWITCHING

- a. Interval Programming. Timer units shall be supplied with EE PROM signal drive circuit programming means to allow for arrangement, or rearrangement, of signal output interval sequences to energize, or deenergize, any signal circuit during any interval. This program shall provide separate, distinct access codes for timing and for sequence. Where EPROM programming has been previously approved, one (1) EPROM burner shall be furnished with each 75 timer units with a minimum of two (2) EPROM burners per contract.
- b. Outputs. All signal circuit outputs shall be capable of reliably switching from five (5) to twenty-four (24) VDC with a steady current of three (3) to ten (10) ma.
- c. Output Circuits. The controller shall be capable of forty eight (48) user defined and individually programmed signal outputs.
- d. Pre-Emption. The controller shall be capable of a minimum of five (5) Pre-Emption sequences utilizing separate, or a combination of separate and existing, output sequencing. It shall also be capable of defining priority of Pre-Emption inputs.
- e. Actuation. The controller shall be capable of responding to a minimum of four (4) actuation inputs. Responses shall service user defined intervals in a user defined sequence.
- f. Signal Plans. The controller shall be capable of eight (8) separate user defined signal plans.
- g. M.U.T.C.D. Flash. The controller shall be capable of M.U.T.C.D. flash without external devices.
- h. Transfer Intervals. The controller's Split, Signal Plan, Start Up, Restart, Enter Flash and Exit Flash shall be user defined.

V. TIME BASED COORDINATORS

- a. Isolated Intersection (TIME BASE COORDINATOR). Each controller shall be furnished with an internal eight (8) circuit, solid state, "time of day", "day of week", timing device which allows for synchronization of the system without external interconnection. This function shall be keyboard programmable to one (1) second resolution. Programming shall be provided for controlling operating modes, such as SET CLOCK, RUN, EXAMINE/PROGRAM, etc. Indicators shall be provided on the front panel to show day of week, time in hours and minutes, and output circuit activation. This function shall meet the requirements:
- (1) System Synchronization. System synchronization shall be based on an "Absolute Zero" offset reference. This method provides for a "continuous" reference, of the system to a real time base as established by the Engineer and strictly prohibits "once a day" synchronization of the System. After a power outage, the system will automatically reference each cycle counter back to its last reference point. The system shall be capable of automatically referencing back a minimum of 100 hours without manual reset.
 - (2) Dials. This function shall provide three (3) outputs for selection of one (1) of eight (8) or more dials. Each dial shall offer a minimum of five (5) offsets, four (4) splits and eight (8) signal plans.
 - (3) Stability of Pulse. The stability of the synchronous pulse output shall be that of the 60HZ power line when it is within 95-135 VAC. When line power is out of this range or power is removed, the device shall maintain synchronization and program functions and not drift more than $\pm 0.005\%$ for a minimum of ten (10) hours.
 - (4) Outputs.
 - a) DC outputs: All DC outputs shall be capable of reliably switching from five (5) to twenty-four (24) VDC with a steady current of three (3) to ten (10) ma.
 - (5) Visual Program Verification. When a program instruction is being entered, each element of the program shall be visible on the display for verification before the instruction is entered. Provision shall be made for correcting any instruction before it is entered. The unit shall provide for alteration of any single instruction of an entered program without disturbing any other instruction in that program.

VI. CONFLICT MONITOR

- a. General. Each controller shall be furnished with a NEMA conflict monitor unit for checking for conflicts in the signal output circuits. The conflict monitor shall be capable of monitoring a minimum of twelve (12) distinct channels. It shall be a self-contained unit with its own power supply and not be located within the timer housing.
- b. Programming Board. A removable programming board shall be supplied with the monitor for programming signal compatibility. The circuits for programming shall be composed of soldered jumper wires. Diode or dip switch type programming shall not be acceptable. The programming board shall contain no circuitry or components other than the wire jumpers and the wire jumper soldering devices.

- c. Flashing Circuit Energizing. The conflict monitor shall be programmed to put the controller in a flashing sequence upon detection of a failure or conflicting signal display. The controller shall also be programmed to energize the flash circuit if the conflict monitor is removed or loses its supply voltage. The conflict monitor shall have a manual reset button to return the controller to normal operation after conflict circuit operation is no longer necessary.
- d. Stop Time Circuit. A stop-time control circuit shall be supplied from the conflict monitor to force the timer unit to stop timing upon detection of a conflict.
- e. Indicator. The front panel of the conflict monitor housing shall have an indicator which shall be activated when a conflict or failure occurs as per Section 6 of NEMA Spec. TS1-1983.
- f. Latch Circuit. The conflict monitor shall have a latch circuit, insuring that if a voltage monitor failure occurs, the intersection remains in conflict until reset.
- g. Memory. The conflict monitor shall have the ability to store, in memory, a minimum of ninety nine (99) conflict events, including date of conflict and channels conflicting.

VII. CONFLICT MONITOR ASSIGNMENTS

- a. Conflict monitor channels shall be assigned as follows:
 - (Red, Yellow, Green channels)
 - Channel 1 Vehicle - Load Switch 1
 - Channel 2 Vehicle - Load Switch 2
 - Channel 3 Vehicle - Load Switch 3
 - Channel 4 Vehicle - Load Switch 4
 - Channel 5 Vehicle - Load Switch 5
 - Channel 6 Vehicle - Load Switch 6
 - Channel 7 Vehicle - Load Switch 7
 - Channel 8 Vehicle - Load Switch 8
 - Channel 9 Vehicle - Load Switch 9
 - Channel 10 Vehicle - Load Switch 10
 - Channel 11 Vehicle - Load Switch 11
 - Channel 12 Vehicle - Load Switch 12
- b. It shall be possible for the user to change conflict assignments without unsoldering any connections.
- c. All unused channels - vehicle or pedestrian - shall be neatly tied or terminal mounted in such a manner that they are readily available in front of the panel. If tied, the harness wires shall be labeled. If terminal mounted, the terminations shall be labeled.
- d. A terminal shall be provided for the red enable feature.
- e. A terminal shall be provided for the hook up of any unused red channels to AC.

- f. Controller monitoring shall consist of; voltage monitor, 24 VDC I, 24 VDC II.
- g. The output relay shall operate a sixty (60) ampere, normally open, "A" type mercury contractor without the use of an external or "cabinet interface" relay.

VIII. CABINET

- a. Housing. Each controller shall be furnished completely housed in an aluminum housing. Hennesy Model LS503017 or approved equivalent for local controllers and Hennesy Model LS554426 for master controller.
- b. Door. The cabinet shall have a main door and a police door hinged with one-quarter inch (1/4") minimum, continuous, removable stainless steel pins. The doors shall be closely fitted to a neoprene gasket making the doors dust, water and weather resistant. The doors shall be interchangeable with any other doors from any other controller in this order.
 - (1) Main Door. Opening of the main door shall provide complete access to the cabinet interior. The door shall be embossed, subject to approval, with the legend "CITY OF CHICAGO-TRAFFIC CONTROL" in letters at least one (1) inch high. The door shall have stops at 90, 150 and 180 degrees, from the closed position. The door latch shall have three (3) point locking with rollers at the ends of the latch rods. The latch handle shall be capable of being padlocked. The key lock for the latch mechanism shall be a Corbin cylinder lock with a #2 key. Two (2) keys shall be furnished with each cabinet.
 - (2) Police Panel Door. The police panel door shall be furnished with a lock for a modified Chicago police key per sample to be furnished to the successful bidder. This key shall have a shaft of at least one and three quarter inches (1-3/4") in length. Two keys shall be furnished with each cabinet.
- c. Cabinet Ventilation. A fan, having a minimum air movement capacity of 100 CFM, shall be mounted in the air baffle in the top of the cabinet with an air outlet built into the roof overhang. The main door shall be louvered and equipped with a removable, standard, commercially available dust filter. The air outlet and the louvered openings shall be equipped with removable covers for summer operation. No external fan housings or air outlets will be allowed. Any other method must be approved.
- d. Shelf. The cabinet shall contain a vertically adjustable shelf large enough to accept the solid state controller and all other shelf mounted devices.
- e. Size. The exterior dimensions of the cabinets shall be approximately forty-nine (49) inches high x thirty (30) inches wide x seventeen (17) inches deep and must conform to N.E.M.A. 3R pad mounted specifications. The bolt pattern shall be a four (4) point pattern with the bolt notches being in the center of each side.

- f. Finish. The exterior surfaces of the cabinet shall be smooth. All drilled, tapped, or punched holes on the outer surface shall be filled with liquid metal and ground smooth, and slotted screw heads shall be ground smooth flush with surface. Bolts extending through cabinet wall shall be round head, carriage, square shoulder type and fastened on the inside of the cabinet with an Esna nut and necessary gaskets to insure the weatherproofing integrity of the cabinet. The finished cabinet shall be thoroughly degreased in a hot iron phosphate wash process and dried in a heated chamber. A thermosetting, ultra violet resistant, polyester powder coat shall be electrostatically applied to all cleaned and treated surfaces and cured to a hard, mar resistant finish in a heated chamber at a temperature recommended by the powder coat paint manufacturer. Color shall be City of Chicago green conforming to Federal Standard 595, color No. 14110. Color shall be submitted for approval prior to acceptance of cabinet. Cabinet interior shall be glossy white and may be either baked enamel or thermosetting, polyester powder coat. For either process, the interior shall be prepared as described above. If the baked enamel finish is used, it shall be preceded by one (1) coat of primer.

IX. POWER SUPPLY

- a. A sixty (60) ampere main breaker shall be inserted in series with the line.
- b. An unfused terminal bus shall be provided for ground side of the power supply and signal conductor commons.
- c. Individual circuit breakers shall be supplied for: (a) AC+ lights, 50 amperes; (b) AC+ control, 10 amperes; (c) duplex outlet supply, 15 amperes.
- d. The incoming line shall contain lightning protection devices consisting of, but not limited to, a metal oxide varistor and gas type arrester. The gas type arrester shall be on the line side of the radio interference filter.
- e. Contactor: A sixty (60) ampere Magnacraft, or approved equivalent, normally open, "A" type mercury contactor shall be supplied for opening and closing the AC supply to the signal bus. This contactor shall be mounted in such a manner on the power supply panel that accidental contact does not produce a safety hazard.
- f. R.I.S. Filter: A radio interference suppression filter rated at sixty (60) amperes minimum shall be installed in line with the main power supply, after the sixty (60) ampere circuit breaker.
- g. Ground. The grounded side of the power supply shall be continuous throughout the controller and shall be grounded to the controller cabinet in an approved manner meeting OSHA requirements.
- h. Polarity. The phase conductors of the signal circuits shall have the same polarity as the phase side of the power supply, and the common conductor(s) shall be of the same polarity as the grounded side of the power supply.

X. LOAD SWITCH BAY

- a. General. A panel shall be provided for mounting the load switch jacks, flash transfer relay jacks, flasher jack, auxiliary relays, time clock jacks, switches, flash change combination terminals, and terminals for field signal connections under non-interconnected operation.
- b. Wiring. Panel wiring shall be neatly laced and properly terminated individual conductors. They shall be insulated and properly sized for their application.
- c. Load Circuits. Each load circuit shall be capable of carrying fifteen (15) amperes continuously at a temperature of 74 degrees C (165 degrees F).
- d. Bus Feeds. Bus feeds shall be capable of carrying fifty (50) amperes continuously at a temperature of 74 degrees C. (165 degrees F).
- e. Equipment. In addition to the items listed in 2(a), the wiring panel shall include, but not be limited to, the following:
 - 1) Ten (10) ampere fuses with barrier type fuse holders shall be installed between the load switch signal output circuits and field terminals for signal light conductors. Each terminal shall be the barrier type with sufficiently long screws to accept four (4) #12 AWG solid conductors. The terminals shall be located at least two inches (2") above the bottom of the cabinet.
 - 2) Switching Device. The signal load switching device shall be a three (3) circuit, solid state, jack mounted load switch which meets the N.E.M.A. Publication TS-1, Part 5 requirements. Each load switch shall be rated for a minimum fifteen (15) ampere continuous resistive load and shall mate with an S-2412-SB panel socket. Minimum of twelve (12) load switches to be provided with each cabinet.
 - 3) User Programmable Interface. Two (2) sets of terminal blocks shall be provided between the machine logic output and the input side of the load switches. By terminating all machine logic output on one set of terminals and all load switch input to the other set, an interface is thus created by which the machine logic can be readily connected to any of the load switches by means of a jumper wire. The two (2) sets of terminal blocks shall be conveniently located in close proximity to each other and shall be arranged such that, initially, each function will be factory wired directly from one set of terminals to the other without the need to criss-cross wires between blocks.
 - 4) Number of Signal Circuits:
 - a. Twelve (12) load bay panel. Each panel shall be equipped with twelve (12) load switch jacks (Section 2.e.2) for thirty-six (36) signal circuits.
 - b. All unused signal circuits shall be neatly tied or terminated, if tied, the harness wire shall be labeled, if terminated, each termination shall be identified.
- f. Identification. All field terminals shall be suitably identified, subject to approval.

XI. FLASHING FEATURE

- a. General. The flasher shall be a solid state device, with no contact points or moving parts, producing between 50 and 60 flashes per minute with a 40 to 50 percent duty cycle. The flasher mechanism shall be mounted on a type P-406-SB plug which will mate with an S-406-SB socket on the controller panel. The flasher shall utilize zero-point switching, with turn-on at the zero voltage point (± 5 degrees) of the power line sinusoid.
- b. Flasher Panel. A panel shall be provided with one (1) terminal wired to the flasher and marked "FL". The panel shall be equipped with terminals to provide or omit flashing of all red and yellow outputs.
- c. Flasher Circuits. Flashers shall provide two (2) output circuits to permit alternate flashing of signal phases and shall be capable of carrying a minimum of twenty (20) amperes per circuit at 120 volts. The flasher shall operate continuously so that flashing power will be available at the field terminal marked "FL". The flasher wiring shall divide the loads imposed on the two (2) circuit flasher alternately on each phase.
- d. Manual Flash. A manual flash switch shall provide flashing indication for all circuits. The flash change combination terminals shall allow the selection of flashing either yellow or red on the main and/or cross streets, or complete omission of the flashing feature if required.

XII. POLICE PANEL

- a. Auto-Off Flash Switch. Each controller shall be provided with an auto-off-flash switch. In the "AUTO" position the signals will be on and the controller timing unit will run normally. In the "OFF" position the signals will be OFF and the controller timing unit will continue to run. In the "FLASH" position the signals will flash and the controller timing unit will continue to run. The auto-off flash switch shall be located on the side of the police switch panel that faces outward when the police door is open.
- b. Auto-Hand Switch. Each controller will have an auto-hand switch on the back side of the police switch panel. This switch shall be so arranged that the switch can be physically rotated 180 degrees to provide usage after opening the police panel door. It shall be so mounted that the act of rotation does not affect the police switch panel. Switch terminals shall not be exposed on either position.
- c. Terminal Block. A two point terminal block shall be mounted on the back side of the police switch panel and the hand control circuit terminated on this block. This shall be for installation of a hand control cord by others, as required.
- d. Space Requirement. Adequate room shall be provided in the police panel section to store the manual switch and retractable cord.

XIII. MANUAL OPERATION

- a. General. The auto-hand switch shall provide a means of manually timing the signals by use of a separate, momentary contact, hand switch. Operation of the timer by manual control shall provide the same color sequence as an automatic operation with no momentary undesirable indications appearing. Manual control shall be possible with the door of the cabinet closed. The hand switch required for manual control shall only be supplied when specified in the PROPOSAL. It shall be of an approved weatherproof construction with a six (6) foot, retractable, flexible, extension cord to allow connection to the appropriate terminals on the panel of the controller. It shall not be possible to manually step through a vehicle clearance interval.

XIV. RELAYS

- a. Transfer Relays. Six (6) double pole, double throw, flash transfer relays shall be furnished with each controller. These relays shall be jack mounted into an S-408-SB, or equivalent, socket mounted on the controller panel.
- b. Contact Arm. Each contact arm shall have over travel on the front and back contacts and be independent of any other contact arms. No adjustment of contact pressure or wipe shall be necessary. Load capability shall be a minimum of fifteen (15) amperes per contact continuously and thirty (30) amperes for one (1) minute. Contacts shall be of coin or fine silver or an approved alternate.
- c. Dust Cover. A suitable dust cover shall be furnished for each relay.
- d. Relay Mounting and Endurance. All relays supplied shall meet their approved specified requirements and shall have contacts which cannot be opened by unusual vibrations, shock, or momentary voltage excursions of up to 30%. All relays other than the flash and bus relay shall be mounted on a molded base with eleven (11) or eight (8) pins for jack mounting to their respective panel or sub-base, and shall be electrically interchangeable with those presently used by the City of Chicago ("MIDTEX", Model 158-92T200).

XV. WIRING

- a. General. All electrical conductors shall be stranded copper, with a minimum of nineteen (19) strands per conductor, and a concentrically applied 90 degree C insulation with a 600 VAC rating. Wiring from the fuse block to the first distribution point, and to the controller bus, shall be No. 10 AWG. Signal circuit wire shall be No. 14 AWG. The wires shall be provided with lugs or other approved terminal fittings for attachment to binding posts. All wiring between various parts of the controller shall be neatly cabled. All wiring and terminal blocks shall be tested for possible short circuits and resistance to ground by a high voltage dielectric test at 1,200 VAC. A wiring harness of adequate length shall be provided to the timing device to allow the timer to be placed on top of the cabinet when required.
- b. All VAC connections to load switches, flasher, and flash transfer relays shall be soldered. All VAC connections on back of terminals shall be soldered.
- c. All VDC connections on back of terminals, and load switches shall be soldered. All VDC connections to load switches are to be soldered or connected in a manner pre-approved by the Engineer.

XVI. INTERCONNECT PANELS (Seven Wire, VAC)

- a. General. The interconnect panel shall serve to isolate interconnect VAC from the controller. The panel shall consist of, but not be limited to, seven (7) relays. Each relay interconnect circuit shall include an M.O.V. properly rated for protection against lightning and switching surges injurious to the controller and a barrier type 3AG fuse receptacle and fuse not to exceed five (5) amperes. Each panel shall provide a seven (7) wire interface with the T.B.C. functions described below and shall provide barrier type terminals suitably labeled for these functions.
- b. The secondary interconnect panel shall be wired in such a manner that an VAC input activates a relay sending an input from that relay to the controller. It shall have a minimum of seven (7) relays for the following functions; Dial 2, Dial 3, Dial 4, Offset 1, Offset 2, Offset 3, M.U.T.C.D. flash.
- c. The master interconnect panel shall provide a means to establish outgoing VAC for a seven (7) wire interconnect system using eight (8) relays. The relays shall be designated as, Dial 2, Dial 3, Dial 4, Sync, Offset 1, Offset 2, Offset 3, M.U.T.C.D. flash. The sync relay shall be wired in such a manner that it provides the offset pulse to the contacts of the three (3) Offset relays.
- d. Each relay shall be a double pole type, with one pole designated as field interconnect output, and the other designated as controller input. Relay coils shall be rated for continuous duty. Relay contacts shall be rated for a continuous fifteen (15) AMP resistive load.
- e. A terminal strip shall be mounted on the top of the master interconnect panel for controller interface.
- f. The master panel shall interface with the T.B.C. terminals as described above.
- g. The master panel shall have separate switches for dial selection and offsets. It shall be possible to operate the interconnect manually through these switches.
- h. Each output shall be fused as outlined above.

XVII. TESTING

- a. General. The following test requirements shall utilize, but not be limited to, the following outline:

1. N.E.M.A. Environmental Test

Any N.E.M.A. environmental test references to minimum recall shall include but not be limited to: All thirty six (36) output circuits shall be "burned in" a test prom in a sequence to simulate the normal functioning of the entire controller cabinet assembly; The conflict monitor shall have a test board with the allowable channel jumpers installed to simulate normal operation; All twenty-four (24) intervals shall be programmed with a minimum of two (2) seconds per interval. A copy of the test prom shall be approved by the Engineer prior to testing.

2. "Burn In"

The "burn in" requirement shall also include a test prom that uses all thirty six (36) output circuits in "solid" burn as well as 1 pps and 5 pps for each circuit. All twenty-four (24) intervals shall be programmed with a minimum of two (2) seconds per interval. A copy of the test prom shall be approved by the Engineer prior to testing.

3. Functional Testing

All thirty six (36) output circuits shall be "burned in" using a test prom in a sequence to simulate the normal functioning of the entire controller-cabinet assembly. The conflict monitor shall have a test board with the allowable channel jumpers installed to simulate normal operation. All twenty-four (24) intervals shall be programmed with a minimum of two (2) seconds per interval. A copy of the test prom shall be approved by the Engineer prior to testing.

- b. NEMA Environmental Test. One controller, as well as the submitted sample, out of every ten (10) from each lot shall be tested, at the manufacturer's expense, in accordance with Part 2 of NEMA Standards Publication TS1-1983. All of the tests listed shall be performed with all data properly recorded and certified.
- c. Performance Testing Requirements. In addition to the NEMA environmental test and the "burn-in" requirements stated above, satisfactory performance of the traffic signal cabinet and its equipment shall be demonstrated prior to shipment from the factory. The manufacturer shall submit five (5) copies of his proposed "Test Procedure Document" for approval with the sample requested above. The test procedure shall consist of two (2) sections; Physical inspection and functional testing. If the test procedure is judged by the Engineer or his duly authorized representative to be incomplete, inadequate or otherwise deficient, the contractor shall revise and resubmit his "test procedure document" until it is approved.
- d. Performance Testing Documentation. Upon completion of the performance testing, two (2) certified copies of the final results of the approved "Test Procedure Document" shall be included with all traffic signal controller production shipments.

Testing, Certification and Observation. Each traffic signal controller ordered shall be tested in accordance with the approved "Test Procedure Document". The Engineer or his authorized representative(s) shall observe the manufacturer's testing in progress. The Engineer shall be notified at least thirty (30) calendar days prior to testing, and no testing shall be initiated without the presence of its representative(s). The representative(s) may observe all, or a portion, of the tests, as he (they) may deem necessary. Certification documents that the traffic signal controller has been tested in accordance with the Test Procedures documents, and the results of these tests, shall be signed by the individual(s) performing the tests and their immediate engineering supervisor. Two (2) copies of each certification document shall be delivered with each production traffic signal controller.

- f. Physical Inspection. The "physical inspection" part of the test procedure document shall require the manufacturer to perform a physical inspection of workmanship and specification compliance for each traffic signal controller assembly. The inspection shall be done using a detailed check list defining items to be inspected and criteria for acceptance. The inspection shall include, but not be limited to, the following items:

- (1) Hardware installation.
- (2) Assembly mounting.
- (3) Dimensions.
- (4) Presence of specified devices and materials.
- (5) Presence of required documents.
- (6) Labeling and required serial numbers.
- (7) Wiring including routing, covering, gauge, length, and soldering of terminations.
- (8) Arrangement of equipment for safety and ease of calibration reprogramming troubleshooting and maintenance.
- (9) Condition of cabinet body and finish.
- (10) Condition and installation of doors, panels, gaskets and ventilation.
- (11) High voltage test of insulation resistance to ground, with wires installed in cabinet and equipment disconnected.

g. Functional Testing. The "functional testing" part of the Test Procedure shall require the manufacturer to perform a complete room-temperature functional test of each complete traffic signal controller assembly for a minimum of seventy-two (72) hours. This test shall be designed to concurrently check integrated hardware systems e.g., from simulated input to load switch output including conflict monitor and time base coordinator. All interface/controller interconnections shall be tested. All load switch and interconnect relay positions shall be tested, regardless of the number of load switches and interconnect relays being purchased. The functions tested shall include, but not be limited to, the following:

1. Flash logic and operation (color, phases).
2. Conflict monitor logic and operation.
3. Police panel switch operation.
4. Auxiliary panel switches (including fans).
5. Interface panel.
6. Time switch operation.
7. Load switches (with a continuous ten (10) ampere load on each signal circuit).
8. Outputs.
9. Power interruptions of less than 500 ms
10. Power interruptions of more than 1.0 sec.

SPECIFICATION 1474
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
MARCH 15, 1995

**CABLE: MULTIPLE-CONDUCTOR VARIOUS SIZE SOLID AND STRANDED COPPER WIRE
600 VOLT ETHYLENE-PROPYLENE RUBBER INSULATION, HYPALON OR NEOPRENE
JACKET**

SUBJECT

1. This specification states the requirements for a multiple conductor cable to be installed in underground conduits and used to distribute electrical energy to operate automatic traffic control equipment at street intersections within the City of Chicago.

GENERAL

2. a. SPECIFICATIONS. The cable shall conform in detail to the requirements hereinstated, and to the Specifications and Method, of Test of the American Society for Testing and Materials, cited by ASTM Designation Number, in which the most recently published revision shall govern.

- b. ACCEPTANCE. Cable not conforming to this specification will not be accepted.

- c. REELS. The cable shall be shipped on non-returnable reels. No charge shall be made for wood lagging.

- d. WARRANTY. The manufacturer shall warrant the cable to be first class material throughout. In addition to any other claim. against them, if the cable be installed within six months of date of shipment, the manufacturer shall replace any cable failing during normal and proper use within two years of date of installation. All replacements under this warranty shall be made free of charge F.O.B. delivery point of the original contract. Lengths of cable having been replaced shall become the property of and shall be returned to the manufacturer F.O.B. City of Chicago.

CABLES

- 3.(a) CONSTRUCTION. The cable shall consist of coated conductors each concentrically encased with a "free-stripping", ethylene propylene, insulation. In two-conductor cables, the insulated and covered conductors shall be parallel and not twisted, with suitable filler, as necessary, to produce a flat core of minimum practicable dimensions. In the larger count cables suitable fillers shall be used to produce an essentially round cross-section. A Mylar tape shall be wrapped over the conductor assembly, and a neoprene or hypalon jacket applied overall.

- 3.(b) OUTER DIAMETER. The maximum allowable outer diameter for round cables shall be as follows:

No. of Conductors	Outer Diameter (inches)
Seven	0.65
Ten	0.80
Fourteen	0.85
Nineteen	0.95
Twenty Two	1.10

- (c) SEALING. Both ends of each length of cable shall be thoroughly sealed to prevent the entrance of moisture and other foreign matter.

COLOR CODE

4. Conductor identification shall be provided by color synthetic-resin covering, or an approved equal. Table A sets forth the color code for the various conductor arrangements.

CONDUCTOR

5. (a) MATERIAL. Round, soft or annealed, copper wire.
- (b) SIZE. Cables shall be made up of conductor sizes as set forth in Table A above. The Number 6 AWG conductors shall be seven (7) strand, and the Number 10 AVG conductors shall be solid.
6. (a) TYPE. The insulation shall be an ethylene propylene compound seating the physical and electrical requirements herein specified when tested in accordance with ASTM D-4704-81.
- (b) THICKNESS. The insulation shall be circular in cross-section and have the following minimum thicknesses:

<u>BASE COLOR</u>	<u>FIRST TRACER</u>	<u>SECOND TRACER</u>	<u>TWO CONDUCTOR NO. 6 AWG.</u>	<u>TWO CONDUCTOR NO. 4 AWG.</u>	<u>SEVEN CONDUCTOR</u>	<u>TEN CONDUCTOR</u>	<u>FOURTEEN CONDUCTOR</u>	<u>NINETEEN CONDUCTOR</u>	<u>TWENTY TWO CONDUCTOR</u>
White	Black	Red	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	12	12
White	Red	Green	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	12.	12.
Black	- -	- -	6	4	12	12	12	12	12
White	- -	- -	6	4	12.	12.	12.	12.	12.
Red	- -	- -	. . . . .	. . . . .	12	12	12	12	12
Green	- -	- -	. . . . .		12.	12.	12.	12.	12.
Orange	- -	- -	. . . . .	. . . . .	12	12	12	12	12
Blue	- -	- -	. . . . .	. . . . .	12.	12.	. . . . .	12	12
White	Black	- -	. . . . .	. . . . .	12	. . . . .	. . . . .	. . . . .	12.
Red	Black	- -	. . . . .	. . . . .	. . . . .	12	12	12	12
Green	Black	- -	. . . . .	. . . . .	. . . . .	12	12	12.	12.
Orange	Black	- -	. . . . .	. . . . .	. . . . .	12.	12	12	12
Blue	Black	- -	. . . . .	. . . . .	. . . . .	12	. . . . .	. . . . .	. . . . .
Black	White	- -	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	12
Red	White	- -	. . . . .	. . . . .	. . . . .	. . . . .	12	12	12
Green	White	- -	. . . . .	. . . . .	. . . . .	. . . . .	12	12	12.
Blue	White	- -	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	12.	12
Orange	White	- -	. . . . .	. . . . .	. . . . .	. . . . .	12	12	12.
White	Red	- -	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	12
Blue	Orange	- -	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	12	12.
Red	Blue	- -	. . . . .	. . . . .	. . . . .	. . . . .	12	12	12
Green	Blue	- -	. . . . .	. . . . .	. . . . .	. . . . .	12	12.	12
Orange	Blue	- -	. . . . .	. . . . .	. . . . .	. . . . .	12	12	12

Table A - COLOR CODE CONDUCTOR IDENTIFICATION

NOTE: Number in column indicates AWG size of conductor

Conductor Size, AWG	Stranding (No. Of Wires)	No. of Conductors	Insulation Thickness (mils)
#4	7	2	45
#6	7	2	45
#10	1	2	25
#12	1	7	25
#12	1	10	25
#12	1	14	25
#12	1	19	25
#12	1	22	25

6. (c) PHYSICAL PROPERTIES. Initial Value.

Tensile Strength.	1200 psi minimum
Elongation at Rupture	250% minimum

(b) PHYSICAL PROPERTIES. After Aging.

(1) After 168 hours in air oven at 121 degrees C:

Tensile Strength	75% of initial value
Elongation	75% of initial value

(c) ACCELERATED WATER ABSORPTION CHARACTERISTICS. Test shall made in accordance with methods discussed in ASTM D470.

Gravimetric Method. The insulation shall not absorb more than five (5) milligrams of water per square inch of exposed surface area after immersion in distilled water at 70 degrees C for a period of seven (7) days.

- (d) Cold-Bend Test Requirements. The completed cable shall pass the "Cold-Bend, Long-Time Voltage Test on Short Specimens" of ASTM D-470 except that the test temperature shall be minus (-) 25° C.

ELECTRICAL REQUIREMENTS

- (1) Voltage Test. The completed cable shall meet an A.C. and D.C. voltage test in accordance with ASTM D-470 and D-2655.
- (2) Insulation Resistance. The completed cable shall have an insulation resistance constant of not less than 20,000 when tested in accordance with methods shown in ASTM D-470.

CABLE TAPE

The assembled and cabled conductor core shall be wrapped with a one mil (0.001 inch) thick Mylar tape allowing a minimum of ten percent (10%) overlap.

JACKET

- 8.(a) MATERIAL. The jacket shall be heavy-duty neoprene or hypalon (chlorosulfonated polyethylene) meeting the physical and electrical requirements specified herein.
- (b) WORKMANSHIP. The jacket shall have a smooth exterior surface free from holes, cracks and splits, and shall be tough, elastic, homogeneous in composition, and properly vulcanized.
- (c) THICKNESS. Average thickness of the jacket shall be not less than that given below. Minimum thickness shall be not less than ninety percent (90%) of the average thickness.

(1) Two-Conductor No.	4 AWG	5/64	inch
(2) Two-Conductor No.	6 AWG	5/64	inch
(3) Two-Conductor No.	10 AWG	4/64	inch
(4) Seven-Conductor		3/64	inch
(5) Ten-Conductor		4/64	inch
(6) Fourteen-Conductor		4/64	inch
(7) Nineteen-Conductor		4/64	Inch
(8) Twenty-Two Conductor		5/64	inch

- (d) INITIAL PHYSICAL REQUIREMENTS:

(1) Tensile strength minimum PSI	1800
(2) Elongation at rupture, minimum percent	300

- (e) AIR OVEN EXPOSURE TEST. After conditioning in an air oven at 121⁰

+1° C for 168 hours:

- | | |
|--|----|
| (1) Tensile strength minimum percent of unaged value | 75 |
| (2) Elongation at rupture, minimum percent of unaged value | 65 |

(f) MECHANICAL WATER ABSORPTION. After 168 hours at 70° + 1° C:

- | | |
|---|----|
| (1) Milligrams per square inch, maximum | 20 |
|---|----|

(g) CABLE MARKING. Outer jacket shall be embossed or printed with the manufacturer's name, year of manufacture, insulation and jacket materials, conductor number, conductor size, at approximately 18" intervals. On the side opposite, the cable shall be sequentially marked in one (1) foot increments.

TESTING

9.(a) GENERAL. Tests shall be performed on insulation, jacket and completed cables in accordance with applicable standards as listed in these specifications. Where standards are at variance with each other or with other portions of this specification, the most stringent requirements, as determined by an engineer from the Bureau of Electricity, shall apply. All tests shall be conducted on cable produced for this order. Where cable insulation and/or jacket thickness preclude obtaining samples of sufficient size for testing, special arrangements shall be made with the engineer to obtain samples of unprocessed materials directly from the extrusion feed bins which will be separately processed and prepared for tests.

(b) NUMBER OF TESTS. Insulation and jacket tests shall be conducted on samples taken every 25,000 feet or fraction thereof of each conductor size. In no case shall samples be taken closer than 15,000 feet apart.

(c) WITNESS TESTS. Where the quantity of cable on a single purchase order is 250,000 feet or more, all insulation and jacket tests shall be witnessed by an engineer from the Bureau of Electricity. In addition to these tests, the engineer shall also witness tests on completed cables for approximately five percent (5%) of the cable. Included in these tests will be a 70,000 BTU per hour flame test in accordance with IEEE 383. Reels to be tested will be selected at random by the engineer.

(d) TEST REPORTS. No cable may be shipped until certified copies of all factory tests, including witness tests where applicable, have been reviewed and approved by the engineer.

(e) ACCEPTANCE. Where the cable fails to conform to any of the tests specified herein, the following shall apply:

- (1) INSULATION OR JACKET TESTS. Samples shall be taken from each reel and shall successfully conform to all tests specified herein. Reels from which samples fail to conform, will be rejected.

- (2) COMPLETED CABEL (REEL) TESTS. Any reel which fails to conform to testing will be rejected. Where a reel fails during witness testing, the Engineer will select five (5) additional reels to witness test.
- (3) Where five percent (5) or more of the reels are rejected for any reason, the entire cable order will be rejected.

PACKAGING

- 10.(a) REELS. The completed cable shall be delivered on sound substantial, non-returnable reels. Both ends of each length of cable shall be properly sealed against the entrance of moisture and other foreign matter by the use of clamp-on cable caps, such as the Reliable Electric Company neoprene cable cap No. 1405, or equal. The ends shall be securely fastened so as not to become loose in transit. Before shipment, complete 2 x 4 lagging shall be applied to all reels.
- 8.
- (b) FOOTAGE. Each reel shall contain the length of cable as set forth below. A tolerance limit of plus or minus five percent (+ 5%) shall be adhered to.
- | | |
|----------------------|-----------|
| Two-Conductor | 2000 feet |
| Seven-Conductor | 2000 feet |
| Ten-Conductor | 2000 feet |
| Fourteen-Conductor | 2000 feet |
| Nineteen-Conductor | 1000 feet |
| Twenty-two Conductor | 1000 feet |
- (c) MARKING. A metal tag shall be securely attached to each reel indicating the reel number, contract number, date of shipment, gross and tare weights, the appropriate City Commodity Code Number as set forth below, and a description of the cable. Also, each reel shall have permanent marking on it indicating directions for unrolling the cable and the footage of cable contained in the reel. Indelible ink or other such material susceptible to washing off or fading will not be permitted; an approved permanent marking material such as paint or a securely attached metal tag is required.
- (d) COMMODITY CODE NUMBER.
- | | |
|------------------------------|--------------|
| (1) Two-Conductor No. 4 AWG | 31-4686-5826 |
| (2) Two-Conductor No. 6 AWG | 31-4686-5808 |
| (3) Two Conductor No. 10 AWG | 31-4686-5510 |
| (4) Seven-Conductor | 31-4682-5620 |
| (5) Ten-Conductor | 31-4882-5630 |
| (6) Fourteen-Conductor | 31-4882-5640 |
| (7) Nineteen-Conductor | 31-4882-5645 |
| (8) Twenty-two-Conductor | 31-4882-5650 |

Underpass Luminaire (BDE)

Effective: November 1, 1998

Revise the first sentence of Article 1085.35(d)(2)a of the Standard Specifications to read:

"The housing, ballast door, and lens frame shall be made of 0.076 mm (0.0299 inches) (22 gauge) minimum thickness stainless steel or heavy duty (NEMA) die cast aluminum".

SITE SPECIFIC SPECIAL PROVISIONS

BRIDGE APPROACH PAVEMENT (SPECIAL) BRIDGE APPROACH PAVEMENT CONNECTOR (PCC) SPECIAL

This work shall consist of a pavement composed of portland cement concrete with reinforcement, constructed on a prepared subgrade and/or subbase. This work shall be according the contract plans and Section 420 of the Standard Specifications.

This work will be paid for at the contract unit price per square meter for BRIDGE APPROACH PAVEMENT (SPECIAL) and BRIDGE APPROACH PAVEMENT CONNECTOR (PCC) SPECIAL.

APPROACH SLAB REMOVAL

This work shall consist of the removal of the existing bridge approach pavements. This work shall be performed in accordance with the applicable portions of Sections 440 and 501 of the Standard Specifications.

This work will be measured for payment in square meters of the area measured and removed of the existing approach slabs.

This work will be paid for at the contract unit price per square meter for APPROACH SLAB REMOVAL.

VIDEO TAPING STORM SEWERS

Description: This work shall require a video taped inspection of the existing storm sewers prior to any proposed or existing storm sewer construction or improvements within the project limits shown on the plans or at locations designated by the City of Chicago Department of Sewers or as directed by the Engineer. The video taping inspection of the storm sewer system will be required prior to the issuance of the sewer permit and in accordance to the requirements by the City of Chicago Department of Water Management.

A second video taped inspection of the storm sewer system shall be required post construction of all new drainage structures and all new storm sewers or the reconstruction and/or adjustments to the existing storm sewer structures within the project limits shown on the plans or as directed by the Engineer. The video taping inspection of the storm sewer system will be in accordance to the requirements by the City of Chicago Department of Water Management.

Method of Measurement: This work will be measured per meter measured along the centerline of the sewers as shown on the plans or as directed by the Engineer.

Basis of Payment: This work will be paid for at the contract unit price per meter for VIDEO TAPING STORM SEWERS, which shall include all material, labor and equipment necessary to video tape the storm sewers system in accordance with the requirements of the City of Chicago Department of Water Management and/or as directed by the Engineer.

FRAME AND LIDS, TYPE 1, OPEN LID (CITY OF CHICAGO)

Description: This work shall include the materials, equipment, labor and installation of Frame and Lids, Type 1, Open Lid that conform to the City of Chicago Requirements, applicable portions of Section 604 of the Standard Specifications and/or as directed by the Engineer.

Method of Measurement: This work will be measured per each Frame and Lid, Type 1, Open Lid (City of Chicago) installed.

Basis of Payment: The work will be paid for at the contract unit price per each for FRAME AND LIDS, TYPE 1, OPEN LID (CITY OF CHICAGO), which shall include all material, labor and equipment necessary to install the frame and lids in accordance with the requirements of the City of Chicago and/or as directed by the Engineer.

PORTABLE CHANGEABLE MESSAGE SIGNS

This work consists of furnishing, placing, and maintaining changeable message sign(s) according to the Standard Specifications and the following:

All signs must be in place and operational at closure points and at locations as determined by the Engineer a minimum of two (2) weeks prior to the closure date to inform motorists of the upcoming closure, and removed once the road is closed. Each sign shall state the day work will begin and delays are possible. The exact message will be approved by the Engineer. The Contractor may be required to relocate each sign multiple times during the contract at his or her expense. The exact location of the placement of these signs shall be determined in the field by the Engineer.

The furnishing, placing, and maintaining of portable changeable message sign(s) shall be paid for per calendar month as CHANGEABLE MESSAGE SIGN.

TEMPORARY SIDEWALK

This work consists of furnishing and placing temporary sidewalks according to Sections 406 and/or 424 of the Standard Specifications.

The temporary sidewalks shall be either HMA SURFACE COURSE, MIX "C", N50 (IL 9.5 mm), 100mm or PORTLAND CEMENT CONCRETE SIDEWALK, 100mm, at the discretion of the Engineer.

This work will be measured for payment in square meters of the area measured and placed for TEMPORARY SIDEWALK.

This work will be paid for at the contract unit price per square meter for TEMPORARY SIDEWALK.

REMOVAL OF ASBESTOS CEMENT CONDUIT

Description. This work shall consist furnishing all equipment, materials, tools, labor and incidentals necessary for the removal and disposal of friable asbestos cement conduits owned by the City of Chicago. The conduits shall be demolished including conduit supports and hangers. All work shall be done in accordance with the requirements of the U.S. Environmental Protection Agency (USEPA), the Illinois Environmental Protection Agency (IEPA), the Occupational Safety and Health Administration (OSHA), and the Special Provision for "Removal and Disposal of Friable Asbestos", as outlined herein. Sketches indicating the location of Asbestos Containing Material (ACM) are included in the drawings.

The work involved in the removal and disposal of friable asbestos if done prior to demolition, shall be performed by a qualified Contractor or Sub-Contractor. The Contractor shall provide a shipping manifest to the Engineer for the disposal of all ACM wastes.

The Contractor shall coordinate with ComEd for adjustment of their ducts by others and with the City of Chicago for replacement of their ducts under this contract.

Permits. The Contractor shall apply for permit(s) in compliance with applicable regulations of the Illinois Environmental Protection Agency. Any and all other permits required by other federal, state, or local agencies for carrying on the work will be the responsibility of the Contractor. Copies of these permits must be sent to the district office and the Engineer.

Notifications. The "Demolition/Renovation Notice" form, which can be obtained from the IEPA office, shall be completed and submitted to the agencies listed below at least 10 days prior to commencement of any asbestos removal or demolition activity. Separate notices must be sent for the asbestos removal work.

- A. Asbestos Demolition/Renovation Coordinator
Illinois Environmental Protection Agency
Division of Air Pollution Control
P.O. Box 19276
Springfield, Illinois 62794-9276

- B. U.S. Environmental Protection Agency
Air Compliance Branch
77 W. Jackson Blvd.
Chicago, Illinois 60604
Attention: Asbestos Coordinator

Notices must be updated if there is a change in the starting date or the amount of asbestos changes by more than 20 percent.

Submittals.

B. Submittals that shall be made prior to start of work:

1. Submittals required under Asbestos Abatement Experience.
2. Submit documentation indicating that all employees have had medical examinations and instruction on the hazards of asbestos exposure, on use and fitting of respirators, on protective dress, on use of showers, on entry and exit from work areas, and on all aspects of work procedures and protective measures as specified in Worker Protection Procedures.
3. Submit manufacturer's certification stating that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to ANSI 29.2.
4. Submit to the Engineer the brand name, manufacturer, and specification of all sealants or surfactants to be used. Testing under existing conditions will be required at the direction of the Engineer.
5. Submit proof that all required permits, site locations, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials, supplies, and the like have been obtained (i.e., a letter of authorization to utilize designated landfill).
6. Submit a list of penalties, including liquidated damages, incurred through noncompliance with asbestos abatement project specifications.
7. Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination units, the sequencing of work, the respiratory protection plan to be used during this work, a site safety plan, a disposal plan including the location of an approved disposal site, and a detailed description of the methods to be used to control pollution. The plan must be submitted to the Engineer prior to the start of work.
8. Submit proof of written notification and compliance with Paragraph "Notifications."

C. Submittals that shall be made upon completion of abatement work:

1. Submit copies of all waste chain-of-custodies, trip tickets, and disposal receipts for all asbestos waste materials removed from the work area;
2. Submit daily copies of work site entry logbooks with information on worker and visitor access.
3. Submit logs documenting filter changes on respirators, HEPA vacuums, negative pressure ventilation units, and other engineering controls; and

Certificate of Insurance.

- A. The Contractor shall document general liability insurance for personal injury, occupational disease and sickness or death, and property damage.
- B. The Contractor shall document current Workmen's Compensation Insurance coverage.
- C. The Contractor shall supply insurance certificates as specified by the Department.

Asbestos Abatement Experience.

A. Company Experience:

1. Prior to start of work, the Contractor shall supply:

- a. Evidence that he/she has been qualified with the State of Illinois and he/she has been included on the Illinois Department of Public Health's list of approved Contractors.

B. Personnel Experience:

1. For Superintendent, the Contractor shall supply:

- a. Evidence of knowledge of applicable regulations in safety and Environmental protection is required as well as training in asbestos abatement as evidenced by the successful completion of a training course in supervision of asbestos abatement as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion must be provided to the Engineer prior to the start of work.
- b. Documentation of experience with abatement work in a supervisory position as evidenced through supervising at least two asbestos abatement projects; provide names, contact, phone number, and locations of two projects in which the individual(s) has worked in a supervisory capacity.

2. For Workers Involved in the Removal of Friable and Nonfriable Asbestos the Contractor shall provide:

- a. Training as evidenced by the participation and successful completion of an accredited training course for asbestos abatement workers as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion must be provided to all employees who will be working on this project.

Abatement Air Monitoring. The Contractor shall comply with the following:

A. Personal Monitoring:

1. All personal monitoring shall be conducted per specifications listed in OSHA regulation, Title 29. Code of Federal Regulation 1926.58. All area sampling shall be conducted in accordance with 40 CFR Part 763.90. All air monitoring equipment shall be calibrated and maintained in proper operating condition. Excursion limits will be monitored daily. Personal monitoring is the responsibility of the contractor. Additional personal samples may be required by the Engineer at any time during the project.

B. Contained Work Areas for Removal of Friable Asbestos

1. Area samples shall be collected for the department within the work area daily. A minimum of one sample shall be taken outside of the abatement area removal operations. The Engineer will also have the option to require additional personal samples and/or clearance samples during this type of work.

C. Air Monitoring Professional

1. All air sampling will be conducted by a qualified Air Sampling Professional supplied by the contractor. The Air Sampling Professional must submit documentation of successful completion of the National Institute for Occupational Safety and Health (NIOSH) course #582 - "Sampling and Evaluating Airborne Asbestos Dust".
2. Air sampling will be conducted in accordance with NIOSH Method 7400. The results of these tests will be provided to the Engineer within 24 hours of the collection of air samples.

Method of Measurement. The removal of asbestos cement conduit will be measured for payment per linear meter.

Basis of Payment. This work will be paid for at the contract unit price per meter for REMOVAL OF ASBESTOS CEMENT CONDUIT, as shown, which price shall include furnishing all labor, materials, equipment and services required to remove and dispose of the friable asbestos cement conduits, hangers and conduit supports.

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 TREE TRUNK PROTECTION, TEMPORARY FENCE, TREE ROOT PRUNING, and TREE PRUNING.

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

1. Whenever proposed excavation falls within a drip-line of a tree, the Contractor shall:
 - a. Root prune 6-inches behind and parallel to the proposed edge of trench a neat, clean vertical cut to a minimum depth directed by the Engineer through all affected tree roots.

- b. Root prune to a maximum width of 4-inches using a "Vermeer" wheel, or other similar machine. Trenching machines will not be permitted.
 - c. Exercise care not to cut any existing utilities.
 - d. If during construction it becomes necessary to expose tree roots which have not been 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.
2. Whenever curb and gutter is removed for replacement, or excavation for removal of or construction of a structure is within the drip line/root zone of a tree, the Contractor shall:
 - a. Root prune 6-inches behind the curbing so as to neatly cut the tree roots.
 - b. Depth of cut shall be 12 inches for curb removal and replacement and 24 inches for structural work. Any roots encountered at a greater depth shall be neatly saw cut at no additional cost.
 - c. Locations where earth saw cutting of tree roots is required will be marked in the field by the Engineer.
 3. All root pruning work is to be performed through the services of a licensed arborist to be approved by the Engineer.

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

B. Temporary Fence:

1. The Contractor shall erect a temporary fence around all trees 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.

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 included 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 ensue, 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.

STRUCTURAL STEEL REMOVAL

This work shall consist of the removal of the existing steel diaphragms and connection hardware. This work shall be performed in accordance with the applicable portions of Section 501 of the Standard Specifications.

This work will be measured for payment in kilograms of structural steel that is removed.

This work will be paid for at the contract unit price per kilogram for STRUCTURAL STEEL REMOVAL.

BRIDGE FENCE RAILING

Add the following paragraph to Article 509.03 of the Standard Specifications:

"The Contractor shall coordinate the final bridge fence railing post spacing with the Engineer to ensure proper openings for the light poles and re-installation of the existing bridge mounted signs prior to construction and fabrication of the bridge fence railing. Any modifications required to provide the necessary openings shall be included in the cost for the Pay Item for BRIDGE FENCE RAILING."

PROTECTIVE SHIELD

Add the following paragraphs to Article 501.03 of the Standard Specifications:

"The Contractor shall make any necessary adjustments and shall maintain the protective shield system throughout the duration of the contract. This work shall be included in the Pay Item for PROTECTIVE SHIELD."

"The existing protective shield system currently installed shall be dismantled, protected, stored and delivered to the Department, as instructed by the Engineer. This work shall be included in the Pay Item for PROTECTIVE SHIELD."

"The existing protective shield system currently installed may be reused. However, if the existing protective shield system is reused, it must meet the requirements of Article 501.03 of the Standard Specifications. Additional members may be needed to satisfy these requirements. This work shall be included in the Pay Item for PROTECTIVE SHEILD."

PAVEMENT GROOVING

This work shall consist of providing a Type A Final Finish on the concrete pavement located at the northeast corner of Ashland and 115th Street as shown on the plans. This work shall be performed in accordance with applicable portions of Article 420.09 of the Standard Specifications.

This work will be measured for payment in square meters of grooved pavement.

This work will be paid for at the contract unit price per square meter for PAVEMENT GROOVING.

DETECTABLE WARNINGS

Effective: December 1, 2008

Description. Work under this item shall consist of installing tactile/detectable warning surface system on ADA curb ramps. This work shall be done in coordination with PORTLAND CEMENT CONCRETE SIDEWALK, COMBINATION CONCRETE CURB AND GUTTER, CONCRETE CURB TYPE B, BRIDGE APPROACH PAVEMENT CONNECTOR (PCC) SPECIAL AND BRIDGE APPROACH PAVEMENT (SPECIAL) as shown on the plans or as directed by the Engineer. Work under this item shall be performed according to the latest Chicago Department of Transportation ADA Standard details.

General Requirements. The detectable warning system shall be provided by a Manufacturer approved by the Chicago Department of Transportation.

Submittals.

- The Manufacturer shall provide the Engineer with two (2) samples (minimum 8" square) of the tile type proposed for use.
- The Manufacturer shall provide the Engineer with maintenance procedures of the tactile detectable warning systems.
- The detectable warning system shall come with a Manufacturer's five year warranty. The warranty period shall begin upon final acceptance of the project.
- The Manufacturer shall provide the Engineer with the specifications stating the required materials, equipment and installation procedures.

Construction Requirements. The materials, equipment, and installation procedures used shall be according to the Manufacturer's specifications.

Material Acceptance. The Contractor must provide a Manufacturer's written certification that the material complies with these specifications.

Method of Measurement. Detectable warning tiles will be measured for payment in place and the area computed in square meters.

Basis of Payment. This work will be paid at the contract unit price per square meter for DETECTABLE WARNINGS.

√	<u>File Name</u>	<u>Title</u>	<u>Effective</u>	<u>Revised</u>
	GBSP04	Polymer Modified Portland Cement Mortar	June 7, 1994	June 1, 2007
	GBSP11	Permanent Steel Sheet Piling	Dec 15, 1993	Jan 1, 2007
	GBSP12	Drainage System	June 10, 1994	Jan 1, 2007
	GBSP13	High-Load Multi-Rotational Bearings	Oct 13, 1988	Jan 1, 2007
√	GBSP14	Jack and Remove Existing Bearings	April 20, 1994	Jan 1, 2007
	GBSP15	Three Sided Precast Concrete Structure	July 12, 1994	June 1, 2007
	GBSP16	Jacking Existing Superstructure	Jan 11, 1993	Jan 1, 2007
	GBSP17	Bonded Preformed Joint Seal	July 12, 1994	Jan 1, 2007
	GBSP18	Modular Expansion Joint	May 19, 1994	Jan 1, 2007
√	GBSP21	Cleaning and Painting Contact Surface Areas of Existing Steel Structures	June 30, 2003	Jan 1, 2007
	GBSP22	Cleaning and Painting New Metal Structures	Sept 13, 1994	Jan 1, 2007
	GBSP25	Cleaning and Painting Existing Steel Structures	Oct 2, 2001	July 9, 2008
	GBSP26	Containment and Disposal of Lead Paint Cleaning Residues	Oct 2, 2001	July 9, 2008
	GBSP28	Deck Slab Repair	May 15, 1995	July 9, 2008
	GBSP29	Bridge Deck Microsilica Concrete Overlay	May 15, 1995	June 1, 2007
	GBSP30	Bridge Deck Latex Concrete Overlay	May 15, 1995	June 1, 2007
	GBSP31	Bridge Deck High-Reactivity Metakaolin (HRM) Conc Overlay	Jan 21, 2000	June 1, 2007
√	GBSP32	Temporary Sheet Piling	Sept 2, 1994	Jan 1, 2007
	GBSP33	Pedestrian Truss Superstructure	Jan 13, 1998	Jan 1, 2007
	GBSP34	Concrete Wearing Surface	June 23, 1994	Jan 15, 2008
	GBSP35	Silicone Bridge Joint Sealer	Aug 1, 1995	Jan 1, 2007
	GBSP36	Surface Preparation and Painting Req. for Weathering Steel	Nov 21, 1997	Feb 2, 2007
	GBSP37	Underwater Structure Excavation Protection	April 1, 1995	Jan 1, 2007
	GBSP38	Mechanically Stabilized Earth Retaining Walls	Feb 3, 1999	Jan 15, 2008
	GBSP42	Drilled Soldier Pile Retaining Wall	Sept 20, 2001	Feb 2, 2007
	GBSP43	Driven Soldier Pile Retaining Wall	Nov 13, 2002	Feb 2, 2007
	GBSP44	Temporary Soil Retention system	Dec 30, 2002	Jan 1, 2007
	GBSP45	Bridge Deck Thin Polymer Overlay	May 7, 1997	Jan 1, 2007
	GBSP46	Geotextile Retaining walls	Sept 19, 2003	June 1, 2007
	GBSP47	High Performance Concrete Structures	Aug 5, 2002	Jan 1, 2007
	GBSP50	Removal of Existing Non-composite Bridge Decks	June 21, 2004	Jan 1, 2007
	GBSP51	Pipe Underdrain for Structures	May 17, 2000	Jan 1, 2007
√	GBSP52	Porous Granular Embankment (Special)	Sept 28, 2005	Jan 1, 2007
√	GBSP53	Structural Repair of Concrete	Mar 15, 2006	April 2, 2008
	GBSP55	Erection of Curved Steel Structures	June 1, 2007	
	GBSP56	Setting Piles in Rock	Nov 14, 1996	Jan 1, 2007
	GBSP57	Temporary Mechanically Stabilized Earth Retaining Walls	Jan 6, 2003	April 2, 2008
	GBSP58	Mechanical Splice	Sept 21, 1995	Jan 1, 2007
	GBSP59	Diamond Grinding and Surface Testing Bridge Sections	Dec 6, 2004	July 9, 2008

	GBSP60	Containment and Disposal of Non-Lead Paint Cleaning Residues	Nov 25, 2004	July 9, 2008
	GBSP61	Slipform Parapet	June 1, 2007	
	GBSP62	Concrete Deck Beams	June 13, 2008	July 9, 2008
	GBSP63	Demolition Plans for Removal of Existing Structures	Sept 5, 2007	
	GBSP64	Segmental Concrete Block Wall	Jan 7, 1999	July 9, 2008

BDE SPECIAL PROVISIONS
 For the January 16 and March 6, 2009 Lettings

The following special provisions indicated by an "x" are applicable to this contract and will be included by the Project Development and Implementation Section of the BD&E. An * indicates a new or revised special provision for the letting.

File Name	#		Special Provision Title	Effective	Revised
80099	1		Accessible Pedestrian Signals (APS)	April 1, 2003	Jan. 1, 2007
* 80186	2	X	Alkali-Silica Reaction for Cast-in-Place Concrete	Aug. 1, 2007	Jan. 1, 2009
* 80213	3		Alkali-Silica Reaction for Precast and Precast Prestressed Concrete	Jan. 1, 2009	
80207	4		Approval of Proposed Borrow Areas, Use Areas, and/or Waste Areas Inside Illinois State Borders	Nov. 1, 2008	
80192	5		Automated Flagger Assistance Device	Jan. 1, 2008	
80173	6	X	Bituminous Materials Cost Adjustments	Nov. 2, 2006	Jan. 2, 2007
50261	7		Building Removal-Case I (Non-Friable and Friable Asbestos)	Sept. 1, 1990	Jan. 1, 2007
50481	8		Building Removal-Case II (Non-Friable Asbestos)	Sept. 1, 1990	Jan. 1, 2007
50491	9		Building Removal-Case III (Friable Asbestos)	Sept. 1, 1990	Jan. 1, 2007
50531	10		Building Removal-Case IV (No Asbestos)	Sept. 1, 1990	Jan. 1, 2007
80166	11	X	Cement	Jan. 1, 2007	Nov. 1, 2007
80198	12		Completion Date (via calendar days)	April 1, 2008	
80199	13		Completion Date (via calendar days) Plus Working Days	April 1, 2008	
80193	14		Concrete Barrier	Jan. 1, 2008	
* 80214	15		Concrete Gutter, Type A	Jan. 1, 2009	
* 80215	16		Concrete Joint Sealer	Jan. 1, 2009	
80177	17		Digital Terrain Modeling for Earthwork Calculations	April 1, 2007	
80029	18	X	Disadvantaged Business Enterprise Participation	Sept. 1, 2000	Nov. 1, 2008
80178	19	X	Dowel Bars	April 1, 2007	Jan. 1, 2008
80179	20	X	Engineer's Field Office Type A	April 1, 2007	Aug. 1, 2008
80205	21		Engineer's Field Office Type B	Aug. 1, 2008	
80175	22	X	Epoxy Pavement Markings	Jan. 1, 2007	
80189	23	X	Equipment Rental Rates	Aug. 2, 2007	Jan. 2, 2008
80169	24		High Tension Cable Median Barrier	Jan. 1, 2007	
80194	25		HMA – Hauling on Partially Completed Full-Depth Pavement	Jan. 1, 2008	
80181	26	X	Hot-Mix Asphalt – Field Voids in the Mineral Aggregate	April 1, 2007	April 1, 2008
80201	27		Hot-Mix Asphalt – Plant Test Frequency	April 1, 2008	
80202	28		Hot-Mix Asphalt – Transportation	April 1, 2008	
80136	29		Hot-Mix Asphalt Mixture IL-4.75	Nov. 1, 2004	Jan. 1, 2008
80195	30		Hot-Mix Asphalt Mixture IL-9.5L	Jan. 1, 2008	
80109	31		Impact Attenuators	Nov. 1, 2003	Nov. 1, 2008
80110	32	X	Impact Attenuators, Temporary	Nov. 1, 2003	Jan. 1, 2007
* 80196	33		Mast Arm Assembly and Pole	Jan. 1, 2008	Jan. 1, 2009
* 80045	34		Material Transfer Device	June 15, 1999	Jan. 1, 2009
80203	35		Metal Hardware Cast into Concrete (NOTE: This special provision was previously named "Steel Inserts and Brackets Cast into Concrete".)	April 1, 2008	Nov. 1, 2008
80165	36		Moisture Cured Urethane Paint System	Nov. 1, 2006	Jan. 1, 2007
80082	37	X	Multilane Pavement Patching	Nov. 1, 2002	
80180	38		National Pollutant Discharge Elimination System / Erosion and Sediment Control Deficiency Deduction (NOTE: This special provision was previously named "Erosion and Sediment Control Deficiency Deduction".)	April 1, 2007	Nov. 1, 2008
80208	39		Nighttime Work Zone Lighting	Nov. 1, 2008	
80129	40		Notched Wedge Longitudinal Joint	July 1, 2004	Jan. 1, 2007
80182	41	X	Notification of Reduced Width	April 1, 2007	
80069	42	X	Organic Zinc-Rich Paint System	Nov. 1, 2001	Jan. 1, 2008
* 80216	43		Partial Exit Ramp Closure for Freeway/Expressway	Jan. 1, 2009	
80022	44	X	Payments to Subcontractors	June 1, 2000	Jan. 1, 2006
80209	45		Personal Protective Equipment	Nov. 1, 2008	

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	80134	46		Plastic Blockouts for Guardrail		Nov. 1, 2004	Jan. 1, 2007
*	80119	47	X	Polyurea Pavement Marking		April 1, 2004	Jan. 1, 2009
	80210	48		Portland Cement Concrete Inlay or Overlay		Nov. 1, 2008	
	80170	49	X	Portland Cement Concrete Plants		Jan. 1, 2007	
*	80217	50		Post Clips for Extruded Aluminum Signs		Jan. 1, 2009	
	80171	51	X	Precast Handling Holes		Jan. 1, 2007	
*	80218	52		Preventive Maintenance – Bituminous Surface Treatment		Jan. 1, 2009	
*	80219	53		Preventive Maintenance – Cape Seal		Jan. 1, 2009	
*	80220	54		Preventive Maintenance – Micro-Surfacing		Jan. 1, 2009	
*	80221	55		Preventive Maintenance – Slurry Seal		Jan. 1, 2009	
	80211	56		Prismatic Curb Reflectors		Nov. 1, 2008	
	80015	57		Public Convenience and Safety		Jan. 1, 2000	
	34261	58	X	Railroad Protective Liability Insurance		Dec. 1, 1986	Jan. 1, 2006
	80157	59		Railroad Protective Liability Insurance (5 and 10)		Jan. 1, 2006	
*	80223	60		Ramp Closure for Freeway/Expressway		Jan. 1, 2009	
	80172	61	X	Reclaimed Asphalt Pavement (RAP)		Jan. 1, 2007	Aug. 1, 2007
	80183	62	X	Reflective Sheeting on Channelizing Devices		April 1, 2007	Nov. 1, 2008
	80151	63	X	Reinforcement Bars		Nov. 1, 2005	Jan. 2, 2008
	80206	64		Reinforcement Bars – Storage and Protection		Aug. 1, 2008	
*	80224	65		Restoring Bridge Approach Pavements Using High-Density Foam		Jan. 1, 2009	
	80184	66		Retroreflective Sheeting, Nonreflective Sheeting, and Translucent Overlay Film for Highway Signs		April 1, 2007	
*	80131	67	X	Seeding		July 1, 2004	Jan. 1, 2009
*	80152	68	X	Self-Consolidating Concrete for Cast-In-Place Construction		Nov. 1, 2005	Jan. 1, 2009
	80132	69	X	Self-Consolidating Concrete for Precast Products		July 1, 2004	Jan. 1, 2007
	80212	70		Sign Panels and Sign Panel Overlays		Nov. 1, 2008	
	80197	71	X	Silt Filter Fence		Jan. 1, 2008	
	80127	72	X	Steel Cost Adjustment		April 2, 2004	April 1, 2007
	80153	73		Steel Plate Beam Guardrail		Nov. 1, 2005	Aug. 1, 2007
	80191	74	X	Stone Gradation Testing		Nov. 1, 2007	
	80143	75	X	Subcontractor Mobilization Payments		April 2, 2005	
	80075	76		Surface Testing of Pavements		April 1, 2002	Jan. 1, 2007
	80087	77	X	Temporary Erosion Control		Nov. 1, 2002	Jan. 1, 2008
*	80225	78		Temporary Raised Pavement Marker		Jan. 1, 2009	
	80176	79	X	Thermoplastic Pavement Markings		Jan. 1, 2007	
	20338	80	X	Training Special Provisions		Oct. 15, 1975	
	80185	81		Type ZZ Retroreflective Sheeting, Nonreflective Sheeting, and Translucent Overlay Film for Highway Signs		April 1, 2007	
	80149	82		Variable Spaced Tining		Aug. 1, 2005	Jan. 1, 2007
	80071	83	X	Working Days		Jan. 1, 2002	
	80204	84		Woven Wire Fence		April 1, 2008	

The following special provisions are in the 2009 Supplemental Specifications and Recurring Special Provisions:

<u>File Name</u>	<u>Special Provision Title</u>	<u>New Location</u>	<u>Effective</u>	<u>Revised</u>
80108	Asbestos Bearing Pad Removal	Check Sheet #32	Nov. 1, 2003	
72541	Asbestos Waterproofing Membrane and Asbestos Hot-Mix Asphalt Surface Removal	Check Sheet #33	June 1, 1989	Jan. 2, 2007
80167	Electrical Service Installation – Traffic Signals	Section 805	Jan. 1, 2007	
80164	Removal and Disposal of Regulated Substances	Section 669	Aug. 1, 2006	Jan. 1, 2007
80161	Traffic Signal Grounding	Sections 873 and 1076	April 1, 2006	Jan. 1, 2007
80162	Uninterruptable Power Supply (UPS)	Sections 801, 862 and 1074	April 1, 2006	Jan. 1, 2007
80163	Water Blaster with Vacuum Recovery	Articles 783.02 and 1101.12	April 1, 2006	Jan. 1, 2007

The following special provisions require additional information from the designer. The additional information needs to be included in a separate document attached to this check sheet. The Project Development and Implementation section will then include the information in the applicable special provision. The Special Provisions are:

- Building Removal-Case I
- Building Removal-Case II
- Building Removal-Case III
- Building Removal-Case IV
- Completion Date
- Completion Date Plus Working Days
- DBE Participation
- Material Transfer Device
- Railroad Protective Liability Insurance
- Training Special Provisions
- Working Days

STRUCTURAL STEEL REMOVAL

Effective: October 3, 1997

Revised: March 5, 2001

Description. This work shall consist of the satisfactory removal and disposal of structural steel members as shown on the plans. This work shall be performed according to Section 501 of the Standard Specifications.

Burning of existing rivets or bolts will only be allowed near steel surfaces which are to be removed and discarded. Burning of existing rivets or bolts will not be allowed for members to remain in place and members that are to be removed and reinstalled at a later date. When burning of rivets or bolts is not allowed the head of the rivet or bolt shall be sheared off and the shank driven or drilled out. Extreme care shall be taken while removing the rivets or bolts so as not to damage the existing structural steel which is to remain. Unless noted otherwise on the plans, the cost of rivet or bolt removal shall be included in this item of work. All damage to existing members, which are to remain, shall be repaired or the member replaced to the satisfaction of the Engineer. Repair or replacement of damaged members shall be at the Contractor's expense and at no additional cost to the State.

Method of Measurement. Structural steel removal will not be measured for payment. Payment will be based upon the kilograms (pounds) of structural steel removal shown on the plans.

Basis of Payment. This work will be paid for at the contract unit price per kilogram (pound) for STRUCTURAL STEEL REMOVAL.

AMERICAN RECOVERY AND REINVESTMENT ACT SIGNING (BDE)

Effective: April 1, 2009

Description. This work shall consist of furnishing, fabricating and installing sign panels, complete with sign faces, legend, and supplemental panels according to Section 720 of the Standard Specifications and as specified herein.

Materials. The "Putting America to Work" sign shall be fabricated using Type AP fluorescent orange sheeting for the background material with black vinyl or black opaque ink legend, symbol and borders. The "American Recovery and Reinvestment Act" sign shall be fabricated using Type AP green sheeting for the background with Type AP white sheeting for the legend and border. A green translucent overlay film may also be used over white Type AP sheeting to fabricate the "American Recovery and Reinvestment Act" sign.

Sign Layout. See following attachment.

General. The signs shall be erected to applicable portions of Article 701.14 of the Standard Specifications. These signs shall be erected midway between the first and second warning signs as required by the traffic control plan and standards utilized for this project. If the second warning sign is defining a moving or intermittent operation, the sign may be maintained at a distance of 500 ft (150 m) beyond the first post mounted ROAD CONSTRUCTION AHEAD sign. The signs shall remain in place for the duration of the project. Upon completion of the project, the signs and posts shall be removed and shall remain the property of the Contractor.

Basis of Payment. This work will not be paid for separately but shall be included in the cost of Traffic Control items as shown on the plans.

Attachment

**PROJECT FUNDING SOURCE SIGN ASSEMBLY
AMERICAN RECOVERY AND REINVESTMENT ACT
SIGN LAYOUT DETAILS**



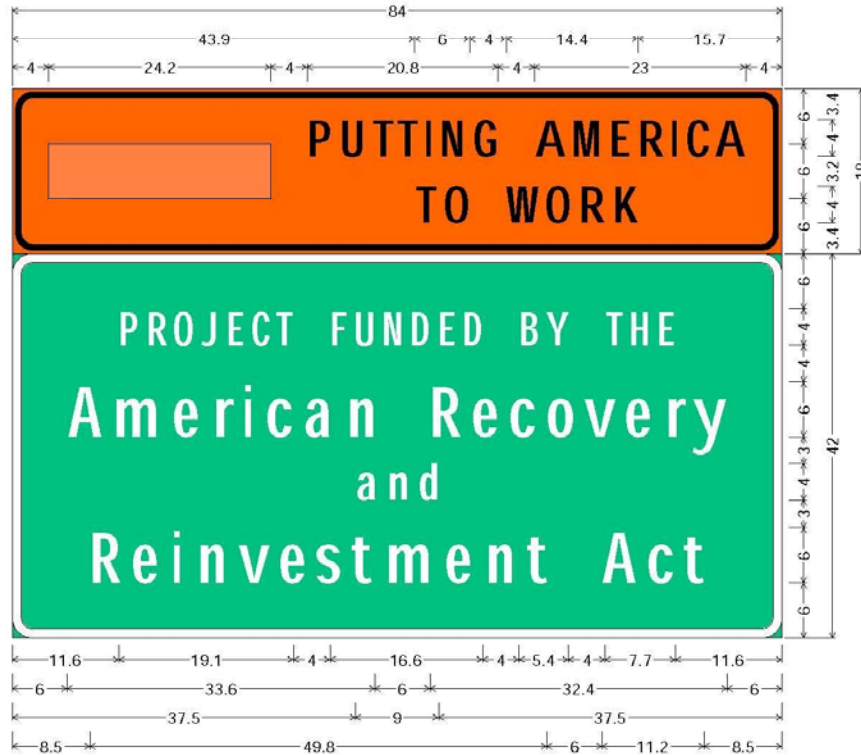
PROJECT FUNDING SOURCE
SIGN ASSEMBLY

(Note: Outline of small rectangle on plaque shall be removed.)

PROJECT FUNDING SOURCE SIGN ASSEMBLY AMERICAN RECOVERY AND REINVESTMENT ACT SIGN LAYOUT DETAILS



W21-1A MIN;
 18.0" across sides 1.5" Radius, 0.6" Border, 0.4" Indent, Black on Orange;



2.3" Radius, 0.6" Border, 0.4" Indent, Black on Orange;
 Rectangle White; "PUTTING AMERICA" D; "TO WORK" D;
 2.3" Radius, 1.0" Border, White on Green;
 "PROJECT FUNDED BY THE" C; "American Recovery" C; "and" D; "Reinvestment Act" C;

PROJECT FUNDING SOURCE SIGN ASSEMBLY

(Note: Outline of small rectangle on plaque shall be removed.)

ALKALI-SILICA REACTION FOR CAST-IN-PLACE CONCRETE (BDE)

Effective: August 1, 2007

Revised: January 1, 2009

Description. This special provision is intended to reduce the risk of a deleterious alkali-silica reaction in concrete exposed to humid or wet conditions. The special provision is not intended or adequate for concrete exposed to potassium acetate, potassium formate, sodium acetate or sodium formate. The special provision shall not apply to the dry environment (humidity less than 60 percent) found inside buildings for residential or commercial occupancy. The special provision shall also not apply to precast products or precast prestressed products.

Aggregate Expansion Values. Each coarse and 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 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 0.05 percent will be assigned to limestone or dolomite coarse aggregates and 0.03 percent to limestone or dolomite fine aggregates (manufactured stone sand); however the Department reserves the right to perform the ASTM C 1260 test.

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		
	$\leq 0.16\%$	$> 0.16\% - 0.27\%$	$> 0.27\%$
	$\leq 0.16\%$	Group I	Group II	Group III
$> 0.16\% - 0.27\%$	Group II	Group II	Group III
$> 0.27\%$	Group III	Group III	Group IV

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.

- Group I - Mixture options are not applicable. Use any cement or finely divided mineral.
- Group II - Mixture options 1, 2, 3, 4, or 5 shall be used.
- Group III - Mixture options 1, 2 and 3 combined, 4, or 5 shall be used.
- Group IV - Mixture options 1, 2 and 4 combined, or 5 shall be used.

For Class PP-3 concrete the mixture options are not applicable, and any cement may be used with the specified finely divided minerals.

- 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.

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. The replacement ratio is defined as “finely divided mineral:portland cement”.

1) Class F Fly Ash. For Class PV, BS, MS, DS, SC, and SI concrete and cement aggregate mixture II (CAM II), Class F fly ash shall replace 15 percent of the portland cement at a minimum replacement ratio of 1.5:1.

2) Class C Fly Ash. For Class PV, MS, SC, and SI Concrete, Class C fly ash with 18 percent to less than 26.5 percent calcium oxide content, and less than 2.0 percent loss on ignition, shall replace 20 percent of the portland cement at a minimum replacement ratio of 1:1; or at a minimum replacement ratio of 1.25:1 if the loss on ignition is 2.0 percent or greater. Class C fly ash with less than 18 percent calcium oxide content shall replace 20 percent of the portland cement at a minimum replacement ratio of 1.25:1.

For Class PP-1, RR, BS, and DS concrete and CAM II, Class C fly ash with less than 26.5 percent calcium oxide content shall replace 15 percent of the portland cement at a minimum replacement ratio of 1.5:1.

3) Ground Granulated Blast-Furnace Slag. For Class PV, BS, MS, SI, DS, and SC concrete, ground granulated blast-furnace slag shall replace 25 percent of the portland cement at a minimum replacement ratio of 1:1.

For Class PP-1 and RR concrete, ground granulated blast-furnace slag shall replace 15 percent of the portland cement at a minimum replacement ratio of 1.5:1.

For Class PP-2, ground granulated blast-furnace slag shall replace 25 to 30 percent of the portland cement at a minimum replacement ratio of 1:1.

4) Microsilica or High Reactivity Metakaolin. Microsilica solids or high reactivity metakaolin shall be added to the mixture at a minimum 25 lb/cu yd (15 kg/cu m) or 27 lb/cu yd (16 kg/cu m) respectively.

- 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, any finely divided mineral may be used with a portland cement.
- 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, any finely divided mineral may be used with a portland cement.
- 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 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.

Testing. If an individual aggregate has an ASTM C 1260 expansion value > 0.16 percent, an ASTM C 1293 test may be performed by the Contractor to evaluate the Department's ASTM C 1260 test result. The ASTM C 1293 test shall be performed with Type I or II 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 or wick of absorbent material, 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.

The Engineer reserves the right to verify a Contractor's ASTM C 1293 or 1567 test result. The Engineer will not accept the result if the precision and bias for the test methods are not met.

The laboratory performing the ASTM C 1567 test shall either be accredited by the AASHTO Materials Reference Laboratory (AMRL) for ASTM C 227 under Portland Cement Concrete or Aggregate; or shall be inspected for Hydraulic Cement - Physical Tests by the Cement and Concrete Reference Laboratory (CCRL) and shall be approved by the Department. The laboratory performing the ASTM C 1293 test shall be inspected for Portland Cement Concrete by CCRL and shall be approved by the Department.

APPROVAL OF PROPOSED BORROW AREAS, USE AREAS, AND/OR WASTE AREAS INSIDE ILLINOIS STATE BORDERS (BDE)

Effective: November 1, 2008

Revise the title of Article 107.22 of the Standard Specifications to read:

“107.22 Approval of Proposed Borrow Areas, Use Areas, and/or Waste Areas Inside Illinois State Borders.”

Add the following sentence to the end of the first paragraph of Article 107.22 of the Standard Specifications:

“Proposed borrow areas, use areas, and/or waste areas outside of Illinois shall comply with Article 107.01.”

CEMENT (BDE)

Effective: January 1, 2007

Revised: April 1, 2009

Revise Section 1001 of the Standard Specifications to read:

“SECTION 1001. CEMENT

1001.01 Cement Types. Cement shall be according to the following.

- (a) Portland Cement. Acceptance of portland cement shall be according to the current Bureau of Materials and Physical Research’s Policy Memorandum, “Portland or Blended Cement Acceptance Procedure for Qualified and Non-Qualified Plants”.

Portland cement shall be according to ASTM C 150, and shall meet the standard physical and chemical requirements. Type I or Type II may be used for cast-in-place, precast, and precast prestressed concrete. Type III may be used according to Article 1020.04, or when approved by the Engineer. All other cements referenced in ASTM C 150 may be used when approved by the Engineer.

The total of all organic processing additions shall be a maximum of 1.0 percent by weight (mass) of the cement. The total of all inorganic processing additions shall be a maximum of 4.0 percent by weight (mass) of the cement. However, a cement kiln dust inorganic processing addition shall be limited to a maximum of 1.0 percent. Organic processing additions shall be limited to grinding aids that improve the flowability of cement, reduce pack set, and improve grinding efficiency. Inorganic processing additions shall be limited to granulated blast-furnace slag according to the chemical requirements of AASHTO M 302, Class C fly ash according to the chemical requirements of AASHTO M 295, and cement kiln dust.

- (b) Portland-Pozzolan Cement. Acceptance of portland-pozzolan cement shall be according to the current Bureau of Materials and Physical Research’s Policy Memorandum, “Portland or Blended Cement Acceptance Procedure for Qualified and Non-Qualified Plants”.

Portland-pozzolan cement shall be according to ASTM C 595 and shall meet the standard physical and chemical requirements. Type IP may be used for cast-in-place, precast, and precast prestressed concrete, except when Class PP concrete is used. The pozzolan constituent for Type IP shall be a maximum of 21 percent of the weight (mass) of the portland-pozzolan cement.

For cast-in-place construction, portland-pozzolan cement shall not be used in concrete mixtures when the air temperature is below 40 °F (4 °C) without permission of the Engineer. If permission is given, the mix design strength requirement may require the Contractor to increase the cement or eliminate the cement factor reduction for a water-reducing or high range water-reducing admixture which is permitted according to Article 1020.05(b).

The total of all organic processing additions shall be a maximum of 1.0 percent by weight (mass) of the cement. Organic processing additions shall be limited to grinding aids as defined in (a) above. Inorganic processing additions shall be limited to cement kiln dust at a maximum of 1.0 percent.

- (c) Portland Blast-Furnace Slag Cement. Acceptance of portland blast-furnace slag cement shall be according to the current Bureau of Materials and Physical Research's Policy Memorandum, "Portland or Blended Cement Acceptance Procedure for Qualified and Non-Qualified Plants".

Portland blast-furnace slag cement shall be according to ASTM C 595 and shall meet the standard physical and chemical requirements. Type IS portland blast-furnace slag cement may be used for cast-in-place, precast, and precast prestressed concrete, except when Class PP concrete is used. The blast-furnace slag constituent for Type IS shall be a maximum of 25 percent of the weight (mass) of the portland blast-furnace slag cement.

For cast-in-place construction, portland blast-furnace slag cement shall not be used in concrete mixtures when the air temperature is below 40 °F (4 °C) without permission of the Engineer. If permission is given, the mix design strength requirement may require the Contractor to increase the cement or eliminate the cement factor reduction for a water-reducing or high range water-reducing admixture which is permitted according to Article 1020.05(b).

The total of all organic processing additions shall be a maximum of 1.0 percent by weight (mass) of the cement. Organic processing additions shall be limited to grinding aids as defined in (a) above. Inorganic processing additions shall be limited to cement kiln dust at a maximum of 1.0 percent.

- (d) Rapid Hardening Cement. Rapid hardening cement shall be used according to Article 1020.04 or when approved by the Engineer. The cement shall be on the Department's current "Approved List of Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repairs", and shall be according to the following.

- (1) The cement shall have a maximum final set of 25 minutes, according to Illinois Modified ASTM C 191.
 - (2) The cement shall have a minimum compressive strength of 2000 psi (13,800 kPa) at 3.0 hours, 3200 psi (22,100 kPa) at 6.0 hours, and 4000 psi (27,600 kPa) at 24.0 hours, according to Illinois Modified ASTM C 109.
 - (3) The cement shall have a maximum drying shrinkage of 0.050 percent at seven days, according to Illinois Modified ASTM C 596.
 - (4) The cement shall have a maximum expansion of 0.020 percent at 14 days, according to Illinois Modified ASTM C 1038.
 - (5) The cement shall have a minimum 80 percent relative dynamic modulus of elasticity; and shall not have a weight (mass) gain in excess of 0.15 percent or a weight (mass) loss in excess of 1.0 percent, after 100 cycles, according to AASHTO T 161, Procedure B.
- (e) Calcium Aluminate Cement. Calcium aluminate cement shall be used only where specified by the Engineer. The cement shall meet the standard physical requirements for Type I cement according to ASTM C 150, except the time of setting shall not apply. The chemical requirements shall be determined according to ASTM C 114 and shall be as follows: minimum 38 percent aluminum oxide (Al_2O_3), maximum 42 percent calcium oxide (CaO), maximum 1 percent magnesium oxide (MgO), maximum 0.4 percent sulfur trioxide (SO_3), maximum 1 percent loss on ignition, and maximum 3.5 percent insoluble residue.

1001.02 Uniformity of Color. Cement contained in single loads or in shipments of several loads to the same project shall not have visible differences in color.

1001.03 Mixing Brands and Types. Different brands or different types of cement from the same manufacturing plant, or the same brand or type from different plants shall not be mixed or used alternately in the same item of construction unless approved by the Engineer.

1001.04 Storage. Cement shall be stored and protected against damage, such as dampness which may cause partial set or hardened lumps. Different brands or different types of cement from the same manufacturing plant, or the same brand or type from different plants shall be kept separate.”

CONCRETE ADMIXTURES (BDE)

Effective: January 1, 2003

Revised: April 1, 2009

Replace the first paragraph of Article 1020.05(b) of the Standard Specifications to read:

“(b) Admixtures. The use of admixtures to increase the workability or to accelerate the hardening of the concrete will be permitted when approved by the Engineer. Admixture dosages shall result in the mixture meeting the specified plastic and hardened properties. The Department will maintain an Approved List of Corrosion Inhibitors. Corrosion inhibitor dosage rates shall be according to Article 1020.05(b)(12). The Department will also maintain an Approved List of Concrete Admixtures, and an admixture technical representative shall be consulted when determining an admixture dosage from this list. 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(s) 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 overlayer 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.”

Revise Section 1021 of the Standard Specifications to read:

“SECTION 1021. CONCRETE ADMIXTURES

1021.01 General. Admixtures shall be furnished in liquid form ready for use. The admixtures shall be delivered in the manufacturer's original containers, bulk tank trucks or such containers or tanks as are acceptable to the Engineer. Delivery shall be accompanied by a ticket which clearly identifies the manufacturer and trade name of the material. Containers shall be readily identifiable as to manufacturer and trade name of the material they contain.

Corrosion inhibitors will be maintained on the Department's Approved List of Corrosion Inhibitors. All other concrete admixture products will be maintained on the Department's Approved List of Concrete Admixtures. For the admixture submittal, a report prepared by an independent laboratory accredited by the AASHTO Materials Reference Laboratory (AMRL) for Portland Cement Concrete shall be provided. The report shall show the results of physical tests conducted no more than five years prior to the time of submittal, according to applicable specifications. However, for corrosion inhibitors the ASTM G 109 test information specified in ASTM C 1582 is not required to be from an independent lab. All other information in ASTM C 1582 shall be from an independent lab.

Tests shall be conducted using materials and methods specified on a "test" concrete and a "reference" concrete, together with a certification that no changes have been made in the formulation of the material since the performance of the tests. Per the manufacturer's option, the cement content for all required tests shall either be according to applicable specifications or 5.65 cwt/cu yd (335 kg/cu m). Compressive strength test results for six months and one year will not be required.

Prior to the approval of an admixture, the Engineer reserves the right to request a sample for testing. The test and reference concrete mixtures tested by the Engineer will contain a cement content of 5.65 cwt/cu yd (335 kg/cu m). For freeze-thaw testing, the Department will perform the test according to AASHTO T 161, Procedure B. The flexural strength test will be performed according to AASHTO T 177. If the Engineer decides to test the admixture, the manufacturer shall submit AASHTO T 197 water content and set time test results on the standard cement used by the Department. The test and reference concrete mixture shall contain a cement content of 5.65 cwt/cu yd (335 kg/cu m). The manufacturer may select their lab or an independent lab to perform this testing. The laboratory is not required to be accredited by AASHTO.

The manufacturer shall include in the submittal the following admixture information: the manufacturing range for specific gravity, the midpoint and manufacturing range for residue by oven drying, and the manufacturing range for pH. The submittal shall also include an infrared spectrophotometer trace no more than five years old.

For air-entraining admixtures according to Article 1021.02, the specific gravity allowable manufacturing range shall be established by the manufacturer and the test method shall be according to ASTM C 494. For residue by oven drying and pH, the allowable manufacturing range and test methods shall be according to ASTM C 260.

For admixtures according to Articles 1021.03, 1021.04, 1021.05, 1021.06, and 1021.07, the pH allowable manufacturing range shall be established by the manufacturer and the test method shall be according to ASTM E 70. For specific gravity and residue by oven drying, the allowable manufacturing range and test methods shall be according to ASTM C 494.

When test results are more than seven years old, the manufacturer shall re-submit the infrared spectrophotometer trace and the report prepared by an independent laboratory accredited by AASHTO.

All admixtures, except chloride-based accelerators, shall contain a maximum of 0.3 percent chloride by weight (mass).

Random field samples may be taken by the Department to verify an admixture meets specification. A split sample will be provided to the manufacturer if requested. Admixtures that do not meet specification requirements or an allowable manufacturing range established by the manufacturer shall be replaced with new material.

1021.02 Air-Entraining Admixtures. Air-entraining admixtures shall be according to AASHTO M 154.

1021.03 Retarding and Water-Reducing Admixtures. The admixture shall be according to the following.

- (a) The retarding admixture shall be according to AASHTO M 194, Type B (retarding) or Type D (water-reducing and retarding).
- (b) The water-reducing admixture shall be according to AASHTO M 194, Type A.
- (c) The high range water-reducing admixture shall be according to AASHTO M 194, Type F (high range water-reducing) or Type G (high range water-reducing and retarding).

1021.04 Accelerating Admixtures. The admixture shall be according to AASHTO M 194, Type C (accelerating) or Type E (water reducing and accelerating).

1021.05 Self-Consolidating Admixtures. The self-consolidating admixture system shall consist of either a high range water-reducing admixture only or a high range water-reducing admixture combined with a separate viscosity modifying admixture. The one or two component admixture system shall be capable of producing a concrete mixture that can flow around reinforcement and consolidate under its own weight without additional effort and without segregation.

The high range water-reducing admixture shall be according to AASHTO M 194, Type F.

The viscosity modifying admixture shall be according to ASTM C 494, Type S (specific performance).

1021.06 Rheology-Controlling Admixture. The rheology-controlling admixture shall be capable of producing a concrete mixture with a lower yield stress that will consolidate easier for slipform applications used by the Contractor. The rheology-controlling admixture shall be according to ASTM C 494, Type S (specific performance).

1021.07 Corrosion Inhibitor. The corrosion inhibitor shall be according to one of the following.

- (a) Calcium Nitrite. The corrosion inhibitor shall contain a minimum 30 percent calcium nitrite by weight (mass) of solution, and shall comply with the requirements of AASHTO M 194, Type C (accelerating).
- (b) Other Materials. The corrosion inhibitor shall be according to ASTM C 1582.”

CONSTRUCTION AIR QUALITY – DIESEL VEHICLE EMISSIONS CONTROL (BDE)

Effective: April 1, 2009

Diesel Vehicle Emissions Control. The reduction of construction air emissions shall be accomplished by using cleaner burning diesel fuel. The term “equipment” refers to any and all diesel fuel powered devices rated at 50 hp and above, to be used on the project site in excess of seven calendar days over the course of the construction period on the project site (including any “rental” equipment).

All equipment on the jobsite, with engine ratings of 50 hp and above, shall be required to: use Ultra Low Sulfur Diesel fuel (ULSD) exclusively (15 ppm sulfur content or less).

In addition, all construction motor vehicles (both on-road and off-road, gasoline or diesel fuel powered) shall comply with all pertinent State and Federal regulations relative to exhaust emission controls and safety, including opacity. Frequently Asked Questions (FAQ's) regarding Illinois Environmental Protection Agency (IEPA) emissions testing for gasoline powered vehicles can be accessed at (<http://www.epa.state.il.us/air/vim/faqs.html>) . Regulations regarding diesel powered vehicles over 16,000 lb (7260 kg), and the Diesel Emission Inspection Program (Title 92: Transportation Part 460, Diesel Emission Inspection Program, Subpart A: General) can be accessed at (<http://www.ilga.gov/commission/jcar/admincode/092/09200460sections.html>). Diesel powered vehicles less than 16,000 lb (7260 kg) are exempt from testing by the Department. All diesel powered equipment used on the project site shall be subject to reasonable, random spot checks for compliance with the required emissions controls and proper diesel fuel usage. The Secretary of State, Illinois State Police and other law enforcement officers will enforce Part 460. For additional information concerning Illinois diesel emission inspection requirements, please call the Illinois Department of Transportation, Diesel Emission Inspections Unit, at 217-557-6081.

Diesel powered equipment in non-compliance will not be allowed to be used on the project site, and is also subject to a notice of non-compliance as outlined below.

The Contractor shall submit copies of monthly summary reports and include certified copies of the ULSD diesel fuel delivery slips for diesel fuel delivered to the jobsite for the reporting time period, noting the quantity of diesel fuel used with each piece of diesel powered equipment. The addition or deletion of any diesel powered equipment shall be included in the summary and noted on the monthly report.

If any diesel powered equipment is found to be in non-compliance with any portion of this specification, the Engineer will issue the Contractor a notice of non-compliance and identify an appropriate period of time, as outlined below under environmental deficiency deduction, in which to bring the equipment into compliance or remove it from the project site.

Any costs associated with bringing any diesel powered equipment into compliance with these diesel vehicle emissions controls 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 also not be grounds for a claim.

Environmental Deficiency Deduction. When the Engineer is notified, or determines that an environmental control deficiency exists, he/she will notify the Contractor in writing, and direct the Contractor to correct the deficiency within a specified time period. The specified time-period, which begins upon Contractor notification, will be from 1/2 hour to 24 hours long, based on the urgency of the situation and the nature of the deficiency. The Engineer shall be the sole judge regarding the time period.

The deficiency will be based on lack of repair, maintenance and diesel vehicle emissions control.

If the Contractor fails to correct the deficiency within the specified time frame, 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.

If a Contractor or subcontractor accumulates three environmental deficiency deductions 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 contract time, waiver of penalties, or be grounds for any claim.

CONSTRUCTION AIR QUALITY - IDLING RESTRICTIONS (BDE)

Effective: April 1, 2009

Idling Restrictions. The Contractor shall establish truck-staging areas for all diesel powered vehicles that are waiting to load or unload material at the jobsite. Staging areas shall be located where the diesel emissions from the equipment will have a minimum impact on adjacent sensitive receptors. The Department will review the selection of staging areas, whether within or outside the existing highway right-of-way, to avoid locations near sensitive areas or populations to the extent possible. Sensitive receptors include, but are not limited to, hospitals, schools, residences, motels, hotels, daycare facilities, elderly housing and convalescent facilities. Diesel powered engines shall also be located as far away as possible from fresh air intakes, air conditioners, and windows. The Engineer will approve staging areas before implementation.

Diesel powered vehicle operators may not cause or allow the motor vehicle, when it is not in motion, to idle for more than a total of 10 minutes within any 60 minute period, except under any of the following circumstances:

- 1) The motor vehicle has a gross vehicle weight rating of less than 8000 lb (3630 kg).
- 2) The motor vehicle idles while forced to remain motionless because of on-highway traffic, an official traffic control device or signal, or at the direction of a law enforcement official.
- 3) The motor vehicle idles when operating defrosters, heaters, air conditioners, or other equipment solely to prevent a safety or health emergency.
- 4) A police, fire, ambulance, public safety, other emergency or law enforcement motor vehicle, or any motor vehicle used in an emergency capacity, idles while in an emergency or training mode and not for the convenience of the vehicle operator.
- 5) The primary propulsion engine idles for maintenance, servicing, repairing, or diagnostic purposes if idling is necessary for such activity.
- 6) A motor vehicle idles as part of a government inspection to verify that all equipment is in good working order, provided idling is required as part of the inspection.
- 7) When idling of the motor vehicle is required to operate auxiliary equipment to accomplish the intended use of the vehicle (such as loading, unloading, mixing, or processing cargo; controlling cargo temperature; construction operations, lumbering operations; oil or gas well servicing; or farming operations), provided that this exemption does not apply when the vehicle is idling solely for cabin comfort or to operate non-essential equipment such as air conditioning, heating, microwave ovens, or televisions.
- 8) When the motor vehicle idles due to mechanical difficulties over which the operator has no control.
- 9) The outdoor temperature is less than 32 °F (0 °C) or greater than 80 °F (26 °C).

When the outdoor temperature is greater than or equal to 32 °F (0 °C) or less than or equal to 80 °F (26 °C), a person who operates a motor vehicle operating on diesel fuel shall not cause or allow the motor vehicle to idle for a period greater than 30 minutes in any 60 minute period while waiting to weigh, load, or unload cargo or freight, unless the vehicle is in a line of vehicles that regularly and periodically moves forward.

The above requirements do not prohibit the operation of an auxiliary power unit or generator set as an alternative to idling the main engine of a motor vehicle operating on diesel fuel.

Environmental Deficiency Deduction. When the Engineer is notified, or determines that an environmental control deficiency exists based on non-compliance with the idling restrictions, he/she will notify the Contractor, and direct the Contractor to correct the deficiency.

If the Contractor fails to correct the deficiency a monetary deduction will be imposed. The monetary deduction will be \$1,000.00 for each deficiency identified.

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (DBE)

Effective: September 1, 2000

Revised: November 1, 2008

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 or most recent addendum.

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. This 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 10.00 % 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 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 forth in this Special Provision:

- (a) The bidder documents that firmly committed 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 may 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 web site at www.dot.il.gov.

BIDDING PROCEDURES. Compliance with the bidding procedures of this Special Provision is required prior to the award of the contract and the failure of the as-read low bidder to comply will render the bid not responsive.

- (a) In order to assure the timely award of the contract, the as-read low bidder shall submit a Disadvantaged Business Utilization Plan on Department form SBE 2026 within seven working days after the date of letting. To meet the seven day requirement, the bidder may send the Plan by certified mail or delivery service within the seven working day period. If a question arises concerning the mailing date of a Plan, the mailing date will be established by the U.S. Postal Service postmark on the original certified mail receipt from the U.S. Postal Service or the receipt issued by a delivery service. It is the responsibility of the bidder to ensure that the postmark or receipt date is affixed within the seven working days if the bidder intends to rely upon mailing or delivery to satisfy the submission day requirement.

The Plan is to be submitted 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). It is the responsibility of the bidder to obtain confirmation of telefax delivery. The Department will not accept a Utilization Plan if it does not meet the seven day submittal requirement and the bid will be declared not responsive.

In the event the bid is declared not responsive due to a failure to submit a Plan or failure to comply with the bidding procedures set forth herein, the Department may elect to cause the forfeiture of the penal sum of the bidder's proposal guaranty, and may deny authorization to bid the project if re-advertised for bids. The Department reserves the right to invite any other bidder to submit a Utilization Plan at any time for award consideration or to extend the time for award.

- (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. The signatures on these forms must be original signatures. All elements of information indicated on the said form shall be provided, including but not limited to the following:
 - (1) The name and address of each DBE to be used;
 - (2) A description, including pay item numbers, of the commercially useful work to be done by each DBE;
 - (3) The price to be paid to each DBE for the identified work specifically stating 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) A commitment statement signed by the bidder and each DBE evidencing availability and intent to perform commercially useful work on the project; and
 - (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).

- (d) The contract will not be awarded until the Utilization Plan submitted by the bidder is approved. The Utilization Plan will be approved by the Department if the Plan commits sufficient commercially useful DBE work performance to meet the contract goal. The Utilization Plan will not be approved by the Department if the Plan does not commit sufficient DBE performance to meet the contract goal unless the bidder documents that it made a good faith effort to meet the goal. The good faith procedures of Section VIII of this special provision apply. If the Utilization Plan is not approved because it is deficient in a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no less than a five working day period in order to cure the deficiency.

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 full value of all such DBE trucks operated using DBE employed drivers. Goal credit will be limited to the value of the reasonable fee or commission received by the DBE if trucks are leased from a non-DBE company.
- (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.

GOOD FAITH EFFORT PROCEDURES. If the bidder cannot obtain sufficient DBE commitments to meet the contract goal, the bidder must document in the Utilization Plan the good faith efforts made in the attempt 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 could reasonably be expected to obtain sufficient DBE participation. The Department will consider the quality, quantity, and intensity of the kinds of efforts that the bidder has made. Mere *pro forma* efforts are not good faith efforts; rather, the bidder is expected to have taken those 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 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 a good faith effort has not been made, the Department will notify the bidder of that preliminary determination by contacting the responsible company official designated in the Utilization Plan. The preliminary determination shall include a statement of reasons why good faith efforts have not been found, and may include additional good faith efforts that the bidder could take.

The notification will designate a five working day period during which the bidder shall take additional efforts. The bidder is not limited by a statement of additional efforts, but may take other action beyond any stated additional efforts in order to obtain additional DBE commitments. The bidder shall submit an amended Utilization Plan if additional DBE commitments to meet the contract goal are secured. If additional DBE commitments sufficient to meet the contract goal are not secured, the bidder shall report the final good faith efforts made in the time allotted. All additional efforts taken by the bidder will be considered as part of the bidder's good faith efforts. If the bidder is not able to meet the goal after taking additional efforts, the Department will make a pre-final determination of the good faith efforts of the bidder and will notify the designated responsible company official of the reasons for an adverse determination.

- (c) The bidder may request administrative reconsideration of a pre-final determination adverse to the bidder within the five working days after 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 pre-final determination shall become final if a request is not made and delivered. A request may provide additional written documentation and/or argument concerning the issue of whether an adequate good faith effort was made to meet the contract goal. In addition, the request shall be considered a consent by the bidder to extend the time for award. 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 whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

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 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.

(a) 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) All work indicated for performance by an approved DBE shall be performed, managed, and supervised by the DBE executing the Participation Statement. The Contractor shall not terminate for convenience a DBE listed in the Utilization Plan and then perform the work of the terminated DBE with its own forces, those of an affiliate or those of another subcontractor, whether DBE or not, without first obtaining the written consent of the Bureau of Small Business Enterprises to amend the Utilization Plan. If a DBE listed in the Utilization Plan is terminated for reasons other than convenience, or fails to complete its work on the contract for any reason, the Contractor shall make good faith efforts to find another DBE to substitute for the terminated DBE.

The good faith efforts shall be directed at finding another DBE to perform at least the same amount of work under the contract as the DBE that was terminated, but only to the extent needed to meet the contract goal or the amended contract goal. The Contractor shall notify the Bureau of Small Business Enterprises of any termination for reasons other than convenience, and shall obtain approval for inclusion of the substitute DBE in the Utilization Plan. If good faith efforts following a termination of a DBE for cause are not successful, the Contractor shall contact the Bureau of Small Business Enterprises and provide a full accounting of the efforts undertaken to obtain substitute DBE participation. The Bureau of Small Business Enterprises will evaluate the good faith efforts in light of all circumstances surrounding the performance status of the contract, and determine whether the contract goal should be amended.

(c) 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 DBE companies indicated in the Plan, the Department will deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages.

- (d) 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.
- (e) 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.

DOWEL BARS (BDE)

Effective: April 1, 2007

Revised: January 1, 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 not 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 Department will maintain an approved list."

ENGINEER'S FIELD OFFICE TYPE A (BDE)

Effective: April 1, 2007

Revised: August 1, 2008

Revise Article 670.02 of the Standard Specifications to read:

"670.02 Engineer's Field Office Type A. Type A field offices shall have a minimum ceiling height of 7 ft (2 m) and a minimum floor space 450 sq ft (42 sq m). The office shall be provided with sufficient heat, natural and artificial light, and air conditioning.

The office shall have an electronic security system that will respond to any breach of exterior doors and windows. Doors and windows shall be equipped with locks. Doors shall also be equipped with dead bolt locks or other secondary locking device.

Windows shall be equipped with exterior screens to allow adequate ventilation. All windows shall be equipped with interior shades, curtains, or blinds. Adequate all-weather parking space shall be available to accommodate a minimum of ten vehicles.

Suitable on-site sanitary facilities meeting Federal, State, and local health department requirements shall be provided, maintained clean and in good working condition, and shall be stocked with lavatory and sanitary supplies at all times.

Sanitary facilities shall include hot and cold potable running water, lavatory and toilet as an integral part of the office where available. Solid waste disposal consisting of two waste baskets and an outside trash container of sufficient size to accommodate a weekly provided pick-up service.

In addition, the following furniture and equipment shall be furnished.

- (a) Four desks with minimum working surface 42 x 30 in. (1.1 m x 750 mm) each and five non-folding chairs with upholstered seats and backs.
- (b) One desk with minimum working surface 48 x 72 in. (1.2 x 1.8 m) with height adjustment of 23 to 30 in. (585 to 750 mm).
- (c) One four-post drafting table with minimum top size of 37 1/2 x 48 in. (950 mm x 1.2 m). The top shall be basswood or equivalent and capable of being tilted through an angle of 50 degrees. An adjustable height drafting stool with upholstered seat and back shall also be provided.
- (d) Two free standing four drawer legal size file cabinet with lock and an underwriters' laboratories insulated file device 350 degrees one hour rating.
- (e) One 6 ft (1.8 m) folding table with six folding chairs.
- (f) One equipment cabinet of minimum inside dimension of 44 in. (1100 mm) high x 24 in. (600 mm) wide x 30 in. (750 mm) deep with lock. The walls shall be of steel with a 3/32 in. (2 mm) 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.
- (g) One refrigerator with a minimum size of 16 cu ft (0.45 cu m) with a freezer unit.
- (h) One electric desk type tape printing calculator.
- (i) A minimum of two communication paths. The configuration shall include:
 - (1) Internet Connection. An internet service connection using telephone DSL, cable broadband, or CDMA wireless technology. Additionally, an 802.11g/N wireless router shall be provided, which will allow connection by the Engineer and up to four Department staff.
 - (2) Telephone Lines. Three separate telephone lines.

- (j) One plain paper copy machine capable of reproducing prints up to 11 x 17 in. (280 x 432 mm) with an automatic feed tray capable of storing 30 sheets of paper. Letter size and 11 x 17 in. (280 x 432 mm) paper shall be provided.
- (k) One plain paper fax machine with paper.
- (l) Two telephones, with touch tone, where available, and a digital telephone answering machine, for exclusive use by the Engineer.
- (m) One electric water cooler dispenser.
- (n) One first-aid cabinet fully equipped.
- (o) One microwave oven, 1 cu ft (0.03 cu m) minimum capacity.
- (p) One fire-proof safe, 0.5 cu ft (0.01 cu m) minimum capacity.
- (q) One electric paper shredder.
- (r) One post mounted rain gauge, located on the project site for each 5 miles (8 km) of project length.”

Revise the first sentence of the first paragraph of Article 670.07 of the Standard Specifications to read:

“The building or buildings fully equipped as specified will be paid for on a monthly basis until the building or buildings are released by the Engineer.”

Revise the last sentence of the first paragraph of Article 670.07 of the Standard Specifications to read:

“This price shall include all utility costs and shall reflect the salvage value of the building or buildings, equipment, and furniture which become the property of the Contractor after release by the Engineer, except that the Department will pay that portion of the monthly long distance telephone bills that, when combined, exceed \$150.”

EPOXY PAVEMENT MARKINGS (BDE)

Effective: January 1, 2007

Revise Article 1095.04(a) of the Standard Specifications to read:

- “(a) The epoxy marking material shall consist of a 100 percent solid two part system formulated and designed to provide a simple volumetric mixing ratio of two components (must be two volumes of Part A and one volume of Part B). No volatile solvents or fillers will be allowed. Total solids shall not be less than 99 percent when determined, on the mixed material, according to ASTM D 2369, excluding the solvent dispersion.”

Revise Article 1095.04(d) of the Standard Specifications to read:

“(d) Composition by Weight of Component A as Determined by Low Temperature Ashing. A 0.5 gram sample of component A shall be dispersed with a paperclip on the bottom of an aluminum dish, weighed and then heated in a muffle furnace at 1000 °F (538 °C) for one hour and weighed again. No solvents shall be used for dispersion. The difference in the weights shall be calculated and meet the following.

Pigment*	White	Yellow
Titanium Dioxide ASTM D 476 Type II	21-24%	
Organic Yellow, Titanium Dioxide, Other		± 2%**
Epoxy Resin	76-79%	± 2%**

* No extender pigments are permitted.

** From the pigment and epoxy resin content determined on qualification samples.”

Revise Article 1095.04(f) of the Standard Specifications to read:

“(f) The daylight directional reflectance of the paint (without glass spheres) applied at 14 to 16 mils (0.35 to 0.41 mm) shall meet the following requirements when tested, using a color spectrophotometer with 45 degree circumferential/zero degree geometry, illuminant C, and two degree observer angle.

The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm.

White: Daylight Reflectance 80 % min.
 Yellow:* Daylight Reflectance 50 % min.

*Shall meet the coordinates of the following color tolerance chart.

x	0.490	0.475	0.485	0.530
y	0.470	0.438	0.425	0.456”

Revise Article 1095.04(h) of the Standard Specifications to read:

“(h) The epoxy pavement marking material, when mixed in the proper mix ratio and tested according to ASTM D 7234 shall have a degree of adhesion which results in a 100 percent concrete failure in the performance of this test.”

Revise Article 1095.04(n) of the Standard Specifications to read:

“(n) The epoxy paint shall be applied to an aluminum alloy panel (Federal Test Std. No. 141, Method 2013) at a film thickness of 14 to 16 mils (0.35 to 0.41 mm) and allowed to cure for 72 hours at room temperature. Subject the coated panel for 75 hours to accelerated weathering using the light and water exposure apparatus (fluorescent UV - condensation type) as specified in ASTM G 53 (equipped with UVB-313 lamps).

The cycle shall consist of four hours UV exposure at 122 °F (50 °C) followed by four hours of condensation at 104 °F (40 °C). UVB 313 bulbs shall be used. At the end of the exposure period, the panel shall show no more than 10 Hunter Lab Delta E units or substantial change in gloss from the original, non-exposed paint.”

EQUIPMENT RENTAL RATES (BDE)

Effective: August 2, 2007

Revised: January 2, 2008

Replace the second and third paragraphs of Article 105.07(b)(4)a. of the Standard Specifications with the following:

“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).”

Replace Article 109.04(b)(4) of the Standard Specifications with the following:

“(4) Equipment. Equipment used for extra work shall be authorized by the Engineer. The equipment shall be specifically described, be of suitable size and capacity for the work to be performed, and be in good operating condition. For such equipment, the Contractor will be paid as follows.

- a. Contractor Owned Equipment. Contractor owned equipment will be paid for by the hour using the applicable FHWA hourly rate from the “Equipment Watch Rental Rate Blue Book” (Blue Book) in effect when the force account work begins. The FHWA hourly rate is calculated as follows.

$$\text{FHWA hourly rate} = (\text{monthly rate}/176) \times (\text{model year adj.}) \times (\text{Illinois adj.}) + \text{EOC}$$

Where: EOC = Estimated Operating Costs per hour (from the Blue Book)

The time allowed will be the actual time the equipment is operating on the extra work. For the time required to move the equipment to and from the site of the extra work and any authorized idle (standby) time, payment will be made at the following hourly rate: 0.5 x (FHWA hourly rate - EOC).

All time allowed shall fall within the working hours authorized for the extra work.

The rates above include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs, overhaul and maintenance of any kind, depreciation, storage, overhead, profits, insurance, and all incidentals. The rates do not include labor.

The Contractor shall submit to the Engineer sufficient information for each piece of equipment and its attachments to enable the Engineer to determine the proper equipment category. If a rate is not established in the Blue Book for a particular piece of equipment, the Engineer will establish a rate for that piece of equipment that is consistent with its cost and use in the industry.

- b. Rented Equipment. Whenever it is necessary for the Contractor to rent equipment to perform extra work, the rental and transportation costs of the equipment plus five percent for overhead will be paid. In no case shall the rental rates exceed those of established distributors or equipment rental agencies.

All prices shall be agreed to in writing before the equipment is used.”

HOT-MIX ASPHALT - FIELD VOIDS IN THE MINERAL AGGREGATE (BDE)

Effective: April 1, 2007

Revised: April 1, 2008

Add the following to the table in Article 1030.05(d)(2)a. of the Standard Specifications:

"Parameter	Frequency of Tests	Frequency of Tests	Test Method See Manual of Test Procedures for Materials
	High ESAL Mixture Low ESAL Mixture	All Other Mixtures	
VMA	Day's production ≥ 1200 tons: 1 per half day of production	N/A	Illinois-Modified AASHTO R 35
Note 5.	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 5. 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.”

Add the following to the Control Limits table in Article 1030.05(d)(4) of the Standard Specifications:

"CONTROL LIMITS			
Parameter	High ESAL Low ESAL	High ESAL Low ESAL	All Other
	Individual Test	Moving Avg. of 4		Individual Test
VMA	-0.7 % ^{2/}	-0.5 % ^{2/}	N/A

2/ Allowable limit below minimum design VMA requirement”

Add the following to the table in Article 1030.05(d)(5) of the Standard Specifications:

“CONTROL CHART REQUIREMENTS	High ESAL Low ESAL	All Other
	VMA”	

Revise the heading of Article 1030.05(d)(6)a.1. of the Standard Specifications to read:

“1. Voids, VMA, and Asphalt Binder Content.”

Revise the first sentence of the first paragraph of Article 1030.05(d)(6)a.1.(a.) of the Standard Specifications to read:

“If the retest for voids, VMA, or asphalt binder content exceeds control limits, HMA production shall cease and immediate corrective action shall be instituted by the Contractor.”

Revise the table in Article 1030.05(e) of the Standard Specifications to read:

“Test Parameter	Acceptable Limits of Precision
% Passing: ^{1/}	
1/2 in. (12.5 mm)	5.0 %
No. 4 (4.75 mm)	5.0 %
No. 8 (2.36 mm)	3.0 %
No. 30 (600 μm)	2.0 %
Total Dust Content No. 200 (75 μm) ^{1/}	2.2 %
Asphalt Binder Content	0.3 %
Maximum Specific Gravity of Mixture	0.026
Bulk Specific Gravity	0.030
VMA	1.4 %
Density (% Compaction)	1.0 % (Correlated)

1/ Based on washed ignition.”

HOT-MIX ASPHALT – PLANT TEST FREQUENCY (BDE)

Effective: April 1, 2008

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 Hot bins for batch and continuous plants. Individual cold-feed or combined belt-feed for drier drum plants. % 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 dry gradation per day of production (either morning or afternoon sample). and 1 washed ignition oven test on the mix per day of production (conduct in the afternoon if dry gradation is conducted in the morning or vice versa). Note 3. Note 4.	1 gradation per day of production. The first day of production shall be a washed ignition oven test on the mix. Thereafter, the testing shall alternate between dry gradation and washed ignition oven test on the mix. 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
Air Voids Bulk Specific Gravity of Gyratory Sample	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)	1 per day	Illinois-Modified AASHTO T 312
Maximum Specific Gravity of Mixture	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)	1 per day	Illinois-Modified AASHTO T 209"

HOT-MIX ASPHALT – TRANSPORTATION (BDE)

Effective: April 1, 2008

Revise Article 1030.08 of the Standard Specifications to read:

“1030.08 Transportation. Vehicles used in transporting HMA shall have clean and tight beds. The beds shall be sprayed with asphalt release agents from the Department’s approved list. In lieu of a release agent, the Contractor may use a light spray of water with a light scatter of manufactured sand (FA 20 or FA 21) evenly distributed over the bed of the vehicle. After spraying, the bed of the vehicle shall be in a completely raised position and it shall remain in this position until all excess asphalt release agent or water has been drained.

When the air temperature is below 60 °F (15 °C), the bed, including the end, endgate, sides and bottom shall be insulated with fiberboard, plywood or other approved insulating material and shall have a thickness of not less than 3/4 in (20 mm). When the insulation is placed inside the bed, the insulation shall be covered with sheet steel approved by the Engineer. Each vehicle shall be equipped with a cover of canvas or other suitable material meeting the approval of the Engineer which shall be used if any one of the following conditions is present.

- (a) Ambient air temperature is below 60 °F (15 °C).
- (b) The weather is inclement.
- (c) The temperature of the HMA immediately behind the paver screed is below 250 °F (120 °C).

The cover shall extend down over the sides and ends of the bed for a distance of approximately 12 in. (300 mm) and shall be fastened securely. The covering shall be rolled back before the load is dumped into the finishing machine.”

IMPACT ATTENUATORS, TEMPORARY (BDE)

Effective: November 1, 2003

Revised: January 1, 2007

Description. This work shall consist of furnishing, installing, maintaining, and removing temporary impact attenuators of the category and test level specified.

Materials. Materials shall meet the requirements of the impact attenuator manufacturer and the following:

Item	Article/Section
(a) Fine Aggregate (Note 1)	003.01
(b) Steel Posts, Structural Shapes, and Plates	1006.04
(c) Rail Elements, End Section Plates, and Splice Plates	1006.25
(d) Bolts, Nuts, Washers and Hardware	1006.25
(e) Hollow Structural Tubing	1006.27(b)
(f) Wood Posts and Wood Blockouts	1007.01, 1007.02, 1007.06

(g) Preservative Treatment	1007.12
(h) Packaged Rapid Hardening Mortar	1018.01

Note 1. Fine aggregate shall be FA 1 or FA 2, Class A quality. The sand shall be unbagged and shall have a maximum moisture content of five percent.

CONSTRUCTION REQUIREMENTS

General. Impact Attenuators shall meet the testing criteria contained in National Cooperative Highway Research Program (NCHRP) Report 350 for the test level specified and shall be on the Department's approved list.

Installation. Regrading of slopes or approaches for the installation shall be as shown on the plans.

Attenuator bases, when required by the manufacturer, shall be constructed on a prepared subgrade according to the manufacturer's specifications. The surface of the base shall be slightly sloped or crowned to facilitate drainage.

Impact attenuators shall be installed according to the manufacturer's specifications and include all necessary transitions between the impact attenuator and the item to which it is attached.

When water filled attenuators are used between November 1 and April 15, they shall contain anti-freeze according to the manufacturer's recommendations.

Markings. Sand module impact attenuators shall be striped with alternating reflectorized Type AA or Type AP fluorescent orange and reflectorized white horizontal, circumferential stripes. There shall be at least two of each stripe on each module.

Other types of impact attenuators shall have a terminal marker applied to their nose and reflectors along their sides.

Maintenance. All maintenance of the impact attenuators shall be the responsibility of the Contractor until removal is directed by the Engineer.

Relocate. When relocation of temporary impact attenuators is specified, they shall be removed, relocated and reinstalled at the new location. The reinstallation requirements shall be the same as those for a new installation.

Removal. When the Engineer determines the temporary impact attenuators are no longer required, the installation shall be dismantled with all hardware becoming the property of the Contractor.

Surplus material shall be disposed of according to Article 202.03. Anti-freeze, when present, shall be disposed of/recycled according to local ordinances.

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

Method of Measurement. This work will be measured for payment as each, where each is defined as one complete installation.

Basis of Payment. This work will be paid for at the contract unit price per each for IMPACT ATTENUATORS, TEMPORARY (FULLY REDIRECTIVE, NARROW); IMPACT ATTENUATORS, TEMPORARY (FULLY REDIRECTIVE, WIDE); IMPACT ATTENUATORS, TEMPORARY (FULLY REDIRECTIVE, RESETTABLE); IMPACT ATTENUATORS, TEMPORARY (SEVERE USE, NARROW); IMPACT ATTENUATORS, TEMPORARY (SEVERE USE, WIDE); or IMPACT ATTENUATORS, TEMPORARY (NON-REDIRECTIVE) of the test level specified.

Relocation of the devices will be paid for at the contract unit price per each for IMPACT ATTENUATORS, RELOCATE (FULLY REDIRECTIVE); IMPACT ATTENUATORS, RELOCATE (SEVERE USE); or IMPACT ATTENUATORS, RELOCATE (NON-REDIRECTIVE); of the test level specified.

Regrading of slopes or approaches will be paid for according to Section 202 and/or Section 204 of the Standard Specifications.

LIQUIDATED DAMAGES (BDE)

Effective: April 1, 2009

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	\$ 375	\$ 500
100,000	500,000	625	875
500,000	1,000,000	1,025	1,425
1,000,000	3,000,000	1,125	1,550
3,000,000	5,000,000	1,425	1,950
5,000,000	10,000,000	1,700	2,350
10,000,000	And over	3,325	4,650"

MONTHLY EMPLOYMENT REPORT (BDE)

Effective: April 1, 2009

In addition to any other reporting required by the contract, the Contractor shall provide to the Engineer an employment summary for all employees working on the contract from the contract execution date to the last full pay period each month for the duration of the contract. The report may include but is not limited to:

- a) A listing of the total number of employees.
- b) The employee job classification.
- c) The total hours worked and payroll for each employee.

The report shall be completed by the Contractor and each subcontractor. Employee hours worked from home office or other off-site office hours worked related directly to this contract shall be included. Engineering consulting firms performing construction layout and material testing for the Contractor shall also be included.

Hours worked for material suppliers, services provided by purchase orders, Department employees or consulting firms performing inspection or testing for the Department shall not be included in the report.

The report shall contain all hours worked under the contract from the start of the month to the last full pay period each month and shall be submitted no later than 10 business days after the end of each month.

The report shall be submitted electronically in a format determined by the Engineer. See attachment for potential reporting format.

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.

Attachment

MONTHLY PRIME AND SUBCONTRACTOR EMPLOYMENT REPORT AMERICAN RECOVERY AND REINVESTMENT ACT			
1. First day of reporting period (mm/dd/yyyy)	2. Last day of reporting period (mm/dd/yyyy)	3. Notice to Proceed Date (mm/dd/yyyy)	
4. NAME AND ADDRESS OF FIRM		5. FEDERAL AID PROJECT NUMBER	
		5. State Project Number (if D)	
7. CONTRACTING AGENCY		8. STATE (or Federal Lands Region)	
Employment Data			
Direct, On-Project Jobs	TOTAL EMPLOYEES	TOTAL HOURS	TOTAL PAYROLL
CONSTRUCTION	NEW HIRES		
	EXISTING EMPLOYEES		
NON-CONSTRUCTION	NEW HIRES		
	EXISTING EMPLOYEES		
TOTAL			
10. PREPARED BY (Signature and Title)			DATE
11. REVIEWED BY (Signature and Title of State Highway Official)			DATE

This form is issued in association with the American Recovery and Reinvestment Act of 2009

MULTILANE PAVEMENT PATCHING (BDE)

Effective: November 1, 2002

Pavement broken and holes opened for patching shall be completed prior to weekend or holiday periods. Should delays of any type or for any reason prevent the completion of the work, temporary patches shall be constructed. Material able to support the average daily traffic and meeting the approval of the Engineer shall be used for the temporary patches. The cost of furnishing, placing, maintaining, removing and disposing of the temporary work, including traffic control, shall be the responsibility of the Contractor.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM / EROSION AND SEDIMENT CONTROL DEFICIENCY DEDUCTION (BDE)

Effective: April 1, 2007

Revised: November 1, 2008

Revise Article 105.03(a) of the Standard Specifications to read:

“(a) National Pollutant Discharge Elimination System (NPDES) / Erosion and Sediment Control Deficiency Deduction. When the Engineer is notified or determines an erosion and/or sediment control deficiency(s) exists, or the Contractor’s activities represents a violation of the Department’s NPDES permits, the Engineer will notify and direct the Contractor to correct the deficiency within a specified time. The specified time, which begins upon notification to the Contractor, will be from 1/2 hour to 1 week based on the urgency of the situation and the nature of the work effort required. The Engineer will be the sole judge.

A deficiency may be any lack of repair, maintenance, or implementation of erosion and/or sediment control devices included in the contract, or any failure to comply with the conditions of the Department’s NPDES permits. A deficiency may also be applied to situations where corrective action is not an option such as the failure to participate in a jobsite inspection of the project, failure to install required measures prior to initiating earth moving operations, disregard of concrete washout requirements, or other disregard of the NPDES permit.

If the Contractor fails to correct a deficiency within the specified time, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency exists. The calendar day(s) will begin with notification to the Contractor and end with the Engineer’s acceptance of the correction. The daily monetary deduction will be either \$1000.00 or 0.05 percent of the awarded contract value, whichever is greater. For those deficiencies where corrective action was not an option, the monetary deduction will be immediate and will be valued at one calendar day.”

NOTIFICATION OF REDUCED WIDTH (BDE)

Effective: April 1, 2007

Add the following after the first paragraph of Article 701.06 of the Standard Specifications:

“Where the clear width through a work zone with temporary concrete barrier will be 16.0 ft (4.88 m) or less, the Contractor shall notify the Engineer at least 21 days in advance of implementing the traffic control for that restriction.”

ORGANIC ZINC-RICH PAINT SYSTEM (BDE)

Effective: November 1, 2001

Revised: January 1, 2008

Add the following to Section 1008 of the Standard Specifications:

“**1008.05 Organic Zinc-Rich Paint System.** The organic zinc-rich paint system shall consist of an organic zinc-rich primer, an epoxy or urethane intermediate coat, and aliphatic urethane finish coats. It is intended for use over blast-cleaned steel when three-coat shop applications are specified. The system is also suitable for field painting blast-cleaned existing structures.

The coating system shall be evaluated for performance through the National Transportation Product Evaluation Program (NTPEP) for Structural Steel Coatings following the requirements of AASHTO R 31, and shall meet the performance criteria listed herein. After successful NTPEP testing, the coatings shall be submitted to the Illinois Department of Transportation, Bureau of Materials and Physical Research, for qualification and acceptance testing.

(a) General Requirements.

- (1) Compatibility. Each coating in the system shall be supplied by the same paint manufacturer.
- (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.
- (3) Volatile Organics. The volatile organic compounds of each coating shall not exceed 3.5 lb/gal (420 g/L) as applied.

(b) Panel Preparation for NTPEP testing. The test panels shall be prepared according to AASHTO R 31, except for the following: Test panels shall be scribed according to ASTM D 1654 with a single "X" mark centered on the panel. The rectangular dimensions of the scribe shall have a top width of 2 in. (50 mm) and a height of 4 in. (100 mm). The scribe cut shall expose the steel substrate as verified with a microscope.

(c) Zinc-Rich Primer Requirements.

- (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.
- (2) Zinc Dust. The zinc dust pigment shall comply with ASTM D 520, Type II.
- (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 325 (A 325M) or A 490 (A 490M) bolts.
- (4) Adhesion. The adhesion to an abrasively blasted steel substrate shall not be less than 900 psi (6.2 MPa) when tested according to ASTM D 4541 Annex A4.
- (5) Unit Weight. The unit weight of the mixed material shall be within 0.4 lb/gal (48 kg/cu m) of the original qualification sample unit weight when tested according to ASTM D 1475.
- (6) Percent Solids by Weight of Mixed Primer. The percent solids by weight for the mixed material shall be a minimum of 70 percent and shall not vary more than ± 2 percentage points from the percent solids by weight of the original qualification samples when tested according to ASTM D 2369.

- (7) Percent Solids by Weight of Vehicle Component. The percent solids by weight of the vehicle component shall not vary more than ± 2 percentage points from the percent solids by weight of the original qualification samples when tested according to ASTM D 2369.
 - (8) Viscosity. The viscosity of the mixed material shall not vary more than ± 10 Krebs Units from the original qualification sample viscosity when tested according to ASTM D 562 at 77 °F (25 °C).
 - (9) Dry Set to Touch. The mixed material when applied at 6 mils (150 microns) wet film thickness shall have a dry set to touch of 30 minutes or less when tested according to ASTM D 1640 at 77°F (25 °C).
 - (10) Pot Life. After sitting eight hours at 77°F (25 °C), the mixed material shall not show curdling, gelling, gassing, or hard caking.
- (d) Intermediate Coat Requirements.
- (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.
 - (2) Color. The color of the intermediate coat shall be white, off-white, or beige.
 - (3) Unit Weight. The unit weight of the mixed material and the unit weight of the individual components shall be within 0.20 lb/gal (24 kg/cu m) of the original qualification sample unit weights when tested according to ASTM D 1475.
 - (4) Percent Solids by Weight. The percent solids by weight for the mixed material shall not vary more than ± 2 percentage points from the percent solids by weight of the original qualification samples when tested according to ASTM D 2369.
 - (5) Dry Time. The mixed material shall be dry to touch in two hours and dry hard in eight hours when applied at 10 mils (255 microns) wet film thickness and tested according to ASTM D 1640.
 - (6) Viscosity. The viscosity of the mixed material shall not vary more than ± 10 Krebs Units from the original qualification samples when tested according to ASTM D 562 at 77 °F (25 °C).
 - (7) Pot Life. After sitting two hours at 77°F (25 °C), the mixed material shall not show curdling, gelling, gassing, or hard caking.
- (e) Urethane Finish Coat Requirements.
- (1) Generic Type. This material shall be an aliphatic urethane. It shall be suitable as a topcoat over epoxies and urethanes.

- (2) Color and Hiding Power. The finish coat shall match Munsell Glossy Color 7.5G 4/8 Interstate Green, 2.5YR 3/4 Reddish Brown, 10B 3/6 Blue, or 5B 7/1 Gray. The color difference shall not exceed 3.0 Hunter Delta E Units. Color difference shall be measured by instrumental comparison of the designated Munsell standard to a minimum dry film thickness of 3 mils (75 microns) of sample coating produced on a test panel according to ASTM D 823, Practice E, Hand–Held, Blade Film Application. Color measurements shall be determined on a spectrophotometer with 45 degrees circumferential/zero degrees geometry, illuminant C, and two degrees observer angle. The spectrophotometer shall measure the visible spectrum from 380-720 nanometers with a wavelength interval and spectral bandpass of 10 nanometers.
- (3) Contrast Ratio. The contrast ratio of the finish coat applied at 3 mils (75 microns) dry film thickness shall not be less than 0.99 when tested according to ASTM D 2805.
- (4) Weathering Resistance. Test panels shall be aluminum alloy measuring 12 x 4 in. (300 x 100 mm) prepared according to ASTM D 1730 Type A, Method 1 Solvent Cleaning. A minimum dry film thickness of 3 mils (75 microns) of finish coat shall be applied to three test panels according to ASTM D 823, Practice E, Hand Held Blade Film Application. The coated panels shall be cured at least 14 days at 75 °F ± 2 °F (24 °C ± 1 °C) and 50 ± 5 percent relative humidity. The panels shall be subjected to 300 hours of accelerated weathering using the light and water exposure apparatus (fluorescent UV - condensation type) as specified in ASTM G 53-96 and ASTM G 154 (equipped with UVB-313 lamps). The cycle shall consist of eight hours UV exposure at 140 °F (60 °C) followed by four hours of condensation at 104 °F (40 °C). After exposure, rinse the panel with clean water; allow to dry at room temperature for one hour. The exposed panels shall not show a color change of more than 3 Hunter Delta E Units.
- (5) Dry Time. The mixed material shall be dry to touch in two hours and dry hard in six hours when applied at 6 mils (150 microns) wet film thickness and tested according to ASTM D 1640.

(f) Three Coat System Requirements.

- (1) Finish Coat Color. For NTPEP testing purposes, the color of the finish coat shall match the latest applicable AASHTO R 31 specified color.
- (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 scraping after 5,000 hours of salt fog exposure:

Salt Fog Acceptance Criteria		
Blister Criteria	Rust Criteria	
Conversion Value	Maximum Creep	Average Creep
9	4 mm	2 mm

- (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		
Blister Criteria	Rust Criteria	
Conversion Value	Maximum Creep	Average Creep
9	7 mm	4 mm

- (4) Abrasion. The abrasion resistance shall be evaluated according to ASTM D 4060 using a Taber Abrader with a 2.20 lb (1000 gram) load and CS 17 wheels. The duration of the test shall be 1,000 cycles. The loss shall be calculated by difference and be less than 0.00049 lb (220 mgs).
- (5) Adhesion. The adhesion to an abrasively blasted steel substrate shall not be less than 900 psi (6.2 MPa) when tested according to ASTM D 4541 Annex A4.
- (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 -22 °F (-30 °C) followed by four hours of thawing at 122 °F (50 °C) and four hours tap water immersion at 77 °F (25 °C). The test panels shall remain in the freezer mode on weekends and holidays.
- (g) Sampling, Testing, Acceptance, and Certification. Sampling, testing, acceptance, and certification of the coating system shall be according to Article 1008.01.”

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.

PAYROLLS AND PAYROLL RECORDS (BDE)

Effective: March 1, 2009

FEDERAL AID CONTRACTS. Revise the following section of Check Sheet #1 of the Recurring Special Provisions to read:

“STATEMENTS AND PAYROLLS

The payroll records shall include each worker's name, address, telephone number, social security number, classification, rate of pay, number of hours worked each day, starting and ending times of work each day, total hours worked each week, itemized deductions made, and actual wages paid.

The Contractor and each subcontractor shall submit payroll records to the Engineer each week from the start to the completion of their respective work, except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number.). The submittals shall be on the Department's form SBE 48, or an approved facsimile. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate box ("No Work", "Suspended", or "Complete") checked on the form."

STATE CONTRACTS. Revise Section IV of Check Sheet #5 of the Recurring Special Provisions to read:

"IV.COMPLIANCE WITH THE PREVAILING WAGE ACT

1. Prevailing Wages. All wages paid by the Contractor and each subcontractor shall be in compliance with The Prevailing Wage Act (820 ILCS 130), as amended, except where a prevailing wage violates a federal law, order, or ruling, the rate conforming to the federal law, order, or ruling shall govern. The Contractor shall be responsible to notify each subcontractor of the wage rates set forth in this contract and any revisions thereto. If the Department of Labor revises the wage rates, the Contractor will not be allowed additional compensation on account of said revisions.
2. Payroll Records. The Contractor and each subcontractor shall make and keep, for a period of three years from the date of completion of this contract, records of the wages paid to his/her workers. The payroll records shall include each worker's name, address, telephone number, social security number, classification, rate of pay, number of hours worked each day, starting and ending times of work each day, total hours worked each week, itemized deductions made, and actual wages paid. Upon two business days' notice, these records shall be available, at all reasonable hours at a location within the State, for inspection by the Department or the Department of Labor.
3. Submission of Payroll Records. The Contractor and each subcontractor shall submit payroll records to the Engineer each week from the start to the completion of their respective work, except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). The submittals shall be on the Department's form SBE 48, or an approved facsimile. When there has been no activity during a work week, a payroll record shall still be submitted with the appropriate box ("No Work", "Suspended", or "Complete") checked on the form.

Each submittal shall be accompanied by a statement signed by the Contractor or subcontractor which avers that: (i) such records are true and accurate; (ii) the hourly rate paid to each worker is not less than the general prevailing rate of hourly wages required by the Act; and (iii) the Contractor or subcontractor is aware that filing a payroll record that he/she knows to be false is a Class B misdemeanor.

4. Employee Interviews. The Contractor and each subcontractor shall permit his/her employees to be interviewed on the job, during working hours, by compliance investigators of the Department or the Department of Labor.”

PERSONAL PROTECTIVE EQUIPMENT (BDE)

Effective: November 1, 2008

Revise the first sentence of Article 701.12 of the Standard Specifications to read:

“All personnel on foot, excluding flaggers, within the highway right-of-way 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.”

POLYUREA PAVEMENT MARKING (BDE)

Effective: April 1, 2004

Revised: January 1, 2009

Description. This work shall consist of furnishing and applying pavement marking lines.

The type of polyurea pavement marking applied will be determined by the type of reflective media used. Polyurea Pavement Marking Type I shall use glass beads as a reflective media. Polyurea Pavement Marking Type II shall use a combination of composite reflective elements and glass beads as a reflective media.

Polyurea-based liquid pavement markings shall only be applied by Contractors on the list of Approved Polyurea Contractors maintained by the Engineer of Operations and in effect on the date of advertisement for bids.

Materials. Materials shall meet the following requirements:

- (a) Polyurea Pavement Marking. The polyurea pavement marking material shall consist of 100 percent solid two part system formulated and designed to provide a simple volumetric mixing ratio of two components (must be two or three volumes of Part A to one volume of Part B). No volatile or polluting solvents or fillers will be allowed.
- (b) Pigmentation. The pigment content by weight (mass) of component A shall be determined by low temperature ashing according to ASTM D 3723. The pigment content shall not vary more than \pm two percent from the pigment content of the original qualified paint.

White Pigment shall be Titanium Dioxide meeting ASTM D 476 Type II, Rutile.

Yellow Pigment shall be an Organic Yellow and contain no heavy metals.

- (c) Environmental. Upon heating to application temperature, the material shall not exude fumes which are toxic or injurious to persons or property.

(d) Daylight Reflectance. The daylight directional reflectance of the cured polyurea material (without reflective media) shall be a minimum of 80 percent (white) and 50 percent (yellow) relative to magnesium oxide when tested using a color spectrophotometer with a 45 degrees circumferential /zero degrees geometry, illuminant C, and two degrees observer angle. The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm. In addition, the color of the yellow polyurea shall visually match Color Number 33538 of Federal Standard 595a with chromaticity limits as follows:

X	0.490	0.475	0.485	0.539
Y	0.470	0.438	0.425	0.456

(e) Weathering Resistance. The polyurea marking material, when mixed in the proper ratio and applied at 14 to 16 mils (0.35 to 0.41 mm) wet film thickness to an aluminum alloy panel (Federal Test Std. No. 141, Method 2013) and allowed to cure for 72 hours at room temperature, shall be subjected to accelerated weathering for 75 hours. The accelerated weathering shall be completed by using the light and water exposure apparatus (fluorescent UV - condensation type) and tested according to ASTM G 53.

The cycle shall consist of four hours UV exposure at 122 °F (50 °C) and four hours of condensation at 104 °F (40 °C). UVB 313 bulbs shall be used. At the end of the exposure period, the material shall show no substantial change in color or gloss.

(f) Dry Time. The polyurea pavement marking material, when mixed in the proper ratio and applied at 14 to 16 mils (0.35 to 0.41 mm) wet film thickness and with the proper saturation of reflective media, shall exhibit a no-tracking time of ten minutes or less when tested according to ASTM D 711.

(g) Adhesion. The catalyzed polyurea pavement marking materials when applied to a 4 x 4 x 2 in. (100 x 100 x 50 mm) concrete block, shall have a degree of adhesion which results in a 100 percent concrete failure in the performance of this test.

The concrete block shall be brushed on one side and have a minimum strength of 3500 psi (24,100 kPa). A 2 in. (50 mm) square film of the mixed polyurea shall be applied to the brushed surface and allowed to cure for 72 hours at room temperature. A 2 in. (50 mm) square cube shall be affixed to the surface of the polyurea by means of an epoxy glue. After the glue has cured for 24 hours, the polyurea specimen shall be placed on a dynamic testing machine in such a fashion so that the specimen block is in a fixed position and the 2 in. (50 mm) cube (glued to the polyurea surface) is attached to the dynamometer head. Direct upward pressure shall be slowly applied until the polyurea system fails. The location of the break and the amount of concrete failure shall be recorded.

(h) Hardness. The polyurea pavement marking materials when tested according to ASTM D 2240, shall have a shore D hardness of between 70 and 100. Films shall be cast on a rigid substrate at 14 to 16 mils (0.35 to 0.41 mm) in thickness and allowed to cure at room temperature for 72 hours before testing.

(i) Abrasion. The abrasion resistance shall be evaluated according to ASTM D 4060 using a Taber Abrader with a 1,000 gram load and CS 17 wheels. The duration of the test shall be 1,000 cycles. The loss shall be calculated by difference and be less than 120 mgs. The tests shall be run on cured samples of polyurea material which have been applied at a film thickness of 14 to 16 mils (0.35 to 0.41 mm) to code S-16 stainless steel plates. The films shall be allowed to cure at room temperature for at least 72 hours and not more than 96 hours before testing.

(j) Reflective Media. The reflective media shall meet the following requirements:

(1) Type I - The glass beads shall meet the requirements of Article 1095.07 of the Standard Specifications and the following requirements:

a. First Drop Glass Beads. The first drop glass beads shall be tested by the standard visual method of large glass spheres adopted by the Department. The beads shall have a silane coating and meet the following sieve requirements:

U.S. Standard Sieve Number	Sieve Size	% Passing By Weight (mass)
12	1.70 mm	95-100
14	1.40 mm	75-95
16	1.18 mm	10-47
18	1.00 mm	0-7
20	850 µm	0-5

b. Second Drop Glass Beads. The second drop glass beads shall meet the requirements of Article 1095.07 of the Standard Specifications for Type B.

(2) Type II - The combination of microcrystalline ceramic elements and glass beads shall meet the following requirements:

a. First Drop Glass Beads. The first drop glass beads shall meet the following requirements:

1. Composition. The elements shall be composed of a titania opacified ceramic core having clear and or yellow tinted microcrystalline ceramic beads embedded to the outer surface.

2. Index of Refraction. All microcrystalline reflective elements embedded to the outer surface shall have an index of refraction of 1.8 when tested by the immersion method.

3. Acid Resistance. A sample of microcrystalline ceramic beads supplied by the manufacturer, shall show resistance to corrosion of their surface after exposure to a one percent solution (by weight (mass)) of sulfuric acid. Adding 0.2 oz (5.7 ml) of concentrated acid into the water shall make the one percent acid solution. This test shall be performed by taking a 1 x 2 in. (25 x 50 mm) sample and adhering it to the bottom of a glass tray and placing just enough acid solution to completely immerse the sample. The tray shall be covered with a piece of glass to prevent evaporation and allow the sample to be exposed for 24 hours under these conditions. The acid solution shall be decanted (do not rinse, touch, or otherwise disturb the bead surfaces) and the sample dried while adhered to the glass tray in a 150 °F (66 °C) oven for approximately 15 minutes. Microscope examination (20X) shall show no white (corroded) layer on the entire surface.

b. Second Drop Glass Beads. The second drop glass beads shall meet the requirements of Article 1095.07 of the Standard Specifications for Type B or the following manufacturer's specification:

1. Sieve Analysis. The glass beads shall meet the following sieve requirements:

U.S. Standard Sieve Number	Sieve Size	% Passing By Weight (mass)
20	850 μm	100
30	600 μm	75-95
50	300 μm	15-35
100	150 μm	0-5

The manufacturer of the glass beads shall certify that the treatment of the glass beads meets the requirements of the polyurea manufacturer.

2. Imperfections. The surface of the glass beads shall be free of pits and scratches. The glass beads shall be spherical in shape and shall contain a maximum of 20 percent by weight (mass) of irregular shapes when tested by the standard method using a vibratile inclined glass plate as adopted by the Department.

3. Index of Refraction. The index of refraction of the glass beads shall be a minimum of 1.50 when tested by the immersion method at 77 °F (25 °C).

(k) Packaging. Microcrystalline ceramic reflective elements and glass beads shall be delivered in approved moisture proof bags or weather resistant bulk boxes. Each carton shall be legibly marked with the manufacturer, specifications and type, lot number, and the month and year the microcrystalline ceramic reflective elements and/or glass beads were packaged. The letters and numbers used in the stencils shall be a minimum of 1/2 in. (12.7 mm) in height.

(1) Moisture Proof Bags. Moisture proof bags shall consist of at least five ply paper construction unless otherwise specified. Each bag shall contain 50 lb (22.7 kg) net.

- (2) Bulk Weather Resistance Boxes. Bulk weather resistance boxes shall conform to Federal Specification PPP-8-640D Class II or latest revision. Boxes are to be weather resistant, triple wall, fluted, corrugated-fiber board. Cartons shall be strapped with two metal straps. Straps shall surround the outside perimeter of the carton. The first strap shall be located approximately 2 in. (50 mm) from the bottom of the carton and the second strap shall be placed approximately in the middle of the carton. All cartons shall be shrink wrapped for protection from moisture. Cartons shall be lined with a minimum 4 mil polyester bag and meet Interstate Commerce Commission requirements. Cartons shall be approximately 38 x 38 in. (1 x 1 m), contain 2000 lb (910 kg) of microcrystalline ceramic reflective elements and/or glass beads and be supported on a wooden pallet with fiber straps.
- (l) Packaging. The material shall be shipped to the job site in substantial containers and shall be plainly marked with the manufacturer's name and address, the name and color of the material, date of manufacture, and batch number.
- (m) Verification. Prior to approval and use of the polyurea pavement marking materials, the manufacturer shall submit a notarized certification of an independent laboratory, together with the results of all tests, stating these materials meet the requirements as set forth herein. The certification test report shall state the lot tested, manufacturer's name, brand name of polyurea and date of manufacture. The certification shall be accompanied by one 1 pt (1/2 L) samples each of Part A and Part B. Samples shall be sent in the appropriate volumes for complete mixing of Part A and Part B.
- After approval by the Department, certification by the polyurea manufacturer shall be submitted for each batch used. New independent laboratory certified test results and samples for testing by the Department shall be submitted any time the manufacturing process or paint formulation is changed. All costs of testing (other than tests conducted by the Department) shall be borne by the manufacturer.
- (n) Acceptance samples. Acceptance samples shall consist of one 1 pt (1/2 L) samples of Part A and Part B, of each lot of paint. Samples shall be sent in the appropriate volumes for complete mixing of Part A and Part B. The samples shall be submitted to the Department for testing, together with a manufacturer's certification. The certification shall state the formulation for the lot represented is essentially identical to that used for qualification testing. All, acceptance samples will be taken by a representative of the Department. The polyurea pavement marking materials shall not be used until tests are completed and they have met the requirements as set forth herein.
- (o) Material Retainage. The manufacturer shall retain the test sample for a minimum of 18 months.

Equipment. The polyurea pavement marking compounds shall be applied through equipment specifically designed to apply two component liquid materials, glass beads and/or reflective elements in a continuous and skip-line pattern. The two-component liquid materials shall be applied after being accurately metered and then mixed with a static mix tube or airless impingement mixing guns. The static mixing tube or impingement mixing guns shall accommodate plural component material systems that have a volumetric ratio of 2 to 1 or 3 to 1. This equipment shall produce the required amount of heat at the mixing head and gun tip and maintain those temperatures within the tolerances specified. The guns shall have the capacity to deliver materials from approximately 1.5 to 3 gal/min (5.7 to 11.4 L/min) to compensate for a typical range of application speeds of 6 to 8 mph (10 to 13 km/h). The accessories such as spray tip, mix chamber, and rod diameter shall be selected according to the manufacturer's specifications to achieve proper mixing and an acceptable spray pattern. The application equipment shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. This equipment shall also have as an integral part of the gun carriage, a high pressure air spray capable of cleaning the pavement immediately prior to making application.

The equipment shall be capable of spraying both yellow and white polyurea, according to the manufacturer's recommended proportions and be mounted on a truck of sufficient size and stability with an adequate power source to produce lines of uniform dimensions and prevent application failure. The truck shall have at least two polyurea tanks each of 110 gal (415 L) minimum capacity and be equipped with hydraulic systems and agitators. It shall be capable of placing stripes on the left and right sides and placing two lines on a three-line system simultaneously with either line in a solid or intermittent pattern, in yellow or white, and applying the appropriate reflective media according to manufacturer's recommendations. All guns shall be in full view of operations at all times. The equipment shall have a metering device to register the accumulated installed quantities for each gun, each day. Each vehicle shall include at least one operator who shall be a technical expert in equipment operations and polyurea application techniques. Certification of equipment shall be provided at the pre-construction conference.

The mobile applicator shall include the following features:

- (a) Material Reservoirs. The applicator shall provide individual material reservoirs, or space for the storage of Part A and Part B of the resin composition.
- (b) Heating Equipment. The applicator shall be equipped with heating equipment of sufficient capacity to maintain the individual resin components at the manufacturer's recommended temperature of ± 5 °F (± 2.8 °C) for spray application.
- (c) Dispensing Equipment. The applicator shall be equipped with glass bead and/or reflective element dispensing equipment. The applicator shall be capable of applying the glass beads and/or reflective elements at a rate and combination indicated by the manufacturer.
- (d) Volumetric Usage. The applicator shall be equipped with metering devices or pressure gauges on the proportioning pumps as well as stroke counters to monitor volumetric usage. Metering devices or pressure gauges and stroke counters shall be visible to the Engineer.

- (e) Pavement Marking Placement. The applicator shall be equipped with all the necessary spray equipment, mixers, compressors and other appurtenances to allow for the placement of reflectorized pavement markings in a simultaneous sequence of operations.

The Contractor shall provide an accurate temperature-measuring device(s) that shall be capable of measuring the pavement temperature prior to application of the material, the material temperature at the gun tip and the material temperature prior to mixing.

CONSTRUCTION REQUIREMENTS

General. The pavement shall be cleaned by a method approved by the Engineer to remove all dirt, grease, glaze, or any other material that would reduce the adhesion of the markings with minimum or no damage to the pavement surface. New portland cement concrete pavements shall be air-blast-cleaned to remove all latents.

Widths, lengths, and shapes of the cleaned surface shall be of sufficient size to include the full area of the specified pavement marking to be placed.

The cleaning operation shall be a continuous moving operation process with minimum interruption to traffic.

Markings shall be applied to the cleaned surfaces on the same calendar day. If this cannot be accomplished, the surface shall be re-cleaned prior to applying the markings. No markings shall be applied until the Engineer approves the cleaning.

The pavement markings shall be applied to the cleaned road surface, during conditions of dry weather and subsequently dry pavement surfaces at a minimum uniform wet thickness of 15 mils (0.4 mm) according to the manufacturer's installation instructions. On new hot-mix asphalt (HMA) surfaces the pavement markings shall be applied at a minimum uniform wet thickness of 20 mils (0.5 mm). The application of and combination of reflective media (glass beads and/or reflective elements) shall be applied at a rate specified by the manufacturer. At the time of installation the pavement surface temperature and the ambient temperature shall be above 40 °F (4 °C) and rising.

The pavement markings shall not be applied if the pavement shows any visible signs of moisture or it is anticipated that damage causing moisture, such as rain showers, may occur during the installation and set periods. The Engineer will determine the atmospheric conditions and pavement surface conditions that produce satisfactory results.

Using the application equipment, the pavement markings shall be applied in the following manner, as a simultaneous operation:

- (a) The surface shall be air-blasted to remove any dirt and residue.
- (b) The resin shall be mixed and heated according to manufacturer's recommendations and sprayed onto the pavement surface.

The edge of the center line or lane line shall be offset a minimum distance of 2 in. (50 mm) from a longitudinal crack or joint. Edge lines shall be approximately 2 in. (50 mm) from the edge of pavement. The finished center and lane lines shall be straight, with the lateral deviation of any 10 ft (3 m) line not to exceed 1 in. (25 mm).

Notification. The Contractor shall notify the Engineer 72 hours prior to the placement of the markings in order that he/she can be present during the operation. At the time of notification, the Contractor shall provide the Engineer the manufacturer and lot numbers of polyurea and reflective media that will be used.

Inspection. The polyurea pavement markings will be inspected following installation according to Article 780.10 of the Standard Specifications, except, no later than December 15, and inspected following a winter performance period that extends 180 days from December 15.

Method of Measurement. This work will be measured for payment as follows:

- (a) Contract Quantities. The requirements for the use of contract quantities shall be according to Article 202.07(a).
- (b) Measured Quantities. Lines will be measured for payment in place in feet (meters). Double yellow lines will be measured as two separate lines.

Basis of Payment. This work will be paid for at the contract unit price per foot (meter) for POLYUREA PAVEMENT MARKING TYPE I – LINE of the line width specified or for POLYUREA PAVEMENT MARKING TYPE II – LINE of the line width specified.

PORTLAND CEMENT CONCRETE PLANTS (BDE)

Effective: January 1, 2007

Add the following to Article 1020.11(a) of the Standard Specifications.

- “(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 their mean strength shall not exceed 450 psi (3100 kPa) compressive and 80 psi (550 kPa) flexural. The strength standard deviation for each plant shall not exceed 650 psi (4480 kPa) compressive and 110 psi (760 kPa) flexural. The mean and standard deviation requirements shall apply to the test of record. 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 until the haul time difference is corrected.”

PRECAST CONCRETE HANDLING HOLES (BDE)

Effective: January 1, 2007

Add the following to Article 540.02 of the Standard Specifications:

“(g) Handling Hole Plugs 1042.16”

Add the following paragraph after the sixth paragraph of Article 540.06 of the Standard Specifications:

“Handling holes shall be filled with a precast concrete plug and sealed with mastic or mortar, or filled with a polyethylene plug. The plug shall not project beyond the inside surface after installation. When metal lifting inserts are used, their sockets shall be filled with mastic or mortar.”

Add the following to Article 542.02 of the Standard Specifications:

“(ee) Handling Hole Plugs 1042.16”

Revise the fifth paragraph of Article 542.04(d) of the Standard Specifications to read:

“Handling holes in concrete pipe shall be filled with a precast concrete plug and sealed with mastic or mortar; or filled with a polyethylene plug. The plug shall not project beyond the inside surface after installation.”

Add the following to Article 550.02 of the Standard Specifications:

“(o) Handling Hole Plugs 1042.16”

Replace the fourth sentence of the fifth paragraph of Article 550.06 of the Standard Specifications with the following:

“Handling holes in concrete pipe shall be filled with a precast concrete plug and sealed with mastic or mortar; or filled with a polyethylene plug. The plug shall not project beyond the inside surface after installation.”

Add the following to Article 602.02 of the Standard Specifications:

“(p) Handling Hole Plugs 1042.16(a)”

Replace the fifth sentence of the first paragraph of Article 602.07 of the Standard Specifications with the following:

“Handling holes shall be filled with a precast concrete plug and sealed with mastic or mortar. The plug shall not project beyond the inside surface after installation. When metal lifting inserts are used, their sockets shall be filled with mastic or mortar.”

Add the following to Section 1042 of the Standard Specifications:

“**1042.16 Handling Hole Plugs.** Plugs for handling holes in precast concrete products shall be as follows.

- (a) Precast Concrete Plug. The precast concrete plug shall have a tapered shape and shall have a minimum compressive strength of 3000 psi (20,700 kPa) at 28 days.

- (b) Polyethylene Plug. The polyethylene plug shall have a “mushroom” shape with a flat round top and a stem with three different size ribs. The plug shall fit snugly and cover the handling hole.

The plug shall be according to the following.

Mechanical Properties	Test Method	Value (min.)
Flexural Modulus	ASTM D 790	3300 psi (22,750 kPa)
Tensile Strength (Break)	ASTM D 638	1600 psi (11,030 kPa)
Tensile Strength (Yield)	ASTM D 638	1200 psi (8270 kPa)

Thermal Properties	Test Method	Value (min.)
Brittle Temperature	ASTM D 746	-49 °F (-45 °C)
Vicat Softening Point	ASTM D 1525	194 °F (90 °C)”

REFLECTIVE SHEETING ON CHANNELIZING DEVICES (BDE)

Effective: April 1, 2007

Revised: November 1, 2008

Revise the seventh paragraph of Article 1106.02 of the Standard Specifications to read:

“At the time of manufacturing, the retroreflective prismatic sheeting used on channelizing devices shall meet or exceed the initial minimum coefficient of retroreflection as specified in the following table. Measurements shall be conducted according to ASTM E 810, without averaging. Sheeting used on cones, drums and flexible delineators shall be reboundable as tested according to ASTM D 4956. Prestriped sheeting for rigid substrates on barricades shall be white and orange. **The sheeting shall be uniform in color and devoid of streaks throughout the length of each roll. The color shall conform to the latest appropriate standard color tolerance chart issued by the U.S. Department of Transportation, Federal Highway Administration, and to the daytime and nighttime color requirements of ASTM D 4956.**

Initial Minimum Coefficient of Retroreflection candelas/foot candle/sq ft (candelas/lux/sq m) of material				
Observation Angle (deg.)	Entrance Angle (deg.)	White	Orange	Fluorescent Orange
0.2	-4	365	160	150
0.2	+30	175	80	70
0.5	-4	245	100	95
0.5	+30	100	50	40”

Revise the first sentence of the first paragraph of Article 1106.02(c) of the Standard Specifications to read:

“Barricades and vertical panels shall have alternating white and orange stripes sloping downward at 45 degrees toward the side on which traffic will pass.”

Revise the third sentence of the first paragraph of Article 1106.02(d) of the Standard Specifications to read:

“The bottom panels shall be 8 x 24 in. (200 x 600 mm) with alternating white and orange stripes sloping downward at 45 degrees toward the side on which traffic will pass.”

REINFORCEMENT BARS (BDE)

Effective: November 1, 2005

Revised: April 1, 2009

Revise Article 1006.10(a) of the Standard Specifications to read:

“(a) Reinforcement Bars. Reinforcement bars will be accepted according to the current Bureau of Materials and Physical Research Policy Memorandum, “Reinforcement Bar and/or Dowel Bar Plant Certification Procedure”. The Department will maintain an approved list of producers.

(1) Reinforcement Bars (Non-Coated). Reinforcement bars shall be according to ASTM A 706 (A 706M), Grade 60 (420) for deformed bars and the following.

- a. For straight bars furnished in cut lengths and with a well-defined yield point, the yield point shall be determined as the elastic peak load, identified by a halt or arrest of the load indicator before plastic flow is sustained by the bar and dividing it by the nominal cross-sectional area of the bar.
- b. Tensile strength shall be a minimum of 1.20 times the yield strength.
- c. For bars straightened from coils or bars bent from fabrication, there shall be no upper limit on yield strength; and for bar designation Nos. 3 - 6 (10 - 19), the elongation after rupture shall be at least 9%.
- d. Heat Numbers. Bundles or bars at the construction site shall be marked or tagged with heat identification numbers of the bar producer.
- e. Guided Bend Test. Bars may be subject to a guided bend test across two pins which are free to rotate, where the bending force shall be centrally applied with a fixed or rotating pin of a certain diameter as specified in Table 3 of ASTM A 706 (A 706M). The dimensions and clearances of this guided bend test shall be according to ASTM E 190.
- f. Spiral Reinforcement. Spiral reinforcement shall be deformed or plain bars conforming to the above requirements or cold-drawn steel wire conforming to AASHTO M 32.

- (2) Epoxy Coated Reinforcement Bars. Epoxy coated reinforcement bars shall be according to Article 1006.10(a)(1) and shall be epoxy coated according to AASHTO M 284 (M 284M) and the following.
- a. Certification. 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 Department will maintain an approved list.
 - b. Coating Thickness. When spiral reinforcement is coated after fabrication, the thickness of the epoxy coating shall be 7 to 20 mils (0.18 to 0.50 mm).
 - c. Cutting Reinforcement. Reinforcement bars may be sheared or sawn to length after coating, providing the end damage to the coating does not extend more than 0.5 in. (13 mm) back and the cut is patched before any visible rusting appears. Flame cutting will not be permitted."

REINFORCEMENT BARS - STORAGE AND PROTECTION (BDE)

Effective: August 1, 2008

Revised: April 1, 2009

Revise Article 508.03 of the Standard Specifications to read:

“508.03 Storage and Protection. Reinforcement bars shall be stored off the ground using platforms, skids, or other supports; and shall be protected from mechanical injury and from deterioration by exposure. Epoxy coated bars shall be stored on wooden or padded steel cribbing and all systems for handling shall have padded contact areas. The bars or bundles shall not be dragged or dropped.

When epoxy coated bars are stored in a manner where they will be exposed to the weather more than 60 days prior to use, they shall be protected from deterioration such as that caused by sunlight, salt spray, and weather exposure. The protection shall consist of covering with opaque polyethylene sheeting or other suitable opaque material. The covering shall be secured and allow for air circulation around the bars to minimize condensation under the cover.

Covering of the epoxy coated bars will not be required when the bars are installed and tied, or when they are partially incorporated into the concrete.”

SEEDING (BDE)

Effective: July 1, 2004

Revised: January 1, 2009

Revise the following seeding mixtures shown in Table 1 of Article 250.07 of the Standard Specifications to read:

"Table 1 - SEEDING MIXTURES		
Class – Type	Seeds	lb/acre (kg/hectare)
2 Roadside Mixture 7/	Tall Fescue (Inferno, Tarheel II, Quest, Blade Runner, or Falcon IV)	100 (110)
	Perennial Ryegrass	50 (55)
	Creeping Red Fescue	40 (50)
	Red Top	10 (10)
2A Salt Tolerant Roadside Mixture 7/	Tall Fescue (Inferno, Tarheel II, Quest, Blade Runner, or Falcon IV)	60 (70)
	Perennial Ryegrass	20 (20)
	Red Fescue (Audubon, Sea Link, or Epic)	30 (20)
	Hard Fescue (Rescue 911, Spartan II, or Reliant IV)	30 (20)
	Fults Salt Grass 1/	60 (70)"

Revise Note 7 of Table 1 – Seeding Mixtures of Article 250.07 of the Standard Specifications to read:

“7/ In Districts 1 through 6, the planting times shall be April 1 to June 15 and August 1 to November 1. In Districts 7 through 9, the planting times shall be March 1 to June 1 and August 1 to November 15. Seeding may be performed outside these dates provided the Contractor guarantees a minimum of 75 percent uniform growth over the entire seeded area(s) after a period of establishment. Inspection dates for the period of establishment will be as follows: Seeding conducted in Districts 1 through 6 between June 16 and July 31 will be inspected after April 15 and seeding conducted between November 2 and March 31 will be inspected after September 15. Seeding conducted in Districts 7 through 9 between June 2 and July 31 will be inspected after April 15 and seeding conducted between November 16 and February 28 will be inspected after September 15. The guarantee shall be submitted to the Engineer in writing prior to performing the work. After the period of establishment, areas not exhibiting 75 percent uniform growth shall be interseeded or reseeded, as determined by the Engineer, at no additional cost to the Department.”

Revise Table II of Article 1081.04(c)(6) of the Standard Specifications to read:

TABLE II						
Variety of Seeds	Hard Seed %	Purity %	Pure Live Seed %	Weed %	Secondary * Noxious Weeds No. per oz (kg)	Notes
	Max.	Min.	Min.	Max.	Max. Permitted	
Alfalfa	20	92	89	0.50	6 (211)	1/
Clover, Alsike	15	92	87	0.30	6 (211)	2/
Red Fescue, Audubon	0	97	82	0.10	3 (105)	-
Red Fescue, Creeping	-	97	82	1.00	6 (211)	-
Red Fescue, Epic	-	98	83	0.05	1 (35)	-
Red Fescue, Sea Link	-	98	83	0.10	3 (105)	-
Tall Fescue, Blade Runner	-	98	83	0.10	2 (70)	-
Tall Fescue, Falcon IV	-	98	83	0.05	1 (35)	-
Tall Fescue, Inferno	0	98	83	0.10	2 (70)	-
Tall Fescue, Tarheel II	-	97	82	1.00	6 (211)	-
Tall Fescue, Quest	0	98	83	0.10	2 (70)	-
Fults Salt Grass	0	98	85	0.10	2 (70)	-
Kentucky Bluegrass	-	97	80	0.30	7 (247)	4/
Oats	-	92	88	0.50	2 (70)	3/
Redtop	-	90	78	1.80	5 (175)	3/
Ryegrass, Perennial, Annual	-	97	85	0.30	5 (175)	3/
Rye, Grain, Winter	-	92	83	0.50	2 (70)	3/
Hard Fescue, Reliant IV	-	98	83	0.05	1 (35)	-
Hard Fescue, Rescue 911	0	97	82	0.10	3 (105)	-
Hard Fescue, Spartan II	-	98	83	0.10	3 (105)	-
Timothy	-	92	84	0.50	5 (175)	3/
Wheat, hard Red Winter	-	92	89	0.50	2 (70)	3/

Revise the first sentence of the first paragraph of Article 1081.04(c)(7) of the Standard Specifications to read:

“The seed quantities indicated per acre (hectare) for Prairie Grass Seed in Classes 3, 3A, 4, 4A, 6, and 6A in Article 250.07 shall be the amounts of pure, live seed per acre (hectare) for each species listed.”

SELF-CONSOLIDATING CONCRETE FOR CAST-IN-PLACE CONSTRUCTION (BDE)

Effective: November 1, 2005

Revised: January 1, 2009

Definition. Self-consolidating concrete is a flowable mixture that does not require mechanical vibration for consolidation.

Usage. Self-consolidating concrete may be used for cast-in-place concrete construction items involving Class MS, DS, and SI concrete.

Materials. Materials shall be according to Section 1021 of the Standard Specifications.

Mix Design Criteria. Article 1020.04 of the Standard Specifications shall apply, except as follows:

- (a) The cement factor shall be according to Article 1020.04 of the Standard Specifications. If the maximum cement factor is not specified, it shall not exceed 7.05 cwt/cu yd (418 kg/cu m). The cement factor shall not be reduced if a water-reducing, retarding, or high range water-reducing admixture is used.
- (b) The maximum allowable water/cement ratio shall be according to Article 1020.04 of the Standard Specifications or 0.44, whichever is lower.
- (c) The slump requirements shall not apply.
- (d) The coarse aggregate gradations shall be CA 13, CA 14, CA 16, or a blend of these gradations. CA 11 may be used when the Contractor provides satisfactory evidence to the Engineer that the mix will not segregate. The fine aggregate proportion shall be a maximum 50 percent by weight (mass) of the total aggregate used.
- (e) The slump flow range shall be ± 2 in. (± 50 mm) of the Contractor target value, and within the overall Department range of 20 in. (510 mm) minimum to 28 in. (710 mm) maximum.
- (f) The visual stability index shall be a maximum of 1.
- (g) The J-ring value shall be a maximum of 4 in. (100 mm). The Contractor may specify a lower maximum in the mix design.
- (h) The L-box blocking ratio shall be a minimum of 60 percent. The Contractor may specify a higher minimum in the mix design.
- (i) The column segregation index shall be a maximum 15 percent.
- (j) The hardened visual stability index shall be a maximum of 1.

Test Methods. Illinois Test Procedures SCC-1, SCC-2, SCC-3, SCC-4, SCC-5, SCC-6, and Illinois Modified AASHTO T 22, 23, 121, 126, 141, 152, 177, 196, and 309 shall be used for testing of self-consolidating concrete mixtures.

Mix Design Submittal. The Contractor's Level III PCC Technician shall submit a mix design according to the "Portland Cement Concrete Level III Technician" course manual, except target slump information is not applicable and will not be required. However, a slump flow target range shall be submitted. In addition, the design mortar factor may exceed 1.10 and durability test data will be waived.

A J-ring value shall be submitted if a lower mix design maximum will apply. An L-box blocking ratio shall be submitted if a higher mix design minimum will apply. The Contractor shall also indicate applicable construction items for the mix design.

Trial mixture information will be required by the Engineer. A trial mixture is a batch of concrete tested by the Contractor to verify the Contractor's mix design will meet specification requirements. Trial mixture information shall include test results as specified in the "Portland Cement Concrete Level III Technician" course manual. Test results shall also include slump flow, visual stability index, J-ring value, L-box blocking ratio, column segregation index, and hardened visual stability index. For the trial mixture, the slump flow shall be near the midpoint of the proposed slump flow target range.

Trial Batch. A minimum 2 cu yd (1.5 cu m) trial batch shall be produced, and the self-consolidating concrete admixture dosage proposed by the Contractor shall be used. The slump flow shall be within 1.0 in. (25 mm) of the maximum slump flow range specified by the Contractor, and the air content shall be within the top half of the allowable specification range.

The trial batch shall be scheduled a minimum of 21 calendar days prior to anticipated use and shall be performed in the presence of the Engineer.

The Contractor shall provide the labor, equipment, and materials to test the concrete. The mixture will be evaluated by the Engineer for strength, air content, slump flow, visual stability index, J-ring value, L-box blocking ratio, column segregation index, and hardened visual stability index.

Upon review of the test data from the trial batch, the Engineer will verify or deny the use of the mix design and notify the Contractor. Verification by the Engineer will include the Contractor's target slump flow range. If applicable, the Engineer will verify the Contractor's maximum J-ring value and minimum L-box blocking ratio.

A new trial batch will be required whenever there is a change in the source of any component material, proportions beyond normal field adjustments, dosage of the self-consolidating concrete admixture, batch sequence, mixing speed, mixing time, or as determined by the Engineer. The testing criteria for the new trial batch will be determined by the Engineer.

When necessary, the trial batches shall be disposed of according to Article 202.03 of the Standard Specifications.

Mixing Portland Cement Concrete. In addition to Article 1020.11 of the Standard Specifications, the mixing time for central-mixed concrete shall not be reduced as a result of a mixer performance test. Truck-mixed or shrink-mixed concrete shall be mixed in a truck mixer for a minimum of 100 revolutions.

Wash water, if used, shall be completely discharged from the drum or container before the succeeding batch is introduced.

The batch sequence, mixing speed, and mixing time shall be appropriate to prevent cement balls and mix foaming for central-mixed, truck-mixed, and shrink-mixed concrete.

Falsework and Forms. In addition to Articles 503.05 and 503.06 of the Standard Specifications, the Contractor shall ensure the design of the falsework and forms is adequate for the additional form pressure caused by the fluid concrete. Forms shall be tight to prevent leakage of fluid concrete.

When the form height for placing the self-consolidating concrete is greater than 10.0 ft (3.0 m), direct monitoring of form pressure shall be performed 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. A minimum of one sensor will be required below each point of concrete placement to measure the maximum pressure. The first sensor below the point of concrete placement shall be approximately 12 in. (300 mm) above the base of the formwork. Additional sensors shall be installed above the bottom sensor when the form height is greater than 10.0 ft (3.0 m) above the bottom sensor. The additional sensors shall be installed at a maximum vertical spacing of 10.0 ft (3.0 m). 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.

Placing and Consolidating. Concrete placement and consolidation shall be according to Article 503.07 of the Standard Specifications, except as follows:

Revise the third paragraph of Article 503.07 of the Standard Specifications to read:

“Open troughs and chutes shall extend as nearly as practicable to the point of deposit. The drop distance of concrete shall not exceed 5 ft (1.5 m). If necessary, a tremie shall be used to meet this requirement. The maximum distance of horizontal flow from the point of deposit shall be 25 ft (7.6 m), unless approved otherwise by the Engineer. For drilled shafts, free fall placement will not be permitted.”

Delete the seventh, eighth, ninth, and tenth paragraphs of Article 503.07 of the Standard Specifications.

Add to the end of the eleventh paragraph of Article 503.07 of the Standard Specifications the following:

“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 shall be the pencil head type with a maximum diameter or width of 1 in. (25 mm). Any other method for restoring the fluidity of the concrete shall be approved by the Engineer.”

Quality Control by Contractor at Plant. The specified test frequencies for aggregate gradation, aggregate moisture, air content, unit weight/yield, and temperature shall be performed as indicated in the contract.

Slump flow, visual stability index, and J-ring or L-box tests shall be performed as needed to control production. The column segregation index test and hardened visual stability index test will not be required to be performed at the plant.

Quality Control by Contractor at Jobsite. The specified test frequencies for air content, strength, and temperature shall be performed as indicated in the contract.

Slump flow, visual stability index, and J-ring or L-box tests shall be performed on the first two truck deliveries of the day, and every 50 cu yd (40 cu m) thereafter. The Contractor shall select either the J-ring or L-box test for jobsite testing.

The column segregation index test will not be required to be performed at the jobsite. The hardened visual stability index test shall be performed on the first truck delivery of the day, and every 300 cu yd (230 cu m) thereafter. Slump flow, visual stability index, J-ring value or L-box blocking ratio, air content, and concrete temperature shall be recorded for each hardened visual stability index test.

The Contractor shall retain all hardened visual stability index cut cylinder specimens until the Engineer notifies the Contractor that the specimens may be discarded.

If mix foaming or other potential detrimental material is observed during placement or at the completion of the pour, the material shall be removed while the concrete is still plastic.

Quality Assurance by Engineer at Plant. For air content and aggregate gradation, quality assurance independent sample testing and split sample testing will be performed as indicated in the contract.

For slump flow, visual stability index, and J-ring or L-box tests, quality assurance independent sample testing and split sample testing will be performed as determined by the Engineer.

Quality Assurance by Engineer at Jobsite. For air content and strength, quality assurance independent sample testing and split sample testing will be performed as indicated in the contract.

For slump flow, visual stability index, J-ring or L-box, and hardened visual stability index tests, quality assurance independent sample testing will be performed as determined by the Engineer.

For slump flow and visual stability index quality assurance split sample testing, the Engineer will perform tests at the beginning of the project on the first three tests performed by the Contractor. Thereafter, a minimum of ten percent of total tests required of the Contractor will be performed per plant, which will include a minimum of one test per mix design. The acceptable limit of precision will be 1.5 in. (40 mm) for slump flow and a limit of precision will not apply to the visual stability index.

For the J-ring or the L-box quality assurance split sample testing, a minimum of 80 percent of the total tests required of the Contractor will be witnessed by the Engineer per plant, which will include a minimum of one witnessed test per mix design. The Engineer reserves the right to conduct quality assurance split sample testing. The acceptable limit of precision will be 1.5 in. (40 mm) for the J-ring value and ten percent for the L-box blocking ratio.

For each hardened visual stability index test performed by the Contractor, the cut cylinders shall be presented to the Engineer for determination of the rating. The Engineer reserves the right to conduct quality assurance split sample testing. A limit of precision will not apply to the hardened visual stability index.

SELF-CONSOLIDATING CONCRETE FOR PRECAST PRODUCTS (BDE)

Effective: July 1, 2004

Revised: January 1, 2007

Definition. Self-consolidating concrete is a flowable mixture that does not require mechanical vibration for consolidation.

Usage. Self-consolidating concrete may be used for precast concrete products.

Materials. Materials shall be according to Section 1021 of the Standard Specifications.

Mix Design Criteria. The mix design criteria shall be as follows:

- (a) The minimum cement factor shall be according to Article 1020.04 of the Standard Specifications. If the maximum cement factor is not specified, it shall not exceed 7.05 cwt/cu yd (418 kg/cu m).
- (b) The maximum allowable water/cement ratio shall be according to Article 1020.04 of the Standard Specifications or 0.44, whichever is lower.
- (c) The slump requirements of Article 1020.04 of the Standard Specifications shall not apply.
- (d) The coarse aggregate gradations shall be CA 13, CA 14, CA 16, or a blend of these gradations. CA 11 may be used when the Contractor provides satisfactory evidence to the Engineer that the mix will not segregate. The fine aggregate proportion shall be a maximum 50 percent by weight (mass) of the total aggregate used.
- (e) The slump flow range shall be ± 2 in. (± 50 mm) of the Contractor target value, and within the overall Department range of 20 in. (510 mm) minimum to 28 in. (710 mm) maximum.
- (f) The visual stability index shall be a maximum of 1.
- (g) The J-ring value shall be a maximum of 4 in. (100 mm). The Contractor may specify a lower maximum in the mix design.

- (h) The L-box blocking ratio shall be a minimum of 60 percent. The Contractor may specify a higher minimum in the mix design.
- (i) The column segregation index shall be a maximum 15 percent.
- (j) The hardened visual stability index shall be a maximum of 1.

Placing and Consolidating. The maximum distance of horizontal flow from the point of deposit shall be 25 ft (7.6 m), unless approved otherwise by the Engineer.

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 shall be the pencil head type with a maximum diameter or width of 1 in. (25 mm). Any other method for restoring the fluidity of the concrete shall be approved by the Engineer.

Mix Design Approval. The Contractor shall obtain mix design approval according to the Department's Policy Memorandum "Quality Control/Quality Assurance Program for Precast Concrete Products".

SILT FILTER FENCE (BDE)

Effective: January 1, 2008

For silt filter fence fabric only, revise Article 1080.02 of the Standard Specifications to read:

"1080.02 Geotextile Fabric. The fabric for silt filter fence shall be a woven fabric meeting the requirements of AASHTO M 288 for unsupported silt fence with less than 50 percent geotextile elongation."

Replace the last sentence of Article 1081.15(b) of the Standard Specifications with the following:

"Silt filter fence stakes shall be a minimum of 4 ft (1.2 m) long and made of either wood or metal. Wood stakes shall be 2 in. x 2 in. (50 mm x 50 mm). Metal stakes shall be a standard T or U shape having a minimum weight (mass) of 1.32 lb/ft (600 g/300 mm)."

STONE GRADATION TESTING (BDE)

Effective: November 1, 2007

Revise the first sentence of note 1/ of the Erosion Protection and Sediment Control Gradations table of Article 1005.01(c)(1) of the Standard Specifications to read:

"A maximum of 15 percent of the total test sample by weight may be oversize material."

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: April 2, 2005

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 in accordance with 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.

This provision shall be incorporated directly or by reference into each subcontract approved by the Department.

TEMPORARY EROSION CONTROL (BDE)

Effective: November 1, 2002

Revised: January 1, 2008

Revise the third paragraph of Article 280.03 of the Standard Specifications to read:

“Erosion control systems shall be installed prior to beginning any activities which will potentially create erodible conditions. Erosion control systems for areas outside the limits of construction such as storage sites, plant sites, waste sites, haul roads, and Contractor furnished borrow sites shall be installed prior to beginning soil disturbing activities at each area. These offsite systems shall be designed by the Contractor and be subject to the approval of the Engineer.”

Add the following paragraph after the third paragraph of Article 280.03 of the Standard Specifications:

“The temporary erosion and sediment control systems shown on the plans represent the minimum systems anticipated for the project. Conditions created by the Contractor's operations, or for the Contractor's convenience, which are not covered by the plans, shall be protected as directed by the Engineer at no additional cost to the Department. Revisions or modifications of the erosion and sediment control systems shall have the Engineer's written approval.”

Add the following paragraph after the ninth paragraph of Article 280.07 of the Standard Specifications:

“Temporary or permanent erosion control systems required for areas outside the limits of construction will not be measured for payment.”

Delete the tenth (last) paragraph of Article 280.08 of the Standard Specifications.

THERMOPLASTIC PAVEMENT MARKINGS (BDE)

Effective: January 1, 2007

Revise Article 1095.01(a)(2) of the Standard Specifications to read:

“(2) Pigment. The pigment used for the white thermoplastic compound shall be a high-grade pure (minimum 93 percent) titanium dioxide (TiO₂). The white pigment content shall be a minimum of ten percent by weight and shall be uniformly distributed throughout the thermoplastic compound.

The pigments used for the yellow thermoplastic compound shall not contain any hazardous materials listed in the Environmental Protection Agency Code of Federal Regulations (CFR) 40, Section 261.24, Table 1. The combined total of RCRA listed heavy metals shall not exceed 100 ppm when tested by X-ray fluorescence spectroscopy. The pigments shall also be heat resistant, UV stable and color-fast yellows, golds, and oranges, which shall produce a compound which shall match Federal Standard 595 Color No. 33538. The pigment shall be uniformly distributed throughout the thermoplastic compound.”

Revise Article 1095.01(b)(1)e. of the Standard Specifications to read:

“e. Daylight Reflectance and Color. The thermoplastic compound after heating for four hours ± five minutes at 425 ± 3 °F (218.3 ± 2 °C) and cooled at 77 °F (25 °C) shall meet the following requirements for daylight reflectance and color, when tested, using a color spectrophotometer with 45 degree circumferential/zero degree geometry, illuminant C, and two degree observer angle. The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm.

White: Daylight Reflectance75 percent min.

*Yellow: Daylight Reflectance45 percent min.

*Shall meet the coordinates of the following color tolerance chart.

x	0.490	0.475	0.485	0.530
y	0.470	0.438	0.425	0.456”

Revise Article 1095.01(b)(1)k. of the Standard Specifications to read:

- “k. Accelerated Weathering. After heating the thermoplastic for four hours \pm five minutes at 425 ± 3 °F (218.3 ± 2 °C) the thermoplastic shall be applied to a steel wool abraded aluminum alloy panel (Federal Test Std. No. 141, Method 2013) at a film thickness of 30 mils (0.70 mm) and allowed to cool for 24 hours at room temperature. The coated panel shall be subjected to accelerated weathering using the light and water exposure apparatus (fluorescent UV - condensation type) for 75 hours according to ASTM G 53 (equipped with UVB-313 lamps).

The cycle shall consist of four hours UV exposure at 122 °F (50 °C) followed by four hours of condensation at 104 °F (40 °C). UVB 313 bulbs shall be used. At the end of the exposure period, the panel shall not exceed 10 Hunter Lab Delta E units from the original material.”

TRAINING SPECIAL PROVISIONS

This Training Special Provision supersedes Section 7b of the Special Provision entitled “Specific Equal Employment Opportunity Responsibilities,” and is in implementation of 23 U.S.C. 140(a).

As part of the contractor’s equal employment opportunity affirmative action program, training shall be provided as follows:

The contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved. The number of trainees to be trained under this contract will be 2. In the event the contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor’s needs and the availability of journeymen in the various classifications within the reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to the Illinois Department of Transportation for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g. by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Illinois Department of Transportation and the Federal Highway Administration. The Illinois Department of Transportation and the Federal Highway Administration shall approve a program, if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period.

Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved by not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Illinois Department of Transportation and the Federal Highway Administration. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirement of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program.

It is not required that all trainees be on board for the entire length of the contract. A contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The contractor shall furnish the trainee a copy of the program he will follow in providing the training. The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily complete.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

METHOD OF MEASUREMENT The unit of measurement is in hours.

BASIS OF PAYMENT This work will be paid for at the contract unit price of 80 cents per hour for TRAINEES. The estimated total number of hours, unit price and total price have been included in the schedule of prices.

JACK AND REMOVE EXISTING BEARINGS

Effective: April 20, 1994

Revised: January 1, 2007

Description: This work consists of furnishing all labor, tools and equipment for jacking and supporting the existing beams/slab while removing the bearing assembly. The Contractor is responsible for the complete design of the bridge lifting procedures and the materials used. The Contractor shall furnish and place all bracing, shoring, blocking, cribbing, temporary structural steel, timber, shims, wedges, hydraulic jacks, and any other materials and equipment necessary for safe and proper execution of the work. The Contractor shall remove and dispose of the bearings according to Article 501.05 of the Standard Specifications.

Construction Requirements: The Contractor shall submit details and calculations of his/her proposed jacking systems and temporary support procedures for approval by the Engineer before commencing work. At any time during the bridge raising operations, the Engineer may require the Contractor to provide additional supports or measures in order to furnish an added degree of safety. The Contractor shall provide such additional supports or measures at no additional cost to the Department. Neither added precautions nor the failure of the Engineer to order additional protection will in any way relieve the Contractor of sole responsibility for the safety of lives, equipment and structure.

- (a) Jack and Remove Existing Bearings with bridge deck in place. Jacking and cribbing under and against the existing diaphragms, if applicable, will not be allowed. The Contractor's jacking plans and procedures shall be designed and sealed by an Illinois Licensed Structural Engineer.

In all cases, traffic shall be removed from the portion of the structure to be jacked prior to and during the entire time the load is being supported by the hydraulic pressure of the jack(s). The minimum jack capacity per beam shall be as noted in the plans. Whenever possible, traffic shall be kept off that portion of the structure during the entire bearing replacement operation. The shoring or cribbing supporting the beam(s) during bearing replacement shall be designed to support the dead load plus one half of the live load and impact shown in the plans. If traffic cannot be kept off that portion of the structure during the bearing replacement then the shoring or cribbing supporting the beam(s) shall be designed to support the dead load and full live load and impact shown in the plans.

No jacking shall be allowed during the period of placement and cure time required for any concrete placed in the span(s) contributing loads to the bearings to be jacked and removed.

Jacking shall be limited to 1/8 in. (4 mm) maximum when jacking one bearing at a time. Simultaneous jacking of all beams at one support may be performed provided the maximum lift is 1/4 in. (7 mm) and the maximum differential displacement between adjacent beams is 1/8 in. (4 mm). Suitable gauges for the measurement of superstructure movement shall be furnished and installed by the Contractor.

- (b) Jack and Remove Existing Bearings when entire bridge deck is removed. Jacking and bearing removal shall be done after the removal of the existing bridge deck is complete. The Contractor's plans and procedures for the proposed jacking and cribbing system shall be designed and sealed by an Illinois Licensed Structural Engineer, unless jacking can be accomplished directly from the bearing seat under the beams or girders.

Jacking shall be limited to 1/4 in. (7 mm) maximum when jacking one beam at a time. Simultaneous jacking of all beams at one support may be performed provided the maximum lift is 3/4 in. (19 mm) and the maximum differential displacement between adjacent beams is 1/4 in. (7 mm). When staged construction is utilized, simultaneous jacking of all beams shall be limited to 1/4 in. (7 mm) unless the diaphragms at the stage line are disconnected, in which case the maximum lift is 3/4 in. (19 mm). Suitable gauges for the measurement of superstructure movement shall be furnished and installed by the Contractor.

The Contractor shall be responsible for restoring to their original condition, prior to jacking, the drainage ditches, pavement, or slopewall disturbed by the cribbing footings.

Basis of Payment: This work will be paid for at the contract unit price each for JACK AND REMOVE EXISTING BEARINGS.

CLEANING AND PAINTING CONTACT SURFACE AREAS OF EXISTING STEEL STRUCTURES

Effective: June 30, 2003

Revised: January 1, 2007

Description. This work shall consist of the surface preparation and painting of existing steel structures in areas that will be in contact with new steel.

The existing steel at primary connections (faying surfaces) shall be prepared, and primed as specified herein prior to connecting new structural steel to the existing structure.

The existing steel at secondary connections shall be prepared, and if bare metal is exposed, primed as specified herein prior to connecting new structural steel to the existing structure.

General. The existing coatings shall be assumed to contain lead and may also contain other toxic metals. Any plans that may be furnished for the work, and any dimensions or other information given regarding a structure, are only for the purpose of assisting bidders in determining the type and location of steel to be cleaned and painted. It is the responsibility of the Contractor to verify this information and the accuracy of the information provided shall in no way affect the price bid for structural steel.

Materials. The Bureau of Materials and Physical Research has established a list of all products that have met preliminary requirements. Each batch of material must be tested and approved before use.

The paint materials shall meet the requirements of the following articles of the Standard Specification:

Item Article

- a) Organic Zinc Rich Primer (Note 1)
- b) Aluminum Epoxy Mastic 1008.03

Note 1: These material requirements shall be according to the Special Provision for the Organic Zinc-Rich Paint System.

Submittals:

- a) Manufacturer's application instructions and product data sheets. Copies of the paint manufacturer's application instructions and product data sheets shall be furnished to the Engineer at the field site before steel cleaning begins.
- b) Waste Management Plan. The Waste Management Plan shall address all aspects of waste handling, storage, testing, hauling and disposal. Include the names, addresses, and a contact person for the proposed licensed waste haulers and disposal facilities. Submit the name and qualifications of the laboratory proposed for Toxicity Characteristic Leaching Procedure (TCLP) analysis.
- c) Quality Control (QC) Program. The QC Program shall identify the following; the instrumentation that will be used, a schedule of required measurements and observations, procedures for correcting unacceptable work, and procedures for improving surface preparation and painting quality as a result of quality control findings.

Construction Requirements. The Contractor shall perform first line, in process QC inspections. The Contractor shall implement the submitted and accepted QC Program to insure that the work accomplished complies with these specifications. The designated Quality Control inspector shall be onsite full time during any operations that affect the quality of the coating system (e.g., surface preparation, coating mixing and application, and evaluations between coats and upon completion of the work). The Contractor shall provide artificial lighting in areas where natural light is inadequate, as determined by the Engineer, to allow proper cleaning, inspection, and painting. Illumination for inspection shall be at least 30 foot candles (325 LUX). Illumination for cleaning and priming, including the working platforms, access, and entryways shall be at least 20 foot candles (215 LUX).

The Contractor shall be responsible for any damage caused to persons, vehicles, or property, except as indemnified by the Response Action Contractor Indemnification Act. Whenever the intended purposes of the protective devices are not being accomplished, as determined by the Engineer, work shall be immediately suspended until corrections are made. Painted surfaces damaged by any Contractor's operation shall be removed and repainted, as directed by the Engineer, at the Contractor's expense.

Weather Conditions. Surfaces to be primed after cleaning shall remain free of moisture and other contaminants. The Contractor shall control his/her operations to insure that dust, dirt, or moisture does not come in contact with surfaces cleaned prior to painting. Surfaces painted shall be protected until the coating is sufficiently cured to protect itself from damage.

Restrictions on ambient conditions shall be as per the coating manufacturer's written specifications.

Surface Preparation: Prior to making connections or painting, all loose abrasives, paint, and residue shall be contained, collected, removed from the surface area and properly disposed of as specified later in this specification.

Painted surfaces of new steel damaged by abrasive blasting or by the Contractor's operations shall be repainted, as directed by the Engineer, at the Contractor's expense.

- a) **Primary Connections.** Primary connections shall be defined as faying (contact) surfaces of high-strength bolted splices in main, load-carrying members, end diaphragms, end cross-frames, and other areas specifically noted in plans (such as cross-frame connections on curved girders, etc.). These will typically occur where existing splices are replaced or new splices are added.

The surfaces of existing steel in all areas that will be in direct contact with new steel shall be prepared according to SSPC-SP15, Commercial Grade Power Tool Cleaning using vacuum-shrouded power tools equipped with HEPA filtration. The surface preparation shall remove all rust, mill scale, and existing paint from the contact surface. At the Contractor's option, vacuum blast cleaning according to SSPC-SP6, Commercial Blast Cleaning may be substituted for SSPC-SP15 at no additional cost to the Department. The surface profile for primary connection surfaces shall be 1.5 to 3.5 mils (38 to 90 microns).

- b) **Secondary Connections.** Secondary connections shall be defined as all surface areas of existing members that will be in contact with new steel except as previously defined as primary connections.

These surfaces of existing steel in all areas that will be in direct contact with new steel shall be prepared according to SSPC-SP3, Power Tool Cleaning using vacuum-shrouded power tools equipped with HEPA filtration. The surface preparation shall remove all loose rust, loose mill scale, and loose, checked, alligatored and peeling paint from the contact surface. At the Contractor's option, vacuum blast cleaning according to SSPC-SP6, Commercial Blast Cleaning or SSPC-SP15, Commercial Grade Power Tool Cleaning may be substituted for SSPC-SP3 at no additional cost to the Department. The surface profile for abrasive blast cleaning and Commercial Grade Power Tool Cleaning shall be 1.5 to 3.5 mils (38 to 90 microns).

Painting. The manufacturer's written instructions shall be followed for paint storage, mixing, thinning, application, ambient conditions, and drying times between coats. The surface shall be free of dirt, dust, and debris prior to the application of any coat. The coatings shall be applied as a continuous film of uniform thickness free of defects including, but not limited to, runs, sags, overspray, dryspray, pinholes, voids, skips, misses, and shadow-through. Defects such as runs and sags shall be brushed out immediately during application.

The Engineer will approve surface preparation prior to priming.

- a) For Primary connections the surface of the prepared steel cleaned to bare metal shall be primed with an organic zinc rich primer between 3.5 and 5.0 mils (90 and 125 microns) dry film thickness.
- b) For Secondary Connections the surface of the prepared steel cleaned to bare metal shall be painted with one coat of epoxy mastic between 5 and 7 mils (125 microns to 180 microns) in thickness. Areas not cleaned to bare metal need not be painted.

The primer shall cure according to the manufacturers instructions prior to connecting new structural steel to the existing structure.

The surrounding coating at each prepared location shall be feathered for a minimum distance of 1 1/2 in. (40 mm) to achieve a smooth transition between the prepared areas and the existing coating.

Collection, Temporary Storage, Transportation and Disposal of Waste. The Contractor and the Department are considered to be co-generators of the waste.

The Contractor is responsible for all aspects of waste collection, testing and identification, handling, storage, transportation, and disposal according to these specifications and all applicable Federal, State, and Local regulations. The Contractor shall provide for Engineer review and acceptance a Waste Management Plan that addresses all aspects of waste handling, storage, and testing, and provides the names, addresses, and a contact person for the proposed licensed waste haulers and disposal facilities. The Department will not perform any functions relating to the waste other than provide EPA identification numbers, provide the Contractor with the emergency response information, the emergency response telephone number required to be provided on the manifest, and to sign the waste manifest. The Engineer will obtain the identification numbers from the state and federal environmental protection agencies for the bridge(s) to be painted and furnish those to the Contractor.

All surface preparation/paint residues shall be collected daily and deposited in all-weather containers supplied by the Contractor as temporary storage. The storage area shall be secure to prevent unauthorized entry or tampering with the containers. Acceptable measures include storage within a fully enclosed (e.g., fenced in) and locked area, within a temporary building, or implementing other reasonable means to reduce the possibility of vandalism or exposure of the waste to the public or the environment (e.g., securing the lids or covers of waste containers and roll-off boxes).

Waste shall not be stored outside of the containers. Waste shall be collected and transferred to bulk containers taking extra precautions as necessary to prevent the suspension of residues in air or contamination of surrounding surfaces. Precautions may include the transfer of the material within a tarpaulin enclosure. Transfer into roll-off boxes shall be planned to minimize the need for workers to enter the roll-off box.

No residues shall remain on uncontained surfaces overnight. Waste materials shall not be removed through floor drains or by throwing them over the side of the bridge. Flammable materials shall not be stored around or under any bridge structures.

The all-weather containers shall meet the requirements for the transportation of hazardous materials and as approved by the Department. Acceptable containers include covered roll-off boxes and 55-gallon drums (17H). The Contractor shall insure that no breaks and no deterioration of these containers occurs and shall maintain a written log of weekly inspections of the condition of the containers. A copy of the log shall be furnished to the Engineer upon request. The containers shall be kept closed and sealed from moisture except during the addition of waste. Each container shall be permanently identified with the date that waste was placed into the container, contract number, hazardous waste name and ID number, and other information required by the IEPA.

The Contractor shall have each waste stream sampled for each project and tested by TCLP and according to EPA and disposal company requirements. The Engineer shall be notified in advance when the samples will be collected. The samples shall be collected and shipped for testing within the first week of the project, with the results due back to the Engineer within 10 days. The costs of testing shall be considered included in this work. Copies of the test results shall be provided to the Engineer prior to shipping the waste.

The existing paint removed, together with the surface preparation media (e.g. abrasive) shall be handled as a hazardous waste, regardless of the TCLP results. The waste shall be transported by a licensed hazardous waste transporter, treated by an IEPA permitted treatment facility to a non-hazardous special waste and disposed of at an IEPA permitted disposal facility in Illinois.

The treatment/disposal facilities shall be approved by the Engineer, and shall hold an IEPA permit for waste disposal and waste stream authorization for this cleaning residue. The IEPA permit and waste stream authorization must be obtained prior to beginning cleaning, except that if necessary, limited paint removal will be permitted in order to obtain samples of the waste for the disposal facilities. The waste shall be shipped to the facility within 90 days of the first accumulation of the waste in the containers. When permitted by the Engineer, waste from multiple bridges in the same contract may be transported by the Contractor to a central waste storage location(s) approved by the Engineer in order to consolidate the material for pick up, and to minimize the storage of waste containers at multiple remote sites after demobilization. Arrangements for the final waste pickup shall be made with the waste hauler by the time blast cleaning operations are completed or as required to meet the 90 day limit stated above.

The Contractor shall submit a waste accumulation inventory table to the Engineer no later than the 5th day of the month. The table shall show the number and size of waste containers filled each day in the preceding month and the amount of waste shipped that month, including the dates of shipments.

The Contractor shall prepare a manifest supplied by the IEPA for off-site treatment and disposal before transporting the hazardous waste off-site. The Contractor shall prepare a land ban notification for the waste to be furnished to the disposal facility. The Contractor shall obtain the handwritten signature of the initial transporter and date of the acceptance of the manifest. The Contractor shall send one copy of the manifest to the IEPA within two working days of transporting the waste off-site. The Contractor shall furnish the generator copy of the manifest and a copy of the land ban notification to the Engineer. The Contractor shall give the transporter the remaining copies of the manifest.

All other project waste shall be removed from the site according to Federal, State and Local regulations, with all waste removed from the site prior to final Contractor demobilization.

The Contractor shall make arrangements to have other hazardous waste, which he/she generates, such as used paint solvent, transported to the Contractor's facility at the end of each day that this waste is generated. These hazardous wastes shall be manifested using the Contractor's own generator number to a treatment or disposal facility from the Contractor's facility. The Contractor shall not combine solvents or other wastes with cleaning residue wastes. All waste streams shall be stored in separate containers.

The Contractor is responsible for the payment of any fines and undertaking any clean up activities mandated by State or federal environmental agencies for improper waste handling, storage, transportation, or disposal.

Contractor personnel shall be trained in the proper handling of hazardous waste, and the necessary notification and clean up requirements in the event of a spill. The Contractor shall maintain a copy of the personnel training records at each bridge site.

It is understood and agreed that the cost of all work outlined above, unless otherwise specified, has been included in the bid, and no extra compensation will be allowed.

Basis of Payment: This work will be considered included in the cost of "Furnishing and Erecting Structural Steel", "Erecting Structural Steel", or "Structural Steel Repair", as applicable, according to the Standard Specifications, unless otherwise specified on the plans.

TEMPORARY SHEET PILING

Effective: September 2, 1994

Revised: January 1, 2007

Description: This work shall consist of furnishing, driving, adjusting for stage construction when required and subsequent removal of the sheet piling according to the dimensions and details shown on the plans and according to the applicable portions of Section 512 of the Standard Specifications.

This work shall also include furnishing, installing and subsequent removal of all miscellaneous steel shapes, plates and connecting hardware when required to attach the sheeting to an existing substructure unit and/or to facilitate stage construction.

General: The Contractor may propose other means of supporting the sides of the excavation provided they are done so at no extra cost to the department. If the Contractor elects to vary from the design requirements shown on the plans, the revised design calculations and details 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.

Material: The sheet piling shall be made of steel and may be new or used material, at the option of the Contractor. The sheet piling shall have a minimum section modulus as shown on the plans or in the approved Contractor's alternate design. The sheeting shall have a minimum yield strength of 38.5 ksi (265 MPa) unless otherwise specified. The sheeting, used by the Contractor, shall be identifiable and in good condition 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.

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 excavation. 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 excavation adjacent to the sheet piling in question. The Contractor shall not excavate below the maximum excavation line shown on the plans without the prior permission of the Engineer. The sheet piling shall remain in place until the Engineer determines it is no longer required.

The sheet piling 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 sheet piling leaving the remainder in place. The remaining sheet piling shall be a minimum of 12 in. (300 mm) below the finished grade or as directed by the Engineer. Removed sheet piling 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 it's presence was not obvious or specifically noted on the plans prior to bidding, that cannot be driven through or around with normal driving procedures, but requires additional excavation or other procedures to remove or miss the obstruction.

Method of Measurement: The temporary sheet piling will be measured for payment in place in square feet (square meter). Any temporary sheet piling cut off, left in place, or driven to dimensions other than those shown on the contract plans without the written permission of the Engineer, shall not be measured for payment but shall be done at the contractor's expense.

If the Contractor is unable to drive the sheeting to the specified tip elevation(s) and can demonstrate that any further effort to drive it would only result in damaging the sheeting, then the Contractor shall be paid based on the plan quantity of temporary sheeting involved. However, no additional payment will be made for any walers, bracing, or other supplement to the temporary sheet piling, which may be required as a result of the re-evaluation in order to insure the original design intent was met.

Basis of Payment: This work will be paid for at the contract unit price per square foot (square meter) for TEMPORARY SHEET PILING.

Payment for any 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.

POROUS GRANULAR EMBANKMENT, SPECIAL

Effective: September 28, 2005

Revised: November 14, 2008

Description. This work shall consist of furnishing and placing porous granular embankment special material as detailed on the plans, according to Section 207 except as modified herein.

Materials. The gradation of the porous granular material may be any of the following CA 8 thru CA 18, FA 1 thru FA 4, FA 7 thru FA 9, and FA 20 according to Articles 1003 and 1004.

Construction. The porous granular embankment special shall be installed according to Section 207, except that it shall be uncompacted.

Basis of Payment. This work will be paid for at the contract unit price per Cubic Yard (Cubic Meter) for POROUS GRANULAR EMBANKMENT, SPECIAL.

STRUCTURAL REPAIR OF CONCRETE

Effective: March 15, 2006

Revised: April 2, 2008

Description. This work shall consist of structurally repairing concrete.

Materials. Materials shall be according to the following.

Item	Article/Section
(a) Portland Cement Concrete (Note 1)	1020
(b) R1 or R2 Mortar (Note2)	
(c) Normal Weight Concrete (Note 3)	
(d) Shotcrete (High Performance) (Note 4)	
(e) Reinforcement Bars	1006.10

(f) Anchor Bolts	1006.09
(g) Water	1002
(h) Curing Compound (Type I)	1022
(i) Cotton Mats	1022.02
(j) Protective Coat	1023.01
(k) Epoxy (Note 5)	1025
(l) Mechanical Bar Splicers (Note 6)	

Note 1. The concrete shall be Class SI, except the cement factor shall be a minimum 6.65 cwt/cu. yd. (395 kg/cu. m), the coarse aggregate shall be a CA 16, and the strength shall be a minimum 4000 psi (27,500 kPa) compressive or 675 psi (4650 kPa) flexural at 14 days. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump, but the cement factor shall not be reduced. This cement factor restriction shall also apply if a water-reducing admixture is used.

Note 2. The R1 or R2 mortar shall be from the Department's approved list of Packaged, Dry, Rapid Hardening, Cementitious Materials for Concrete Repairs with coarse aggregate added. The amount of coarse aggregate added to the R1 or R2 Mortar shall be per the manufacturer's recommendations. The coarse aggregate gradation shall be CA 16 from an Aggregate Gradation Control System source or a packaged aggregate meeting Article 1004.02 with a maximum size of 1/2 in. (12.5 mm). The R1 or R2 Mortar and coarse aggregate mixture shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125175 mm) slump.

Note 3. The packaged concrete mixture shall be from the Department's approved list of Packaged, Dry, Formed, Concrete Repair Mixtures. The materials and preparation of aggregate shall be according to ASTM C 387. Proportioning shall be according to ASTM C 387, except the minimum cement factor shall be 6.65 cwt/cu. yd. (395 kg/cu. m). Cement replacement with fly ash or ground granulated blast-furnace slag shall be according to Section 1020. The coarse aggregate shall be a maximum size of 1/2 in. (12.5 mm). The packaged concrete mixture shall comply with the air content and strength requirements for Class SI concrete as indicated in Note 1. Mixing shall be per the manufacturer's recommendations, except the water/cement ratio shall not exceed the value specified for Class SI concrete as indicated in Note 1. A high range water-reducing admixture shall be used to obtain a 5-7 in. (125-175 mm) slump.

Note 4. A packaged, pre-blended, and dry combination of materials, for the wet-mix shotcrete method shall be provided according to ASTM C 1480. An accelerator is prohibited, except the shotcrete may be modified at the nozzle with a non-chloride accelerator for overhead applications. The shotcrete shall be Type FA, Grade FR, and Class I. The fibers shall be Type III synthetic according to ASTM C 1116.

The 7 and 28 day compressive strength requirements in ASTM C 1480 shall not apply. Instead the shotcrete shall obtain a minimum compressive strength of 4000 psi (27,500 kPa) at 14 days.

The packaged shotcrete shall be limited to the following proportions:

The cement and finely divided minerals shall be 6.05 cwt/cu. yd. (360 kg/cu. m) to 7.50 cwt/cu. yd. (445 kg/cu. m), and the cement shall not be below 4.70 cwt/cu. yd. (279 kg/cu. m).

Class F fly ash is optional and the maximum shall be 15 percent by weight (mass) of cement.

Class C fly ash is optional and the maximum shall be 20 percent by weight (mass) of cement.

Ground granulated blast-furnace slag is optional and the maximum shall be 25 percent by weight (mass) of cement.

Microsilica is required and shall be a minimum of 5 percent by weight (mass) of cement, and a maximum of 10 percent. As an alternative to microsilica, high-reactivity metakaolin may be used at a minimum of 5 percent by weight (mass) of cement, and a maximum of 10 percent.

Fly ash shall not be used in combination with ground granulated blast-furnace slag. Class F fly ash shall not be used in combination with Class C fly ash. Microsilica shall not be used in combination with high-reactivity metakaolin. A finely divided mineral shall not be used in combination with a blended hydraulic cement, except for microsilica or high-reactivity metakaolin.

The water/cement ratio shall be a maximum of 0.42.

The air content as shot shall be 4.0 – 8.0 percent.

Note 5. In addition ASTM C 881, Type IV, Grade 2 or 3, Class A, B, or C may be used.

Note 6. Mechanical bar splicers shall be from the approved list of Mechanical Reinforcing Bar Splicers / Coupler Systems, and shall be capable of developing in tension at least 125 percent of the yield strength of the existing reinforcement bar.

Equipment. Equipment shall be according to Article 503.03 and the following.

Chipping Hammer – The chipping hammer for removing concrete shall be a light-duty pneumatic or electric tool with a 15 lb. (7 kg) maximum class or less.

Blast Cleaning Equipment – Blast cleaning equipment for concrete surface preparation shall be the abrasive type, and the equipment shall have oil traps.

Hydrodemolition Equipment – Hydrodemolition equipment for removing concrete shall be calibrated, and shall use water according to Section 1002.

High Performance Shotcrete Equipment – The batching, mixing, pumping, hose, nozzle, and auxiliary equipment shall be for the wet-mix shotcrete method, and shall meet the requirements of ACI 506R.

Construction Requirements

General. The repair methods shall be either formed concrete repair or shotcrete. The repair method shall be selected by the Contractor with the following rules.

- (a) Rule 1. For formed concrete repair, a subsequent patch to repair the placement point after initial concrete placement will not be allowed. As an example, this may occur in a vertical location located at the top of the repair.
- (b) Rule 2. Formed concrete repair shall not be used for overhead applications.
- (c) Rule 3. Shotcrete shall not be used for column repairs greater than 4 in. (100 mm) in depth, or any repair location greater than 8 in. (205 mm) in depth. The only exception to this rule would be for a horizontal application, where the shotcrete may be placed from above in one lift.
- (d) Rule 4. If formed concrete repair is used for locations that have reinforcement with less than 0.75 in. (19 mm) of concrete cover, the concrete mixture shall contain fly ash or ground granulated blast-furnace slag at the maximum cement replacement allowed.

Temporary Shoring or Cribbing. When a temporary shoring or cribbing support system is required, the Contractor shall provide details and computations, prepared and sealed by an Illinois licensed Structural Engineer, to the Department for review and approval. When ever possible the support system shall be installed prior to starting the associated concrete removal. If no system is specified, but during the course of removal the need for temporary shoring or cribbing becomes apparent or is directed by the Engineer due to a structural concern, the Contractor shall not proceed with any further removal work until an appropriate and approved support system is installed.

Concrete Removal. The Contractor shall provide ladders or other appropriate equipment for the Engineer to mark the removal areas. Repair configurations will be kept simple, and squared corners will be preferred.

The repair perimeter shall be sawed a depth of 1/2 in. (13 mm) or less, as required to avoid cutting the reinforcement. If the concrete is broken or removed beyond the limits of the initial saw cut, the new repair perimeter shall be recut. The areas to be repaired shall have all loose, unsound concrete removed completely by the use of chipping hammers, hydrodemolition equipment, or other methods approved by the Engineer. The concrete removal shall extend along the reinforcement bar until the reinforcement is free of bond inhibiting corrosion. The outermost layer of reinforcement bar within the repair area shall be undercut to a depth of 3/4 in. (19 mm) or the diameter of the reinforcement bar, whichever value is larger. The underlying transverse reinforcement bar shall also be undercut as previously described, unless the reinforcement is not corroded, and the reinforcement bar is encased and well bonded to the surrounding concrete.

If sound concrete is encountered before existing reinforcement bars are exposed, further removal of concrete shall not be performed unless the minimum repair depth is not met.

The repair depth shall be a minimum of 1 in. (25 mm). The substrate profile shall be $\pm 1/16$ in. (± 1.5 mm). The perimeter of the repair area shall have a vertical face.

If a repair is located at the ground line, any excavation required below the ground line to complete the repair shall be included in this work.

The Contractor shall have a maximum of 14 calendar days to complete each repair location with concrete or shotcrete, once concrete removal has started for the repair.

The Engineer shall be notified of concrete removal that exceeds 6 in. (150 mm) in depth, one fourth the cross section of a structural member, more than half the vertical column reinforcement is exposed in a cross section, more than 6 consecutive reinforcement bars are exposed in any direction, within 1.5 in. (38 mm) of a bearing area, or other structural concern. Excessive deterioration or removal may require further evaluation of the structure or installation of temporary shoring and cribbing support system.

Surface Preparation. Prior to placing the concrete or shotcrete, the Contractor shall prepare the repair area and exposed reinforcement by blast cleaning. The blast cleaning shall provide a surface that is free of oil, dirt, and loose material.

If a succeeding layer of shotcrete is to be applied, the initial shotcrete surface and remaining exposed reinforcement shall be free of curing compound, oil, dirt, loose material, rebound (i.e. shotcrete material leaner than the original mixture which ricochets off the receiving surface), and overspray. Preparation may be by lightly brushing or blast cleaning if the previous shotcrete surface is less than 36 hours old. If more than 36 hours old, the surface shall be prepared by blast cleaning.

The repair area and perimeter vertical face shall have a rough surface. Care shall be taken to ensure the perimeter sawcut is roughened. Just prior to concrete or shotcrete placement, saturate the repair area with water to a saturated surface-dry condition. Any standing water shall be removed.

Concrete or shotcrete placement shall be done within 3 calendar days of the surface preparation or the repair area shall be prepared again.

Reinforcement. Exposed reinforcement bars shall be cleaned of concrete and corrosion by blast cleaning. After cleaning, all exposed reinforcement shall be carefully evaluated to determine if replacement or additional reinforcement bars are required.

Reinforcing bars that have been cut or have lost 25 percent or more of their original cross sectional area shall be supplemented by new in kind reinforcement bars. New bars shall be lapped a minimum of 32 bar diameters to existing bars. A mechanical bar splicer shall be used when it is not feasible to provide the minimum bar lap. No welding of bars shall be performed.

Intersecting reinforcement bars shall be tightly secured to each other using 0.006 in. (1.6 mm) or heavier gauge tie wire, and shall be adequately supported to minimize vibration during concrete placement or application of shotcrete.

For reinforcement bar locations with less than 0.75 in. (19 mm) of cover, protective coat shall be applied to the completed repair. The application of the protective coat shall be according to Article 503.19, 2nd paragraph, except blast cleaning shall be performed to remove curing compound.

The Contractor shall anchor the new concrete to the existing concrete with 3/4 in. (19 mm) diameter hook bolts for all repair areas where the depth of concrete removal is greater than 8 in. (205 mm) and there is no existing reinforcement extending into the repair area. The hook bolts shall be spaced at 15 in. (380 mm) maximum centers both vertically and horizontally, and shall be a minimum of 12 in. (305 mm) away from the perimeter of the repair. The hook bolts shall be installed according to Section 584.

Repair Methods. All repair areas shall be inspected and approved by the Engineer prior to placement of the concrete or application of the shotcrete.

- (a) Formed Concrete Repair. Falsework shall be according to Article 503.05. Forms shall be according to Article 503.06. Formwork shall provide a smooth and uniform concrete finish, and shall approximately match the existing concrete structure. Formwork shall be mortar tight and closely fitted where they adjoin the existing concrete surface to prevent leakage. Air vents may be provided to reduce voids and improve surface appearance. The Contractor may use exterior mechanical vibration, as approved by the Engineer, to release air pockets that may be entrapped.

The concrete for formed concrete repair shall be a Class SI Concrete, or a packaged R1 or R2 Mortar with coarse aggregate added, or a package Normal Weight Concrete at the Contractor's option. The concrete shall be placed and consolidated according to Article 503.07. The concrete shall not be placed when frost is present on the surface of the repair area, or the surface temperature of the repair area is less than 40 °F (4 °C). All repaired members shall be restored as close as practicable to their original dimensions.

Curing shall be done according to Article 1020.13.

If temperatures below 45°F (7°C) are forecast during the curing period, protection methods shall be used. Protection Method I according to Article 1020.13(d)(1), or Protection Method II according to Article 1020.13(d)(2) shall be used during the curing period.

The surfaces of the completed repair shall be finished according to Article 503.15.

- (b) Shotcrete. Shotcrete shall be tested by the Engineer for air content according to Illinois Modified AASHTO T 152. Obtain the sample in a damp, non-absorbent container from the discharge end of the nozzle.

For compressive strength of shotcrete, a 18 x 18 x 3.5 in. (457 x 457 x 89 mm) test panel shall be shot by the Contractor for testing by the Engineer. A steel form test panel shall have a minimum thickness of 3/16 in. (5 mm) for the bottom and sides. A wood form test panel shall have a minimum 3/4 in. (19 mm) thick bottom, and a minimum 1.5 in. (38 mm) thickness for the sides. The test panel shall be cured according to Article 1020.13 (a) (3) or (5) while stored at the jobsite and during delivery to the laboratory. After delivery to the laboratory for testing, curing and testing shall be according to ASTM C 1140.

The method of alignment control (i.e. ground wires, guide strips, depth gages, depth probes, and formwork) to ensure the specified shotcrete thickness and reinforcing bar cover is obtained shall be according to ACI 506R. Ground wires shall be removed after completion of cutting operations. Guide strips and formwork shall be of dimensions and a configuration that do not prevent proper application of shotcrete. Metal depth gauges shall be cut 1/4 in. (6 mm) below the finished surface. All repaired members shall be restored as close as practicable to their original dimensions.

The shotcrete shall not be applied when the air temperature is below 45°F (7°C) and falling or below 40°F (4°C). Shotcrete shall not be applied when the air temperature is greater than 90°F (32°C). The applied shotcrete shall have a minimum temperature of 50°F (10°C) and a maximum temperature of 90°F (32°C). The shotcrete shall not be applied during periods of rain unless protective covers or enclosures are installed. The shotcrete shall not be applied when frost is present on the surface of the repair area, or the surface temperature of the repair area is less than 40°F (4°C). If necessary, lighting shall be provided to provide a clear view of the shooting area.

The shotcrete shall be applied according to ACI 506R, and shall be done in a manner that does not result in cold joints, laminations, sandy areas, voids, sags, or separations. In addition, the shotcrete shall be applied in a manner that results in maximum densification of the shotcrete. Shotcrete which is identified as being unacceptable while still plastic shall be removed and re-applied.

The nozzle shall normally be at a distance of 2 to 5 ft. (0.6 to 1.5 m) from the receiving surface, and shall be oriented at right angles to the receiving surface. Exceptions to this requirement will be permitted to fill corners, encase large diameter reinforcing bars, or as approved by the Engineer. For any exception, the nozzle shall never be oriented more than 45 degrees from the surface. Care shall be taken to keep the front face of the reinforcement bar clean during shooting operations. Shotcrete shall be built up from behind the reinforcement bar. Accumulations of rebound and overspray shall be continuously removed prior to application of new shotcrete. Rebound material shall not be incorporated in the work.

Whenever possible, shotcrete shall be applied to the full thickness in a single layer. The maximum thickness shall be 4 in. (100 mm) unless the shotcrete is applied from above on a horizontal surface, or a thicker application is approved by the Engineer. When two or more layers are required, the minimum number shall be used and shall be done in a manner without sagging or separation. A flash coat (i.e. a thin layer of up to 1/4 in. (6 mm) applied shotcrete) may be used as the final lift for overhead applications.

Prior to application of a succeeding layer of shotcrete, the initial layer of shotcrete shall be prepared according to the surface preparation and reinforcement bar cleaning requirements. Upon completion of the surface preparation and reinforcement bar treatment, water shall be applied according to the surface preparation requirements unless the surface is moist. The second layer of shotcrete shall then be applied within 30 minutes.

Shotcrete shall be cut back to line and grade using trowels, cutting rods, screeds or other suitable devices. The shotcrete shall be allowed to stiffen sufficiently before cutting. Cutting shall not cause cracks or delaminations in the shotcrete. For depressions, cut material may be used for small areas. Rebound material shall not be incorporated in the work. For the final finish, a wood float shall be used to approximately match the existing concrete texture. All repaired members shall be restored as close as practicable to their original dimensions.

Cotton mats shall be applied, according to Article 1020.13(a)(5), to the exposed layer of shotcrete within 10 minutes after finishing, and wet curing shall begin immediately. As an alternative, Type I curing compound shall be applied within 10 minutes and moist curing with cotton mats shall begin within 3 hours.

When a shotcrete layer is to be covered by a succeeding shotcrete layer within 36 hours, the repair area shall be protected with intermittent hand fogging, or wet curing with either burlap or cotton mats shall begin within 10 minutes. Intermittent hand fogging may be used only for the first hour. Thereafter, wet curing with burlap or cotton mats shall be used until the succeeding shotcrete layer is applied. Intermittent hand fogging may be extended to the first hour and a half if the succeeding shotcrete layer is applied by the end of this time.

The curing period shall be for 7 days, except when there is a succeeding layer of shotcrete. In this instance, the initial shotcrete layer shall be cured until the surface preparation and reinforcement bar treatment is started.

If temperatures below 45°F (7°C) are forecast during the curing period, protection methods shall be used. Protection Method I according to Article 1020.13(d)(1), or Protection Method II according to Article 1020.13(d)(2) shall be used during the curing period

Inspection of Completed Work. The Contractor shall provide ladders or other appropriate equipment for the Engineer to inspect the repaired areas. After curing but no sooner than 28 days after placement of concrete or shooting of shotcrete, the repair shall be examined for conformance with original dimensions, cracks, voids, and delaminations. Sounding for delaminations will be done with a hammer or by other methods determined by the Engineer.

The repaired area shall be removed and replaced, as determined by the Engineer, for nonconformance with original dimensions, surface cracks greater than 0.01 in. (0.25 mm) in width, map cracking with a crack spacing in any direction of 18 in. (0.45 m) or less, voids, or delaminations.

If a nonconforming repair is allowed to remain in place, cracks 0.01 in. (0.25 mm) or less shall be repaired with epoxy according to Section 590. For cracks less than 0.007 in. (2 mm), the epoxy may be applied to the surface of the crack. Voids shall be repaired according to Article 503.15.

Publications and Personnel Requirements. The Contractor shall provide a current copy of ACI 506R to the Engineer a minimum of one week prior to start of construction.

The shotcrete crew foreman shall have current American Concrete Institute (ACI) nozzle men certification for vertical wet and overhead wet applications. A copy of the certificate shall be given to the Engineer.

Method of Measurement. This work will be measured for payment in place and the area computed in square feet (square meters). For a repair at a corner, both sides will be measured.

Basis of Payment. This work will be paid for at the contract unit price per square foot (square meter) for STRUCTURAL REPAIR OF CONCRETE (DEPTH GREATER THAN 5 IN. (125 MM), STRUCTURAL REPAIR OF CONCRETE (DEPTH EQUAL TO OR LESS THAN 5 IN. (125 MM).

When there is no pay item for temporary shoring or cribbing, the work to design, install, and remove the temporary shoring and cribbing will be paid for according to Article 109.04.

The furnishing and installation of supplemental reinforcement bars, mechanical bar splicers, hook bolts, and protective coat will be paid according to Article 109.04.

DEMOLITION PLANS FOR REMOVAL OF EXISTING STRUCTURES

Effective: September 5, 2007

Add to the beginning of Article 501.02 of the Standard Specifications.

“The Contractor shall submit a demolition plan to the Engineer for approval, detailing the proposed methods of demolition and the amount, location(s) and type(s) of equipment to be used. With the exception of removal of single box culverts, for work adjacent to or over an active roadway, railroad or navigable waterway, the demolition plan shall include an assessment of the structure’s condition and an evaluation of the structure’s strength and stability during demolition and shall be sealed by an Illinois Licensed Structural Engineer.”

BITUMINOUS MATERIALS COST ADJUSTMENTS (BDE) (RETURN FORM WITH BID)

Effective: November 2, 2006

Revised: April 1, 2009

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 pavement preservation 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:** _____

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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) Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness) Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness) Other piling	23 lb/ft (34 kg/m) 32 lb/ft (48 kg/m) 37 lb/ft (55 kg/m) 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 Steel Plate Beam Guardrail, Type B w/steel posts Steel Plate Beam Guardrail, Types A and B w/wood posts Steel Plate Beam Guardrail, Type 2 Steel Plate Beam Guardrail, Type 6 Traffic Barrier Terminal, Type 1 Special (Tangent) Traffic Barrier Terminal, Type 1 Special (Flared)	20 lb/ft (30 kg/m) 30 lb/ft (45 kg/m) 8 lb/ft (12 kg/m) 305 lb (140 kg) each 1260 lb (570 kg) each 730 lb (330 kg) each 410 lb (185 kg) each
Steel Traffic Signal and Light Poles, Towers and Mast Arms Traffic Signal Post Light Pole, Tenon Mount and Twin Mount, 30 - 40 ft (9 - 12 m) Light Pole, Tenon Mount and Twin Mount, 45 - 55 ft (13.5 - 16.5 m) Light Pole w/Mast Arm, 30 - 50 ft (9 - 15.2 m) Light Pole w/Mast Arm, 55 - 60 ft (16.5 - 18 m) Light Tower w/Luminaire Mount, 80 - 110 ft (24 - 33.5 m) Light Tower w/Luminaire Mount, 120 - 140 ft (36.5 - 42.5 m) Light Tower w/Luminaire Mount, 150 - 160 ft (45.5 - 48.5 m)	11 lb/ft (16 kg/m) 14 lb/ft (21 kg/m) 21 lb/ft (31 kg/m) 13 lb/ft (19 kg/m) 19 lb/ft (28 kg/m) 31 lb/ft (46 kg/m) 65 lb/ft (97 kg/m) 80 lb/ft (119 kg/m)
Metal Railings (excluding wire fence) Steel Railing, Type SM Steel Railing, Type S-1 Steel Railing, Type T-1 Steel Bridge Rail	64 lb/ft (95 kg/m) 39 lb/ft (58 kg/m) 53 lb/ft (79 kg/m) 52 lb/ft (77 kg/m)
Frames and Grates Frame Lids and Grates	250 lb (115 kg) 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:** _____

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**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

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ATTACHMENTS

- A. Employment Preference for Appalachian Contracts
(included in Appalachian contracts only)

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

- Section I, paragraph 2;
- Section IV, paragraphs 1, 2, 3, 4 and 7;
- Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6 and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. Selection of Labor: During the performance of this contract, the contractor shall not:

- a. Discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
- b. Employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60 (and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 *et seq.*) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

- a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
- b. The contractor will accept as his operating policy the following statement: "It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job-training."

2. EEO Officer: The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for an must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

- a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
- b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
- c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
- d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
- e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

- a. The contractor will, unless precluded by a valid bargaining

agreement, conduct systematic and direct recruitment through public and private employees referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish which such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the

contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

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9. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash

equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

d. In the event the contractor or subcontractors, as

appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the question, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any cost reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

a. Apprentices:

(1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's

registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which cases such trainees shall receive the same fringe benefits as apprentices.

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(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV. 2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainee's and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall; upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any

liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

- a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.
- b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.
- c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees

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(including apprentices trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for submitting payroll copies of all subcontractors.

- d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall

certify the following:

- (1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;
 - (2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;
 - (3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of worked performed, as specified in the applicable wage determination incorporated into the contract.
- e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.
- f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S. C. 1001 and 31 U.S.C. 231.
- g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all federal-aid contracts on the national highway system, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:

- a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
 - b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.
 - c. Furnish, upon the completion of the contract, to the SHA resident engineer on /Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.
2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total

original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractors' own organization (23 CFR 635).

- a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
- b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

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2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S. C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the

duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more).

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L.

92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

- g.** The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- h.** A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded from Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.
- i.** Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j.** Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

- a.** Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- b.** Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- c.** Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
- d.** Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- a.** By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b.** The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c.** The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d.** The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- e.** The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f.** The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- g.** A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
- h.** Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealing.
- i.** Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

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Certification Regarding Debarment, Suspension, Ineligibility And Voluntary Exclusion-Lower Tier Covered Transactions:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**MINIMUM WAGES FOR FEDERAL AND FEDERALLY
ASSISTED CONSTRUCTION CONTRACTS**

This project is funded, in part, with Federal-aid funds and, as such, is subject to the provisions of the Davis-Bacon Act of March 3, 1931, as amended (46 Sta. 1494, as amended, 40 U.S.C. 276a) and of other Federal statutes referred to in a 29 CFR Part 1, Appendix A, as well as such additional statutes as may from time to time be enacted containing provisions for the payment of wages determined to be prevailing by the Secretary of Labor in accordance with the Davis-Bacon Act and pursuant to the provisions of 29 CFR Part 1. The prevailing rates and fringe benefits shown in the General Wage Determination Decisions issued by the U.S. Department of Labor shall, in accordance with the provisions of the foregoing statutes, constitute the minimum wages payable on Federal and federally assisted construction projects to laborers and mechanics of the specified classes engaged on contract work of the character and in the localities described therein.

General Wage Determination Decisions, modifications and supersedes decisions thereto are to be used in accordance with the provisions of 29 CFR Parts 1 and 5. Accordingly, the applicable decision, together with any modifications issued, must be made a part of every contract for performance of the described work within the geographic area indicated as required by an applicable DBRA Federal prevailing wage law and 29 CFR Part 5. The wage rates and fringe benefits contained in the General Wage Determination Decision shall be the minimum paid by contractors and subcontractors to laborers and mechanics.

NOTICE

The most current **General Wage Determination Decisions** (wage rates) are available on the IDOT web site. They are located on the Letting and Bidding page at <http://www.dot.state.il.us/desenv/delett.html>.

In addition, ten (10) days prior to the letting, the applicable Federal wage rates will be e-mailed to subscribers. It is recommended that all contractors subscribe to the Federal Wage Rates List or the Contractor's Packet through IDOT's subscription service.

PLEASE NOTE: if you have already subscribed to the Contractor's Packet you will automatically receive the Federal Wage Rates.

The instructions for subscribing are at <http://www.dot.state.il.us/desenv/subsc.html>.

If you have any questions concerning the wage rates, please contact IDOT's Chief Contract Official at 217-782-7806.