

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 downloading and/or ordering CD-ROM's and are 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, signed and notarized, "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 bidder check IDOT's website <http://www.dot.il.gov/desenv/delett.html> before submitting final bid information.

IDOT is not responsible for any e-mail related 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 garmantr@dot.il.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
Electronic plans and proposals	(217)524-1642

ADDENDUMS AND REVISIONS TO THE PROPOSAL FORMS

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

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RETURN WITH BID

Proposal Submitted By
Name
Address
City

Letting June 17, 2005

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. 62695
COOK County
Section (1516.1,1717&1818)R-9
Route FAI 94
Project IM-NHI-94-3(393)60
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

F

Checked by

(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
2. Other special documentation and/or information that may be required by the contract special provisions

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Mailing of CD-ROMS	217/782-7806

RETURN WITH BID



PROPOSAL

TO THE DEPARTMENT OF TRANSPORTATION

1. Proposal of _____

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

**Contract No. 62695
COOK County
Section (1516.1,1717&1818)R-9
Project IM-NHI-94-3(393)60
Route FAI 94
District 1 Construction Funds**

2.26 miles of reconstruction of the southbound ramps from 71st Street to I-57, construction of retaining walls and bridge reconstruction of the structure carrying 76th Street over I-94, all located along I-94 (Dan Ryan Expressway) 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.

BD 354 (Rev. 11/2001)

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 - 62695

State Job # - C-91-074-04
 PPS NBR - 1-74823-0615
 County Name - COOK- -
 Code - 31 - -
 District - 1 - -
 Section Number - (1516.1,1717&1818)R-9

Project Number
 IM-NHI094-3/393/060

Route
 FAI 94

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
E20200G1	V-PARTHEN QUINQ 1G	EACH	1,304.000				
K0030400	PERENNIAL PLANT DAYLI	UNIT	13.000				
XX004046	AERIAL CABLE REMOVAL	FOOT	370.000				
XX005128	STRIP SEAL EXP JT ASY	FOOT	167.000				
XX005489	STEEL CASING 48	FOOT	129.000				
XX104800	COMB CC&G TBV.12	FOOT	6,343.000				
X0300057	MAN TA 6D T1FCL R-PLT	EACH	3.000				
X0301295	ELECT MAN REMOVAL	EACH	8.000				
X0301898	E MAN 3'X4'X4' W24F&L	EACH	8.000				
X0320001	PVC CON T 2 (S40)	FOOT	205.000				
X0320080	ROD & CL DUCT EX COND	FOOT	610.000				
X0320815	SLEEPER SLAB	FOOT	206.000				
X0320868	BRACED EXCAVATION SPL	CU YD	216.000				
X0321072	BRIDGE FENCE RAIL	FOOT	694.000				
X0321519	CONDUIT SUPPORT SYS	L SUM	1.000				

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X0322122	METALLIZE STRUCT STL	L SUM	1.000				
X0322256	TEMP INFO SIGNING	SQ FT	144.000				
X0322425	C BRK 1P 70/480 EXCT	EACH	2.000				
X0322679	C FDN TY P BM TS CONT	EACH	2.000				
X0322706	ELCBL C 12 10C	FOOT	512.000				
X0322741	LPS34.5MH12MA3G 1.50A	EACH	1.000				
X0322859	WEED CONTR PRE-EM GRN	POUND	20.000				
X0323426	SED CONT DR ST INL CL	EACH	30.000				
X0323574	MAINTAIN LIGHTING SYS	CAL MO	18.000				
X0323710	REMOV COND ATT TO STR	FOOT	760.000				
X0323830	DRAINAGE SCUPPR DS-11	EACH	10.000				
X0323907	COMMUNICATIONS VAULT	EACH	6.000				
X0324112	BARRIER BASE	FOOT	1,039.000				
X0324198	REMOV ASB CEM CONDUIT	FOOT	795.000				
X0324210	C EN RC 4-4 CNC 2X2	FOOT	260.000				

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X0324212	C EN RC 6-4 CNC 2X3	FOOT	40.000				
X0324214	C EN RC 5-4 1-2RGC2X3	FOOT	34.000				
X0324217	C ENR 5-4CNC 3-2RG2X4	FOOT	431.000				
X0324225	CONTR TRAF 16LB P CAB	EACH	2.000				
X0324414	CON EN RC 1-3 CNC	FOOT	48.000				
X0324420	PVC CON T 4 (S40)	FOOT	68.000				
X0324433	LT TOWER SERV PAD 6	SQ FT	411.000				
X0324455	DRILL/SET SOLD P SOIL	CU FT	185,131.000				
X0324456	DRILL/SET SOLD P ROCK	CU FT	152.000				
X0324478	PVC CON T 3 (S40)	FOOT	150.000				
X0324486	C F 24D 1.25AR 15BC 9	FOOT	54.000				
X0324487	C F 30D 1.5AR 16.5BC	FOOT	11.000				
X0324491	CONC MED WALL 18 WIDE	FOOT	435.000				
X0324493	CONC MEDIAN SURF SP	SQ FT	527.000				
X0324571	MAINT ST LTG SYS CHGO	L SUM	1.000				

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X0324697	SOIL STABILIZERS	POUND	528,845.000				
X0324698	APPLY DUST SUP AGENTS	UNIT	196.000				
X0324706	CF 30D 1.25AR17.25B 9	FOOT	18.000				
X0324864	DRAIN CONNECTIONS	FOOT	212.000				
X0324872	CIP T/D WSS RAMP DISB	SQ FT	156.000				
X0325015	ADJ FR & LID	EACH	6.000				
X0325016	CLEAN EX MH & HH	FOOT	4.000				
X0325017	COMBINED SEWER T2 8"	FOOT	56.000				
X0325018	C ENC RC 3-2 CNC 2X2	FOOT	20.000				
X0325019	C ENC RC 4-4 2-2 2X3	FOOT	394.000				
X0325020	C ENC RC 6-4 2-3 2X4	FOOT	31.000				
X0325021	INTER 7 WIRE LOCAL	EACH	1.000				
X0325022	INTER 7 WIRE MASTER	EACH	1.000				
X0325023	LPS32.5MH12MA7G11.5IO	EACH	6.000				
X0325024	LPS34.5MH12MA3G 15 BC	EACH	3.000				

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X0325025	LPS34.5MH12MA3G 17.25	EACH	2.000				
X0325026	LPS34.5MH12MA7G 15 BC	EACH	3.000				
X0325027	MED & PVT REM (SPL)	SQ YD	560.000				
X0325028	P CITY STL 7 32.5 IO	EACH	6.000				
X0325029	PVC CON IN DCT 2-3"	FOOT	194.000				
X0325030	TR & BKFIL 2-4 DUCTS	FOOT	448.000				
X0325031	C EN RC 6-4 2-2RGC2X4	FOOT	35.000				
X0329888	REM EX ST LIGHT EQUIP	L SUM	1.000				
X0656300	PAVEMENT REM & REPL	SQ YD	74.000				
X0712400	TEMP PAVEMENT	SQ YD	11,045.000				
X0933900	PVC CON T 3 (S80)	FOOT	295.000				
X0934000	PVC CON T 4 (S80)	FOOT	405.000				
X0934800	MA STL MONOTUBE 20	EACH	1.000				
X0934900	MA STL MONOTUBE 26	EACH	2.000				
X0935000	MA STL MONOTUBE 30	EACH	2.000				

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X0935100	MA STL MONOTUBE 35	EACH	1.000				
X0966500	SN MES ELEC ILLUM MAM	EACH	3.000				
X0966600	SN MESS ELEC ILLUM BM	EACH	5.000				
X0966700	JUNC BOX POLE/POST MT	EACH	9.000				
X4021000	TEMP ACCESS- PRIV ENT	EACH	5.000				
X4022000	TEMP ACCESS- COM ENT	EACH	5.000				
X4023000	TEMP ACCESS- ROAD	EACH	5.000				
X4066426	BC SC SUPER "D" N70	TON	1,721.000				
X4066770	LEV BIND MM SUPER N70	TON	710.000				
X4067100	P LB MM SU IL4.75 N50	TON	533.000				
X6022120	MAN DT 7 DIA T1F CL	EACH	1.000				
X6022130	MAN DT 8 DIA T1F CL	EACH	1.000				
X6060015	COMB CC&G TM4.24 VWGF	FOOT	207.000				
X6061001	COMB CC&G TM4.48	FOOT	6,448.500				
X6063401	COMB CC&G TM4.12	FOOT	5,145.500				

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X6063600	COMB CC&G TM4.24	FOOT	5,086.000				
X6065740	CONC MED SURF 5 MOD	SQ FT	14,493.000				
X6370920	CONC BAR 1F 42HT	FOOT	478.000				
X6370930	CONC BAR 2F 32HT	FOOT	420.000				
X6640210	TEMP CH LK FENCE PORT	FOOT	14,693.000				
X6643300	CH LK FENCE REMOV CTA	FOOT	270.000				
X6643310	CH LK FN REM/RE-E CTA	FOOT	100.000				
X6700410	ENGR FLD OFF A SPL	CAL MO	15.000				
X7011015	TR C-PROT EXPRESSWAYS	L SUM	1.000				
X7013820	TR CONT SURVEIL EXPWY	CAL DA	330.000				
X7015000	CHANGEABLE MESSAGE SN	CAL MO	144.000				
X7040600	FUR TEMP CONC BARRIER	FOOT	460.000				
X8100060	CON T 4 GALVS PVC CTD	FOOT	48.000				
X8110125	CON ATS 4 GALVS PVC	FOOT	1,100.000				
X8150200	TR & BKFIL W SCRN	FOOT	845.000				

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X8170400	EC C EPR HYP 1C 6	FOOT	2,240.000				
X8170405	EC C EPR HYP 1C 8	FOOT	1,120.000				
X8210451	LUM SL HPS 400W 240V	EACH	9.000				
X8210453	LUM SL HPS400W240V IO	EACH	6.000				
X8420090	REM EXIST SIGN LUM	EACH	10.000				
X8801300	SH P LED 1F 3S BM	EACH	4.000				
X8801310	SH P LED 1F 3S MAM	EACH	11.000				
X8801395	SH P LED 1F 5S BM	EACH	2.000				
X8801400	SH P LED 1F 5S MAM	EACH	2.000				
X8810610	PED SH LED 1F BM	EACH	6.000				
X8810620	PED SH LED 2F BM	EACH	3.000				
Z0002600	BAR SPLICERS	EACH	164.000				
Z0008236	DRIL SHAFT/SOIL 36	FOOT	430.000				
Z0008342	DRIL SHAFT/ROCK 42	FOOT	10.000				
Z0013798	CONSTRUCTION LAYOUT	L SUM	1.000				

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Z0018800	DRAINAGE SYSTEM	L SUM	1.000				
Z0018940	DRILL EX MAN/HANDHOLE	EACH	13.000				
Z0030020	IMP ATTEN FRD NAR TL2	EACH	2.000				
Z0030070	IMP ATTEN SU NAR TL3	EACH	2.000				
Z0030240	IMP ATTN TEMP NRD TL2	EACH	4.000				
Z0030250	IMP ATTN TEMP NRD TL3	EACH	14.000				
Z0030340	IMP ATTN REL NRD TL2	EACH	4.000				
Z0030350	IMP ATTN REL NRD TL3	EACH	5.000				
Z0047300	PROTECTIVE SHIELD	SQ YD	4,727.000				
Z0048665	RR PROT LIABILITY INS	L SUM	1.000				
Z0056220	SAND MOD IMP ATT REM	EACH	1.000				
Z0068400	STEEL CASINGS 42	FOOT	159.000				
Z0075300	TIE BARS	EACH	91.000				
Z0076600	TRAINEES	HOUR	3,000.000		0.800		2,400.000
20100110	TREE REMOV 6-15	UNIT	3,369.000				

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20100210	TREE REMOV OVER 15	UNIT	915.000				
20101000	TEMPORARY FENCE	FOOT	11,361.000				
20200100	EARTH EXCAVATION	CU YD	83,380.000				
20201200	REM & DISP UNS MATL	CU YD	12,238.000				
20700220	POROUS GRAN EMBANK	CU YD	3,479.000				
20700420	POROUS GRAN EMB SUBGR	CU YD	809.000				
20800150	TRENCH BACKFILL	CU YD	15,209.000				
21001000	GEOTECH FAB F/GR STAB	SQ YD	25,432.000				
21101615	TOPSOIL F & P 4	SQ YD	69,172.000				
21101645	TOPSOIL F & P 12	SQ YD	16,364.000				
21101825	COMPOST F & P 6	SQ YD	16,364.000				
25000210	SEEDING CL 2A	ACRE	17.250				
25000400	NITROGEN FERT NUTR	POUND	1,541.000				
25000500	PHOSPHORUS FERT NUTR	POUND	1,541.000				
25000600	POTASSIUM FERT NUTR	POUND	1,541.000				

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25000750	MOWING	ACRE	27.250				
25100630	EROSION CONTR BLANKET	SQ YD	82,729.000				
28000200	EARTH EXC - EROS CONT	CU YD	870.000				
28000250	TEMP EROS CONTR SEED	POUND	3,380.000				
28000300	TEMP DITCH CHECKS	EACH	37.000				
28000400	PERIMETER EROS BAR	FOOT	19,148.000				
28000510	INLET FILTERS	EACH	159.000				
28001000	AGGREGATE - EROS CONT	TON	12.000				
31101400	SUB GRAN MAT B 6	SQ YD	12,210.000				
31101810	SUB GRAN MAT B 12	SQ YD	2,319.000				
31101860	SUB GRAN MAT B 24	SQ YD	23,113.000				
31200100	STAB SUB-BASE 4	SQ YD	21,434.000				
35300400	PCC BSE CSE 9	SQ YD	4,681.000				
35300510	PCC BSE CSE 10 1/2	SQ YD	5,913.000				
40600200	BIT MATLS PR CT	TON	30.500				

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40600300	AGG PR CT	TON	65.000				
40600895	CONSTRUC TEST STRIP	EACH	2.000				
40600980	BIT SURF REM BUTT JT	SQ YD	145.000				
40601000	BIT REPL OVER PATCH	TON	29.000				
42000501	PCC PVT 10 JOINTED	SQ YD	2,576.000				
42000521	PCC PVT 11 JOINTED	SQ YD	15,900.000				
42001300	PROTECTIVE COAT	SQ YD	33,363.000				
42001400	BR APPROACH PAVT SPL	SQ YD	540.000				
42001420	BR APPR PVT CON (PCC)	SQ YD	88.000				
42400200	PC CONC SIDEWALK 5	SQ FT	3,415.000				
42400410	PC CONC SIDEWALK 8	SQ FT	649.000				
44000006	BIT SURF REM 1 1/2	SQ YD	6,023.000				
44000007	BIT SURF REM 2	SQ YD	3,516.000				
44000100	PAVEMENT REM	SQ YD	24,568.000				
44000112	BIT RM OV PATCH 3	SQ YD	326.000				

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44000500	COMB CURB GUTTER REM	FOOT	23,935.000				
44000600	SIDEWALK REM	SQ FT	8,580.000				
44000700	APPROACH SLAB REM	SQ YD	450.000				
44001980	CONC BARRIER REMOV	FOOT	938.000				
44003100	MEDIAN REMOVAL	SQ FT	241.000				
44004250	PAVED SHLD REMOVAL	SQ YD	8,296.000				
44004260	PAVED SHLD REMOVAL SP	SQ YD	250.000				
44004400	PAVT REMOVAL SPL	SQ YD	542.000				
44201351	CL C PATCH T1 10 1/2	SQ YD	150.000				
44201355	CL C PATCH T2 10 1/2	SQ YD	290.000				
44201360	CL C PATCH T4 10 1/2	SQ YD	412.000				
48202400	BIT SHLD SUPER 6	SQ YD	560.000				
48300600	PCC SHOULDERS 11	SQ YD	752.100				
48300700	PCC SHOULDERS 12	SQ YD	126.200				
50100300	REM EXIST STRUCT N1	EACH	1.000				

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50100400	REM EXIST STRUCT N2	EACH	1.000				
50100500	REM EXIST STRUCT N3	EACH	1.000				
50102400	CONC REM	CU YD	1.000				
50104650	SLOPE WALL REMOV	SQ YD	43.000				
50200100	STRUCTURE EXCAVATION	CU YD	13,811.000				
50200410	ROCK EXC STRUCT SPL	CU YD	27.000				
50300225	CONC STRUCT	CU YD	5,452.000				
50300255	CONC SUP-STR	CU YD	784.000				
50300260	BR DECK GROOVING	SQ YD	1,943.000				
50300300	PROTECTIVE COAT	SQ YD	13,196.000				
50300310	ELAST BEARING ASSY T1	EACH	24.000				
50300510	RUSTICATION FINISH	SQ FT	34,916.000				
50500405	F & E STRUCT STEEL	POUND	713,938.000				
50500505	STUD SHEAR CONNECTORS	EACH	15,144.000				
50700209	UNTREATED TIMBER LAG	SQ FT	40,859.000				

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50700211	FUR SOLDIER PILES HP	FOOT	3,698.000				
50700213	FUR SOLDIER PILES BU	FOOT	79.000				
50700215	FUR SOLDIER PILES WS	FOOT	31,247.000				
50800205	REINF BARS, EPOXY CTD	POUND	852,040.000				
50900905	REM & RE EX RAILING	FOOT	11.000				
51100100	SLOPE WALL 4	SQ YD	11.000				
51205200	TEMP SHT PILING	SQ FT	5,040.000				
51500100	NAME PLATES	EACH	1.000				
5421D012	P CUL CL D 1 12 TEMP	FOOT	85.000				
550A0340	STORM SEW CL A 2 12	FOOT	5,368.000				
550A0360	STORM SEW CL A 2 15	FOOT	270.000				
550A0380	STORM SEW CL A 2 18	FOOT	1,397.000				
550A0400	STORM SEW CL A 2 21	FOOT	34.000				
550A0410	STORM SEW CL A 2 24	FOOT	1,184.000				
550A0420	STORM SEW CL A 2 27	FOOT	1,370.000				

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550A0430	STORM SEW CL A 2 30	FOOT	310.000				
550A0450	STORM SEW CL A 2 36	FOOT	1,466.000				
550A0470	STORM SEW CL A 2 42	FOOT	126.000				
550A0640	STORM SEW CL A 3 12	FOOT	437.000				
550A0660	STORM SEW CL A 3 15	FOOT	8.000				
550A0680	STORM SEW CL A 3 18	FOOT	1,041.000				
550A0700	STORM SEW CL A 3 21	FOOT	432.000				
550A0710	STORM SEW CL A 3 24	FOOT	719.000				
550A0720	STORM SEW CL A 3 27	FOOT	516.000				
550A0730	STORM SEW CL A 3 30	FOOT	443.000				
550A0750	STORM SEW CL A 3 36	FOOT	589.000				
550A0770	STORM SEW CL A 3 42	FOOT	95.000				
550A0960	STORM SEW CL A 4 15	FOOT	191.000				
550A0980	STORM SEW CL A 4 18	FOOT	457.000				
550A1010	STORM SEW CL A 4 24	FOOT	396.000				

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550A1020	STORM SEW CL A 4 27	FOOT	38.000				
550A1030	STORM SEW CL A 4 30	FOOT	217.000				
55100300	STORM SEWER REM 8	FOOT	7.000				
55100400	STORM SEWER REM 10	FOOT	321.000				
55100500	STORM SEWER REM 12	FOOT	516.000				
55101600	STORM SEWER REM 36	FOOT	27.000				
552A0900	SS JKD CL A 24	FOOT	159.000				
552A1100	SS JKD CL A 30	FOOT	65.000				
552A1300	SS JKD CL A 36	FOOT	64.000				
56200900	WATER SERV LINE 2 1/2	FOOT	110.000				
58700200	BRIDGE SEAT SEALER	SQ FT	422.000				
59100100	GEOCOMPOSITE WALL DR	SQ YD	5,272.000				
60107700	PIPE UNDERDRAINS 6	FOOT	17,893.000				
60108200	PIPE UNDERDRAIN 6 SP	FOOT	1,788.000				
60109582	P UNDR FOR STRUCT 6	FOOT	8,290.000				

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60200105	CB TA 4 DIA T1F OL	EACH	37.000				
60200205	CB TA 4 DIA T1F CL	EACH	1.000				
60201310	CB TA 4 DIA T20F&G	EACH	189.000				
60202505	CB TA 4D T1FOL (CHGO)	EACH	33.000				
60206905	CB TC T1F OL	EACH	16.000				
60208210	CB TC T20F&G	EACH	4.000				
60218400	MAN TA 4 DIA T1F CL	EACH	34.000				
60221100	MAN TA 5 DIA T1F CL	EACH	58.000				
60223800	MAN TA 6 DIA T1F CL	EACH	2.000				
60224446	MAN TA 7 DIA T1F CL	EACH	2.000				
60250200	CB ADJUST	EACH	25.000				
60255500	MAN ADJUST	EACH	58.000				
60257900	MAN RECONST	EACH	4.000				
60260100	INLETS ADJUST	EACH	4.000				
60260400	INLETS ADJ NEW T1F CL	EACH	4.000				

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60265700	VV ADJUST	EACH	2.000				
60406520	FR & LIDS OL (CHGO)	EACH	5.000				
60406530	FR & LIDS CL (CHGO)	EACH	5.000				
60500040	REMOV MANHOLES	EACH	8.000				
60500050	REMOV CATCH BAS	EACH	50.000				
60500060	REMOV INLETS	EACH	95.000				
60500105	FILL MANHOLES	EACH	3.000				
60600605	CONC CURB TB	FOOT	172.000				
60602200	CONC GUTTER	FOOT	1,214.000				
60603800	COMB CC&G TB6.12	FOOT	993.000				
60605000	COMB CC&G TB6.24	FOOT	126.500				
60605900	COMB CC&G TB9.12	FOOT	51.000				
60608300	COMB CC&G TM2.12	FOOT	739.500				
60608521	COMB CC&G TM2.24	FOOT	641.600				
60608530	COMB CC&G TM2.48	FOOT	155.500				

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60618324	CONC MEDIAN SURF 6 SP	SQ FT	7,366.000				
60618390	CONC MED SURF CORR	SQ FT	444.000				
63000000	SPBGR TY A	FOOT	138.000				
63100045	TRAF BAR TERM T2	EACH	3.000				
63100085	TRAF BAR TERM T6	EACH	4.000				
63100167	TR BAR TRM T1 SPL TAN	EACH	5.000				
63200310	GUARDRAIL REMOV	FOOT	806.000				
63700805	CONC BAR TRANS	FOOT	142.000				
66400305	CH LK FENCE 6	FOOT	2,992.000				
66410300	CH LK FENCE REMOV	FOOT	9,270.000				
66900200	NON SPL WASTE DISPOSL	CU YD	25,001.000				
66900450	SPL WASTE PLNS/REPORT	L SUM	1.000				
66900530	SOIL DISPOSAL ANALY	EACH	6.000				
67100100	MOBILIZATION	L SUM	1.000				
70101800	TRAF CONT & PROT SPL	L SUM	1.000				

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70102550	TR CONT-PROT TEMP DET	EACH	2.000				
70103815	TR CONT SURVEILLANCE	CAL DA	60.000				
70300100	SHORT-TERM PAVT MKING	FOOT	1,250.000				
70300240	TEMP PVT MK LINE 6	FOOT	17,970.000				
70300510	PAVT MARK TAPE T3 L&S	SQ FT	293.000				
70300520	PAVT MARK TAPE T3 4	FOOT	19,784.000				
70300540	PAVT MARK TAPE T3 6	FOOT	1,100.000				
70300550	PAVT MARK TAPE T3 8	FOOT	2,112.000				
70300570	PAVT MARK TAPE T3 24	FOOT	202.000				
70301000	WORK ZONE PAVT MK REM	SQ FT	12,424.000				
70400100	TEMP CONC BARRIER	FOOT	20,340.000				
70400200	REL TEMP CONC BARRIER	FOOT	6,686.000				
72000100	SIGN PANEL T1	SQ FT	50.000				
72000200	SIGN PANEL T2	SQ FT	189.000				
72000300	SIGN PANEL T3	SQ FT	4,606.000				

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72100100	SIGN PANEL OVERLAY	SQ FT	72.000				
72400310	REMOV SIGN PANEL T1	SQ FT	9.000				
72400330	REMOV SIGN PANEL T3	SQ FT	1,119.000				
72400720	RELOC SIGN PANEL T2	SQ FT	20.000				
72700100	STR STL SIN SUP BA	POUND	3,547.000				
72800100	TELES STL SIN SUPPORT	FOOT	18.000				
72900100	METAL POST TY A	FOOT	165.000				
72900200	METAL POST TY B	FOOT	197.000				
73000100	WOOD SIN SUPPORT	FOOT	395.000				
73000105	WOOD SIN SUPPORT SPL	FOOT	34.000				
73100100	BASE TEL STL SIN SUPP	EACH	2.000				
73300100	OVHD SIN STR-SPAN T1A	FOOT	86.000				
73300200	OVHD SIN STR-SPAN T2A	FOOT	418.000				
73300300	OVHD SIN STR-SPAN T3A	FOOT	93.000				
73302190	OSS CANT 3CA 2-0X7-0	FOOT	149.000				

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73304000	OVHD SIN STR BR MT	FOOT	173.000				
73305000	OVHD SIN STR WALKWAY	FOOT	475.000				
73400100	CONC FOUNDATION	CU YD	9.000				
73400200	DRILL SHAFT CONC FDN	CU YD	169.000				
73600100	REMOV OH SIN STR-SPAN	EACH	5.000				
73600200	REMOV OH SIN STR-CANT	EACH	3.000				
73602000	REM OVHD SN STR-BR MT	EACH	1.000				
73700100	REM GR-MT SIN SUPPORT	EACH	20.000				
73700200	REM CONC FDN-GR MT	EACH	18.000				
73700300	REM CONC FDN-OVHD	EACH	8.000				
78000100	THPL PVT MK LTR & SYM	SQ FT	904.000				
78000200	THPL PVT MK LINE 4	FOOT	6,600.000				
78000400	THPL PVT MK LINE 6	FOOT	3,393.000				
78000500	THPL PVT MK LINE 8	FOOT	2,787.000				
78000600	THPL PVT MK LINE 12	FOOT	378.000				

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78000650	THPL PVT MK LINE 24	FOOT	460.000				
78003100	PREF PL PM TB LTR-SYM	SQ FT	146.000				
78003110	PREF PL PM TB LINE 4	FOOT	85.000				
78003130	PREF PL PM TB LINE 6	FOOT	1,953.000				
78003150	PREF PL PM TB LINE 12	FOOT	92.000				
78003180	PREF PL PM TB LINE 24	FOOT	61.000				
78005110	EPOXY PVT MK LINE 4	FOOT	14,096.000				
78005120	EPOXY PVT MK LINE 5	FOOT	10,304.000				
78005140	EPOXY PVT MK LINE 8	FOOT	12,221.000				
78005150	EPOXY PVT MK LINE 12	FOOT	2,967.000				
78008210	POLYUREA PM T1 LN 4	FOOT	11,040.000				
78008220	POLYUREA PM T1 LN 5	FOOT	224.000				
78008240	POLYUREA PM T1 LN 8	FOOT	5,185.000				
78008250	POLYUREA PM T1 LN 12	FOOT	2,398.000				
78008270	POLYUREA PM T1 LN 24	FOOT	68.000				

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78100100	RAISED REFL PAVT MKR	EACH	32.000				
78100300	REPLACEMENT REFLECTOR	EACH	762.000				
78200100	MONODIR PRIS BAR REFL	EACH	758.000				
78200410	GUARDRAIL MKR TYPE A	EACH	32.000				
78200530	BAR WALL MKR TYPE C	EACH	20.000				
78201000	TERMINAL MARKER - DA	EACH	5.000				
78300100	PAVT MARKING REMOVAL	SQ FT	12,061.000				
80700140	GROUND ROD 5/8 X 10	EACH	68.000				
80800525	TEMP WP60 CL4 15MA	EACH	6.000				
81000600	CON T 2 GALVS	FOOT	2,542.000				
81000800	CON T 3 GALVS	FOOT	227.000				
81012805	CON T 3 PVC ENC CONG	FOOT	1,016.000				
81023750	CON ENC C 3 PVC	FOOT	343.000				
81200100	CON EMB STR 1 GALVS	FOOT	15.000				
81200120	CON EMB STR 2 GALVS	FOOT	15.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
 CONTRACT
 NUMBER - 62695

State Job # - C-91-074-04
 PPS NBR - 1-74823-0615
 County Name - COOK - -
 Code - 31 - -
 District - 1 - -
 Section Number - (1516.1,1717&1818)R-9

Project Number
 IM-NHI094-3/393/060

Route
 FAI 94

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
81200230	CON EMB STR 2 PVC	FOOT	525.000				
81301010	JUN BX SS ES 10X8X4	EACH	2.000				
81400200	HD HANDHOLE	EACH	24.000				
81400205	HD HANDHOLE SPL	EACH	2.000				
81500200	TR & BKFIL F ELECT WK	FOOT	4,192.000				
81800700	A CBL 3-1C2 AL MESS W	FOOT	890.000				
82102310	LUM SV HOR MT 310W	EACH	6.000				
83600300	LIGHT POLE FDN 30D	FOOT	60.000				
83700250	LT TOWER FDN 44D	FOOT	180.000				
84200700	LIGHTING FDN REMOV	EACH	9.000				
84200705	LIGHTING FDN REM PART	EACH	36.000				
85000200	MAIN EX TR SIG INSTAL	EACH	7.000				
87301155	ELCBL C SIGNAL 12 7C	FOOT	662.000				
87301185	ELCBL C SIGNAL 12 19C	FOOT	792.000				
87301805	ELCBL C SERV 6 2C	FOOT	426.000				

ILLINOIS DEPARTMENT OF TRANSPORTATION
 SCHEDULE OF PRICES
 CONTRACT
 NUMBER - 62695

State Job # - C-91-074-04
 PPS NBR - 1-74823-0615
 County Name - COOK- -
 Code - 31 - -
 District - 1 - -
 Section Number - (1516.1,1717&1818)R-9

Project Number
 IM-NHI094-3/393/060

Route
 FAI 94

Item Number	Pay Item Description	Unit of Measure	Quantity	x	Unit Price	=	Total Price
87800100	CONC FDN TY A	FOOT	12.000				
87900200	DRILL EX HANDHOLE	EACH	1.000				
89000100	TEMP TR SIG INSTALL	EACH	2.000				
89502300	REM ELCBL FR CON	FOOT	2,261.000				
89502375	REMOV EX TS EQUIP	EACH	2.000				
89502385	REMOV EX CONC FDN	EACH	19.000				

CONTRACT NUMBER

62695

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 \$150,700.00. Sixty percent of the salary is \$90,420.00.

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.

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 provides:

Section 50-60(c).

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.

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 sign the following certification statement indicating that the information previously submitted by the bidder is, as of the date of signature, current and accurate. The Certification must be signed and dated by a person who is authorized to execute contracts for the bidding company. Before signing this certification, the bidder should carefully review its prior submissions to ensure the Certification is correct. If the Bidder signs 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)

Name of Authorized Representative (type or print)

Title of Authorized Representative (type or print)

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 \$90,420.00? YES ___ NO ___
3. Does anyone in your organization receive more than \$90,420.00 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 \$90,420.00? 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. It must be signed by an individual who is authorized to execute contracts for the bidding entity. *Note: Signing the NOT APPLICABLE STATEMENT on Form A does not allow the bidder to ignore Form B. Form B must be completed, signed 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 signature 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 \$90,420.00 (60% of the Governor's salary as of 7/1/01). (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 \$90,420.00, (60% of the Governor's salary as of 7/1/01) 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 \$90,420.00, (60% of the Governor's salary as of 7/1/01) 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 \$90,420.00, (60% of the Governor's salary as of 7/1/01) 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 \$90,420.00, (60% of the Governor's salary as of 7/1/01) 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 \$90,420.00, (60% of the salary of the Governor as of 7/1/01) 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 \$90,420.00, (60% of the Governor's salary as of 7/1/01) 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: _____
Name of Authorized Representative (type or print)

Completed by: _____
Title of Authorized Representative (type or print)

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.

Name of Authorized Representative (type or print)

Title of Authorized Representative (type or print)

Signature of Authorized Representative Date _____

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 SIGNED

Name of Authorized Representative (type or print)	

Title of Authorized Representative (type or print)	
_____	_____
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. 62695
COOK County
Section (1516.1,1717&1818)R-9
Project IM-NHI-943(393)60
Route FAI 94
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. 62695
COOK County
Section (1516.1,1717&1818)R-9
Project IM-NHI-943(393)60
Route FAI 94
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

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

Notary Certification for Principal and Surety

STATE OF ILLINOIS,
COUNTY OF

I, a Notary Public in and for said County, do hereby certify that and

(Insert names of individuals signing on behalf of PRINCIPAL & SURETY)

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

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

My commission expires Notary Public

In lieu of completing the above section of the Proposal Bid Form, the Principal may file an Electronic Bid Bond. By signing 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. 62695
COOK County
Section (1516.1,1717&1818)R-9
Project IM-NHI-943(393)60
Route FAI 94
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., June 17, 2005. 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. 62695
COOK County
Section (1516.1,1717&1818)R-9
Project IM-NHI-943(393)60
Route FAI 94
District 1 Construction Funds**

2.26 miles of reconstruction of the southbound ramps from 71st Street to I-57, construction of retaining walls and bridge reconstruction of the structure carrying 76th Street over I-94, all located along I-94 (Dan Ryan Expressway) 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

Timothy W. Martin, Secretary

BD 351 (Rev. 01/2003)

INDEX
 FOR
 SUPPLEMENTAL SPECIFICATIONS AND RECURRING SPECIAL PROVISIONS
 Adopted March 1, 2005

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

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 1-1-02) (Revised 3-1-05)

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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, 2002 (hereinafter referred to as the Standard Specifications): the latest edition of the “Illinois Manual on Uniform Traffic Control Devices for Streets and Highways”, and the “Manual of Test Procedures for Materials” in effect on the date of invitation for bids, and the Supplemental Specifications and Recurring Special Provisions indicated on the Check Sheet included herein which apply to and govern the reconstruction of FAI Route 94, Project IM-NHI-094-3(393)060, Section 1516.1, 1717 & 1818)R-9 in Cook County. In case of conflict with any part or parts of said specifications, the said Special Provisions shall take precedence and shall govern.

F.A.I. Route 94 (Dan Ryan / Bishop Ford / I-57 Expressways)
Section: (1516.1, 1717 & 1818) R-9
County: Cook
Contract: 62695 (17B)

LOCATION OF PROJECT

The project is located on the southbound section of Interstate 94 (Dan Ryan Expressway), extending between 71st Street on the north and through the I-57 interchange to IL 1 (Halsted Street) on the west leg and Martin Luther King, Jr. (MLK) Drive on the east leg. The total length along the Dan Ryan Expressway is approximately 3 miles, while the total length along the east and west leg is approximately 1 mile each.

The 76th Street bridge reconstruction within the project limits is located on 76th Street (FAU 1541) from approximately 212 feet west of existing LaFayette Avenue to approximately 168 feet east of existing State Street, in Cook County, Illinois. The improvement is within the limits of the City of Chicago and covers an approximate distance of 823 feet (0.16 miles) along 76th Street (FAU 1541).

DESCRIPTION OF PROJECT

The work within the I-94 Dan Ryan limits of construction consists of bridge demolition and replacement, storm sewer replacement, retaining wall construction, ramp removal and C-D road and access ramp construction, frontage road restoration, signing, lighting, striping, landscaping, lighting/ITS infrastructure construction and appurtenances between the project limits specified. Included in this work is providing traffic control protection, earth retention systems, slope excavation and grading, erosion control, temporary connector pavement and other incidental and collateral work.

Roadway signing within this section consists of concrete foundation construction, erection of truss, cantilever, and ground mount structures, sign panel installation and removal, disposal of existing sign structures, existing sign lighting and existing electrical connections. Proposed sign lighting and electrical connections are to be done under separate contract. The proposed sign construction is distributed throughout the length of the project.

The proposed bridge reconstruction consists of removal of the existing 3 span precast prestressed concrete girder bridge carrying 76th Street over FAI 94 (Dan Ryan Expressway), and construction of a 3-span continuous steel beam bridge, Structure No. 016-2850. The improvement additionally includes increased vertical clearance, approach pavement reconstruction, intersection improvements and channelization, and overpass lighting replacement. Underpass lighting replacement shall be done by others in Contract 62583. A detour route is to be utilized during the entire structure replacement.

Retaining wall construction consists of 12 drilled soldier pile and 1 spread footing wall varying from 150 feet to 962 feet in length, distributed throughout the project. Structure Numbers and individual wall lengths are as follows:

<u>Structure No.</u>	<u>Wall No.</u>	<u>Length (ft)</u>
016-W952	67	930
016-W967	68	641
016-W959	33	180
016-W946	34	962
016-W947	35	358
016-W948	36	1141
016-W949	37	150
016-W950	38	570
016-W951	39	945
016-W958	AIS 3	360
016-W971	72	360
016-W972	73A	690
016-W973	73B	510 (spread footing), 135 (soldier pile)

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 estimated dates:

<u>Name of Utility</u>	<u>Type</u>	<u>Location</u>	<u>Estimated Dates for Start and Completion of Relocation or Adjustments</u>
Peoples Energy	24" Gas	76 th St. Bridge, Along State Street	No conflict anticipated. Hand excavation is required. Contact Mr. Stan Jones at 773-962-4841 at least 48 hours in advance. Emergency Number 312-240-7001
Peoples Energy	1- 16" L.P. Steel, 16" M.P. Steel Both mains in potential conflict with retaining wall and slope grading.	79 th St Two locations. Station 1313+40 Station 1313+45	Peoples Energy to verify conflict. Adjustment completed by September 1, 2005.
SBC	36 MTD in potential conflict with retaining wall and ramp grading	77 th St Station 1325+92	SBC to verify conflict. Adjustment completed by September 1, 2005.
SBC	18 MTD in potential conflict with retaining wall and ramp grading.	Near 92 nd St. Station 1226+79	SBC to lower duct in place through side slope area. Adjustment completed by September 1, 2005.
SBC	12 MTD in potential conflict with retaining wall and side slope grading.	95 th Street Station 1204+33	SBC to verify conflict. Adjustment completed by September 1, 2005.
Com Ed/ IDOT	Power Feed For Tunnel Lighting conflicts with retaining wall. Potential conflict with ramp grading.	Near 97 th St. Station 144+60 SB I-57	The ITS/Lighting contractor will construct a temporary electric service during contract 62583. Contractor to contact Ms. LaShawn Greer (773) 838-4194 to coordinate the installation. Adjustment completed by September 1, 2005.
Com Ed	Duct to transformer in potential conflict with knee wall.	95 th Street Station 1205+25	Com Ed will verify depth of conduit. If a conflict exists, a sleeve will be required through the wall. Adjustment to be made during the roadway contract.

CTA - DC POWER FEED TO TRACKS	(6H, 4W) duct in potential conflict with retaining wall and mainline grading.	79 th St Station 1314+16	Duct to be protected by concrete slab or land bridge by roadway contractor.

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 GUARANTEED WORKING DAYS

Effective: January 21, 2003

All temporary lane closures during the period governed by guaranteed working days 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 guaranteed working days and any extensions of that contract time.

COORDINATION WITH ADJACENT AND/OR OVERLAPPING CONTRACTS

This contract abuts and /or overlaps with other concurrent Contracts as listed below. Each Contract includes work items requiring close coordination between the Contractors regarding the sequence and timing for the execution of such work items.

67TH ST. SB & NB C-D SYSTEM & RAMPS Contract 62590 (Dan Ryan Contract 7)

<u>Location</u>	<u>Starting Date</u>	<u>Tentative Completion Date</u>
67 th to 71 st ST	Under Construction	June - 2005

CONSTRUCT NB EXPRESS LANES Contract 62300 (Dan Ryan Contract 14)

<u>Location</u>	<u>Starting Date</u>	<u>Tentative Completion Date</u>
31 st to 71 st ST	March 2006	November - 2006

CONSTRUCT SB EXPRESS LANES Contract 62302 (Dan Ryan Contract 15)

<u>Location</u>	<u>Starting Date</u>	<u>Tentative Completion Date</u>
31 st to 71 st ST	March 2006	November - 2006

NB RETAINING WALLS, RAMPS & SIGNING (Contract 62694)

<u>Location</u>	<u>Letting Date</u>	<u>Tentative Completion Date</u>
71 st ST to I-57 Interchange	June - 2005	July - 2006

LIGHTING & SURVEILLANCE (Contract 62583)

<u>Location</u>	<u>Letting Date</u>	<u>Tentative Completion Date</u>
31 st ST to I-57 Interchange	March - 2005	December - 2007

OVERHEAD BRIDGES (OVER DAN RYAN EXPRESSWAY)

<u>Location</u>	<u>Letting Date</u>	<u>Tentative Completion Date</u>
71 st Street Bridge	July 2005	Dec 2005
75 th Street Bridge	Unknown	Feb 2005
91 st Street Bridge	March 2005	Dec 2005
Michigan Avenue Bridge	Dec 2004	Sept 2005

WATER MAIN CROSSINGS (Contract 62692)

<u>Location</u>	<u>Tentative Completion Date</u> (Provided by Contractor)
83 rd	1/14/05
85 th	3/4/05
Halsted & Martin Luther King	3/18/05
95 th & 69 th	4/1/05
Eggleston	4/16/05
45 th , 75 th & 79 th	4/30/05
87 th & 91 st	5/26/05

I-57 CONVENTIONAL LIGHTING (Contract 62937) Dan Ryan Contract 2D

<u>Location</u>	<u>Letting Date</u>	<u>Tentative Completion Date</u>
Halsted ST to Railroad Br	June- 2006	December - 2007

SEWER TELEVISIONING NB RAMPS (Contract 62936) Dan Ryan Contract 17E

<u>Location</u>	<u>Letting Date</u>	<u>Tentative Completion Date</u>
71 st ST to I-57 Interchange	June- 2005	July - 2006

SEWER TELEVISIONING SB RAMPS (Contract 62935) Dan Ryan Contract 17F

<u>Location</u>	<u>Letting Date</u>	<u>Tentative Completion Date</u>
71 st ST to I-57 Interchange	June- 2005	July - 2006

**CORNER GARDENS, SOIL & IRRIGATION SYSTEM, NB LOCATIONS
(Contract 62934) Dan Ryan Contract 17G**

<u>Location</u>	<u>Letting Date</u>	<u>Tentative Completion Date</u>
71 st ST to I-57 Interchange	August- 2005	July - 2006

**CORNER GARDENS, SOIL & IRRIGATION SYSTEM, SB LOCATIONS
(Contract 62933) Dan Ryan Contract 17H**

<u>Location</u>	<u>Letting Date</u>	<u>Tentative Completion Date</u>
71 st ST to I-57 Interchange	August- 2005	July - 2006

FENCING ON NB RETAINING WALLS (Contract 62932) Dan Ryan Contract 17I

<u>Location</u>	<u>Letting Date</u>	<u>Tentative Completion Date</u>
71 st ST 95 th ST	June- 2005	July - 2006

FENCING ON SB RETAINING WALLS (Contract 62931) Dan Ryan Contract 17J

<u>Location</u>	<u>Letting Date</u>	<u>Tentative Completion Date</u>
76 th ST to I-57 Interchange	June- 2005	July - 2006

Supplemental to the requirements of the Standard Specifications Article 105.08-Cooperation Between Contractors, the Contractors shall identify all such work items at the beginning of the Contract, and coordinate sequence and timing for their execution with the other Contractors through the Engineer. These work items shall be identified as separate line items in the Contractor's proposed Construction and Progress Schedule. Any conflicts between Contractor's schedules, the Department will be consulted through the Engineer to determine a resolution. Additional compensation or extension of the contract time will not be allowed for work and/or progress and/or lack of progress affected by lack of such coordination by the Contractor.

COORDINATION WITH FENCE INSTALLATION CONTRACT 62931 (17J)

Once work on a retaining wall has begun, the Contractor shall be required to complete all work on that segment of wall in its entirety, including the parapet portion above the bonded construction joint. This requirement is necessary so as not to delay the construction of the fencing on top of the wall, to be constructed by others in Contract 62931 (J)

The Contractor is required to coordinate the sequence of retaining wall construction with the fence installation contractor so that the ramps will be opened on time. The fence must be installed on the wall before the ramp can be opened. The contractor for Contract 62695 (17B) shall provide a retaining wall schedule to the fence installation contractor for Contract 62931 (17J), showing the approximate start and end dates for each retaining wall.

The cost of complying with this special provision shall not be paid for separately, but shall be included in the unit prices for the various retaining wall items.

Coordination With Lighting and Surveillance Contract 62583

The lighting systems installed in Contract 62583 must be operational for the ramps to be open to traffic. The Contractor for Contract 62695 must coordinate and cooperate with the lighting Contractor to allow sufficient time for the Light Towers to be installed and wired prior to the interim and final completion dates.

ADVANCED PUBLIC NOTIFICATION

Description.

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

General.

The Contractor shall provide notice to the public a minimum of 14 days in advance of any work that requires the closure of lanes or ramps through the use of a changeable message sign or temporary information signing.

Basis of Payment.

This work will be paid as CHANGEABLE MESSAGE SIGNS in calendar months or TEMPORARY INFORMATION SIGNING in sq. ft.

COMPLETION DATE PLUS GUARANTEED WORKING DAYS

The Contractor shall complete all contract items and safely open all roadways to traffic by July 31, 2006 except as specified herein.

The Contractor will be allowed to complete all clean-up work and punch list items within fifteen (15) guaranteed 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 guaranteed 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 of the Standard Specifications, 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.

INTERIM COMPLETION DATE FOR STAGE I

The Contractor shall complete all work on the Stage 1 ramps by November 22, 2005. The ramps and associated work to be completed in Stage 1 are as follows:

Ramp Completion

C-D Ramp System Between 71st St and 75th St

Exit Ramp from Expressway to 87th St.

Exit Ramp from Expressway to Wentworth Ave.

FAILURE TO COMPLETE STAGE 1 ON TIME

Should the Contractor fail to complete the work on or before the completion date as specified in Special Provision for Interim Completion Date For Stage 1 or within such extended time as may have been allowed by the Department, the Contractor shall be liable to the Department in the amount of \$3,000.00 per day not as a penalty but as liquidated damages, for each calendar day or portion thereof of overrun in the contract time or such extended time as may have been allowed.

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

A calendar day is every day shown on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

INTERIM COMPLETION DATE FOR JACKING PIPE ACROSS EXPRESSWAY

The Contractor shall complete the construction of drainage structure #99, #910 and the jacked pipe in steel casing between them, and drainage structures #133, #134 and the jacked pipe in steel casing between them by June 30, 2006. This work includes pavement and landscape restoration and all other appurtenances necessary to re-establish traffic on the expressway.

FAILURE TO COMPLETE JACKING PIPE ACROSS EXPRESSWAY ON TIME

Should the Contractor fail to complete the work on or before the completion date as specified in Special Provision for Interim Completion Date For Jacking Pipe Across Expressway or within such extended time as may have been allowed by the Department, the Contractor shall be liable to the Department in the amount of \$3,000.00 per day not as a penalty but as liquidated damages, for each calendar day or portion thereof of overrun in the contract time or such extended time as may have been allowed.

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

A calendar day is every day shown on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

INTERIM COMPLETION DATE FOR 76TH STREET BRIDGE

The Contractor shall complete the specified elements of the 76th Street Bridge by the dates indicated:

NB and SB Piers (November 22, 2005)
NB Abutment (May 1, 2006)

FAILURE TO COMPLETE 76TH STREET BRIDGE WORK ON TIME

Should the Contractor fail to complete the work on or before the completion date as specified in Special Provision for Interim Completion Dates For 76th Street Bridge or within such extended time as may have been allowed by the Department, the Contractor shall be liable to the

Department in the amount of \$3,000.00 per day not as a penalty but as liquidated damages, for each calendar day or portion thereof of overrun in the contract time or such extended time as may have been allowed.

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

A calendar day is every day shown on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

CTA COORDINATION

All work to be done by the Contractor on, over or in close proximity of the CTA (Chicago Transit Authority) right-of-way shall be performed in accordance with Article 107.12 of the Standard Specifications and the following additional CTA requirements.

1. The CTA's Representative for this project will be:

Mr. Marvin A. Watson
General Manager, Construction
567 W. Lake Street
P. O. Box 7598
Chicago, IL 60680-7598
(312) 681-3860

2. NOTIFICATION TO CTA:

- A. After the letting of the contract and prior to performing any work, the CTA Representative shall be notified by the Department to attend the pre-construction meeting. In this meeting, the Contractor shall confer with the CTA's Representative regarding the CTA's requirements for the protection of CTA utilities clearances, operations, and safety.

- B. Prior to the start of any work on or over the CTA's right-of-way, the Contractor shall meet with the CTA Representative to determine his requirements for flagmen and other necessary items related to the work activities on, over, and next to the CTA facilities and to receive CTA's approval for the Contractor's proposed operations.

- C. The Contractor shall notify the CTA Representative 72-hours in advance of the time he intends to enter upon the CTA right-of-way for the performance of any work.

3. PROTECTION OF THE CTA TRAFFIC:

A. The CTA will be operating mainline trains and performing rail yard operations 24 hours per day, seven days per week during the construction of this project.

B. The Contractor shall, at all times, take special care to conduct his operations over, under, adjacent to or adjoining the CTA facilities in such a manner as to prevent settlement, damage or displacement to any CTA structures, equipment, tracks or portions thereof and to prevent interruption of train service.

C. Any damage to the tracks, or other CTA facilities caused by the Contractor's operations, shall be replaced or repaired by the CTA at the Contractor's expense.

4. REIMBURSEMENT OF COSTS:

A. All Contractors performing work on or near CTA property shall be required to provide a deposit, in advance, equal to the CTA's Construction Department's estimate. This estimated amount equals the anticipated amount of CTA services and includes, but is not limited to, Flagging charges, Inspector charges, and Maintenance charges. No Contractor will be permitted to work prior to submission of a deposit.

B. If the deposited amount is used up, prior to the completion of the project, the CTA will require an additional deposit to cover the anticipated work remaining. Any money unused at time of project completion will be returned to the Contractor within 30 days.

C. All checks must be made payable to Chicago Transit Authority and be submitted, with a copy of the estimate, to the CTA Treasury Department, 567 West Lake Street, P.O. Box 7565, 7th Floor, Chicago, IL 60680-7565.

D. The Department will not be liable for any delays by the CTA in providing flagmen or other services required by this Special Provision.

5. Whenever any work, such as temporary shoring and erection procedures for spans over the CTA track, in the opinion of the CTA's inspector, may affect the safety of the trains and the continuity of the CTA's operations, the methods of performing such work shall first be submitted to the CTA for approval. If operations by the Contractor during construction are determined by the CTA's inspector to be hazardous to the CTA's operations, the Contractor shall suspend such work until reasonable remedial measures, and/or alternate methods, satisfactory of the CTA, are taken. Such remedial measures may include obtaining the services of the CTA personnel so that adequate protection may be provided.

6. CTA OPERATING RESTRICTIONS:

Operating requirements of the CTA, while work on this project is in progress, are as follows:

A. When the construction work is performed adjacent to an active track and the work does not involve the track or the third rail, the Contractor can provide (and the right-of-way allows for) an uninterrupted physical barrier (fence) at least 6 feet high (above track or platform level) to separate the work area from operating track(s). With the barrier in place, work at track level may be permitted at any time without CTA flagman and Slow Zone protection.

Such temporary barriers shall be installed as far from the operating track(s) as possible, but no closer than 7'-2" from the centerline of the nearest operating track. The materials, location, construction, and installation of the temporary barrier and the work procedures in the vicinity of the barrier must all be approved 48 hours in advance by the CTA Representative. Any construction work involving a crane lifting material higher than the barrier wall will still require CTA flagging protection.

Work that is adjacent to or over the CTA operating tracks without a barrier in place requires CTA flagmen. Work is to be done during the following hours:

Monday through Friday – 9:00 a.m. to 3:00 p.m.
(Based on one slow zone allowed in each direction per line)
Monday through Saturday, inclusive - 8:00 p.m. to 4:00 a.m.
Sunday - 12:00 a.m. to Monday 4:00 a.m.

C. Work within the clearance envelope may require a single track operation and hours and length of single track will be determined by CTA rail operations (see paragraph 13 for clearance envelope).

D. As much work as possible is to be done under normal CTA operating conditions (under traffic) without disruption of train movements.

E. In order to request a single track (taking one track out of service), the Contractor, through the Resident Engineer, shall notify the CTA Representative forty-two (42) calendar days in advance of the proposed interruption.

F. Interruptions will be provided solely at the CTA's discretion, depending upon the transit service demands for special events and possible conflicts with prior commitments to other work scheduled on the same route.

G. No more than one service interruption will be allowed simultaneously on this CTA line.

H. If the Contractor is unable to return the CTA track to normal operation on time, after the interruption, liquidated damages of at least \$100.00 per minute of delay shall be paid directly to the CTA by the Contractor. Liquidated damages paid by the Contractor will not be reimbursed.

7. Pedestrian traffic to the CTA facilities shall be maintained at all times.

8. A notice of at least seventy-two (72) hours shall be given to the CTA prior to any beam removal or replacement, which will cause interruption to the CTA facilities and service.

9. Simultaneous work on two piers that will require flagmen and affect the train operation shall not be allowed. Work, which will require flagmen, shall be limited to only **one side of the track at a time**.

10. CTA shall have access to all storage tracks and unrestricted train operation over special holidays such as "July 4" and events such as the "Taste of Chicago". Dates for the above and other special holidays and events such as conventions, auto shows, World Series, etc., will be given to the Department as soon as they are available.

11. The Contractor will be required to take all precautions to avoid debris, concrete, and other materials falling over and/or on the tracks.

12. OTHER SPECIAL CONDITIONS:

A. The Contractor shall caution all employees of the presence of electric third rail (600 volts DC), live cables, and moving trains on CTA tracks. The Contractor shall take all necessary precautions to prevent damage to life or property through contact with the electrical or operations systems. The Contractor shall caution all employees that any contact with live electric third rail or "live" portions of train undercarriage may result in a severe burn or death.

B. The Contractor shall establish third-rail safety precautions in accordance with Authority regulations, such as, using insulating hoods or covers for live third rail or cables adjacent to the work. The Authority will provide CTA-qualified personnel to the Contractor as Contact Personnel. Unless otherwise noted, only CTA personnel are allowed to disconnect power.

C. Safety Training: All employees of the Contractor or his Subcontractors who are required to work upon or adjacent to the CTA's operating tracks shall be required to attend and provide evidence of completion of a right-of-way safety training course administered by CTA.

D. Arrangements for the safety training course shall be the Contractor's responsibility. Contact the CTA Representative to arrange for the safety course.

E. The cost of the course is \$150.00 per person, payable to the CTA prior to taking the course. The cost of this course and the employee's time for the course shall be considered incidental to the cost of the contract. The course is one day long from 8:00 a.m. to 4:00 p.m.

F. The Contractor his Subcontractors and all of his employees who are required to work on or around the CTA's operating tracks shall wear a CTA type safety vest.

13. CTA TRANSIT CLEARANCES:

The Contractor shall perform his work in a manner that provides adequate clearance to the CTA tracks. The clearances shall not be less than the following for safe passage of trains.

7'-2" horizontal to the centerline of the nearest track in yard and right-of-way.

14'-6" vertical from the top of the high running rail.

14. PROTECTIVE SHIELD:

A. The Contractor shall furnish, install, and later remove a protective shield to protect the CTA traffic from damage due to falling material and objects during construction. The protective shield may be a platform, a net or any other Department approved structure.

B. A minimum vertical clearance of 14'-6" above the high running rail of the CTA tracks shall be provided at all times.

C. The protective shield and supporting members shall be designed to sustain a load of 200 pounds per square foot in addition to its own weight. Drawings and design calculations for the protective shield shall be stamped by an Illinois Licensed Structural Engineer and shall be submitted to the Department for approval. The protective shield shall be constructed only after the Department has approved the drawings and the design.

15. The contractor shall be required to provide a schedule for material removal, delivery of new material, crane operation over and around the tracks, and a schedule for access of workmen to the construction site.

PRE-CONSTRUCTION VIDEO LOG

In addition to requirements in Article 107.20 of the Standard Specifications, the Contractor shall prepare a photo/video log of all structures adjacent to the Frontage Road right-of-way within the project limits prior to the start of any construction work. The Contractor shall provide a copy to the Engineer. Also the Contractor shall prepare and furnish a photo/video log of the final condition.

The cost to comply with this requirement will not be paid for separately, but shall be considered as included in the contract unit bid prices of the contract, and no additional compensation will be allowed.

CONTRACTOR'S DAILY WORK SCHEDULE

Description:

The Contractor shall submit a daily work schedule to the Resident Engineer for the purpose of coordinating the Contractor's activities for the next working day. The daily schedule must be submitted by 3:00 pm the day before. This schedule is necessary for the Engineer to schedule inspection, testing and layout checking for the following day.

The schedule shall include the location and type of all work to be performed that day and all material deliveries. It shall identify all concrete pours, the concrete mix design numbers, and estimated number of cubic yards. The placement of bituminous materials shall be identified, including the mix design numbers, location and number of estimated tons to be placed. The Contractor shall identify all locations where survey verification is required and shall give sufficient advance notification to the Engineer so as not to cause delay.

Method of Measurement:

This coordination work will not be measured for payment.

Basis of Payment:

Preparation and submittal of the Contractor's Daily Work Schedule shall not be paid for separately, but shall be included in the cost of the contract items of work.

REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL

This work shall consist of removing and disposing of unsuitable materials encountered during construction. The work shall include but not be limited to the removal and disposal of the top 6 inches of topsoil encountered within the construction limits of this contract as shown on the plans or directed by the Engineer. This work shall be performed, measured and paid for in accordance with Section 202 of the Standard Specifications.

EMBANKMENT

Effective:

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

Material. Reclaimed asphalt shall not be used within the ground water table or as a fill if ground water is present. All material must pass the 75mm (3 in) sieve.

CONSTRUCTION REQUIREMENTS

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

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

Compaction. Soils classification for moisture content control will be determined by the Soils Inspector using visual field examination techniques and the IDH Textural Classification Chart. When tested for density in place each lift shall have a maximum moisture content as follows.

- a) A maximum of 110 percent of the optimum moisture for all forms of clay soils.
- b) A maximum of 105 percent of the optimum moisture for all forms of clay loam soils.

POROUS GRANULAR EMBANKMENT, SUBGRADE

Effective: September 30, 1985 Revised: November 1, 1996

This work consists of furnishing, placing, and compacting porous granular material to the lines and grades shown on the plans or as directed by the Engineer in accordance with applicable portions of Section 207 of the Standard Specifications. The material shall be used as a bridging

layer over soft, pumpy, loose soil and for placing under water and shall conform with Article 1004.06 of the Standard Specifications except the gradation shall be as follows:

1. Crushed Stone, Crushed Blast Furnace Slag, and Crushed Concrete

<u>Sieve Size</u>	<u>Percent Passing</u>		
*150 mm (6 inches)	97±3		
*100 mm (4 inches)	90±10	50 mm (2 inches)	45±25
75 um (#200)	5±5		

2. Gravel, Crushed Gravel and Pit Run Gravel

<u>Sieve Size</u>	<u>Percent Passing</u>
*150 mm (6 inches)	97±3
*100 mm (4 inches)	90±10
50 mm (2 inches)	55±25
4.75 mm (#4)	30±20
75 um (#200)	5±5

*For undercut greater than 450 mm (18 inches) the percent passing the 150 mm (6 inches) sieve may be 90±10 and the 100 mm (4 inches) sieve requirements eliminated.

The porous granular material shall be placed in one lift when the total thickness to be placed is 600 mm (2 feet) or less or as directed by the Engineer. Each lift of the porous granular material shall be rolled with a vibratory roller meeting the requirements of Article 1101.01 of the Standard Specifications to obtain the desired keying or interlock and compaction. The Engineer shall verify that adequate keying has been obtained.

A 75 mm (3 inches) nominal thickness top lift of capping aggregate having a gradation of CA 6 will be required when Aggregate Subgrade is not specified in the contract and Porous Granular Embankment, Subgrade will be used under the pavement and shoulders. Capping aggregate will not be required when embankment meeting the requirements of Section 207 of the Standard Specifications or granular subbase is placed on top of the porous granular material.

Construction equipment not necessary for the completion of the replacement material will not be allowed on the undercut areas until completion of the recommended thickness of the porous granular embankment subgrade.

Full depth subgrade undercut should occur at limits determined by the Engineer. A transition slope to the full depth of undercut shall be made outside of the undercut limits at a taper of 300 mm (1 foot) longitudinal per 25 mm (1 inch) depth below the proposed subgrade or bottom of the proposed aggregate subgrade when included in the contract.

This work will be measured for payment in accordance with Article 207.04 of the Standard Specifications. When specified on the contract, the theoretical elevation of the bottom of the aggregate subgrade shall be used to determine the upper limit of Porous Granular Embankment, Subgrade. The volume will be computed by the method of average end areas.

This work shall be paid for at the contract unit price per cubic meter (cubic yard) for POROUS GRANULAR EMBANKMENT, SUBGRADE which price shall include the capping aggregate, when required.

The Porous Granular Embankment, Subgrade shall be used as field conditions warrant at the time of construction. No adjustment in unit price will be allowed for an increase or decrease in quantities from the estimated quantities shown on the plans.

COMPOST FURNISH AND PLACE

Delete the first sentence of Article 211.01 Description and substitute the following:

This work shall consist of furnishing, transporting and placing topsoil, special types of topsoil, compost, or compost/topsoil blend to the depth specified in areas as shown in the plans or as directed by the Engineer.

Delete the first sentence of the first paragraph of Article 211.04 Placing Topsoil and Compost and substitute the following:

Topsoil, compost, or compost/topsoil blend shall not be placed until the area to be covered has been shaped, trimmed and finished according to Section 212.

Delete the first sentence of the second paragraph of Article 211.04 Placing Topsoil and Compost and substitute the following:

The Engineer will verify that that the proper topsoil, compost, or compost/topsoil blend depth has been applied.

Add the following to Article 211.06 Clearing Area and Disposal of Surplus Material:

Prior to placing topsoil, compost or compost/topsoil blend, the contractor shall remove all litter (including plastic bags, bottles, rocks, etc.) and plant debris.

Add the following to Article 211.08 Basis of Payment:

Payment shall include all costs for materials, equipment and labor required to complete the work specified herein, including the cost of removing and disposing of any debris.

WEED CONTROL, PRE-EMERGENT GRANULAR HERBICIDE

Description:

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

Materials:

The pre-emergent granular herbicide (Snapshot 2.5 TG or equivalent) shall contain the chemicals Trifluralin 2% active ingredient and Isoxaben with 0.5% active ingredient. The herbicide label shall be submitted to the Engineer for approval at least seventy-two (72) hours prior to application.

Method:

The pre-emergent granular herbicide shall be used in accordance with the manufacturer's directions on the package. The granules are to be applied prior to mulching.

Apply the granular herbicide using a drop or rotary-type spreader designed to apply granular herbicide or insecticides. Calibrate application equipment to use according to manufacturer's directions. Check frequently to be sure equipment is working properly and distributing granules uniformly. Do not use spreaders that apply material in narrow concentrated bands. Avoid skips or overlaps as poor weed control or crop injury may occur. More uniform application may be achieved by spreading half of the required amount of product over the area and then applying the remaining half in swaths at right angles to the first. Apply the granular herbicide at the rate of 100 lbs/acre (112 kg/ha) or 2.3 lbs/1000 sq. ft. (11.2 kg/1000 sq. meters).

Method of Measurement:

Pre-emergent granular herbicide will be measured in place in Pounds (Kilograms) of Pre-emergent Granular Herbicide applied. Areas treated after mulch placement shall not be measured for payment.

Basis of Payment:

This work will be paid for at the contract unit price per pound (kilogram) of WEED CONTROL, PRE-EMERGENT GRANULAR HERBICIDE which price shall include all materials, equipment, and labor necessary to complete the work as specified.

MOWING

Description: This work shall consist of mowing existing grass cover not disturbed by the project or areas that are seeded or sodded. The grass shall be cut to a height of 3 inches. All areas shall be mowed when the height of the grass is 6 inches or when directed by the Engineer. This work shall be done according to the applicable portions of Section 250.06 of the Standard Specification for Road and Bridge Construction.

The Method of Measurement and Basis of Payment will be according to Section 250.09 and 250.10 of the Standard Specification book.

TEMPORARY DITCH CHECKS

This Special Provision revises Section 280 of the Standard specifications for Road and Bridge Construction to eliminate the use of Aggregate Ditch Checks and Hay and Straw Bales for Temporary Ditch Checks.

Delete Paragraphs 2 and 3 of Article 280.04(a) Temporary Ditch Checks.

Add to Article 280.04(a) Temporary Ditch Checks: Temporary Ditch Checks shall be at least 3.66 meters (12 feet) or longer in length.

USE OF RAP FOR TEMPORARY ACCESS ENTRANCES AND/OR AGGREGATE SHOULDERS, TYPE B

Reclaimed Asphalt Pavement (RAP) for Temporary Access Entrances and/or Aggregate Shoulders, Type B

Effective: April 1, 2001

Replace the Note in Articles 402.02(a) and 481.02(a) of the Standard Specifications for Road and Bridge Construction with the following:

"Note: Reclaimed asphalt pavement (RAP) may be used as aggregate in surface course for temporary access entrances and/or aggregate shoulders Type B. 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. The RAP shall also meet the following requirements:

One hundred percent of the RAP material shall pass the 37.5 mm (1 1/2 inch) sieve. The RAP material shall be reasonably well graded from coarse to fine. RAP material that is gap-graded or single-sized will not be accepted."

AGGREGATE SURFACE COURSE FOR TEMPORARY ACCESS

Effective: April 1, 2001

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.

Private Entrance. The minimum width shall be 3.6 m (12 ft). The minimum compacted thickness shall be 150 mm (6 in.). The maximum grade shall be eight percent, except as required to match the existing grade.

Commercial Entrance. The minimum width shall be 7.2 m (24 ft). The minimum compacted thickness shall be 230 mm (9 in.). The maximum grade shall be six percent, except as required to match the existing grade.

Road. The minimum width shall be 7.2 m (24 ft). The minimum compacted thickness shall be 230 mm (9 in.). The grade and elevation shall be the same as the removed pavement, except as required to meet the grade of any new pavement constructed.

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

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

Add the following to Article 402.12 of the Standard Specifications:

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

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

"Aggregate surface course for temporary access will be paid for at the contract unit price per each for TEMPORARY ACCESS (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:

Upon construction of the temporary access, sixty percent of the contract unit price per each, of the type constructed, will be paid.

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."

EXTENDED LIFE CONCRETE PAVEMENT (30 YEAR)

Description: This work shall consist of constructing concrete pavement, shoulders and appurtenances of an extended life (30 year) design. Work shall be performed according to the Standard Specifications except as modified herein:

Definitions:

Granular Subbase. The aggregate above the subgrade and below the granular subbase cap.

Granular Subbase Cap. The aggregate above the granular subbase and below the bituminous concrete base.

Bituminous Concrete Base. The bituminous concrete layer above the granular subbase cap and below the pavement.

Embankment: Add the following to Section 205:

“Embankment material shall be approved by the Engineer and shall have a standard laboratory density of not less than 90 lb/cu ft. It shall not have an organic content greater than ten percent when tested according to AASHTO T 194. Soils that demonstrate the following properties shall be restricted to the interior of the embankment:

A grain size distribution with less than 35 percent passing the #200 sieve.

A plasticity index (PI) of less than 12.

A liquid limit (LL) in excess of 50.

Potential for erosion.

Potential for excess volume change.

Such soils shall be covered on the side and top with a minimum of 3 ft of soil not characterized by any of the five items above.”

Revised the second paragraph of Article 205.05 to read:

“All lifts shall be compacted to not less than 95 percent of the standard laboratory density.”

Revise the first sentence of the third paragraph of Article 205.05 to read:

“The embankment shall not contain more than 110 percent of the optimum moisture content determined according to AASHTO T 99 (Method C).”

Subgrade Preparation: Add the following to the second paragraph of Article 301.06:

“During compaction, the upper 8 in. of the subgrade shall not contain more than 110 percent of the optimum moisture content determined according to AASHTO T 99 (Method C).”

Granular Subbase and Granular Subbase Cap: Revise Article 311.02 to read:

“311.02 Materials. Materials shall meet the requirements of the following Articles of Section 1000 – Materials:

Granular Subbase (Note 1).....1004.04
Granular Subbase Cap (Note 2).....1004.04

Note 1. The quality requirements in Article 1004.04 (b) shall not apply. The granular subbase shall be subbase granular material Type B, shall be classified as Category III in the Aggregate Gradation Control System (AGCS), and shall meet the following gradation requirements:

Granular Subbase Gradations						
Coarse Aggregate Type	Sieve Size Percent Passing					
	8 in.	6 in.	4 in.	2 in.	#4	#200
Crushed Stone, Crushed Slag, and Crushed Concrete	100	97 ± 3	90 ± 10	45 ± 25		5 ± 5
Crushed Gravel		100	90 ± 10	55 ± 25	30 ± 20	5 ± 5

The granular subbase shall be well-graded from coarse to fine. Material that is gap-graded or single-sized will not be accepted.

Note 2. The granular subbase cap shall be subbase granular material, Type B and shall be CA 6 gradation. Reclaimed Asphalt Pavement (RAP) meeting Article 1004.07 of the Standard Specifications and having 100% passing the 3 inches sieve and well-graded down through fines may also be used as capping aggregate. RAP shall not contain steel slag or other expansive material. The results of the Department’s tests on the RAP material will be the determining factor for consideration as expansive.”

Add the following to Article 311.03:

“(h) Vibratory Roller.....1101.01 (g)”

Revise Article 311.05(c) to read:

“(c) Subbase Granular Material, Type B. The manner of placing and compacting the material shall be approved by the Engineer prior to starting the work.
 The Granular subbase shall be constructed in layers not more than 2 ft thick when compacted. Each layer shall be compacted with a vibratory roller to the satisfaction of the Engineer.

After completion of the granular subbase, the granular subbase cap shall be placed. Each layer shall be compacted with a vibratory roller to the satisfaction of the Engineer.

If the moisture content of the material is insufficient to obtain satisfactory compaction, sufficient water shall be added, at the Contractors expense, so that satisfactory compaction can be obtained.”

Revise that first sentence of the first paragraph of Article 311.08 (b) to read:

“Aggregate used in the granular subbase and granular subbase cap will be measured for payment in square meters (square yards).”

Bituminous Concrete Base: This work shall be performed according to the special provision, “Superpave Bituminous Concrete Mixtures. The mixture used shall be the Superpave IL-19.0, N50, 3.0% voids.

Pavement and Shoulders: Add the following to Articles 420.03, 421.03, and 483.03:

“The Contractor shall submit to the Engineer, for approval before paving, the proposed internal type vibrator spacing for the paver. The Contractor shall also provide the proposed vibrator operating frequencies for a paving speed greater than or equal to 3 ft./min and a paving speed less than 3 ft./min.”

Portland Cement Concrete: Revise Article 1020.02 (d) to read:

“(d) Coarse Aggregate (Note 1).....1004.01 – 1004.02”

Add the following to Article 1020.02:

“Note 1. For pavement, median, curb, gutter, combination curb and gutter and concrete barrier, the freeze-thaw rating expansion limit for the coarse aggregate shall be a maximum of 0.040 percent according to Illinois Modified AASHTO T 161, Procedure B.”

Revise the curing table of Article 1020.13 as follows:

“The curing period for pavement, median, curb, gutter and combination curb and gutter shall be a minimum of 7 days.”

Revise the first sentence of the second paragraph of Article 1020.13 (a)(4) to read:

“Membrane curing shall be completed within ten minutes after tining.”

Add the following to Article 1020.14(a):

“Prior to placing concrete, the Contractor shall indicate to the Engineer how the temperature of the concrete mixture will be controlled. If the temperature requirements are not being met, production of concrete shall stop until corrective action is taken. The Contractor will be allowed to deliver concrete already en route to the paving site.”

SUB-BASE COOLING

Add the following to Article 420.07:

“When the surface temperature, as measured on the surface with a device as approved by the Engineer, of the Stabilized Sub-base is 115°F (46°C) or greater the Contractor shall spray the Stabilized Sub-base with a water mist with equipment that meets the approval of the Engineer. The Stabilized Sub-base shall be cooled below 115°F (46°C) prior to paving on top. The water spray shall not produce excessive water runoff or leave puddles on the Stabilized Sub-base at the time of paving. All cooling shall be completed a minimum of 10 minutes prior to paving. The surface temperature shall be monitored during the paving operation to determine if the Stabilized Sub-base requires re-spraying.

The water used shall meet the requirements of Section 1002.”

Add the following to Article 420.23:

“When a cooling method is used to cool the Stabilized Sub-base it shall not be paid for separately, but included in the cost of PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED), of the thickness specified or PORTLAND CEMENT CONCRETE SHOULDER, of the thickness specified.

TYPE A FINAL FINISH OF PCC PAVEMENT WITH VARIABLY SPACED TINING

Type A Final Finish Of Portland Cement Concrete Pavement With Variably Spaced Tining

Revised: October 4, 2002

Revise the third paragraph of Article 420.11(e)(1) of the Standard Specifications to read:

“ The metal comb shall consist of a single line of tempered spring steel tines variably spaced between 17 mm (11/16 in.) and 54 mm (2 1/8 in.) as shown in the table below, securely mounted in a suitable head. The tines shall be flat and of a size and stiffness sufficient to produce a groove of the specified dimensions in the plastic concrete without tearing of the pavement edge or surface. The Contractor shall modify the equipment or operations if an acceptable pavement or surface is not produced. The mechanically operated metal comb shall be attached to an exclusive piece of equipment, which is mechanically self-propelled and capable of traversing the entire pavement width being placed in a single pass. The artificial turf carpet drag may be attached to this piece of equipment provided a surface texture is produced satisfactory to the Engineer. The tining device shall be operated so as to produce a pattern of grooves at a 1:6 skew across the pavement, 3 to 5 mm (1/8 to 3/16 in.) deep and 2.5 to 3.2 mm (1/10 to 1/8 in.) wide. No other operation will be permitted with this equipment. Separate passes will be required for the turf dragging operation and the tining operation.

Metal Comb Tine Spacing (Metric, Center to Center of Tines, mm)

34	36	47	54	48	43	32	31	27	36	29	46
21	43	23	42	52	24	18	28	40	34	27	26
25	27	20	37	38	52	51	45	37	43	53	27
37	42	41	29	43	45	44	30	37	33	40	28
31	50	34	45	20	45	50	53	51	29	25	18
53	18	38	51	40	17	49	50	39	51	36	36
38	46	29	38	50	24	33					

Metal Comb Tine Spacing (English, Center to Center of Tines, in.)

1 5/16	1 7/16	1 7/8	2 1/8	1 7/8	1 11/16	1 1/4	1 1/4	1 1/16
1 7/16	1 1/8	1 13/16	13/16	1 11/16	7/8	1 5/8	2 1/16	15/16
11/16	1 1/8	1 9/16	1 5/16	1 1/16	1	1	1 1/16	13/16
1 7/16	1 1/2	2 1/16	2	1 3/4	1 7/16	1 11/16	2 1/16	1 1/16
1 7/16	1 5/8	1 5/8	1 1/8	1 11/16	1 3/4	1 3/4	1 3/16	1 7/16
1 5/16	1 9/16	1 1/8	1 1/4	1 15/16	1 5/16	1 3/4	13/16	1 3/4
1 15/16	2 1/16	2	1 1/8	1	11/16	2 1/16	11/16	1 1/2
2	1 9/16	11/16	1 15/16	1 15/16	1 9/16	2	1 7/16	1 7/16
1 1/2	1 13/16	1 1/8	1 1/2	1 15/16	15/16	1 5/16"		

COMPOSITE PAVEMENT ALTERNATIVE FOR WINTER PERIOD

If pavement restoration is required along frontage roads and bituminous mixtures are not available because the asphalt plants have shut down, the following pavement section shall be constructed:

Subbase Granular Material Type B, 6"
PCC Base Course 12"

The top of the PCC base course shall be placed to match the existing bituminous pavement surface. As soon as bituminous materials become available, or as directed by the Engineer, the top 1 ½" of the pavement surface shall be cold milled and overlaid to the dimensions shown on the plans with Bituminous Concrete Surface Course, Superpave, Mix "D" N70, 1 ½".

The cost for additional thickness of PCC base course and cold milling shall not be paid for separately, but shall be included in the cost of the contract items of work.

TEMPORARY PAVEMENT

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

The contractor shall use either portland cement concrete as outlined in Section 353 and 354 of the Standard Specifications or bituminous concrete according to Section 355, 356, 406 of the Standard Specifications, and the special provisions for Bituminous Base Course/Widening Superpave and Superpave Bituminous Concrete Mixtures. The bituminous mixtures to be used shall be specified in the plans. The thickness of the Temporary Pavement shall be as described in the plans. The contractor shall have the option of constructing either material type if both portland cement concrete and bituminous concrete are shown in the plans.

Articles 355.10 and 406.21 of the Standard Specifications shall not apply.

The removal of the Temporary Pavement shall conform to Section 440 of the Standard Specifications.

Method of Measurement: Temporary pavement will be measured in place and the area computed in square meters (square yards).

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

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

SLEEPER SLAB

Description:

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

Materials:

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

Method of Measurement:

Sleeper slab will be measured for payment in place, and the area computed in square yards. Reinforcement bars, polyethylene bond breaker and preformed joint filler shall not be paid for separately, but shall be included in the unit price for the sleeper slab. Excavation, except excavation in rock, shall be paid as Earth Excavation.

Basis of Payment:

This work will be paid for at the contract unit price per square yard for SLEEPER SLAB, which price shall be payment in full for all materials, labor, tools, equipment and incidentals necessary to complete the work as specified.

ADA RAMPS, CITY OF CHICAGO

CAST IN PLACE TACTILE/DETECTABLE WARNING SURFACE SYSTEM FOR RAMPS FOR PEOPLE WITH DISABILITIES.

PART 1 GENERAL

1. Related Documents

- A. The Contract Plans and Standard Specifications, apply to this Section.

2. Description

- A. This Section specifies furnishing and installing cast-in-place tactile tile modules where indicated.

3. Submittals

- A. Product Data: Submit manufacturer's literature describing products, installation procedures and routine maintenance.

- B. Samples for Verification Purposes: Submit two (2) samples minimum 6"x8" of the kind proposed for use.

- C. Shop drawings are required for products specified showing fabrication details; composite structural system; plans of placement including joints, and material to be used as well as outlining installation materials and procedures.

D. Material Test Reports: Submit test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet the properties indicated. All test reports must be conducted on a tactile system as certified by a qualified independent testing laboratory.

E. Maintenance Instructions: Submit copies of manufacturer's specified maintenance practices for each type of tactile system and accessory as required.

4. Quality Assurance

A. Provide tactile system and accessories as produced by a single manufacturer.

B. Installer's Qualifications: Engage an experienced Installer certified in writing by tactile manufacturer as qualified for installation, who has successfully completed installations similar in material, design, and extent to that indicated for the project.

C. Americans with Disabilities Act (ADA): Provide tactile warning surfaces which comply with the detectable warnings on walking surfaces section of the Americans with Disabilities Act (Title 49 CFR TRANSPORTATION, Part 37.9 STANDARDS FOR ACCESSIBLE TRANSPORTATION FACILITIES, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES).

D. California Code of Regulations (CCR): Provide only approved DSAAC detectable warning products as provided in the California Code of Regulations (CCR). Title 24, Part 1, Articles 2, 3 and 4 and Part 2, Section 205 definition of "Detectable Warning". Section 1127B.5 for "Curb Ramps" and Section 1133B.8.5 for "Detectable Warnings at Hazardous Vehicle Area's".

E. The tile must incorporate an in-line dome pattern of truncated domes 0.2" in height, 0.9" diameter at the base, and 0.4" diameter at top of dome, spaced 2.35" nominal as measured on a diagonal. For wheelchair safety the field area must consist of a non-slip surface with a minimum of 40 - 90° raised points 0.045" high, per square inch.

1. Dimensions: Tile Assemblies must be held within the following dimensions and tolerances:

Length and Width:	:	24"x 24" nominal, Plus or minus 1/16".
Depth	:	1.500" ± 5% max.
Face Thickness	:	0.1875 ± 5% max.
Warpage of Edge	:	± 0.5% max.

2. Water Absorption of Tile when tested by ASTM-D 570 not to exceed 0.35%.

3. Slip Resistance of Tile when tested by ASTM-C 1028, the combined wet/dry static co-efficient of friction not to be less than 0.90 on top of domes and field area.

4. Compressive Strength of tile when tested by ASTM-D 695-91 not to be less than 18,000 psi.
5. Tensile Strength of Tile when tested by ASTM-D 638-91 not to be less than 10,000 psi.
6. Flexural Strength of Tile when tested by ASTM - C293-94 not to be less than 24,000 psi.
7. Chemical Stain Resistance of Tile when tested by ASTM-D 543-87 to withstand without discoloration or staining - 1% hydrochloric acid, urine, calcium chloride, stamp pad ink, gum and red aerosol paint.
8. Abrasive Wear of Tile when tested by BYK - Gardner Tester ASTM-D 2486* with reciprocating linear motion of $37 \pm$ cycles per minute over a 10" travel. The abrasive medium, a 40 grit Norton Metallite sand paper, to be fixed and leveled to a holder. The combined mass of the sled, weight and wood block to be 3.2 lb. Average wear depth must not exceed 0.030 after 1000 abrasion cycles measured on the top surface of the dome representing the average of three measurement locations per sample.
9. Fire Resistance: When tested to ASTM E84 flame spread must be less than 25.
10. Gardner Impact to geometry "GE" of the standard when tested by ASTM-D 5420-93 to have a mean failure energy expressed as a function of specimen thickness of not less than 450 in. 1bf/in. A failure is noted if a hairline fracture is visible in the specimen.
11. Accelerated Weathering of Tile when tested by ASTM-G26-95 for 2000 hours must exhibit the following result - no deterioration, fading or chalking of surface of tile.

5. Delivery, Storage and Handling

- A. Deliver glass fiber reinforced ceramic cement warning panels to worksite in such quantities and at such times to assure continuity of installation. Handle and transport units in a position consistent with their shape and design in order to avoid excessive stresses or damage.
- B. Store units at worksite to prevent cracking, distorting, warping, staining or other physical damage and so that markings are visible.
- C. Keep panels under cover and protected until installed.
- D. Deliver ABS anchors in sufficient quantity for the work to be done before the start of construction.

6. Site Conditions

- A. Environmental Conditions and Protection: Maintain minimum temperature of 40 degrees F in spaces to receive tactile tiles for at least 48 hours prior to installations, during installation, and for not less than 48 hours after installation. Store tactile tile material in spaces where they

will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 40 degrees F in areas where work is completed.

B. The use of water for work, cleaning or dust control, etc. must be contained and controlled and must not be allowed to come into contact with the passengers or public. Provide barricades or screens to protect passengers or public.

C. Disposal of any liquids or other materials of possible contamination must be made in accordance with federal state and local laws and ordinances.

D. Cleaning materials must have code acceptable low VOC solvent content and low flammability if used on the site.

7. Extra Stock

A. Deliver extra stock to storage area designated by engineer. Furnish new materials from same manufactured lot as materials installed and enclose in protective packaging with appropriate identification for cast-in-place tactile tiles. Furnish not less than two (2)% of the supplied materials for each type, color and pattern installed.

8. Guarantee

A. Cast-in-place tactile tiles must be guaranteed in writing for a period of five years from date of final completion. The guarantee includes defective work, breakage, deformation, and loosening of tiles.

Part 2 PRODUCTS

1. Manufacturers

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

2 Glass Fiber Reinforced Ceramic Cement (GFRCC)

A. Proprietary Ceramic Cement Blend.

1. Use only one brand, type and source of supply of cement throughout GFRCC production unless noted otherwise.

B. Aggregates
1. Proprietary blend

C. Water. Potable, free from foreign materials in amounts harmful to concrete.

D. Admixtures: conform to ASTM C260 for air entrapment, ASTM C494 for chemical admixtures, or ASTM C618 for fly ash or natural pozzolan admixtures, at manufacturers option. Do not use admixtures that contain more than 0.1% chloride ions.

E. Coloring Agent

1. Conform to ASTM C979, ultraviolet resistant, high temperature stable, harmless to concrete set or strength.
2. The amount of coloring agent must not exceed 10% of the cement weight.
3. Color: Federal Brick Red 30166 Color must be homogeneous throughout the tile.

3 Anchors and Subsystems

A. Each GFRCC panel is to be attached to the supporting concrete with a minimum of anchors in the top horizontal plane and in the preformed holes.

PART 3 EXECUTION

1. Installation

A. During all concrete pouring and tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.

B. The specifications of the concrete sealants and related materials must be in strict accordance with the contract documents and the guidelines set by their respective manufacturers.

C. The physical characteristics of the concrete must be consistent with the Standard Specifications while maintaining a slump range of 4 - 7 to permit solid placement of the Cast-In-Place Tile System. An overly wet mix will cause the Cast-In-Place System to float, therefore under these conditions suitable weights such as 2 concrete blocks or sandbags (25 lb) must be placed on each tile.

D. Prior to placement of the Cast-In-Place System, the contract plans must be reviewed.

E. The concrete pouring and finishing operations require typical mason's tools, however, a 4' long level with electronic slope readout, 25 lb. weights, vibrator and small sledge hammer with 2" x 6" x 20" wood tamping plate are specific to the installation of the Cast-In Place System.

F. The concrete must be poured and finished, true and smooth to the required dimensions and slope prior to tile placement. Immediately after finishing the concrete, the electronic level should be used to check that the required slope is achieved. The tile must be placed true and square to the curb edge in accordance with the contract plans The Cast-In-Place Tiles must be tamped or vibrated into the fresh concrete to ensure that the field level of tile is flush to the adjacent concrete surface. The contract plans indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes. The tolerance for elevation differences between tile and adjacent surface is 1/16". Place the second panel next to the first, leaving no gap (tiles must be abutted to one another) and press into the wet concrete using a twisting back and forth motion.

Be certain that the second panel is even and level with the first and with the surrounding concrete

G. Immediately after tile placement, the tile elevation is to be checked to adjacent concrete. The tile elevation and slope should be set consistent with the contract plans to permit water drainage to curb as the design dictates.

H. While concrete is workable a steel trowel must be used to trowel the concrete around the tile perimeter to the field level of the tile. - Trowel concrete flat, remove any excess concrete and leaving no gap (tiles must be abutted to one another) between the panels. Apply finish to the area immediately surrounding the panels as shown in the plans.

I. Remove the protective plastic coating and insert one anchor into each of the preformed holes, being certain that the anchors are inserted completely, flush to the panel surface. Tap the top of each anchor 5-6 times using the trowel handle. This will insure good contact of the concrete with the anchor.

J. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external forces placed on the tile to rock the tile, causing a void between the underside of tile and concrete.

K. Following tile placement, review installation tolerances to contract drawings and adjust tile before the concrete sets, 2 suitable weights of 25 lb each must be placed on each tile as necessary to ensure solid contact of tile underside of concrete.

L. Following the curing of the concrete, the protective plastic wrap is to be removed from the tile face by cutting the plastic with a sharp knife tight to the concrete/tile interface. If concrete bleeding occurs, a wire brush will clean the residue without damage to the tile surface.

2. Cleaning and Protection

A. Protect tiles against damage during construction period to comply with tactile tile manufacturer's specification.

B. Protect tiles against damage from rolling loads following installation by covering with plywood or hardwood.

C. Clean tactile tiles not more than four days prior to date scheduled for inspection intended to establish date of substantial completion in each area of project. Clean tactile tile by method specified by tactile tile manufacturer.

Method of Measurement: CAST IN PLACE TACTILE/DETECTABLE WARNING SURFACE SYSTEM FOR RAMPS FOR PEOPLE WITH DISABILITIES will be measured per square foot.

Basis of Payment: The work under this item will be paid for at the contract unit price per square foot as shown in the Schedule of Unit Prices for CAST IN PLACE TACTILE/ DETECTABLE WARNING SURFACE SYSTEM FOR RAMPS FOR PEOPLE WITH DISABILITIES which price will include all labor, installation, equipment, materials and incidental work necessary to complete the work as specified.

PAVEMENT REMOVAL, SPECIAL

Effective: January 13, 1989

Revised: November 1, 1996

This work consists of removing pavement at the locations shown on the plans in accordance with the requirements specified herein.

The only type of pavement removal permitted will be by lifting slabs of pavement. The Contractor shall saw cut the pavement full depth into slabs which can be lifted into trucks and hauled away from the job site.

The outlining sawcut must be made prior to breaking any pavement in adjacent lanes which is done by conventional methods.

This work will be measured for payment in square meters (square yards) of pavement surface.

This work will be paid for at the contract unit price per square meter (square yard) for PAVEMENT REMOVAL (SPECIAL), which price shall include saw cutting and disposal of the pavement from the job site.

PAVED SHOULDER REMOVAL, SPECIAL

This work consists of removing paved shoulder at the locations shown on the plans in accordance with the requirements specified herein.

The only type of shoulder removal permitted will be by lifting slabs of pavement. The Contractor shall saw cut the shoulder full depth into slabs which can be lifted into trucks and hauled away from the job site.

The outlining sawcut must be made prior to breaking any adjacent shoulder pavement that is done by conventional methods.

This work will be measured for payment in square meters (square yards) of shoulder surface.

This work will be paid for at the contract unit price per square meter (square yard) for PAVED SHOULDER REMOVAL (SPECIAL), which price shall include saw cutting and disposal of the shoulder pavement from the job site.

REMOVAL OF EXISTING STRUCTURES NO. 1, NO. 2

Description:

This work consists of the removal and satisfactory disposal of the existing concrete retaining wall, attached fence and portions of the foundation piling at the locations shown on the plans or as directed by the Engineer. The work shall be performed in accordance with the applicable portions of Section 501 of the Standard Specifications, the details in the plans, and as herein specified. Any porous granular embankment necessary for backfilling behind the proposed wall

within the limits of existing structure removal shall be considered included in that item of work (REMOVAL OF EXISTING STRUCTURES) and will not be measured for payment. Materials removed shall be disposed of in accordance with Article 202.03.

General Requirements:

The Contractor shall furnish the Engineer with his plan for removal of the structure, showing his procedures and sequence of removal. The removal of the existing retaining wall and appurtenances shall not commence without the Engineer's approval.

The submittal must include a written description of the proposed sequence of removal and the methods to be employed in the removal operations. Further, the submittal must include drawings and details of the sequence of removal of the existing structure and locations of any temporary supports or bracing, the anticipated loads and the step-by-step removal procedure. The Contractor is responsible to ensure that the removal procedure results in a safe and stable structure at all times and to comply with all safety requirements as required by all city, state and federal laws, codes or other regulations.

The Contractor shall comply with the applicable portions of the "American National Standards Institute" (ANSI): Standard A "Safety Requirements for Demolition" in effect as of the date of the Contract Documents.

All materials removed shall become the property of the Contractor, unless otherwise specified herein, and shall be disposed of by the Contractor off the site in a lawful manner.

Items of salvageable value to the Contractor may be removed from the structure as work progresses. The Contractor's salvaged items shall be transported from the project site as they are removed. Storage or sale of removed items on the project site shall not be permitted.

The Contractor shall conduct demolition operations and removal of debris in a manner to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities. The Contractor shall not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. The Contractor shall provide alternate routes around closed or obstructed traffic ways as shown on the plans and required by governing regulations or the Department.

The Contractor shall promptly repair any adjacent buildings, structures or other improvements damaged or displaced during, or as a result of, demolition operations, as directed by the Engineer and at no additional expense to the Department.

Construction Requirements:

The Contractor shall provide all necessary earth retention systems, bracing, shoring, temporary supports, barricades, fencing etc. necessary to protect surrounding property, existing utilities and the general public from damage or harm caused by falling debris or collapse of any portion of the structure. The Contractor shall submit drawings and design for the earth retention system to the Engineer for approval. The design and drawings shall be signed and sealed by a licensed Structural Engineer in the State of Illinois. The Engineer's approval does not relieve the Contractor from the sole responsibility of the structural integrity of the temporary earth retention system. The Contractor shall also provide temporary support for any adjacent structure, pavement or utility impacted by removal of the existing retaining wall. All support details shall

also be signed and sealed by a licensed Structural Engineer in the State of Illinois. It is the Contractor's responsibility to verify all existing conditions, including utilities and access to the site prior to construction or ordering materials.

The concrete portions of the retaining wall and any attachments or appurtenances shall be removed as detailed on the plans. Portions of the pile foundations to remain shall be cut off as detailed on the plans.

Backfilling behind proposed wall shall be in accordance with Article 502.10 of the Standard Specifications. Backfill material shall be POROUS GRANULAR EMBANKMENT and shall be compacted to not less than 95 % of the standard laboratory density as determined in accordance with AASHTO T-99 (Method C).

Method of Measurement:

Removal of the existing structure, as numbered, shall be measured per each. Any excavation necessary to perform the removal of existing structures shall be considered included in that item of work (REMOVAL OF EXISTING STRUCTURES) and will not be measured for payment. Any porous granular embankment necessary for backfilling behind the proposed wall within the limits of existing structure removal shall be considered included in that item of work (REMOVAL OF EXISTING STRUCTURES) and will not be measured for payment. Existing attached fence shall be included in that item of work (REMOVAL OF EXISTING STRUCTURES) and will not be measured for payment.

Basis of Payment:

This work shall be paid at the contract unit price per each for REMOVAL OF EXISTING STRUCTURES NO. 1 and REMOVAL OF EXISTING STRUCTURES NO. 2, which price shall be payment in full for all labor, tools equipment and incidentals necessary to complete the work as specified.

ROCK EXCAVATION FOR STRUCTURES, (SPECIAL)

This work consists of excavating rock encountered during the construction of water mains and storm sewers jacked in place. This work shall be done in accordance with the applicable portions of Sections 502 and 552 of the Standard Specifications.

The area to be used for calculating the quantity of rock excavation, special shall be the entire area calculated using the outside diameter of the casing pipe until rock is not encountered or as determined by the Engineer.

This work will be paid for at the contract unit price per cubic meter (cubic yard) for ROCK EXCAVATION FOR STRUCTURES, SPECIAL measured as specified.

CONCRETE STRUCTURES

Revise Article 503.02 to include the following:

The coarse aggregate to be used in the concrete for the retaining wall stems shall conform to the requirements for the coarse aggregate that is used for superstructure concrete.

RUSTICATION FINISH FOR RETAINING WALLS

Effective: May 1, 1990

Revised: February 19, 2004

Description. This work consists of providing the forms, materials and rusticated finish on retaining walls, in accordance with the details shown in the plans and the Special Provisions.

Materials. Materials shall conform to Article 503.02; of the Standard Specification and includes the following:

The coarse aggregate to be used in the concrete for the rustication finish shall conform to the requirements for coarse aggregate in concrete superstructure.

Construction Requirements

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

Formliners shall be used to obtain the rustication finish on the retaining walls. Formwork shall have the strength and stability to ensure finished concrete dimensions within the tolerances specified herein. The quality of the formwork shall be maintained throughout the entire project. Variations in dimensions for the wall sections with a rustication finish shall be within the following tolerances: the width and depth of rustication joints shall be within 3 mm (1/8 inch) \pm , the location of the rustication joints shall be within 13 mm (1/2 inch) \pm , the maximum variation of a joint from a straight line shall be 6 mm (1/4 inch) \pm in 3 meters (10 feet).

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

Upon approval of the construction procedures by the Engineer, the Contractor shall pour a 9 m (30 feet) long test section of retaining wall at a location directed by the Engineer. After removal of the formwork, the Engineer will examine the test section of the wall and instruct the Contractor if the rustication finish is acceptable or if future wall sections need further modifications. If necessary, the Contractor shall pour additional test sections of wall at locations designated by the Engineer until a wall section meets with the Engineer's approval. The rustication finish of all subsequently installed wall sections shall match the approved test section. The Contractor shall repair all deviations from the approved rustication finish to the satisfaction of the Engineer at no additional cost to the contract.

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

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

Basis of Payment. This work will be paid for at the contract unit price per square meter (square foot) for RUSTICATION FINISH, which price includes all work as specified herein.

REMOVING AND RE-ERECTING EXISTING RAILING

This work shall be done in accordance with applicable portions of Section 509 and Section 664 of the Standard Specifications except as herein modified.

This work shall consist of removing part of an existing metal railing from its mounting on the wingwall, re-fabricating sections as needed to fit on the revised wingwall, reinstalling the re-fabricated metal railing on the wingwall and disposing of the remainder of the metal railing. The re-fabrication may use undamaged portions of the existing railing including necessary hardware. If sufficient hardware or metal railing panels or parts are not salvageable, the Contractor shall provide new necessary materials of a similar quality, style and color to the existing metal railing at no additional cost to the Department. Samples of proposed replacement material are to be submitted for approval prior to ordering or installation.

Basis of Payment. This work shall be paid for at the contract unit price per foot for REMOVING AND RE-ERECTING EXISTING RAILING, which price shall be payment in full for all labor, tools, equipment and materials necessary to remove and re-erect the existing railing as herein 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 JACKED IN PLACE

Article 552.04 General.

Revise Article 552.04 to include the following:

“The use of a metal liner shall be required for all pipe sizes less than 42 inches in diameter.”

RECLAIMED ASPHALT PAVEMENT FOR NON-POROUS EMBANKMENT AND BACKFILL

“The Contractor shall size the jacking and receiving pits to accommodate construction of the drainage structures attached to the jacked pipe.”

“Security fence shall be required around the perimeter of the jacking and receiving pits.”

Effective: April 1, 2001

Add the following sentence to Article 1004.06 (a) Description of the Standard Specifications for Road and Bridge Construction:

"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 1004.06 (C) Gradation of the Standard Specifications for Road and Bridge Construction.

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

PIPE UNDERDRAINS FOR STRUCTURES

Effective: May 17, 2000

Revised: July 18, 2003

Description. This work shall consist of furnishing and installing the perforated drain pipe, geotechnical fabric and/or impervious geomembrane, and coarse aggregate as shown on the plans, as specified herein, and as directed by the Engineer.

Materials. Materials shall meet the requirements as set forth below:

Pipe underdrains shall consist of perforated drain pipe in accordance with Article 601.02 of the Standard Specifications. Outlet pipes shall not be perforated.

The coarse aggregate shall have a gradation of CA5 or CA7 in accordance with Section 1004 of the Standard Specifications.

The fabric surrounding the coarse aggregate shall consist of Geotechnical Fabric for French Drains in accordance with Article 1080.05 of the Standard Specifications.

The impervious geomembrane surrounding the coarse aggregate shall be a minimum 20 mil in thickness and shall be manufactured from polypropylene, polyethylene, or polyvinyl chloride material.

Construction Requirements. All work shall be in accordance with the applicable requirements of Section 601 of the Standard Specifications except as modified below.

The pipe underdrains shall be installed to the lines and gradients as shown on the plans. The drain pipe shall be situated within an area of coarse aggregate as shown on the plans. The

coarse aggregate shall be wrapped completely in geotechnical fabric and/or impervious geomembrane as shown on the plans.

Method of Measurement. Pipe underdrains for structures shall be measured for payment in meters (feet), in place. Measurement shall be along the centerline of the pipe underdrains. All connectors, outlet pipes, elbows, and all other miscellaneous items shall be included in the measurement.

Basis of Payment. This work will be paid for at the contract unit price per meter (foot) for PIPE UNDERDRAINS FOR STRUCTURES of the diameter specified, installed and measured as specified herein. Furnishing and installation of the coarse aggregate, geotechnical fabric, impervious geomembrane, forming holes in structural elements and any excavation required, will not be paid for separately, but shall be included in the cost of the pipe underdrains for structures.

MANHOLES, DROP TYPE

Description:

This work consists of furnishing and constructing a drop manhole, of the specified diameter, at the locations shown on the plans, or as directed by the Engineer. This work shall be performed in accordance with the applicable portions of Sections 502, 503, 550, 602 and 1043 of the Standard Specifications, the details in the plans and as herein specified.

Construction Requirements:

The structures shall be of pre-cast construction, in accordance with the details shown on the plans. The contract unit price of the structure shall include any pre-cast tee sections required.

Drop manholes shall be backfilled in accordance with Article 502.10 of the Standard Specifications.

Backfilling at all drop manhole locations shall not be paid for separately, but shall be included in the contract unit price of the structure.

Braced Excavation Support System:

It is the Contractor's responsibility to design, construct and remove a braced excavation support system for construction of drop manholes. The braced excavation support system for all drop manholes shall not be paid for separately, but shall be included in the unit price of the various storm sewer items.

Submittals:

Braced Excavation Support System

It is the Contractor's responsibility to design, construct and remove a braced excavation support system at the drop manhole. The Contractor shall submit drawings, designs and calculations for the braced excavation to the Engineer for approval. The designs, drawings, and calculations

shall be signed and sealed by a licensed Structural Engineer in the State of Illinois. The Engineer's approval does not relieve the Contractor from his sole responsibility for the structural integrity of the braced excavation. The Contractor must also provide temporary support for any adjacent structure, pavement or utility impacted by construction of the drop manhole. All support details shall also be signed and sealed by a licensed Structural Engineer in the State of Illinois. It is the Contractor's responsibility to verify all existing conditions, including utilities, and access to the site prior to construction or ordering of materials.

Pre-Cast Manhole Units and Lids

Prior to pre-casting any structural elements for construction of the drop manhole, the Contractor shall submit shop drawings and details of the elements for approval by the Engineer. The drawings and details shall be signed and sealed by a licensed Structural Engineer in the State of Illinois.

Method of Measurement:

This work will be measured per each manhole complete.

Basis of Payment:

This work will be paid for at the contract unit price per each for MANHOLES, DROP TYPE, TYPE 1 FRAME, CLOSED LID, of the diameter specified, which price shall be payment in full for all materials, labor, tools, equipment and incidentals necessary to complete the work as specified.

BRACED EXCAVATION

Description. This work shall consist of furnishing all labor, equipment, and materials necessary to install, maintain and remove a braced excavation support system to protect the adjacent roadway during the construction of the drop manholes as specified herein.

General Requirements. The design of the braced excavation is the responsibility of the Contractor. The Contractor shall submit drawings and design for the braced excavation to the Engineer for approval. The braced excavation design and drawings shall be signed and sealed by an Illinois licensed Structural Engineer, submitted and approved prior to the start of any work. The Engineer's approval shall not relieve the Contractor from the sole responsibility of the structural integrity of the braced excavation system.

The braced excavation shall be capable of restraining earth pressures resulting from the surcharges imposed by construction equipment, trucks and vehicular traffic on the adjacent roadway. The braced excavation shall include all sheeting, walers, struts, and bracing, hardware and all appurtenant and collateral materials and work required to protect the adjacent roadway where the braced excavation is utilized.

It shall be the Contractor's responsibility to verify all existing conditions, including utilities, and access to the site prior to construction or ordering of materials. Any disturbance or damage to existing structures, utilities or other property, caused by the Contractors operation, shall be repaired by the Contractor in a manner satisfactory to the Engineer at no additional cost to the Department.

All materials, equipment and construction methods shall be in accordance with the requirements of Sections 502, 505 and 512 of the Standard Specifications except as herein modified.

At the option of the Contractor, the materials may be new or used. If used, the materials shall be in good condition and acceptable to the Engineer. The Contractor shall provide all temporary or permanent materials required for the proper execution of the work on this Item.

The maximum width of excavation for the drop manholes is the outside diameter of the manhole shaft plus 4 feet. Excavation outside the maximum dimensions specified will not be measured for payment.

Method of Measurement. This work will be measured for payment as a computed volume in cubic yards as described in Section 502 of the Standard Specifications.

Basis of Payment. This work will be paid for at the Contract unit price per cubic yard for BRACED EXCAVATION. The price shall be payment in full for all work, equipment, and materials necessary for excavating, installing, maintaining, and removing the braced excavation support system as specified herein.

CONCRETE MEDIAN SURFACE, 5" (MODIFIED)

Description: This work shall consist of the construction of concrete median as specified in Section 606 of the Standard Specifications with the following revisions:

606.10 Finishing. Revise the first sentence of the first paragraph to read:

All exposed surfaces shall be finished with a California Trowel Finish as shown in the details in the plans.

Basis of Payment: Concrete median as specified herein will be paid for at the contract unit price per square foot for CONCRETE MEDIAN SURFACE, 5" (MODIFIED).

CONCRETE MEDIAN SURFACE, 6" (SPECIAL)

Description: This work shall consist of coloring, patterning, sealing, and placing concrete median surface at locations shown in the plans or as directed by the Engineer. This work shall be in accordance with the applicable sections of Section 606 of the Standard Specification, except modified herein. This work is specialized concrete finishing work requiring experienced concrete finishers.

The work also includes the placement and compaction of aggregate fill in accordance with Article 606.08 at the locations shown on the plans

The concrete median surface shall be integrally colored brick red, patterned, and sealed in accordance with the following:

Materials. Materials for the concrete median surface shall meet the following requirements.

a) Integrally Colored Concrete. Integrally colored concrete shall be according to Section 1020 of the Standard Specification for Class SI concrete except as follows.

Article 1020.04 The allowable water/cement ratio range shall be 0.40 minimum to 0.44 maximum.

Article 1020.04 The allowable slump range shall be 75 mm (3 in.) minimum to 125 mm (5 in.) maximum.

Article 1020.04 The allowable coarse aggregate gradations shall be CA 11, CA 13, CA 14, and CA 16.

Article 1020.05(b) A calcium chloride accelerating admixture shall not be used.

Article 1020.05(b) The cement factor shall not be reduced if a water-reducing or high range water-reducing admixture is used.

Article 1020.05(c) Fly ash shall not be used.

Article 1020.05(k) Ground granulated blast-furnace slag shall not be used.

Article 1020.11 Pigment for integrally colored concrete shall be added to the concrete and mixed per the Manufacturer's recommendation.

Article 1020.13 The curing method shall be Type I membrane curing.

Article 1020.13. The protection method shall be according to Article 1020.13(e)(1) and the protection period shall be 96 hours. No material, including the insulating material, shall be placed in direct contact with the concrete surface.

Pigment for Integrally Colored Concrete. The pigment shall meet the requirements of ASTM C 979, match color number 30166 of Federal Standard 595, and be on the Department's Approved List of Pigments for Integrally Colored Concrete. The color shall meet the approval of the District One Landscape Architect, Rick Wanner (847-705-4171) prior to ordering.

(c) Release Agent for Concrete Stamping Tools. The release agent shall be according to the stamping tool manufacturer's recommendations and shall be a medium gray liquid that will evaporate. It shall not harm the concrete, and it shall allow the application of Type I membrane curing. The releasing agent shall meet the approval of the District One Landscape Architect, Rick Wanner (847-705-4171) prior to ordering

Patterning for the Concrete Median Surface 6" (Special) shall be stamped into the concrete median surface. The texture shall be applied in a running bond brick pattern in a direction perpendicular to the mainline travel lanes. The size of the bricks used in the pattern shall be approximately 4" wide by 8" long (+/-1/2). The brick pattern shall be approved by the District One Landscape Architect, Rick Wanner (847-705-4171) prior to ordering. Application shall be done in accordance to the manufacture's recommendations.

(e) The tamper shall be according to the manufacturer's recommendations for the brick pattern being used.

Sealer. A lacquer base acrylic sealer shall be applied to the surface with three (3) light even coats of a premium stain resistant waterbase. Application shall be done in accordance to the manufacture's recommendations.

CONSTRUCTION REQUIREMENTS

Stamping. The concrete shall be placed and finished according to Article 424.06 except the area to be stamped shall not be brushed. When the bleed water has been absorbed, stamping shall begin. The entire width of the concrete median surface shall be stamped at the same time. A single stamp or a combination of stamps may be used.

Prior to placing the stamp on the concrete, the stamp shall be coated with the release agent. When recommended by the manufacturer, the release agent shall also be applied to the concrete surface. Once the stamp has been placed on the concrete median surface, it shall remain down until the stamping is complete.

The entire area of the stamp shall be tamped with a short, slow, repetitive action such that the depth of the stamped area between the bricks shall be 1/2 inch to 5/8 inch. The surface of the concrete pattern shall be high enough so that water will drain out of the groves between the brick patterns. Stepping or walking on the stamp will not be allowed.

When stamping is complete, the stamp shall be removed and the concrete cured.

Method of Measurement: Concrete median surface, 6" (Special) will be measured for payment in place, and the area computed in square feet. Aggregate fill shall not be measured for payment, but shall be included in the cost of the concrete median surface, 6" (special).

Basis of Payment: This work will be paid for at the contract unit price per square foot for CONCRETE MEDIAN SURFACE, 6" (SPECIAL).

TEMPORARY CHAIN LINK FENCE (PORTABLE)

Description:

This item consists of constructing a minimum 6 feet high chain link fence and any gates as necessary, at the locations shown on the plans or as directed by the Engineer. This work shall be performed in accordance with Section 664 of the Standard Specifications, except as modified herein. The purpose of this fence is to protect the public and to direct pedestrian traffic around and away from the work zone along the frontage roads and at intersections during staged construction.

The temporary chain link fence shall be mounted on stands or other such devices as approved by the Engineer so that the fence is portable and easily relocated as conditions change during construction. The individual fence panels shall be securely fastened together and the stands or other mounting devices shall be weighted with sandbags as necessary to prevent movement.

The Contractor shall submit a catalog cut or details of the fence, gates, mounting stands, hardware, and other appurtenances for approval by the Engineer.

Upon completion of the project or as directed by the Engineer, the fence, gates, posts, and all other fence hardware and appurtenances shall be removed from the job site and become the property of the Contractor. The salvage value of the fence shall be reflected in the contract unit price.

This item shall also include any work necessary to remove and relocate fencing as shown on the plans or as directed by the Engineer for the purposes of staged construction at multiple, different work site locations. Upon completion of the work at a particular location and when directed by the Engineer to be removed, the temporary fencing shall be relocated to a new location as directed by the Engineer. Relocation of temporary chain link fence shall not be paid for separately, but shall be included in the cost of this item.

Method of Measurement:

Temporary chain link fence shall be measured per foot along the top of the fence, from end post to end post. Any gates within the fence shall be measured as a length of fence. Gates shall not be paid for separately.

Basis of Payment:

This work will be paid for at the contract unit price per foot for TEMPORARY CHAIN LINK FENCE (PORTABLE), which price shall include furnishing, placing, maintaining, relocating and removing the fence during staged construction.

CHAIN LINK FENCE REMOVAL

Description:

This work consists of the removal and satisfactory disposal of existing chain link fence at the locations shown on the plans or as directed by the Engineer. This work shall be performed in accordance with the applicable portions of Section 201 of the Standard Specifications and as herein specified.

General:

The chain link fence to be removed is approximately 4 feet in height with the posts set in concrete. Removal shall include posts, fence fabric, fittings, appurtenances, attachments and concrete foundation. Any holes created by removal of the foundation shall be filled with suitable material to eliminate any hazard to the public.

Any signs mounted on the fence shall be removed, stored and re-erected in accordance with Article 107.25.

Disposal of removed materials shall be in accordance with Article 202.03.

Method of Measurement:

Chain link fence removal shall be measured in linear feet along the top of the fence.

Basis of Payment:

This work will be paid for at the contract unit price per foot for CHAIN LINK FENCE REMOVAL, which price shall be payment in full for all labor, tools, equipment and materials necessary to remove and dispose of existing chain link fence as herein specified.

CHAIN LINK FENCE REMOVAL (CTA)

Description:

This work consists of the removal and satisfactory disposal of the existing chain link fence attached to the CTA barrier wall, at the locations shown on the plans or as directed by the Engineer. This work shall be performed in accordance with the applicable portions of Section 201 of the Standard Specifications and as herein specified.

General:

Removal shall include gates, posts, fence fabric, fittings, appurtenances, and attachments. Any signs mounted on the fence shall be removed, stored and re-erected in accordance with Article 107.25.

Disposal of removed materials shall be in accordance with Article 202.03.

Fence fabric shall be removed to the nearest post adjacent to the section of barrier wall being removed. The fabric shall be attached to a stretcher bar and secured to that end post. This work shall not be paid for separately, but shall be included in the cost of the fence removal.

Method of Measurement:

Chain link fence removal shall be measured in linear feet along the top of the fence from end post to end post as described. Any gates encountered within the removal limits shall be measured as fence.

Basis of Payment:

This work will be paid for at the contract unit price per foot for CHAIN LINK FENCE REMOVAL (CTA), which price shall be payment in full for all labor, tools, equipment and materials necessary to remove and dispose of existing chain link fence as herein specified.

NON-SPECIAL WASTE WORKING CONDITIONS

This work shall be according to Article 669 of the Standard Specifications for Road and Bridge Construction adopted January 1, 2002 and the following:

Qualifications. The term environmental firm shall mean an environmental firm with at least five (5) documented leaking underground storage tank (LUST) cleanups or that is prequalified in hazardous waste by the Department. Documentation includes but is not limited to verifying remediation and special waste operations for sites contaminated with gasoline, diesel, or waste oil in accordance with all Federal, State, or local regulatory requirements and shall be provided to the Engineer for approval.

General. Implementation of this Special Provision will likely require the Contractor to subcontract for the execution of certain activities. It will be the Contractor's responsibility to assess the working conditions and adjust anticipated production rates accordingly.

The Contractor shall manage all contaminated materials as non-special waste as previously identified. This work shall include monitoring and potential sampling, analytical testing, and management of petroleum contaminated material.

The Contractor shall excavate and dispose of any soil classified as a non-special waste as directed by this project or the Engineer. Any excavation or disposal beyond what is required by this project or the Engineer shall be at the Contractor's expense. The preliminary site investigation (PSI) report, available through the District's Environmental Studies Unit, estimated the excavation quantity of non-special waste at the following location. The information available at the time of plan preparation determined the limits of the contamination and the quantities estimated were based on soil excavation for construction purposes only. The lateral distance is measured from centerline and the farthest distance is the offset distance or construction limit which ever is less. The Environmental Firm shall continuously monitor for worker protection and the Contractor shall manage and dispose of all soils excavated within the following areas as classified below. Any soil samples or analysis without the approval of the Engineer shall be at the contractor's expense.

Station 2030+25 to Station 2030+75 0 to 50 feet RT (Chicago Transit Authority – 9800 South State Street). Contaminants of concern sampling parameters: Priority Pollutants VOCS and Priority Pollutants Semi-VOCS.

Station 2206+80 to Station 2206+95 20 to 65 feet RT (Marathon Service Station – 4 East 95th Street). Contaminants of concern sampling parameters: PNAs and TCLP Lead.

Station 2208+25 to Station 2208+40 20 to 65 feet RT (Marathon Service Station – 4 East 95th Street). Contaminants of concern sampling parameters: PNAs and TCLP Lead.

Station 2234+70 to Station 2235+75 0 to 75 feet RT (Chicago Asphalt Plant – between 91st Street overpass and Chicago Rail Link). Contaminants of concern sampling parameters: PNAs and Arsenic.

Station 2234+70 to Station 2235+75 0 to 35 feet LT (Chicago Asphalt Plant – between 91st Street overpass and Chicago Rail Link). Contaminants of concern sampling parameters: PNAs and Arsenic.

Station 1251+45 to Station 1258+35 0 to 15 feet RT (Chatham Ridge Mall – 112 West 87th Street). Contaminants of concern sampling parameters: PNAs and Arsenic.

Station 1251+45 to Station 1258+35 0 to 110 feet LT (Chatham Ridge Mall – 112 West 87th Street). Contaminants of concern sampling parameters: PNAs and Arsenic.

Station 4406+85 to Station 4411+20 0 to 70 feet RT (Peoples Energy – 38 West 64th Street). Contaminants of concern sampling parameters: PNAs, Priority Pollutants Pesticides, PCBs, and TCLP Lead.

Station 4406+85 to Station 4411+20 0 to 20 feet LT (Peoples Energy – 38 West 64th Street). Contaminants of concern sampling parameters: PNAs, Priority Pollutants Pesticides, PCBs, and TCLP Lead.

Station 4576+70 to Station 4582+30 0 to 55 feet RT (Former Industrial/UST Site – Between the Railroad Bridge and 39th Street). Contaminants of concern sampling parameters: PNAs and Priority Pollutants Pesticides.

Station 4576+70 to Station 4582+30 0 to 20 feet LT (Former Industrial/UST Site – Between the Railroad Bridge and 39th Street). Contaminants of concern sampling parameters: PNAs and Priority Pollutants Pesticides.

ENGINEER'S FIELD OFFICE TYPE A (SPECIAL)

Add the following to Article 670.01:

Contract 62692 has provided an Engineer's field office at 400 W. 76th Street, Chicago, Illinois 60620. The Contractor shall assume responsibility for providing and maintaining an ENGINEER'S FIELD OFFICE TYPE A, (SPECIAL), as specified herein, at this same location beginning September 1, 2005. The Contractor shall be responsible for maintaining all utilities and services in an uninterrupted state as Contract 62692 ends and Contract 62694 begins. The Contractor shall make arrangements with the telephone service provider to maintain the existing telephone number (773) 371-0312.

Revise the first paragraph of Article 670.02 to read:

Engineer's Field Office Type A (Special). Type A (Special) field offices shall have a ceiling height of not less than 2 m (7ft.) and a floor space of not less than 115 m² (1240 sq. ft.) with a minimum of two separate offices. The office shall also have a separate storage room capable of being locked for the storage of nuclear measuring devices. The office shall be provided with sufficient heat, natural and artificial light, and air conditioning. Doors and windows shall be equipped with locks approved by the Engineer.

Revise the second sentence of the fourth paragraph of Article 670.02 to read:

Solid waste disposal consisting of seven waste baskets and an outside trash container of sufficient size to accommodate a weekly provided pick-up service.

Revise the fifth paragraph of Article 670.02 to read:

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

Add the following to Article 670.02:

A weekly cleaning service for the office shall be provided.

Revise subparagraph (a) of Article 670.02 to read:

(a) Twelve desks with minimum working surface 1.1m x 750 mm (42 in. x 30 in.) each and twelve non-folding chairs with upholstered seats and backs.

Revise the first sentence of subparagraph (c) of Article 670.02 to read:

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

Revise subparagraph (d) of Article 670.02 to read:

(d) Three free standing four drawer legal size file cabinet with lock and an underwriters' laboratories insulated file device 350 degrees one hour rating.

Revise subparagraph (e) of Article 670.02 to read:

Twenty folding chairs and 7 folding tables 8 feet long.

Revise subparagraph (h) of Article 670.02 to read:

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

Revise subparagraph (i) of Article 670.02 to read:

(i) Four telephones (2-line models), with touch tone, where available, two telephone answering machines, and five telephone lines including one line for the fax machine, and two lines for the exclusive use of the Engineer.

Revise subparagraph (j) of Article 670.02 to read:

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

Revise subparagraph (k) of Article 670.02 to read:

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

Revise subparagraph (l) of Article 670.02 to read:

(l) One electric water cooler dispenser including water service.

Add the following subparagraphs to Article 670.02:

(n) One 1.2 m x 1.8 m (4 ft. x 6 ft.) chalk board or dry erase board.

Basis of Payment. The building or buildings fully equipped, will be paid for at the contract unit price per calendar month or fraction thereof for ENGINEER'S FIELD OFFICE TYPE A (SPECIAL) and according to the applicable portions of Article 670.07.

TRAFFIC CONTROL PLAN

Effective: September 30, 1985

Revised: October 1, 1995

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

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

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

STANDARDS

- 701101 - Off-Road Operations, Multilane, Less Than 4.5 m (15') Away,
For Speeds \geq 45MPH
- 701400 - Approach To Lane Closure, Freeway/Expressway
- 701401 - Lane Closure, Freeway/Expressway
- 701402 - Lane Closure, Freeway/Expressway, With Barrier
- 701411 - Lane Closure Multilane At Entrance Or Exit Ramp For Speeds \geq 45 MPH
- 701426 - Lane Closure Multilane Intermittent Or Moving Oper. For Speeds \geq 45 MPH
- 701446 - Two Lane Closure, Freeway/Expressway
- 702001 - Traffic Control Devices
- 704001 - Temporary Concrete Barrier
- For Use On Frontage Roads Only:
 - 701601 - Urban Lane Closure, Multilane 1W Or 2W with Non-traversable Median
 - 701606 – Urban Lane Closure, Multilane 2W with Mountable Median
- 701701 - Urban Lane Closure Multilane Intersection
 - 701801 - Lane Closure Multilane 1W or 2W Crosswalk or Sidewalk Closure

DETAILS

- TC-8 Freeway Entrance and Exit Ramp Closure Details
- TC-9 Traffic Control Details For Freeway Single and Multi-Lane Weave
- TC-10 Traffic Control & Protection for Side Roads, Intersections and Driveways
- TC-12 Multi-Lane Freeway Pavement Marking Detail
- TC-14 Traffic Control & Protection at Turn Bays (To Remain Open To Traffic)
- TC-16 Pavement Marking Letters And Symbols for Traffic Staging
- TC-17 Traffic Control Details For Freeway Shoulder Closures and Partial Ramp Closures
- TC-18 Signing For Flagging Operations At Work Zone Openings
- TC-22 Temporary Information Signing
- TC-24 City of Chicago Typical Pavement Markings

SPECIAL PROVISIONS

- Maintenance of Roadway
- Keeping the Expressway Open to Traffic
- Failure to Open Traffic Lanes To Traffic
- Traffic Control and Protection (Expressways)
- Traffic Control Surveillance (Expressways)
- Work Zone Traffic Control (Lump Sum Payment)
- Traffic Control and Protection for Temporary Detour
- Traffic Control For Work Zone Areas
- Traffic Staging
- Temporary Information Signing
- Changeable Message Signs
- Traffic Control Deficiency Deduction (BDE)

The following requirements apply to 76th Street only:

Special attention is called to Articles 107.09 and 107.14 of the Standard Specifications and the following Highway Standards relating to traffic control.

701301 701501 701606 701701 701801 702001

Temporary Pavement Marking: This work shall be done in accordance with Section 703 "Work Zone Pavement Markings".

All temporary pavement markings that will be operational during the winter months (December through March) shall be paint.

Road Closure: The road closure shall be completed using Type III barricades in compliance with Standards 702001, and signing according to the Detour Plan contained in the Contract Drawings. Two flashers shall be installed above each Type III barricade on the traveled lanes. The "ROAD CLOSED" (R11-2) or "ROAD CLOSED TO THRU TRAFFIC" (R11-4) signs shall be erected over the barricade centered over the travel lane of approaching traffic. Flashers and flags shall be installed above all warning signs involving a night time road closure.

The Contractor shall be required to notify the City of Chicago – Department of Transportation at least 72 hours in advance of closure or opening of the roadway. Traffic Signal Adjustment at the intersections of 76th Street and Lafayette Avenue and 76th Street and State Street will require coordination with the City.

All cost involved in conforming with the closure of 76th Street shall be considered a part of TRAFFIC CONTROL AND PROTECTION (DETOUR 2).

Traffic Control and Protection, Standard 701606: This work shall consist of intersection channelization, traffic signal improvements, and the resurfacing 76th Street, and is to be performed in accordance with Standard 701601 and 701606, Section 701 of the Standard Specifications and as specified herein.

A minimum of 3 drums spaced at 4 feet shall be placed at each return when the sideroad is open. A flagger with a FLAGGER sign shall be required for each separate activity of an operation that requires frequent encroachment in a lane open to traffic.

Traffic Control and Protection, Standard 701601, 701701, and 701801: This work shall consist of intersection channelization, lighting and traffic signal improvements, and the resurfacing 76th Street. This work is to be performed in accordance with Standard 701601 and 701606, Section 701 of the Standard Specifications and as specified herein.

KEEPING THE EXPRESSWAY OPEN TO TRAFFIC

Whenever work is in progress on or adjacent to an expressway, the Contractor shall provide the necessary traffic control devices to warn the public and to delineate the work zone as required in these Special Provisions, the Standard Specifications, the State Standards and the District Freeway details. All Contractor's 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: I-90/94 Dan Ryan 71st to 95th

WEEK NIGHT	TYPE OF CLOSURE	ALLOWABLE LANE CLOSURE HOURS	
		INBOUND	OUTBOUND
Sunday thru Thursday	One Lane	8:00 p.m. - 5:00 a.m.	9:00 p.m. - 6:00 a.m.
	Two Lanes	10:00 p.m. - 5:00 a.m.	12:01 a.m. - 6:00 a.m.
Friday	One Lane	8:00 p.m. (Fri) - 6:00 a.m. (Sat)	9:00 p.m. (Fri) - 7:00 a.m. (Sat)
	Two Lanes	11:00 p.m. (Fri) - 6:00 a.m. (Sat)	12:01 a.m. (Sat) - 7:00 a.m. (Sat)
Saturday	One Lane	8:00 p.m. (Sat) - Noon (Sun)	9:00 p.m. (Sat) - Noon (Sun)
	Two Lanes	11:00 p.m. (Sat) - 9:00 a.m. (Sun)	12:01 a.m. (Sun) - 9:00 a.m. (Sun)

Later closure hours will apply to the area south of 95th along the Dan Ryan, I-57 and on the 2-lane connector areas of the Bishop Ford and I-57 Interchange.

LOCATION: 95th Street to Halsted Street
95th Street to Martin Luther King Drive
EB AND WB Cross Connectors

WEEK NIGHT	TYPE OF CLOSURE	ALLOWABLE LANE CLOSURE HOURS	
		INBOUND (Northbound)	OUTBOUND (Southbound)
Sunday thru Thursday	One Lane	11:00 p.m. to 5:00 a.m.	12:01 a.m. to 6:00 a.m.
Friday	One Lane	11:00 p.m. (Fri) to 6:00 a.m. (Sat)	12:01 a.m. (Sat) to 7:00 a.m. (Sat)
Saturday	One Lane	11:00 p.m. (Sat) to 8:00 a.m. (Sun)	12:01 a.m. (Sun) to 9:00 a.m. (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 through 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. Police forces shall 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 within three (3) miles of 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

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 Blocked = \$3000.00

Two Lanes Blocked = \$5000.00

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: 02/9/05

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 1.2m (48 inch) by 1.2m (48 inch) with 300mm (12 inch) capital letters and a 500mm (20inch) arrow.

Rough Grooved Surface Signs

The Contractor shall furnish and erect "Rough Grooved Surface" signs (W8-1107) on both sides of the expressway, 300m (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 2.1m (7').

Drums/Barricades

Check barricades shall be placed in work areas perpendicular to traffic every 300m (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 (3m [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 temporary concrete barrier wall. These reflectors shall be placed at 50 foot centers along tangents and at 25 foot centers on curves. 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 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 and 701446 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 at the base 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.

TRAFFIC CONTROL SURVEILLANCE (EXPRESSWAYS)

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

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

The Contractor shall supply a telephone staffed on a 24-hour-a-day basis to receive any notification of any deficiencies regarding traffic control and protection or receive any request for

improving, correcting or modifying traffic control, installations or devices, including pavement markings. The Contractor shall dispatch additional men, materials and equipment as necessary to begin to correct, improve or modify the traffic control as directed, within one hour of notification by this surveillance person or by the Department. Upon completion of such corrections and/or revisions, the Contractor shall notify the Department's Communication Center at (847) 705-4612.

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

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

WORK ZONE TRAFFIC CONTROL (LUMP SUM PAYMENT)

Effective: February 1, 1996

Revised: November 1, 1996

Specific traffic control plan details and Special Provisions have been prepared for this contract.

Method of Measurement: All traffic control (except traffic control pavement marking and traffic control and protection for expressways) 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 meter (foot).

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

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

TRAFFIC CONTROL AND PROTECTION FOR TEMPORARY DETOUR

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

Furnishing, erecting, maintaining and removing traffic control devices along detour routes, in accordance with the details shown in the plans, will be paid for at the contract unit price each for TRAFFIC CONTROL AND PROTECTION FOR TEMPORARY DETOUR, numbered as specified.

TRAFFIC CONTROL FOR WORK ZONE AREAS

Effective: 9/14/95

Revised: 1/30/03

Work zone entry and exit openings shall be established daily by the Contractor with the approval of the Engineer. All vehicles including cars and pickup trucks shall exit the work zone at the exit openings. All trucks shall enter the work zone at the entry openings. These openings shall be signed in accordance with the details shown elsewhere in the plans and shall be under flagger control during working hours.

The Contractor shall plan his trucking operations into and out of the work zone as well as on to and off the expressway to maintain adequate merging distance. Merging distances to cross all lanes of traffic shall be no less than 1/2 mile. This distance is the length from where the trucks enter the expressway to where the trucks enter the work zone. It is also the length from where the trucks exit the work zone to where the trucks exit the expressway. The stopping of expressway traffic to allow trucks to change lanes and/or cross the expressway is prohibited.

Failure to comply with the above requirements will result in a Traffic Control Deficiency charge. The deficiency charge will be calculated as outlined in the special provision for "TRAFFIC CONTROL DEFICIENCY DEDUCTION". The Contractor will be assessed this daily charge for each day a deficiency is documented by the Engineer.

TRAFFIC STAGING

Prior to the actual beginning and completion of the various stages of construction and traffic protection, the Contractor will be required to provide lane closures and barricade systems, for preparation work such as pavement marking removal, temporary lane marking, placing temporary concrete barrier, removing existing guardrail, etc. These lane closures and barricade systems, including barricades, drums, cones, lights, signs, flagpersons etc. shall be provided in accordance with details in the plans and these Special Provisions and as approved by the Engineer. The cost of this work will not be paid for separately but shall be considered, included in the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (EXPRESSWAYS). This work shall be performed at night during off-peak hours.

The following is a brief description of the minimum amount of traffic control and protection that will be required from the Contractor during C-D road, ramp and bridge construction along the expressway. The following description shall be correlated with the Traffic Staging and Traffic Control Protection Details located in the contract plans and these Special Provisions.

General

No permanent closure of any expressway lanes shall be allowed. The existing entrance and exit ramps shall be closed utilizing the details on the plans. Utilizing temporary nighttime lane closures during off-peak hours, the Contractor shall construct temporary pavement and install temporary concrete barrier wall as shown on the plans.

The Contractor shall provide two weeks notice to the Department prior to closing any ramp or frontage road.

Frontage Road Lane Closures

Lane closures along the frontage roads are allowable where shown on the plans. Traffic control shall be in accordance with standards and details specified in the Traffic Control Plan. Traffic control and protection established along the frontage roads will be paid for as TRAFFIC CONTROL AND PROTECTION (SPECIAL).

Detours

Prior to closing the northbound Halsted entrance ramp, the Contractor shall implement the detours detailed on the plans. This work shall be paid for as TRAFFIC CONTROL AND PROTECTION FOR TEMPORARY DETOUR.

Closure of 76th Street For Bridge Reconstruction

The Contractor shall coordinate the closure of 76th Street with the City of Chicago Department of Transportation prior to implementing the detour or beginning bridge demolition.

Suggested Sequence Of Operations For Ramp and Retaining Wall Construction.

Frontage Roads

Implement Temporary Frontage Road Lane Closures
Begin Retaining Wall Construction
Implement Detours, Where Indicated
Close Ramps

Expressway

Construct Temporary Pavement Along Expressway (utilize temporary night time lane closures during off-peak hours)
Place Temporary Concrete Barrier Wall Along Expressway (utilize temporary night time lane closures during off-peak hours)
Continue Ramp Reconstruction In Conjunction With Ramp Closure
Complete Retaining Wall, Ramp and Frontage Road Reconstruction
Remove Frontage Road Temporary Lane Closures
Open Ramps

The suggested sequence of operations and summary herein for Traffic Staging does not, nor is it intended to, depict all the work that will be required by the Contractor for staging operations during this Contract. This summary is given as an aid and guide for the Contractor, in order to establish the necessary guidelines to insure a safe and as smooth as possible traffic operation during the prosecution of the work.

RAMP CLOSURE RESTRICTIONS

The Halsted and 95th Street exit ramps shall not be closed at the same time.

The Contractor will be permitted to close the 95th Street ramp for a one-time period of 60 consecutive calendar days to remove the ramp, and to construct and re-open the ramp in its proposed configuration. The pavement, shoulder, curbs, lighting, signing, striping and landscaping are the minimum items of work that must be completed prior to re-opening the ramp.

The Contractor will be permitted to close the Halsted Street ramp for a one-time period of 30 consecutive calendar days to remove the ramp, and to construct and re-open the ramp in its proposed configuration. The pavement, shoulder, curbs, lighting, signing, striping and landscaping are the minimum items of work that must be completed prior to re-opening the ramp.

The Contractor shall submit to the Department in writing the starting date for each of the extended ramp closures. Approval from the Department is required prior to closing either ramp. Should the contractor fail to complete the work and re-open either ramp to traffic within the allowable time limit, the Contractor shall be liable to the Department for liquidated damages as noted under the Special Provision, "Failure to Open the 95th Street and Halsted Street Exit Ramps On Time". The Department shall be the sole judge of the ramps acceptability to be re-opened.

FAILURE TO OPEN THE 95TH STREET AND HELSTED STREET EXIT RAMPS ON TIME

Should the Contractor fail to complete the work within the allowable time for each full closure of the 95th Street ramp and Halsted Street exit ramps as specified in the Special Provision "Ramp Closure Restrictions", or within such extended time as may have been allowed by the Department, the Contractor shall be liable to the Department in the amount of \$3000.00 not as a penalty but as liquidated damages, for each calendar day or portion thereof of overrun in the allowable time period for each closure.

A calendar day is every day shown on the calendar and starts at 12:00 midnight and ends at the following 12:00 midnight, twenty-four hours later.

CONCRETE BARRIER, DISTRICT 1

Effective: February 11, 2004

Revise Section 637 of the Standard Specifications to read:

"SECTION 637. CONCRETE BARRIER

637.01 Description. This work shall consist of constructing a concrete barrier and its base.

637.02 Materials. Materials for concrete barrier and concrete base shall conform to the requirements of the following Articles of Section 1000 - Materials:

Item	Article/Section
(a)	Portland Cement Concrete 1020
(b)	Tie Bars (Note 1) 1006.10(a)(b)
(c)	Dowel Bars 1006.11(b)
(d)	Protective Coat 1023
(e)	Non-Shrink Grout 1024
(f)	Chemical Adhesive 1027
(g)	Prefomed Expansion Joint Filler 1051.01 – 1051.08

Note 1. Tie bars shall be Grade 400 (Grade 60).

The coarse aggregate to be used in the concrete barrier walls shall conform to the requirements for the coarse aggregate that is used for superstructure concrete.

637.03 Equipment. Equipment for concrete barrier shall conform to the requirements of the following Articles of Section 1100 - Equipment:

	Item	Article/Section
(a)	Hand Vibrator	1103.17(a)
(b)	3 m (10 ft) Straightedge	1103.17(h)

Equipment for portland cement concrete base shall conform to the requirements of Article 483.03.

CONSTRUCTION REQUIREMENTS

637.04 Barrier Base. The base may be constructed separately or poured monolithically with the barrier. When constructed separately, portland cement concrete base shall be constructed according to Articles 483.04 – 483.06, except the surface shall be finished according to Article 503.09(a).

637.05 Anchoring. Barrier shall be anchored to the base by the methods shown on the plans. When tie bars are used, they shall be installed in preformed or drilled holes with a non-shrink grout or chemical adhesive.

637.06 Barrier Construction. Concrete barrier shall be constructed according to the applicable portions of Articles 503.06 and 503.07. Where the horizontal alignment of the concrete barrier is curved, the barrier shall be constructed either on the curved alignment or on cords not more than 3 m (10 ft) in length.

When slipformed, the vertical centerline of the barrier shall not vary from the proposed centerline by more than 75 mm (3 in.) nor by more than 13 mm in 3 m (1/2 in. in 10 ft). All surfaces shall be checked with a 3 m (10 ft) straightedge as the concrete exits the slipform mold. Surface irregularities greater than 10 mm in 3 m (3/8 in. in 10 ft) shall be corrected immediately. Continued variations in the barrier surface exceeding 6 mm in 3 m (1/4 in. in 10 ft) will not be permitted and remedial action shall immediately be taken to correct the problem. Any deformations or bulges remaining after the initial set shall be removed by grinding after the concrete has hardened. All holes and honeycombs shall be patched immediately.

637.07 Barrier Transitions. Transitions between barriers of different design shall be constructed according to the details shown on the plans.

637.08 Joints. Joints shall be constructed as shown on the plans and as follows:

(a) Construction Joints. Construction joints shall be constructed in the barrier whenever there is an interruption in the pour of more than 30 minutes.

(b) Expansion Joints. Expansion joints shall be constructed in the barrier and the base in line with expansion joints in the adjacent pavement or shoulder. Expansion joints shall also be constructed at locations where the barrier abuts a rigid structure.

Prior to placing concrete, a light coating of oil shall be uniformly applied to the dowel bars.

(c) Contraction Joints. Contraction joints shall be constructed in the barrier at uniform intervals with a maximum spacing of 6 m (20 ft) or in line with contraction joints in the adjacent pavement or shoulder. Contraction joints shall be formed by a groove 3 mm (1/8 in.) wide by 50 mm (2 in.) deep either formed in the plastic concrete or sawed after the concrete has set.

637.09 Finishing. The surface of concrete barrier shall be finished according to Article 503.16(a).

637.10 Protective Coat. When required, the top and vertical surfaces of the barrier exposed to traffic shall receive a protective coat. The application of the protective coat shall be according to Article 420.21.

637.11 Method of Measurement. This work will be measured as follows:

(a) Contract Quantities. The requirements for the use of contract quantities shall be according to Article 202.07(a).

(b) Measured Quantities. New barrier base, both separate and monolithic, will be measured for payment in meters (feet) in place, along the centerline of the base or barrier. The width of the base will be defined as the width of the barrier.

Concrete barrier will be measured for payment in meters (feet) in place, along the centerline of the barrier.

Barrier transitions will be measured for payment in meters (feet) in place, along the centerline of the transition.

Protective coat will be measured for payment according to Article 420.22(b).

637.12 Basis of Payment. This work will be paid for at the contract unit price per meter (foot) for BARRIER BASE; CONCRETE BARRIER, DOUBLE FACE, of the height specified; CONCRETE BARRIER, SINGLE FACE, of the height specified; and CONCRETE BARRIER TRANSITION.

Protective coat will be paid for according to Article 420.23.”

CONCRETE BARRIER REMOVAL

Description:

This work consists of the removal and satisfactory disposal of portions of the existing concrete barrier at the locations shown on the plans or as directed by the Engineer. This work shall be performed in accordance with the applicable portions of Sections 202 and 501 of the Standard Specifications, the details in the plans and as herein specified.

Construction Requirements:

Concrete barrier removal shall be in accordance with the applicable portions of Article 501.03. A typical detail of the existing wall is provided in the plans.

The portion to be removed shall be disposed of in accordance with Article 202.03.

Method of Measurement:

Concrete barrier removal shall be measured in linear feet along the top of the barrier.

Basis of Payment:

This work shall be paid for at the contract unit price per foot, for CONCRETE BARRIER REMOVAL which price shall be payment in full for all labor, tools, equipment and materials necessary to remove and dispose of the concrete barrier as specified herein.

FURNISH TEMPORARY CONCRETE BARRIER

Description. This work shall consist of furnishing and placing temporary concrete barrier at locations shown on the plans or as directed by the Engineer. This work shall be performed, measured and paid for in accordance with the BDE special provision for Temporary Concrete Barrier with the following revisions:

“704.03 General. The temporary concrete barrier will remain after the contract is complete, at the locations shown on the plans.”

Basis of Payment. Temporary concrete barrier as specified herein will be paid for at the contract unit price per foot for FURNISH TEMPORARY CONCRETE BARRIER.

TEMPORARY INFORMATION SIGNING

Description:

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

This work does not include temporary sign panel overlays. Temporary sign panel overlays shall be included in the contract price for Traffic Control and Protection (Expressways). Permanent sign panel overlays shall be paid for separately as SIGN PANEL OVERLAY.

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)	1090.01

Note 1. The Contractor may use 5/8 inch instead of 3/4 inch thick plywood.

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

Note 3. All sign faces shall be Type A except all orange signs shall meet the requirements of Article 1084.02(b).

Note 4. The overlay panels shall be 0.08 inch thick.

General Construction Requirements

Installation:

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

Signs, which are placed along the expressway shoulder and/or within the construction zone, shall be installed according to the requirements of Article 702.05 and Article 720.04. The signs shall be 7 ft. above the near edge of the pavement and shall be a minimum of 2 ft. beyond the edge of the paved shoulder. A minimum of two posts per sign shall be used.

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

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

Method of Measurement:

This work shall be measured for payment in square feet edge to edge (horizontally and vertically). All hardware, posts, supports, bases for ground mounted signs, and connections, which are required for mounting these signs shall be included as part of this pay item.

Basis of Payment:

This work shall be paid at the contract unit price per square foot for TEMPORARY INFORMATION SIGNING, which price shall be full compensation for all labor, equipment and materials required for performing the work as herein specified.

CHANGEABLE MESSAGE SIGNS

This item shall be as contained in the Special Provisions for "Portable Changeable Message Signs" except as follows:

Ten signs will be required for this contract. The signs shall be located as directed by the Engineer.

METAL POST

Description:

This work consists of furnishing and installing a new metal post in accordance with Section 729 of the Standard Specifications with the following revision:

729.03 General. Add the following sentence after paragraph 3.

Mounting an existing sign panel and furnishing any necessary hardware are included in this work.

STABILIZED CONSTRUCTION ENTRANCE

Description:

This work consists of constructing a stabilized pad of coarse aggregate underlain with geotechnical fabric at the locations where construction traffic will be entering or leaving the work zone. Also included is the removal and satisfactory disposal of the stabilized construction entrance when no longer required. This work shall be performed in accordance with the applicable portions of Sections 202, 210, 1004 and 1080 of the Standard Specifications, the details in the plans or as directed by the Engineer.

Materials:

Aggregate shall consist of coarse aggregate gradations CA-1, CA-2, CA-3, or CA-4 meeting the requirements of Article 1004.04. Aggregate thickness shall be as detailed on the plans

Geotechnical fabric shall meet the requirements of Article 1080.02.

General:

Excess or unsuitable excavated materials shall be disposed of in accordance with Article 202.03.

The coarse aggregate surface coarse shall be compacted to the satisfaction of the Engineer.

Restoration shall be paid for separately as FURNISHED EXCAVATION, TOPSOIL FURNISH AND PLACE, 4", SEEDING CLASS 2A, NITROGEN FERTILIZER NUTRIENT, PHOSPHORUS FERTILIZER NUTRIENT, POTASSIUM FERTILIZER NUTRIENT and EROSION CONTROL BLANKET.

Method of Measurement:

The stabilized construction entrance will be measured in place and the area computed in square yards.

Basis of Payment:

This work will be paid for at the contract unit price per square yard for STABILIZED CONSTRUCTION ENTRANCE, which price shall be payment in full for all excavation, except excavation in rock; removal and disposal of excavated materials; geotechnical fabric; furnishing, placing, compacting, and disposing of coarse aggregate; and for all labor, tools and equipment necessary to construct the work as specified.

SEDIMENT CONTROL, DRAINAGE STRUCTURE INLET FILTER CLEANING

Description:

This work shall consist of cleaning sediment out of a drainage structure inlet filter when directed

by the Engineer. This cleaning work is to be periodically performed as directed by the Engineer, for the duration of the use of each drainage structure inlet filter assembly. The Engineer will be sole judge of the need for cleaning, based on the rate that debris and silt is collected at each inlet filter location.

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

Method of Measurement:

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

Basis of Payment:

The work will be paid for at the contract unit price per each for SEDIMENT CONTROL, DRAINAGE STRUCTURE INLET FILTER CLEANING, which price shall include all costs for labor, materials, equipment, and incidentals necessary to perform the work.

CONSTRUCTION AIR QUALITY – DUST CONTROL

Description. This work shall consist of developing and implementing a detailed Dust Control Plan (DCP). Development of a DCP is required in "Non-attainment" and "Maintenance" areas, per Article 107.36 of the Standard Specifications. All construction activities shall be governed by the DCP. The nature and extent of dust generating activities, and specific control techniques appropriate to specific situations shall be discussed at the pre-construction meeting, with subsequent development of the DCP to include but not be limited to the requirements below.

The Contractor is responsible for the control of dust at all times during the duration of the contract, 24 hours per day, 7 days per week, including non-working hours, weekends, and holidays. This work shall be considered complete after the completion of all permanent erosion control measures required for the contract, and after all temporary and permanent seeding has taken place. Work on this contract shall be conducted in a manner that will not result in generating excessive air borne particulate matter (PM) or nuisance dust conditions.

The DCP shall include legible copies of the product literature and Material Safety Data Sheets for dust suppression agents and stabilizers the contractor proposes to use. The Dust Control Plan shall involve the implementation of control measures before, during and after conducting any dust generating operation. These controls must be in place on non-working days and after working hours, not just while work is being done on the site. The Dust Control Plan must contain information specific to the project site, proposed work, and dust control measures to be implemented. A copy of the Dust Control Plan must be available on the project site at all times.

The Dust Control Plan must contain, at a minimum, all of the following information:

Name, address and phone number of the person(s) responsible for the dust generating operation and for the submittal and implementation of the Dust Control Plan.

A drawing specifying the site boundaries of the project with the areas to be disturbed, the locations of the nearest public roads, and all planned exit and entrance locations to the site from any paved public roadways.

Control measures to be applied to all actual and potential fugitive dust sources before, during and after conducting any dust generating operation, including non-work hours and non-work days.

A list of dust suppressants to be applied, including product specifications, Material Safety Data Sheets, and product label instructions that include the method, frequency and intensity of applications; and information on the environmental impacts and approval or certifications related to the appropriate and safe use for ground applications.

A contingency plan consisting of at least one contingency measure for each activity occurring on the site in case the primary control measure proves inadequate.

The Contractor shall submit two copies of the DCP that outlines in detail the measures to be implemented by the Contractor complying with this section, including prevention, cleanup, and other measures at least 14 days before beginning any dust generating activity. The Contractor shall not begin any dust generating activities until the Engineer approves the DCP in writing. Failure to comply with the DCP or provisions herein will subject the contractor to an "Environmental Deficiency Deduction," as outlined below.

Materials

1. Dust Suppression Agents

Dust suppression agents shall be water soluble, non-toxic, non-reactive, non-volatile, and non-foaming. The use of petroleum for dust control is prohibited.

Calcium Chloride shall conform to the requirements of Article 1013.01 of the Standard Specifications. Other commercially available dust suppression agents may be substituted for calcium chloride subject to the approval of the Engineer. Material Safety Data Sheets must be reviewed and approved by the Engineer prior to the use of any substances other than Calcium Chloride.

Water shall meet the requirements of Article 1002 of the Standard Specifications.

2. Soil stabilizers shall consist of seed and mulch meeting the requirements of Article 1081.06 (a) (2) and (3).

3. Covers for stockpiles shall be commercially available plastic tarps, or other materials approved by the Engineer.

Construction Methods. Dust suppression agents shall be used to provide temporary control of dust on haul roads and other active work areas. Several applications per day may be necessary to control dust depending upon meteorological conditions and work activity. The Contractor shall apply dust suppression on a routine basis as necessary or as directed by the Engineer to control dust. Wet suppression consists of the application of water or a wetting agent in solution with water. Wetting agents shall not be applied directly to live plant material.

Wet suppression equipment shall consist of sprinkler pipelines, tanks, tank trucks or other devices approved by the Engineer, capable of providing a regulated flow, uniform spray and positive shut off.

Calcium chloride dust suppression agents may be used in lieu of wet suppression only when freezing conditions exist. Calcium chloride shall be uniformly applied by a mechanical spreader at a rate of 1 and 1/2 pounds per square yard or its equivalent liquid, unless otherwise directed by the Engineer. Calcium chloride shall not be directly applied to live plant material.

Calcium chloride must not be stored outdoors without an impermeable cover. Storage must be on an impermeable surface such as paved asphalt or appropriately treated concrete of sufficient thickness to avoid exfiltration. Storage should be as airtight as possible to limit the calcium chloride's absorbing moisture from the air. No storage facilities will be allowed within 100 feet of a storm sewer, or any other drain. Positive drainage must be maintained on all treated surfaces. Ditches, culverts and other structures must be kept clean to ensure proper drainage and to limit the amount of water infiltrating earth surfaces and thereby leeching out chlorides. If calcium chloride is applied dry, or during dry periods, and crystals are seen on the road surface, the road should be wetted sufficiently to dissolve the calcium chloride. Wetting should be limited to an amount that will sufficiently cause the calcium chloride to penetrate the surface but not to the point of causing any runoff from the road surface. Other approved dust suppression agents shall be applied and used as per the manufacturer's instructions.

Haul truck cargo areas shall be securely covered during the transport of materials on public roadways that are prone to cause dust.

Public Roadway Dust Control. Track out, including carryout and spillage of material that adheres to the exterior surfaces of or are spilled from motor vehicles and/or equipment and subsequently fall onto a

paved public roadway must be controlled at all times. Clean up of carryout and spillage is required immediately if it extends a cumulative distance of 50 feet or more on a paved public roadway. If the extent of carryout is less than 50 feet, clean up at the end of the day is permissible. Clean up of paved surfaces shall be by wet spray power vacuum street sweeper. Dry power sweeping is prohibited.

Control of earthwork dust. During batch drop operations (i.e. earthwork with a front-end loader, clamshell bucket, or backhoe), the free drop height of excavated or aggregate material shall be reduced to minimum heights as necessary to perform the specified task, and to minimize the generation of dust. To prevent spills during transport, a minimum of 2 inches of freeboard space shall be maintained between the material load and the top of the truck cargo bed rail. A maximum drop height of two feet (or minimum height allowed by equipment) will be allowed, or to heights as directed by the Engineer.

Control of dust on stockpiles and inactive work areas. The Contractor shall use the following methods to control dust and wind erosion of stockpiles and inactive areas of disturbed soil:

Dust suppression agents shall be used during active stockpile load-in, load-out, and maintenance activities.

Soil stabilizers (hydraulic or chemical mulch) shall be applied to the surface of inactive stockpiles and other inactive areas of disturbed soil. Final grading and seeding of inactive areas shall occur immediately after construction activity is completed in an area and as directed by the Engineer.

Plastic tarps may be used on small stockpiles, secured with sandbags or an equivalent method approved by the Engineer, to prevent the cover from being dislodged by the wind. The Contractor shall repair or replace the covers whenever damaged or dislodged at no additional cost.

Method of Measurement. All measuring devices shall be furnished by the Contractor and approved by the Engineer.

Calcium chloride and other approved dust suppression agents shall be mixed with water at the rate specified by the manufacturer and measured for payment in units of 1000 Gallons of solution applied.

The application of soil stabilizers shall be measured by weight (pounds) of soil stabilizer. The soil stabilizer will then be added to water to form a solution in accordance with the manufacturer's recommendation.

All other dust control measures will not be measured for payment.

Basis of Payment. The application of dust suppression agents shall be paid for at the contract unit price per unit for APPLYING DUST SUPPRESSION AGENT.

Soil stabilizers will be paid for at the contract price per pound for SOIL STABILIZERS.

All other dust control measures will not be paid for directly but shall be considered as included in the various items involved and no additional compensation will be allowed.

CONSTRUCTION AIR QUALITY – DIESEL VEHICLE EMISSIONS CONTROLS

Description. The reduction of emissions of Carbon Monoxide (CO), Hydrocarbons (HC), Nitrogen oxides (NOx), and Particulate Matter (PM) will be accomplished by installing Retrofit Emission Control Devices and/or by using cleaner burning diesel fuels. The term "equipment" refers to any and all diesel fuel powered devices rated at 50 Horse power (HP) and above, to be used on the project site for any length of time, (including any "rented" or "rental" equipment).

All Contractor and Sub-contractor diesel powered equipment with engine horsepower (HP) ratings of 50 HP and above, that are on the project or are assigned to the contract shall be prohibited from using "off-road" diesel fuel (above 500 parts per million (ppm) sulfur content) at any time. In addition, diesel powered equipment shall be either (1) retrofitted with Emissions Control Devices and use Cleaner burning "on-road" diesel fuel (500 ppm sulfur content or less), or (2) use Ultra Low Sulfur Diesel fuel (ULSD) exclusively (15 ppm sulfur content or less), in order to reduce diesel particulate matter emissions. Large cranes (Sky cranes or Link Belt cranes), which are responsible for critical lift operations are exempt from installing Retrofit Emission Control Devices if they adversely affect equipment operation.

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 (www.epa.state.il.us/air/vim/faq/testing.html). Regulations regarding diesel powered vehicles over 16,000 pounds, and the Diesel Emission Inspection Program (Title 92: Transportation Part 460, Diesel Emission Inspection Program, Subpart A: General) can be accessed at (www.dot.state.il.us/regulations.html). Diesel powered vehicles less than 16,000 pounds are exempt from testing by IDOT. 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 shall 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.

The Retrofit Emission Control Devices shall consist of oxidation catalysts, or similar retrofit equipment control technology that (1) is included on the Environmental Protection Agency (EPA) Verified Retrofit Technology List (www.epa.gov/otaq/retrofit/retroverifiedlist.html) and (2) is verified by EPA or certified by the manufacturer via letter, to provide a minimum emissions reduction of 20% PM10, 40% CO, and 50% HC when used with "on-road" diesel fuel. As noted above, the Retrofit Emission Control Device must be used with on-road diesel fuel (500 ppm sulfur content or less).

If used, ULSD fuel shall conform to American Society for Testing and Materials (ASTM) D-975 diesel with the following additional specifications:

ASTM D-5453 15 ppm Sulfur max.
ASTM D-6078 Lubricity (SBOCLE) 3100 g min.
ASTM D-613 Cetane 45 min.
Dyed (for Off-road use)

Construction shall not proceed until the contractor submits a certified list of the diesel powered equipment that will be retrofitted with emission control devices and use "on-road" diesel fuel, and a list of equipment that will use ULSD fuel only. The list(s) shall include (1) the equipment number, type, make, and contractor/sub-contractor name; (2) the emission control devices make, model and EPA verification number; and (3) the type and source of clean fuels to be used. Vehicles reported as fitted with emissions control devices shall be made available to the Engineer for visual inspection of the device installation by qualified staff, prior to being used on the project site. 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 under "Environmental Deficiency Deduction."

The contractor shall submit monthly summary reports, updating the list of construction equipment, and include certified copies of the diesel fuel delivery slips (for both "on-road" and ULSD) for the reporting time period, noting the type 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 given 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. Failure to comply with the "Diesel Vehicle Emission Controls", shall also subject the Contractor or sub-contractor to an "Environmental Deficiency Deduction," as outlined below.

Any costs associated with bringing any diesel powered equipment into compliance with these "Diesel Vehicle Emissions Controls" shall be included in the overall cost of the contract. In addition, there shall be no time granted to the contractor for compliance with this notice. The contractor's compliance with this notice and any associated regulations shall also not be grounds for a claim.

A. IDLING. The contractor shall establish truck-staging areas for all diesel powered vehicles that are waiting to load or unload material at the contract area. Such zones shall be located where the diesel emissions from the equipment will have a minimum impact on adjacent abutters and sensitive receptors of the general public. The Department will coordinate such locations with the Contractor and City Of Chicago authorities, including local aldermen, in the selection of staging areas, whether within or outside the existing highway right-of-way (ROW), 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. Idling of diesel powered equipment shall not be permitted during periods of non-active vehicle use. Diesel powered engines shall not be allowed to idle for more than five consecutive minutes when the equipment is not in use, occupied by an operator, or otherwise in motion, except only as follows:

When the equipment is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control;

When it is necessary to operate auxiliary systems installed on the equipment, only when such system operation is necessary to accomplish the intended use of the equipment;

To bring the equipment to the manufacturer's recommended operating temperature;

When the outdoor temperature is below forty-five (45) degrees Fahrenheit or above eighty (80) degrees Fahrenheit;

When the equipment is being repaired.

All work shall be conducted to ensure that no harmful effects are caused to adjacent sensitive receptors. Equipment and equipment operators found in non-compliance with these idling provisions shall receive a warning, and on the next offense be subject to an Environmental Deficiency Deduction as outlined below. The contractor or sub-contractor may reserve the right to enforce this deduction on their own equipment operator, as necessary.

B. MITIGATION. Air quality monitoring will be conducted throughout the course of the Dan Ryan reconstruction project, by a separate air quality consultant. The contractor shall designate a point person to be responsive to IDOT in the event construction related air quality issues

arise. If the ongoing monitoring detects an adverse air quality issue that is due to, or exacerbated by construction activities, the contractors point person will be required to consult with the Engineer, to determine the appropriate course of action.

Appropriate mitigation measures can include a variety of actions ranging from, but not limited to additional watering, removal of construction equipment from nearby sensitive receptors, shut down of diesel powered equipment, or other mitigation measures which may be required as data becomes available and as approved by the Engineer.

Method of Measurement and Basis of Payment:

The CONSTRUCTION AIR QUALITY – DIESEL EMISSIONS CONTROLS will not be measured for payment and the cost of this work shall be included in the unit prices bid and no additional compensation will be allowed.

CONSTRUCTION NOISE MITIGATION

Description. This work shall consist of implementing construction noise restrictions as outlined in a project Construction Noise Mitigation plan. Work on the project shall be in accordance with the Construction Noise Mitigation plan submitted by the contractor, applicable sections of Article 107.35 of the Standard Specifications, and modifications as contained herein for construction noise.

The contractor must provide advance notification, and secure approval from the Engineer prior to the use of heavy construction equipment outside normal construction work hours ("normal construction work hours" as specified in Article 107.35 of the Standard Specifications). Inspection and maintenance of all vehicle exhaust systems shall be conducted on a monthly basis, (or as determined by the Engineer), for all such vehicles and other equipment assigned to or utilized on the project site. Inspections shall be conducted by personnel having a working knowledge of exhaust systems so that proper recommendations regarding the adequacy of the mufflers can be established.

Construction Equipment

Pavement Breakers create high concentrations of low frequency sound energy, and noise attenuation can be achieved through the introduction of high-mass material between the noise source and the receiver. The attachment of shrouds (sound curtains) to the steel frame around the breaker shall be installed, as equipment allows. The operation of pavement breakers shall be prohibited outside of normal work hours, as specified herein, unless otherwise approved by the Engineer.

Special care shall be taken with respect to the set up and operation of concrete batch and concrete crushing plants to minimize the potential noise impacts to the adjacent community. The Department will work with the Contractor and City Of Chicago authorities, including local aldermen in selecting construction concrete batch and/or crushing locations, whether within or outside the ROW, to avoid locations near sensitive areas or populations to the extent possible. All local, City, Village, Town and/or Township rules, regulations, and/or requirements regarding batch and crushing plants shall be followed, as instructed by the Engineer.

Compressors or generators shall be located as far away as possible from sensitive receptors. Compressors and generators shall be positioned such that the coding fan intake does not point towards the community. The Contractor shall review stationary equipment placement with the Engineer prior to commencement of work.

Method of Measurement and Basis of Payment:

The CONSTRUCTION NOISE MITIGATION will not be measured for payment and the cost of this work shall be included in the unit prices bid and no additional compensation will be allowed.

ENVIRONMENTAL DEFICIENCY DEDUCTION

To ensure a prompt response to incidents involving the integrity of work zone Environmental (Air Quality and Noise) Control, the Contractor shall provide a telephone number where a responsible individual can be contacted on a 24 hour a day basis.

When the Engineer is notified, or determines 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 frame. The specified time frame, 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.

The deficiency may include lack of repair, maintenance or non-compliance with the Special Provisions for Construction Air Quality Dust Control and/or Construction Noise Mitigation.

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 exists. The calendar day(s) will begin with Contractor's notification and end with the Engineer's acceptance of the correction. The daily monetary deduction will be either \$1,000.00 or 0.05 percent of the awarded contract value, whichever is greater.

In addition, if the Contractor or sub-contractor fails to respond within the allotted time frame, the Engineer may take action to correct the deficiency, or may cause the correction of the deficiency to be made by others, the cost thereof being deducted from monies due or which may become due the Contractor or sub-contractor. This corrective action will in no way relieve the Contractor or sub-contractor of his/her contractual requirements or responsibilities, and shall not be grounds for any claim.

If a Contractor or sub-contractor accumulates three (3) Deficiency Deductions for the same deficiency, in a contract period, the contractor will be shut down until the deficiency is corrected. Such a shut down will not be grounds for any extension of the completion date, waiver of penalties, or be grounds for any claim.

CONTRACTOR OFF-STREET PARKING RESTRICTION

The Contractor and all employees working on this project will not be allowed to park their vehicles and equipment on frontage roads or streets. The Contractor shall provide off-street

parking facility for all vehicles and equipment. The Contractor shall also provide any transportation required to get his employees to and from the work site. The Contractor will provide the RE with written documentation of the off-site parking location. The cost to comply with this requirement will not be paid for separately, but shall be considered as included in the contract unit bid prices of the contract, and no additional compensation will be allowed.

COMBINED SEWER

Description. This Work shall consist of constructing Combined Sewer of the type and size specified, as shown on the Plans or directed by the Engineer.

Project Conditions. Ground water and sand are expected to be encountered during excavation for sewers.

Materials

a) Pipe and Fittings:

- 1) Pipe for Combined Sewers, Type 1: Combined Sewers, Type 1 shall be constructed of ductile iron pipe and fittings conforming to ANSI A21.51, Class 2 Specification, with 0.33 inch wall thickness and have a push on type bell end.

Where less than 3 feet of cover exists, ductile iron pipe shall be used at no increase in cost unless a separate item is provided for ductile iron pipe of the diameter required.

- 2) Pipe for Combined Sewers, Type 2, 3 and 4: Combined Sewers, Types 2, 3 and 4, less than 24 inch diameter shall be vitrified clay socket pipe conforming with the specifications for Extra Strength Vitrified Clay Pipe, conforming to ASTM C700. Combined Sewers 24 inch and larger shall be constructed of reinforced concrete pipe conforming to Section 1040.03 of the Standard Specifications. The class of pipe required for Combined Sewers 24" and larger shall be according to Table IA in Section 542 of the Standard Specifications, except that the minimum class of pipe allowed shall be Class III.

- #### b) Catch Basin and Inlet Connections: Catch basin connections shall be 8-inch pipe of the type and quality specified herein.

Inlet connections shall be 8-inch Ductile Iron Pipe.

c) Joints:

- 1) Joints for ductile iron pipe shall be push-on type and approved by the Engineer.
- 2) Joints for vitrified clay pipe shall conform to ASTM C425 Compression Joints for Vitrified Clay bell and spigot pipe.

- 3) Joints for reinforced concrete pipe shall be rubber gasketed and sealed inside and outside with concrete mortar. Each length of pipe shall be provided with bell and spigot or tongue and groove ends of concrete formed on machined rings to insure accurate joint surfaces. The theoretical diameter and the actual diameters of the contact surfaces shall not vary more than 1/16 inch. Each spigot or tongue shall be recessed to accommodate either a round rubber gasket or other confined, compression-type rubber gasket.

The rubber gaskets shall be continuous, precision molded gaskets manufactured from a compound containing a basic polymer of not less than 50%, by volume, of neoprene and shall contain no vulcanized vegetable oil, reclaimed rubber of any deleterious substance and shall be the product of a manufacturer having at least 5 years experience in the manufacture of rubber gaskets for sewer pipe joints. Circular gaskets shall be of sufficient cross-sectional area and volume so that when the joint is assembled, the gasket will be compressed to form a water-tight seal. Gaskets shall be extruded or molded and cured in such a manner that any cross-section will be dense, homogenous and free from porosity, blisters, pitting, and other imperfections. The gaskets shall be molded or extruded to the tolerance as specified. All gaskets shall be manufactured within a tolerance of plus or minus 1/64 inch on any dimension measured at any cross section. The physical properties of the rubber gaskets shall conform to ASTM C443M-98. Prior to constructing any combined sewer, the Contractor must submit to the Engineer for approval, detailed drawings of the pipe and pipe joint to be furnished and placed under this Contract, including the dimensions of the rubber gasket and the joint in the assembled pipe position. The gaskets shall be seated on the pipe in accordance with the manufacture's specifications and the ends of the pipe and the gaskets shall be kept clean and free from damage until the joint has been made.

- d) Bedding: The pipe foundation shall be bedding material consisting of gravel, crushed gravel, or crushed stone, having a CA-11 gradation and conforming to the applicable portions of Section 1004 of the Standard Specifications. Place at least 4 inches in depth below the pipe so that at least the lower half of the pipe will be uniformly supported for its entire length. The cost of furnishing, placing and compacting bedding material will be included for the bid price for COMBINED SEWERS, of the type and size specified.
- e) Brick and Mortar: Brick shall be Grade S.W. Building Brick. Mortar shall be as specified for Brick Masonry under Article 602.05 of the Standard Specifications.

Construction Requirements.

- a) General Requirements: Work under these items shall be performed in accordance with Section 550 of the Standard Specifications and Standard Specification for Sewer Construction, Chicago Department of Water Management (CDOWM), except as herein modified. In case of discrepancies, the CDOWM Specifications shall govern over Section 550 of the Standard Specifications.

No cracked, broken or otherwise defective lengths of pipe shall be used in the work. All pipe and fittings shall be reinspected for soundness and damage due to handling immediately before being laid, and any pipe not conforming to the requirements of this Special Provision shall be rejected and removed immediately from the site of the work.

- b) Dewatering: Trenches shall be kept as free as practicable from excess water until the mortar in the joints has sufficiently hardened.
- c) Sheeting and Bracing: Install sheeting and bracing to support the walls of the trench where soil, groundwater and trench depth so require. Where support is necessary, install sheeting and bracing for the full depth of the trench.
- d) Installation: Each length of pipe shall be laid to the required line and grade on a firm, even embedment as described in Article 206.5 of the CDOWM Specifications and as shown on the Plans, with the groove end up-grade. After the gasketed pipe is lowered into position, it shall be drawn home by use of a winch and cable so as to be in proper alignment. The Contractor must prevent excessive movement of the pipe when partially or completely home so as not to displace the rubber gasket or damage the pipe spigot or bell.

Seal all joints in reinforced concrete pipe sewers with portland cement mortar applied to the joint and finished smooth on the entire circumference of pipe on the inside and, so far as practicable, on the outside circumference. All foreign materials and excess mortar shall be removed from the inside of the sewer as pipe laying progresses.

Whenever pipe laying is discontinued, the unfinished end of the sewer shall be protected from displacement and cave-in or other injury and a suitable stopper or dam shall be placed in the end of the sewer.

- e) Disposal of Excavated Material: Unless otherwise directed by the Engineer, all excavated material not needed on the work site shall be legally disposed of beyond the limits of the improvement within 24 hours in accordance with Section 202.03 of the Standard Specifications.
- f) Connections to Existing and Proposed Sewers: Where a combined sewer or drain connection is to be made to a proposed ESVCP combined sewer, a manufactured Y or T branch shall be installed in the sewer at this junction. Where a combined sewer or drain connection is to be made to a proposed RCP combined sewer a pipe section with a predrilled hole of the proper diameter shall be installed at this junction. The junction of the proposed combined sewers shall be constructed as shown in the details in the plans.

Where a combined sewer or drain connection is to be made to proposed RCP sewer, tapered holes shall be so formed that the drain connection will enter the sewer at an angle of approximately 90 degrees with the axis of the sewer. Whenever the diameter of a preformed tapered hole is equal to or exceeds 50% of the diameter of the pipe, additional reinforcement steel satisfactory to the Engineer shall be placed around the hole. Pipe sections shall not be less than 4 feet or more than 8 feet long unless otherwise approved by the Engineer. The work shall be carefully planned with regard to the matching of pipe openings to existing drain locations and the cutting of pipes for

connections will be permitted in special cases, and where permitted, shall be done in a manner satisfactory to and approved by the Engineer. If preformed tapered holes have not been provided for the connection of the drains and for future drain connections, the Contractor must make circular cored openings in the sewer pipe.

When a combined sewer or drain connection is to be made to an existing sewer, a "T" or "Y" saddle shall be installed per the details contained in the plans. The circular opening in the existing combined sewer shall be core drilled to the same size as the external diameter of the proposed combined sewer or drain connection. The protrusion of the proposed sewer into the existing sewer shall not exceed a maximum of 1-inch. Edge of core holes shall be a minimum of 1.5 feet from the edge of pipe and a minimum distance of 5 feet horizontally between holes. Holes shall not be drilled higher than the 10 and 2 o'clock positions.

The joint between the existing combined sewer and the proposed combined sewer shall be completely sealed with brick and mortar as shown in the details contained in the plans.

If the existing sewer pipe is cracked, broken or otherwise damaged by the Contractor in making this cored opening, the Contractor must replace this section of pipe with a pipe equal to and similar in all respects to the pipe of the existing sewer. The Contractor must do this Work in a careful, manner without extra compensation, and so as not to disturb the adjoining sections of existing pipe. The junction of the proposed and existing sewers shall be constructed as shown in the details contained in the plans.

- g) Maintenance of Sewer Flow: Flow in the sewers shall not be interrupted unless adequate provisions, approved by the Engineer, are made to continue service. A temporary flume pipe shall be installed at the end of each day between the existing and proposed sewers at locations where an existing sewer is being replaced.
- h) Preventing Debris from Entering Sewers: Care must be taken to prevent mud, sand or other obstructing materials from entering the sewer. All such materials which enter the sewer must be removed and the sewer left clean and unobstructed upon completion of the work. This shall include all debris created in making the circular opening in existing sewers for purposes of combined sewer connections and all materials employed to seal the joints.
- i) Replacement of Broken Tile: Where broken tile in the existing sewer is determined, the Contractor must replace the broken tile and the work shall be paid for at the Contract Unit Price per foot for Combined Sewer of the type and size specified.
- j) Riser Pipes for Future Laterals: The Contractor must when directed by the Engineer, place riser pipes for future laterals from their connection with the sewer to such a height as directed.
- k) Abandoned Sewers and Drains: Abandoned sewers and drains, as designated by the Engineer, shall be plugged with Class SI concrete or brick and suitable mortar to the satisfaction of the Engineer. This Work will not be paid for separately, but shall be considered as included in the Contract Unit Price for the Combined Sewer items.

- l) Openings in Existing Manholes: New opening or enlargements of existing openings in existing manholes that are required to accommodate the proposed combined sewers shall not be measured for payment but considered incidental to the combined sewer items.
- m) Removal of Existing Sewers in Proposed Sewer Trench: Existing sewers within the proposed sewer trench shall be removed and disposed of legally offsite, in accordance with Section 202.03 of the Standard Specifications.
- n) Inspection/Televising of Sewers: All sewers and sewer structures shall be inspected by the CDOWM prior to the final payment to the Contractor. In conjunction with sewer inspections, the Contractor must furnish videotape of a televised inspection of the interior of all existing and/or new main sewers affected by Work performed under this Contract. The final acceptance of the sewer shall be based on the sewer videotape.

The videotaping of combined/sanitary sewers shall be performed by others in Contract 62935 (17F). The Contractor shall coordinate sewer construction with the videotaping Contractor to insure that the videotaping is completed on time. The contractor for Contract 62695 (17B) shall provide a sewer construction schedule to the videotaping contractor for Contract 62935 (17F), showing the approximate start and end dates for each sewer.

Videotaping of the existing sewer shall be performed prior to starting construction. Videotaping of new sewer shall be performed as soon as practical but no later than two weeks after placement of subbase granular material or aggregate base course. The existing and new sewers shall be cleaned prior to videotaping.

Pavement sections requiring removal shall be full panel sections and pavement anchors shall be required for pavement restoration. The Contractor must re-videotape the sewer to verify that the deficiencies noted on any previous videotape have been corrected to the satisfaction of the CDOWM. Costs to re-videotape the sewer, regardless of the number times required, shall be borne solely by the Contractor for Contract 62695 (17B).

Every effort shall be made by the Contractor to correct all deficiencies prior to the placement of the final wearing surface. If, in the opinion of the Engineer, the Contractor has delayed in submitting the videotape, the placement of the final wearing surface shall be suspended. No time extension shall be granted due to this suspension. The Engineer shall be sole judge as to any delays.

Method of Measurement. Combined sewers of the type and size specified shall be measured for payment in place in feet, with the exception of ductile iron pipe sewers within the first 4 feet of an inlet connection, which is included in the bid price for Inlet Type A (Including Frame & Lid). If more than 4 feet of pipe is required to connect an inlet to a catch basin, this additional pipe will be paid for at the Contract Unit Price per foot for Combined Sewers, Ductile Iron Pipe 8", measured in place and as specified in Article 550.08 of the Standard Specifications. Existing sewers within the proposed sewer trench to be removed will not be measured for payment.

Pavement removal for proposed sewer trenches outside the limits of the scheduled pavement removal shall not be measured separately.

Catch basin half traps on proposed catch basins shall not be measured for payment but considered incidental to the item CATCH BASINS, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, OPEN LID (CITY OF CHICAGO).

Trench backfill will be measured for payment as specified in Article 208.03.

House drain connections to existing and proposed combined sewers will be measured for payment per lineal foot. The drain connection shall be measured along the top of the pipe from the edge of the trench to the centerline of the combined sewer. The diameter of the drain connection pipe shall match existing.

Basis of Payment. This Work will be paid for at the contract unit price per foot of COMBINED SEWER, of the class, type, and diameter specified, which price shall include pipe, fittings, openings to existing manhole wall, excavation, and disposal of existing material, sewers, bedding and all other work required to complete the sewer installation as specified. Any dewatering and sheeting or shoring required to do the work as specified will not be paid for separately but will be included in to the contract unit price of this item.

Trench backfill will be paid for in accordance with Article 208.04 of the Standard Specifications. House drain connections to existing and proposed combined sewers will be paid for at the contract unit price per lineal foot of DRAIN CONNECTIONS, which price shall include all work to make the sewer connection as specified herein.

The cost of coordinating with the videotaping contractor shall not be paid for separately, but shall be included in the unit prices for the various combined sewer items.

STEEL CASING 42", 48"

Description:

This work consists of furnishing and installing, by jacking, a steel casing pipe, of the size indicated, at the location shown on the plans or as directed by the Engineer. The casing pipe is required for the construction of storm sewer installed by jacking. The work shall be performed in accordance with the applicable portions of Section 552 of the Standard Specifications, the applicable portions of the Standard Specifications For Water & Sewer Main Construction In Illinois, the details in the plans and as herein specified.

Materials:

The steel casing pipe shall meet or exceed the requirements of ASTM A-139, Grade B, minimum yield strength of 35,000 psi. The minimum wall thickness shall be as detailed on the plans.

The exterior of the casing pipe shall have a coal-tar enamel coating in accordance with AWWA C-203, or a coal-tar epoxy coating in accordance with AWWA C-210.

General:

Pipe joints shall be welded in accordance with AWWA C-206. No hydrostatic test is required but field welds shall be watertight. After welding, the welded area must be covered and treated with hot tar 1/8-inch thick. The tar must be allowed to cool prior to jacking the casing pipe in place.

Method of Measurement:

Steel casing shall be measured along the invert in feet in place.

Basis of Payment:

This work will be paid for at the contract unit price per foot for STEEL CASING of the size indicated, which price shall be payment in full for all materials, labor, tools, equipment, and incidentals necessary to complete the work as specified.

ROADWAY LIGHTING AND ITS INFRASTRUCTURE SCOPE OF WORK

The work shall consist of the installation of raceways, handholes, equipment foundations, and trench and backfill as shown on the plans. Also included is the removal of existing lighting and surveillance equipment and the temporary operation of the lighting system. The installation of roadway lighting and ITS equipment and its' associated wiring will be by others under Contract 62583.

COORDINATION REQUIREMENTS FOR OVERHEAD AND CANTILEVER SIGNS

Description:

This work consists of coordinating with Contract 62583 for the furnishing and installation of signs, luminaires, conduits, wiring, and other appurtenances prior to the erection of overhead and cantilever sign structures.

General Requirements:

The Contractor is required to minimize the number of lane closures necessary to erect the proposed sign structures. All required components and appurtenances shall be attached to or mounted on the sign structure while it is on the ground, prior to erection. Work items to be furnished and installed in advance include, but are not limited to, dynamic message signs, sign panels, luminaries, conduits, wiring, disconnect switches, walkways and handrails.

The Contractor shall coordinate this work with the other contractors and sub-contractors to insure that all components and appurtenances are installed or attached in advance of sign erection. This work includes the coordination for materials, components, devices and appurtenances to be furnished by other Contracts or installed by Contractors from other Contracts. Complying with the requirements of this Special Provision shall not be cause for the Contractor to claim delay.

Method of Measurement:

This coordination work shall not be measured for payment.

Basis of Payment:

The coordination required for furnishing and installing sign components prior to erection of the sign structure shall not be paid for separately, but shall be included in the cost of the contract

LED DYNAMIC MESSAGE SIGN (BY OTHERS)

Installation of Dynamic Message Sign. At the overhead sign truss at Station 1286+85, a dynamic message sign shall be installed and wired by others during Contract 62583.

MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION

Description: This work shall consist of maintaining an existing traffic signal installation that has been designated to remain in operation during construction. The energy charges for the operation of the traffic signals shall be paid for by the City of Chicago.

Before taking over the maintenance of the existing traffic signal installation, the CONTRACTOR shall arrange to make an inspection with the ENGINEER to determine if any corrective work needs to be done and to mutually agree on a date for the transfer of maintenance. The CONTRACTOR should normally begin maintaining the existing traffic signal installation as soon as he/she begins any physical work at an intersection. The CONTRACTOR's maintenance responsibility shall cease upon written notification of the ENGINEER for individual intersections.

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 lamps or sockets of approved qualities. 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/her own expense. The CONTRACTOR may institute action to recover damages from a responsible third party.

The CONTRACTOR shall install STOP signs (Standard No. R1-3636) 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 personnel who will be available 24 hours a day, 7 days a week, to perform any necessary work on the signal installation.

e. 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 personnel to perform any work, the ENGINEER 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 price each for MAINTENANCE OF EXISTING TRAFFIC SIGNAL INSTALLATION, which price shall be payment in full for all materials, equipment and labor needed to perform the work at one intersection as shown on the Plans.

MAINTENANCE OF LIGHTING SYSTEMS

Effective Date: March 1, 2003

Replace Article 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. This shall be the lighting located between Halsted Street and the C&WI Railroad bridge.

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 located between Halsted Street and the C&WI Railroad bridge and 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 between Halsted Street and the C&WI Railroad bridge 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.

GENERAL ELECTRICAL REQUIREMENTS

Effective Date: March 1, 2003

Add the following to Article 801 of the Standard Specifications:

“Preconstruction Inspection:

General. Before performing any excavation, removal, or installation work (electrical or otherwise) at the site, the Contractor shall request a 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 preconstruction inspection shall be made no less than seven (7) calendar days prior to the desired inspection date. The preconstruction inspection shall:

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.

Delete the last paragraph of Article 801.06 of the Standard Specifications.

Revise the 7th and 8th paragraphs of Article 801.08 of the Standard Specifications to read:

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

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."

Add the following to Section 801.12 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.”

Grounding of Lighting Systems. All electrical systems, equipment and appurtenances shall be properly grounded in strict conformance with the NEC, even though every detail of the requirements is not specified or shown. Good ground continuity throughout the electrical system shall be assured. All electrical circuit runs shall have a continuous equipment grounding conductor. IN NO CASE SHALL THE EARTH BE CONSIDERED AS AN ADEQUATE EQUIPMENT GROUNDING PATH. Where connections are made to painted surfaces, the paint shall be scraped to fully expose metal at the connection point and serrated connectors or washers shall be used. Where metallic conduit is utilized as the equipment grounding conductor, extreme care shall be exercised to assure continuity at joints and termination points. No wiring run shall be installed without a suitable equipment ground conductor. Where no equipment ground conductor is provided for in the plans and associated specified pay item, the Contractor is obligated to bring the case to the attention of the Engineer who will direct the Contractor accordingly. Work which is extra to the contract will be paid extra. All connections to ground rods, structural steel, reinforcing steel or fencing shall be made with exothermic welds. Where such connections are made to insulated conductors, the connection shall be wrapped with at least 4 layers of electrical tape extended 152.4 mm (six inches) onto the conductor insulation. Where a ground field of "made" electrodes is provided, the exact locations of the rods shall be documented by dimensioned drawings as part of the Record Drawings. Equipment ground wires shall be bonded, using a splice and pigtail connection, to all boxes and other metallic enclosures throughout the wiring system.

GROUND ROD

Description. This item shall consist of furnishing, installing and connecting ground rods for the grounding of service neutral conductors and for supplementing the equipment grounding system via connection at poles or other equipment throughout the system. All materials and work shall be in accordance with Article 250 of the NEC.

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

<u>Item</u>	<u>Article/Section</u>
(a) Ground Rod	1087.01(b)
(b) Copper Ground Wire	1087.01(a)
(c) Access Well	1087.01(c)

CONSTRUCTION REQUIREMENTS

General. All connections to ground rods, structural steel or fencing shall be made with exothermic welds. Where such connections are made to insulated conductors, the connection shall be wrapped with at least 4 layers of electrical tape extended 152.4 mm (six inches) onto the conductor insulation.

Ground rods shall be driven so that the tops of the rod are 609.6 mm (24 inches) below finished grade. Where indicated, ground wells shall be included to permit access to the rod connections. Where indicated, ground rods shall be installed through concrete foundations.

Where ground conditions, such as rock, preclude the installation of the ground rod, the ground rod may be deleted with the approval of the Engineer.

Where a ground field of "made" electrodes is provided, such as at control cabinets, the exact locations of the rods shall be documented by dimensioned drawings as part of the Record Drawings.

Ground rod connection shall be made by exothermic welds. Ground wire for connection to foundation steel or as otherwise indicated shall be stranded uncoated bare copper in accordance with the applicable requirements of ASTM Designation B-3 and ASTM Designation B-8 and shall be included in this item. Unless otherwise indicated, the wire shall not be less than No. 2 AWG.

Where connections are made to epoxy coated reinforcing steel, the epoxy coating shall be sufficiently removed to facilitate the exothermic weld.

Method of Measurement. Ground rods at light poles and ground mounted light towers shall be included in this pay item and shall be counted, each. Ground wires and connection of ground rods shall be included in this pay item. Ground rods installed at handholes, light tower foundation integral with retaining wall and foundations for sign structures shall not be measured for payment but shall be included in the cost of the handhole or appropriate foundation pay item.

Basis of Payment. This item shall be paid at the contract unit price each for GROUND ROD, of the diameter and length indicated which shall be payment in full for the material and work described herein.

UNDERGROUND RACEWAYS

Revise Article 810.03 of the Standard Specifications to read:

“Installation. All underground conduit shall have a minimum depth of 700 mm (30 inches) below the finished grade, unless otherwise indicated on the plans.”

Add the following to Article 810.03 of the Standard Specifications:

“All metal conduit installed underground shall be Rigid Metal 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.”

RACEWAYS EMBEDDED IN STRUCTURE

Section 810 of the Standard Specifications for Road and Bridge Construction shall be modified as follows:

Add the following to Article 810.03(c):

“(c) Coilable Nonmetallic Conduit.

Polyethylene Duct. The duct shall be a UL Listed 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 in accordance with the requirements of ASTM F2160.

The duct shall be composed of black high density polyethylene meeting the requirements of ASTM D 3350, Class C, Grade PE30.

Duct dimensions shall conform to the following table within the manufacturing tolerances set forth in ASTM F2160. Duct sizes through 3” shall conform to Tables 3 and 8 for Schedule 40 PE conduit. 4” duct shall conform to Tables 2 and 5 for SDR 13.5 PE conduit.

Nom. Duct Diameter		Nom. Outside Diameter		Min. Wall Thickness	
mm	In	mm	in	mm	in
27	1	33.4	1.315	3.4	0.133
35	1.25	42.2	1.660	3.6	0.140
41	1.5	48.3	1.900	3.7	0.145
53	2.0	60.3	2.375	3.9	0.154
76	3.0	88.9	3.50	5.5	0.216
102	4.0	114.3	4.50	8.5	0.333

Performance Tests. Polyethylene Duct testing procedures and test results shall meet the requirements of ASTM F2160. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the duct.

Coilable non-metallic conduit 2" and larger shall be machine straightened to remove the longitudinal curvature and ovality caused by coiling the conduit onto reels prior to installing in trench, encasing in concrete or embedding in structure. The straightening shall not deform the cross-section of the conduit such that any two measured outside diameters, each from any location and at any orientation around the longitudinal axis along the conduit differ by more than 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 recommendations of the straightening machine manufacturer regarding ambient temperature shall be followed."

Section 812 of the Standard Specifications for Road and Bridge Construction shall be modified as follows:

Add the following to Article 812.02:

"(d) Coilable Nonmetallic Conduit....1088.01(c)"

Change Article 812.03(d) to 812.03(e).

Add the following as the new Article 812.03(d):

"(d) Coilable Nonmetallic Conduit. Conduit installation shall be according to Article 810.03(c)."

Add the following paragraph to Article 812.03:

All conduits which extend outside of the structure but are not terminated in a cabinet, junction box, pull box, handhole, post, pole, or pedestal shall extend a minimum of 300 mm (12") or the length shown on the plans beyond the structure. The end of this extension shall be capped and sealed with a cap designed for the conduit to be capped. The ends of rigid metal conduit to be capped shall be threaded, the threads protected with full galvanizing, and capped with a threaded galvanized steel cap. The ends of rigid nonmetallic conduit 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.

TRENCH AND BACKFILL FOR ELECTRICAL WORK

Effective Date: January 1, 2002

Revise the first sentence of Article 815.03(a) of the Standard Specifications to read:

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

Revise Article 1066.05 of the Standard Specifications to read:

“Underground Cable Marking Tape. The tape shall be 150 mm (6 in.) wide; consisting of 0.2 mm (8 mil) polyethylene according to ASTM D882, and ASTM D2103.

The tape shall be red with black lettering or red with silver lettering reading “CAUTION – ELECTRICAL LINE BURIED BELOW”.

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

COILABLE NONMETALLIC CONDUIT

Description. This work shall consist of furnishing and installing coilable non-metallic raceways, fittings, and accessories either laid in trench or pushed (bored and pulled).

Materials. Materials shall conform to requirements of the Standard Specifications except as modified below.

Revise Article 1088.01(c) to read:

“(c) Coilable Nonmetallic Conduit.

Polyethylene Duct. The duct shall be a UL Listed 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 in accordance with the requirements of ASTM F2160.

The duct shall be composed of black high density polyethylene meeting the requirements of ASTM D 3350, Class C, Grade PE30.

Duct dimensions shall conform to the following table within the manufacturing tolerances set forth in ASTM F2160. Duct sizes through 3” shall conform to Tables 3 and 8 for Schedule 40 PE conduit. 4” duct shall conform to Tables 2 and 5 for SDR 13.5 PE conduit.

Nom. Duct Diameter		Nom. Outside Diameter		Min. Wall Thickness	
mm	In	mm	in	mm	in
27	1	33.4	1.315	3.4	0.133
35	1.25	42.2	1.660	3.6	0.140
41	1.5	48.3	1.900	3.7	0.145
53	2.0	60.3	2.375	3.9	0.154
76	3.0	88.9	3.50	5.5	0.216
102	4.0	114.3	4.50	8.5	0.333

Performance Tests. Polyethylene Duct testing procedures and test results shall meet the requirements of ASTM F2160. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the duct.

Coilable non-metallic conduit 2" and larger shall be machine straightened to remove the longitudinal curvature and ovality caused by coiling the conduit onto reels prior to installing in trench, encasing in concrete or embedding in structure. The straightening shall not deform the cross-section of the conduit such that any two measured outside diameters, each from any location and at any orientation around the longitudinal axis along the conduit differ by more than 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 recommendations of the straightening machine manufacturer regarding ambient temperature shall be followed."

In order to trace the fiber optic cable after installation, pull tape shall be installed or come pre-fabricated in the conduit for each fiber optic cable run. The pull tape shall clearly indicate English units of length on the apparatus. The pull tape shall have a minimum tensile strength of 1250 lbf. All pull tape splices shall be kept to a minimum and shall incorporate maximum lengths of cable supplied by the manufacturer. Pull tape shall be run continuously from handhole to handhole. Pull tape shall be grounded at handholes and cabinets meeting the requirements of Section 801.14, Equipment Grounding Conductor.

CONSTRUCTION REQUIREMENTS

Coilable Non-metallic Conduit, pushed (bored and pulled) or in trench, shall have a minimum depth of 30" feet below the finished grade as indicated on the plans.

Coilable Non-metallic Conduit, pushed (bored and pulled) or in trench, shall be installed according to Section 810.03(c) of the Standard Specifications.

Method of Measurement. This work will be measured for payment according to section 801.04 of the Standard Specifications.

Basis of Payment. This work will be paid for at the Contract unit price for CONDUIT IN TRENCH, HIGH DENSITY POLYETHYLENE, COILABLE, of the size specified, or CONDUIT PUSHED, HIGH DENSITY POLYETHYLENE, COILABLE of the size specified, which price shall be payment in full for furnishing and installing the coilable nonmetallic conduit and all labor, tools, equipment, and incidentals necessary to complete the work.

REINFORCED CONCRETE DUCTBANK

Description. This item shall consist of forming and finishing a reinforced concrete ductbank including spacers, rebar and all required formwork as detailed on the plans and specified herein.

Materials. Materials shall conform to the requirements of the Standard Specifications except as modified below.

Revise Article 1088.01(c) to read:

“(c) Coilable Nonmetallic Conduit.

Polyethylene Duct. The duct shall be a UL Listed 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 in accordance with the requirements of ASTM F2160.

The duct shall be composed of black high density polyethylene meeting the requirements of ASTM D 3350, Class C, Grade PE30.

Duct dimensions shall conform to the following table within the manufacturing tolerances set forth in ASTM F2160. Duct sizes through 3” shall conform to Tables 3 and 8 for Schedule 40 PE conduit. 4” duct shall conform to Tables 2 and 5 for SDR 13.5 PE conduit.

Nom. Duct Diameter		Nom. Outside Diameter		Min. Wall Thickness	
mm	In	mm	in	mm	in
27	1	33.4	1.315	3.4	0.133
35	1.25	42.2	1.660	3.6	0.140
41	1.5	48.3	1.900	3.7	0.145
53	2.0	60.3	2.375	3.9	0.154
76	3.0	88.9	3.50	5.5	0.216
102	4.0	114.3	4.50	8.5	0.333

Performance Tests. Polyethylene Duct testing procedures and test results shall meet the requirements of ASTM F2160. Certified copies of the test report shall be submitted to the Engineer prior to the installation of the duct.

Coilable non-metallic conduit 2” and larger shall be machine straightened to remove the longitudinal curvature and ovality caused by coiling the conduit onto reels prior to installing in trench, encasing in concrete or embedding in structure. The straightening shall not deform the cross-section of the conduit such that any two measured outside diameters, each from any location and at any orientation around the longitudinal axis along the conduit differ by more than 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 recommendations of the straightening machine manufacturer regarding ambient temperature shall be followed.”

Concrete used in ductbank shall be Class SI meeting the requirements of the Standard Specifications for Road and Bridge Construction Section 1020 and shall be tested in accordance with the applicable requirements of the Standard Specifications.

Execution. Construction of the ductbank shall be in accordance with Section 810 of the Standard Specifications. Refer to plan sheets for details.

The engineer shall inspect the ductbank and verify location of reinforcing rebar, conduit spacers and duct joints prior to placing of concrete. The Contractor shall be responsible for coordinating the Engineer's inspection and obtaining his approval.

Basis of Payment. This item shall be paid for at the Contract unit price per foot for CONDUIT ENCASED, REINFORCED CONCRETE of the type, diameter and quantity specified, which shall be payment in full for the material and work described herein.

LIGHTING FOUNDATION REMOVAL, PARTIAL

Description. This item consists of removing and disposing of an existing lighting foundation and backfilling the excavated areas as specified herein, as shown on the Plans and as directed by the Engineer.

General Requirements. General requirements must be in accordance with Section 801 of the Standard Specifications, and in accordance with Bureau of Electricity Standards and the City of Chicago Electrical Code, except as herein modified.

Removal. Removal must be in accordance with Article 842.05 of the Standard Specifications.

The void caused by the removal of a foundation in soil or grass must be backfilled in accordance with the TRENCH AND BACKFILL FOR ELECTRICAL WORK pay item.

Method of Measurement. Each foundation that is removed and disposed of as indicated will be counted as a unit for payment.

Basis of Payment. This work will be paid for at the contract unit price each for LIGHTING FOUNDATION REMOVAL, PARTIAL, which shall be payment in full for the work described herein.

WOOD SIGN SUPPORT, SPECIAL

Description. Replace Section 730.01 of the Standard Specifications with the following:

This work shall consist of furnishing and installing nominal 150 mm (6 in.) by 150 mm (6 in.) wood sign supports for ground-mounted signs.

Basis of Payment. Replace Section 730.06 of the Standard Specifications with the following: This work will be paid for at the contract unit price per foot for WOOD SIGN SUPPORT, SPECIAL. No extra compensation will be allowed for any cutting and treating.

HEAVY DUTY HANDHOLE

Description. This item shall consist of furnishing the materials and constructing a heavy-duty handhole, or a heavy-duty handhole special, cast in place, complete with frame and cover. The handhole shall be constructed in accordance with the following requirements and conforming in all respects to the lines, grades, and dimensions shown on the Plans or as directed by the Engineer.

Materials. All materials shall conform to the requirements of Article 1088.10 of the Standard Specifications. All handholes shall be constructed of Class SI concrete meeting the requirements of the Standard Specifications for Road and Bridge Construction Section 1020. Ground rod materials shall conform to the requirements of Article 806.02 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

Handholes of the type specified shall be constructed in accordance with the details shown on the Plans and conform to the following requirements:

Concrete: Concrete construction shall be done in accordance with the provisions of Concrete for Structures and Incidental Construction contained in the Standard Specifications for Road and Bridge Construction Sec. 503.

Placing Castings: Castings shall be set accurately to the finished elevation so that no subsequent adjustment will be necessary. Castings shall be set flush with a sidewalk or pavement surfaces. When installed in an earth shoulder away from the pavement edge, the top surface of the casting shall be 25.4 mm (1 in.) above the finished surface of the ground.

Backfilling: Any backfilling necessary under a pavement, paved shoulder, and sidewalk or within 600 mm (2 ft.) of the pavement edge shall be made with sand or stone screenings.

Forming: Forms will be required for the inside face of the handhole wall, and across all trenches leading into the handholes excavation. The ends of conduits leading into the handhole shall fit into a conduit bell, which shall fit tightly against the inside form and the concrete shall be carefully placed around it so as to prevent leakage.

French Drain: A French drain conforming to the dimensions as shown on the Plans shall be constructed in the bottom of the handhole excavation.

Steel Hooks: Each handhole shall be provided with four galvanized steel hooks of appropriate size, one on each wall of the handhole.

Frame and Cover: The outside of the cover shall contain a recessed ring Type "G" for lifting and a legend "IDOT" cast-in.

Grounding: A 5/8" x 10' ground rod shall be installed in each handhole. Ground rod connections shall be made by exothermic welds. Ground wire for connection to handhole cover frame shall be stranded uncoated bare copper in accordance with the applicable requirements

of ASTM Designation B-3 and ASTM Designation B-8 and shall be included in this item. Unless otherwise indicated, the wire shall be not less than No. 2 AWG.

Cleaning: The handhole shall be thoroughly cleaned of any accumulation of silt, debris, or foreign matter of any kind, and shall be free from such accumulations at the time of final inspection.

Basis of Payment. This work will be measured and paid for at the contract unit price each for HEAVY-DUTY HANDHOLE; or HEAVY-DUTY HANDHOLE (SPECIAL) of the size specified, which price shall be payment in full for the material and work described herein.

CONCRETE FOUNDATION TYPE A

Description. This item shall consist of constructing a concrete foundation for the installation of a traffic signal, cabinet, and cabinet with pedestal, anchor bolt, and ground rod in accordance with the following requirements and conforming in all respects to the lines, grades and dimensions shown on the plans or as directed by the Engineer and in applicable portions of Section 878 of the Standard Specifications and the Standard Drawing for Concrete Foundations, Standard 2378.

Materials. The materials shall conform to the specifications of Class SI concrete and concrete Reinforcement Bars in the Standard Specifications for Road and Bridge Construction. The conduit and fittings within the limits of the foundation shall conform to the same requirements as that specified for the conduit outside these limits.

Anchor bolts shall meet the requirements of Section 505 of the Standard Specifications and the material shall conform to the requirements of Article 1006.09 of the Standard Specifications for Road and Bridge Construction. A ground rod shall be installed in each foundation and shall conform to Section 807. Unless otherwise indicated in plans, ground rods shall be one piece copper-clad steel rods 1.6cm x 3 m (5/8" x 10')

CONSTRUCTION REQUIREMENTS

Concrete foundations shall be Type A or Type D and location as specified on the plans. The top of the foundation shall be finished level. Shimming will not be permitted. All edges along the top of the foundation shall be given a 25mm (1 inch) bevel. A form extending a minimum of 225mm (9 inches) below the top surface of the foundation is required. The form shall be set level and means shall be provided for holding same rigidly in place while the concrete is being deposited. Whenever the excavation is irregular, a form shall be used to provide the proper dimension of the entire foundation below the ground surface. Where a concrete foundation is contiguous to a sidewalk, preformed joint filler of 12mm (1/2 inch) thickness shall be placed between the foundation and the sidewalk.

All conduit in the foundation shall be installed rigidly in place before concrete is deposited in the form. Insulated bushings shall be provided at the ends of conduit. Anchor bolts shall be set in place before the concrete is deposited by means of a template constructed to space the anchor bolts in accordance with the pattern of the bolt holes in the base. After installation of cables, all

conduit openings in foundations shall be sealed with an approved mastic. The required number and size of galvanized steel conduits shall be installed in every concrete foundation as shown on the plans. An excess of galvanized steel conduits shall be installed in every concrete foundation. These excess stubs shall be 50 mm (2 inches) in diameter. Placement and quantity shall be determined by the Engineer, and the ends of the stubs shall be capped.

Incidental to the cost of each control box foundation, the Contractor shall construct a 125 mm (5") P.C.C. sidewalk of a rectangular area 1 mm (3 ft.) by 1.2 meter (4 ft.) immediately adjacent to the cabinet door, with the 1.2 meter (4') dimension of the rectangle parallel to the cabinet door when closed. This paragraph shall be applicable at all cabinet foundation locations included in this Section. The only situations where this paragraph shall no apply are as follows: When the foundation is immediately adjacent to or within a paved sidewalk or shoulder area and no further surfacing is require. The Engineer shall be the sole judge as to the applicability of this paragraph in all questions arising therefrom.

Basis of Payment. This work will be paid for at the contract unit price per foot for CONCRETE FOUNDATION of the type specified, which price shall be payment in full for all necessary excavating, backfilling, disposal of surplus material and formwork and furnishing all materials, anchor bolts, stubs and ground rod within the limits of the foundation.

REMOVE EXISTING CONCRETE FOUNDATION

Description. This work shall consist of furnishing all labor, equipment, and materials required for the removal of existing Department TSC surveillance equipment cabinet foundations as indicated in the plans.

Removal. Removal of the existing TSC surveillance equipment foundations shall meet the requirements of Section 895 of the Standard Specifications.

The existing TSC surveillance equipment foundations shall be removed from the expressway right-of-way and disposed of at the expense of the Contractor. Foundation removals shall include backfilling and compacting any holes that were created by the removal of the foundations to the satisfaction of the Engineer.

Underground electric cables and conduit shall be removed by the Contractor to a depth of 300mm (1 ft) below ground level and abandoned. Electric cables in conduit may be removed from the duct and may become the property of the Contractor.

CONSTRUCTION REQUIREMENTS

All above ground TSC surveillance equipment shall be removed by others under separate contract. The above ground equipment shall be removed prior to the removal of the foundations.

No removal work shall be permitted without first notifying, and obtaining approval from, the Engineer.

Method of Measurement. Existing concrete foundations to be removed shall be measured for payment per each foundation removed.

Basis of Payment. Payment for the removal of all surveillance equipment cabinet foundations will be made at the contract unit price per each for REMOVE EXISTING CONCRETE FOUNDATION.

COMMUNICATIONS VAULT

Effective Date: June 21, 2002

Revised Date: January 23, 2003

Description. Work under this item shall consist of constructing a communications vault including a vault lid, in accordance with the details shown on the Plans and as provided herein.

Materials. The communications vault and vault lid shall be constructed of polymer concrete material, and shall be gray in color.

The communications vault shall be 30 in x 48 in (760 mm x 1219 mm) and shall have an effective height of 57 in (1448 mm), including one 24-inch (610 mm) tall stackable vault and one 36 in (914 mm) stackable vault with 3 in (76 mm) overlap.

The communications vault lid shall withstand AASHTO H 20 loading and shall have a permanently recessed logo that reads "IDOT COMMUNICATIONS". The communications vault lid shall have two 2½-in x 4-in (64 mm x 102 mm) pull slots. The lid surface shall have a coefficient of friction of 0.50 in accordance with ASTM C-1028.

The Contractor shall install manufacturer-approved gasketing between the lid and the top 24 in (610 mm) -deep stackable vault to prevent water from entering the communications vault.

The communications vault lid shall be secured to the vault with two 3/8 in (9.5 mm) NC stainless steel penta-head bolts and washers to lock the lid. In addition, a "lock tool" shall be provided for communications vault entry.

A fiber optic cable support assembly shall be recommended and approved by the manufacturer of any fiber optic cable and splice enclosures used in the vault. Each support assembly shall consist of multiple brackets, racks, and/or rails required to suspend the required surplus cabling and any splice enclosures required.

The support assembly shall be made from or coated weather resistant material such that there is no corrosion of the supports. The support assemblies shall be anchored to the vault using stainless steel hardware.

The fiber optic cable support assemblies shall be included in the bid price for the communications vault.

Void areas between openings and conduit shall be filled with self-curing caulking consisting of a permanent, flexible rubber which is unaffected by sunlight, water, oils, mild acids or alkalis. The caulking shall be mildew resistant and non-flammable. The material shall provide a permanent

bond between the conduit entering the vault and the polymer concrete. The caulking shall be gray in color.

CONSTRUCTION REQUIREMENTS

Communications Vault shall be installed in accordance with applicable requirements of Section 800 of the Standard Specifications and as provided herein.

A manufacturer-approved knockout punch driver shall be used to provide openings in the vaults for conduit, or the required openings may be machined at the time of stackable vault fabrication. Voids between entering conduits and punch driven or machined openings shall not exceed ½ in (13 mm).

Any void areas shall be caulked from the interior and exterior of the communications vault. The caulk shall be allowed to fully cure per the manufacturer's specifications, prior to backfilling.

Place the fiber optic splice vault on 12 in (300 mm) of coarse aggregate, CA-5 Class A, as specified in Section 1004 of the Standard Specifications. Seal and flash test the vault per the manufacturer's recommendations. Coil 50 ft (15 m) of cable in each vault containing splices. This allows moving the splice enclosure to the splicing vehicle.

Basis of Payment. COMMUNICATIONS VAULT will be paid for at the contract unit price each. This price shall be payment for furnishing and installing all materials, for all excavation, backfilling, and for disposal of surplus material.

CONDUIT ENCASED, CONCRETE, 3" DIA., PVC

Description. This work shall consist of furnishing and installing 3 inch schedule 80 PVC conduits, fittings and accessories, encased in concrete. This specification describes the minimum design, operational, functional and installation requirements for a non-invasive, magneto-inductive vehicle sensor conduit as described herein and as shown in the Plans.

Materials.

Conduit:

The 3-inch Schedule 80 rigid electrical plastic duct shall be manufactured to meet or exceed Section 1088.01 of the Standard Specifications for Road and Bridge Construction and comply with the American Society for Testing and Materials Standards (latest edition) Designation F 512-95, and to the standards of NEMA Publication No. TC-2, for EPC-80.

The duct shall be manufactured from virgin polyvinyl chloride complying with ASTM Designation D 1784 as specified in ASTM F 512-95 (Latest Edition). with the following exception:

1. The Outside Diameter and wall thickness shall be as follows:

Nominal Size inches	Outside Diameter inches	Minimum Wall Thickness inches
3"	3.500 ± 0.012"	0.300 ± 0.036"

The duct shall be permanently marked at regular intervals on the outside with the manufacturer's name or trademark.

Couplings shall be PVC or acetyl butyl styrene drive-on pipe fittings.

Concrete:

Concrete shall be Class SI complying with Section 503 of the Standard Specifications for Road and Bridge Construction.

Construction Requirements. The 3-inch Schedule 80, PVC conduit shall meet or exceed Section 810 of the Standard Specifications for Road and Bridge Construction, which apply to rigid non-metallic conduit with the following additions and modifications:

1. The centerline of the conduit shall not deviate horizontally or vertically more than 0.25 inches per foot. The conduit installer shall provide a log of the boring depth, as measured every two feet along the boring distance.
2. At least one end of the conduit shall terminate at a standard size handhole or standard special size handhole and extend three inches into the handhole.
3. The conduit shall be sloped to drain into the handhole.
4. The far end of the conduit shall be capped when terminating or not terminating in a handhole.
5. The conduit encasement shall not be reinforced.

Straightness verification: Each 3-inch conduit for the installation of non-invasive sensors shall be verified for straightness prior to pavement being placed over the conduit. The Contractor shall provide the presence of the noninvasive sensor manufacturer's authorized representative during the testing of the first detection location. The Contractor shall insert non-invasive sensor carriers the full length of the conduit and demonstrate to the satisfaction of the Engineer and the non-invasive sensor manufacturer's authorized representative that the carriers move freely in the conduit without sticking or binding. If sticking or binding is observed, the non-invasive sensor conduit shall be removed, replaced, and retested. Damaged conduit shall not be re-used. Once the straightness of the non-invasive sensor conduit in the first location has been verified, the Contractor shall notify the Engineer not less than one working day in advance of verifying the straightness of subsequent non-invasive sensor conduits. The Contractor shall verify the straightness, correct any deficiencies, and re-test as described for the first installation to the satisfaction of the Engineer. The Contractor or Engineer may request that the non-invasive sensor manufacturer's authorized representative inspect any subsequent location. Verification of subsequent locations by the non-invasive sensor manufacturer's authorized representative will be at no additional cost to the State.

Underground concrete-encased conduit shall be supported on interlocking plastic spacers specifically designed for the purpose, spaced along the length of the run as recommended by the manufacturer. Spacing between raceways within a common duct bank shall be not less than 2 in. The interlocking spacers shall be used at a minimum interval of 8 ft.

Concrete cover overall shall not be less than 3.5 in above the conduit, 3.0 in below the conduit, and a 10 in by 10 in square. Space below the conduit, and concrete fill shall be assured. Care shall be exercised during concrete placement to assure that there are no voids, so that spacers are undisturbed, and so that conduit joints stay secure and unbroken. Concrete shall be deflected during placement to minimize the possible damage to or movement of the conduits.

The Contractor shall ensure the concrete encasement and conduit remains undamaged during construction. One method for ensuring the concrete encasement and conduit remains undamaged during construction is by providing a granular sub-base mound a minimum of 24" high at the center of the microloop conduit installation and extending 50' on each side of the center of the microloop conduit installation. Other methods may be used, as the Contractor deems appropriate and as approved by the Engineer. Any damage to the concrete encasement and conduit during construction shall become the responsibility of the Contractor to repair or replace, as determined by the Engineer.

The Contractor shall ensure that the conduit is continuous, with no break from one handhole to the end cap as shown on the Plans. The Contractor shall test the integrity of the conduit upon completion of the roadway above each conduit. The Contractor shall install sensor carriers for the entire length of the conduit to demonstrate its suitability and correct installation. These carriers shall be removed upon approval of the Engineer and completion of the demonstration.

Method of Measurement. This item shall be measured for payment in feet for CONDUIT ENCASED, CONCRETE, 3" DIA., PVC. Measurements will be made in straight lines along the centerline of the conduit between ends.

Basis of Payment. This work shall be paid for at the contract unit price per foot for CONDUIT ENCASED, CONCRETE, 3" DIA., PVC, which shall include conduit, labor and miscellaneous materials required to make a complete and operational installation as specified herein and as directed by the Engineer.

STAINLESS STEEL JUNCTION BOX

Effective: January 1, 2002

Revise the second sentence of the seventh paragraph of Article 1088.04 of the Standard Specifications to read:

"The gasket shall be extruded directly onto the junction box cover."

LIGHT TOWER FOUNDATION ATTACHED TO RETAINING WALL

Description. This work shall consist of providing all labor, materials, and equipment necessary to construct a High Mast Light Tower (HMLT) foundation attached to a retaining wall as detailed in the plans.

The components as shown on the plans, such as drilled shaft, epoxy coated reinforcement bars, protective coat, structure excavation and rustication finish are not included in this Special Provision but are paid for as specified elsewhere in this Contract.

Execution. The Engineer shall inspect the foundation formwork and verify location of anchor rods and conduit sleeves prior to the placement of concrete. The Contractor shall be responsible for coordinating the Engineer's inspection and obtaining his approval.

Basis of Payment. The furnishing of concrete structures will be paid for at the contract unit price per cubic yard for CONCRETE STRUCTURES. The anchor rod assembly, PVC conduit, grounding hardware and materials and all other hardware as detailed on the plans will not be paid for separately but shall be included in the cost of CONCRETE STRUCTURES. The drilled shaft will be paid for separately as DRILLED SHAFT IN SOIL, 36", see Special Provision for drilled shafts.

LIGHT TOWER FOUNDATION, 44" DIAMETER

Description. This item shall consist of forming and finishing a light tower foundation for a ground mounted light tower and all required hardware as detailed in the plans and specified herein.

Execution. Construction of the light tower foundation shall be in accordance with Section 837 of the Standard Specifications. Refer to plan sheets for details.

The Engineer shall inspect foundation formwork and verify location of anchor rods and conduit sleeves prior to the placement of concrete. The Contractor shall be responsible for coordinating the Engineer's inspection and obtaining his approval.

Basis of Payment. This item shall be paid for at the contract unit price per foot for LIGHT TOWER FOUNDATION, 44" DIAMETER, which shall be payment in full for the material and work described herein.

LIGHT TOWER SERVICE PAD

Description: This work shall consist of the construction of light tower service pads. The service pads shall be built to the lines and grades and dimensions shown on the plans. The work shall include the concrete, sub-base, epoxy coated rebar, and welded wire fabric required for the installation of the service pad. When shown on the plan a 9" concrete curb or a concrete retaining wall shall be integrally constructed with the service pad. The work to provide the curb and retaining wall will be paid for separately in accordance with the Standard Specifications and is not included in this pay item. This work shall be done according to Section 606 of the Standard Specifications with the following revisions:

Add to Article 606.14 of the Standard Specifications to read:

Basis of Payment. Light tower service pads integral with retaining walls will be paid for at the Contract unit price per square foot for LIGHT TOWER SERVICE PAD, 6" and LIGHT TOWER SERVICE PAD, SPECIAL, which shall be payment in full for the material and work described herein.

No additional compensation will be allowed for furnishing and compacting 6" of CA-6 sub-base, providing and finishing Class SI concrete, providing reinforcement bars, providing welded wire fabric, backfilling, and restoring slopes for the concrete pad as indicated in the plans or as directed by the Engineer.

RAILROAD PROTECTIVE LIABILITY INSURANCE (BDE)

The contractor will be required to carry Railroad Protective Liability and Property Damage Liability Insurance in accordance with Article 107.11 of the Standard Specifications. The limits of liability shall be in accordance with Article 107.11 of the Standard Specifications unless otherwise noted. A separate policy is required for each railroad indicated below unless otherwise noted.

<u>NAMED INSURED & ADDRESS</u>	<u>NUMBER & SPEED OF PASSENGER TRAINS</u>	<u>NUMBER & SPEED OF FREIGHT TRAINS</u>
Chicago Transit Authority 120 N. Racine Chicago, IL 60607	M-F 382 trains / day @ 55 mph Sat 338 trains / day @ 55 mph Sun 356 trains / day @ 55 MPH	-0- -0- -0-

FOR FREIGHT/PASSENGER INFORMATION CONTACT: Mr. Marvin A. Watson
 PHONE: 312/681-3860

FOR INSURANCE INFORMATION CONTACT: Mr. Marvin A. Watson PHONE: 312/681-3860

<u>NAMED INSURED & ADDRESS</u>	<u>NUMBER & SPEED OF PASSENGER TRAINS</u>	<u>NUMBER & SPEED OF FREIGHT TRAINS</u>
The Belt Railway Co. of Chicago 6900 S. Central Ave. Bedford Park, IL 60638	-0-	50 trains / day @ 25 mph

FOR FREIGHT/PASSENGER INFORMATION CONTACT: Tim Coffey
 PHONE: 708/496-4112

FOR INSURANCE INFORMATION CONTACT: Roy Gelder
 PHONE: 708/496-4041

<u>NAMED INSURED & ADDRESS</u>	<u>NUMBER & SPEED OF PASSENGER TRAINS</u>	<u>NUMBER & SPEED OF FREIGHT TRAINS</u>
Norfolk Southern Corp. 3 Commercial Place Norfolk, VA 23510	-0-	70 trains / day @ 30 mph

FOR FREIGHT/PASSENGER INFORMATION CONTACT: Tom Bracey
 PHONE: 404/527-2536

FOR INSURANCE INFORMATION CONTACT: David W. Fries
PHONE: 757/629-2710

<u>NAMED INSURED & ADDRESS</u>	<u>NUMBER & SPEED OF PASSENGER TRAINS</u>	<u>NUMBER & SPEED OF FREIGHT TRAINS</u>
Chicago Rail Link 2728 E. 104 th St. Chicago, IL 60617	-0-	4 trains / day @ 10 mph

FOR FREIGHT/PASSENGER INFORMATION CONTACT: Dave Sass
PHONE: 773/721-4000

FOR INSURANCE INFORMATION CONTACT: Dave Sass

PHONE: 773/721-4000

<u>NAMED INSURED & ADDRESS</u>	<u>NUMBER & SPEED OF PASSENGER TRAINS</u>	<u>NUMBER & SPEED OF FREIGHT TRAINS</u>
Union Pacific Railroad Insurance group M/C 10049 1416 Dodge St. Omaha, NE 68179	-0-	36 trains / day @ 40 mph

FOR FREIGHT/PASSENGER INFORMATION CONTACT: Tom Andryuk or Gary Wilwerding

PHONE: 312/496-4726 or 708/649-5210

FOR INSURANCE INFORMATION CONTACT: Ms. Nancy Savage

PHONE: 402/271-2215

Basis of Payment: The costs for providing insurance, as noted above, will be paid for at the contract unit price per Lump Sum for RAILROAD PROTECTIVE LIABILITY INSURANCE.

APPROVAL OF INSURANCE: The ORIGINAL and one CERTIFIED copy of each required policy shall be submitted to ENGINEER OF DESIGN, ILLINOIS DEPARTMENT OF TRANSPORTATION, 2300 SOUTH DIRKSEN PARKWAY, SPRINGFIELD, ILLINOIS 62764 for approval. The contractor will be advised when the Department has received approval of the insurance from the railroad(s). Before any work begins on railroad right-of-way, the Contractor shall submit to the Resident Engineer evidence that the required railroad protective liability insurance has been approved by the railroad(s). The Contractor shall also provide the Resident Engineer with expiration date of each required policy.

76TH STREET BRIDGE SPECIAL PROVISIONS

WATER SERVICE LINE, 2 ½”

Description: This work shall consist of excavation, furnishing and installing the water service line, and trench backfill. Water service line shall be installed from the Backflow Preventer, (RPZ) to the nearest planter, and between planters at the locations indicated on the plans or as directed by the Engineer.

General Requirements: The Water Service Line shall be installed in a trench at a minimum depth of thirty (30) inches below the finished elevation. The line shall be continuously snaked in alternate horizontal curves, in accordance with the pipe manufacturer's recommendations, to compensate for thermal contraction and expansion.

A tracing wire, 1/C # 14 cable, starting at the RPZ backflow preventer, shall be run continuously in the bottom of the trenches and through the sleeves alongside the full length of the PVC piping.

A warning tape shall be run continuously, at six (6) inches below grade, directly above the Water Service Line and for its full length. At street crossings, the warning tape shall be located above the pipe sleeve between the base course and the bottom of pavement. Acceptable warning tape shall be Presco Products Detectable Underground Utility Marking Tape # D2105-Blue or approved equal.

Horizontal and vertical separation requirements between water and sewer lines shall be in accordance with IEPA requirements.

The Water Service Line shall enter median planters beneath the concrete median and above the Geotechnical Fabric Envelope which surrounds the French Drain.

Excavation shall be in accordance with applicable portions of Section 202 of Standard Specifications. Excavation shall be limited to the area shown on the plans and details. All shoring required shall be considered incidental to this item.

Pavement removal and replacement shall be paid for using applicable line items. Restoration of non-paved areas shall be paid using applicable line items.

Trench Backfill placed and compacted in accordance with Section 208 of the Standard Specification and shall be included in the cost of this item. Trench backfill shall be FA 2 gradation.

Water Service Line shall consist of irrigation mainline pipe, ductile iron sleeves, and additional conduits.

Irrigation Mainline Piping

The polyvinyl chloride (PVC) irrigation mainline piping shall connect to the copper water piping a minimum of five (5) feet downstream of the RPZ assembly and extend not less than four (4) feet inside of the planter.

The line shall be Class 200, Polyvinyl Chloride (PVC) with a minimum pressure rating of 200 PSI. Standard Dimension Ratio (SDR) 21, pressure-rated pipe, Type 1, Grade 1, as identified in ASTM D-1784. Pipe shall conform with the requirements of Commercial Standard CFS-256 and ASTM D-2241.

The water service line shall meet or exceed the minimum requirements set forth by the American Society of Testing Materials (ASTM) and the National Sanitation Foundation (NSF). Materials used in manufacture of the service line piping shall contain the specified amounts of pigment, stabilizers, and other additives approved by the NSF for conveyance of potable water.

Pipe fittings, such as elbows and tees, shall be schedule 80 PVC meeting or exceeding the requirements of ASTM D-2466 for socket-type PVC fittings. Material shall be Type 1, Grade 1 white PVC (cell classification 12454B) and conform to ASTM D-1784. A PVC cap shall be temporarily installed on the downstream end of the Water Service Line to permit hydrostatic testing prior to connection to the Irrigation System.

After all PVC pipe joints, including the temporary end cap, are completely cured, and after shallow backfilling (leaving all joints exposed to view), the Irrigation Mainline shall be subjected to hydrostatic pressure testing using only water. Compressed air or gases shall not be used for testing. The line shall remain under low-pressure while it is visually inspected in its entirety. After repair of any leaks, the line shall be more heavily backfilled but still leaving the joints exposed pipe shall then be subjected to full city water pressure for not less than twelve hours. Removal of the temporary end cap, after completion of all testing, shall be included in this item.

Installation and testing of the Water Service Line, 2 1/2" shall be performed in a manner meeting the approval of the Engineer.

Ductile Iron Sleeves

Water Service Lines beneath pavement, sidewalk, alley, driveways, and concrete median wall, and concrete median surface must be installed in Ductile Iron Sleeves, 6 inch diameter.

Sleeve lengths shall extend not less than twelve (12) inches into planter or turf areas. The ends of the ductile iron sleeve shall have duct seal or an approved equal material installed between the PVC water service line and the ductile iron sleeve. This will prevent material from washing into the sleeve.

Additional Conduits

Water service line shall also include the installation of additional conduits in trench. At all locations three (3") inch PVC Conduit Schedule #80 shall be installed. Large radius elbows must be used to facilitate the pulling of wires. The 3-inch PVC conduit shall have a pull string put in it, for future use.

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

Method of Measurement: Water Service Line will be measured in per linear foot basis.

Basis of Payment: WATER SERVICE LINE, 2 1/2" shall be paid for at the contract price per foot, which price shall include all excavation, trench backfill, PVC piping, fittings, warning tape, tracing wire, ductile iron sleeves, pull string, additional PVC schedule #80 conduits, duct sealant, hydrostatic testing, all permits and associated fees, and all other incidentals required to complete this work as specified herein and as shown on the plans.

APPROACH SLAB REMOVAL

Description: This work shall consist of the complete removal of existing approach slabs including bituminous overlays, reinforcing bars, and sleeper slabs, at locations designated in the plans and in accordance with the applicable portions of Sections 440 and 501 of the Standard Specifications.

This work shall also include the removal of existing concrete piles and pile caps to at least 300 mm (1 ft) below the proposed elevation of subgrade or grade surface, within the area of construction and within the limits of the right-of-way. This work shall also include the removal of any mud jack cylinders encountered within the existing approach slabs.

General: The Contractor shall remove the existing approach slabs in a manner so as not to damage the adjacent structures that are to remain. The Contractor shall provide all equipment, tools, and materials to perform all work necessary to remove and dispose of existing approach slabs as approved by the Engineer.

Basis of Payment: This work shall be paid for at the contract unit price per square yard for APPROACH SLAB REMOVAL, which price shall include all labor and equipment necessary to remove and dispose of the entire approach slab pavement.

STRIP REFLECTIVE CRACK CONTROL TREATMENT, SYSTEM A

Date: October 10, 2000

Strip Reflective Crack Control will be required prior to placement of bituminous materials and leveling binder in areas of surface removal and bituminous resurfacing. This work is to be performed in accordance with Section 443 of the Standard Specifications. Strip Reflective Crack Control will be measured in Feet.

Basis of Payment: Strip Reflective Crack Control will be paid for at the contract unit price per Foot for STRIP REFLECTIVE CRACK CONTROL TREATMENT.

BRIDGE APPROACH PAVEMENT (SPECIAL)

Description: This work shall consist of constructing the Bridge Approach Pavement as detailed on plans and in accordance with applicable portions of Section 420 of the Standard Specifications. This work involves skewed approaches and is to include bridge approach shoulder/sidewalk pavement.

This work shall include all materials, labor and installation relative to subbase granular materials, improved subgrades, stabilized sub-base, reinforcement with epoxy coating, jointing and sealant materials, sawing of joints, pavement connector, concrete pad under rigid pavement, sidewalk and pavement concrete, in accordance with Section 420 of the Standard Specifications.

All reinforcement bars shown in the plans, including any bar splicers, shall be epoxy coated.

Method of Measurement:

This work will be measured as placed, in Square Yards.

Basis of Payment:

This work will be paid for at the contract unit price per Square Yard for BRIDGE APPROACH PAVEMENT (SPECIAL), and shall include all materials, labor and installation relative to subbase granular materials, improved subgrades, stabilized sub-base, reinforcement with epoxy coating, jointing and sealant materials, sawing of joints, pavement connector, concrete pad under rigid pavement, sidewalk and pavement concrete, in accordance with Section 420 of the Standard Specifications.

METALLIZING STRUCTURAL STEEL

Effective: September 19, 1996

Revised: September 19,2003

Description: This work shall consist of surface preparation, application of a thermal sprayed metal coating (metallizing) and all other work described herein. All work shall be done at the steel fabrication shop unless otherwise noted.

Contractor Prequalification. The Metallizing Contractor shall have satisfactorily performed three (3) previous projects involving the preparation of steel surfaces or other large structural members for metallizing, and then thermally spraying various metals or alloys onto them. The Metallizing Contractor shall have performed at least one similar project within the past two (2) years, and provide documentation of successful completion of projects that incorporated the use of thermal spraying. Prior to the pre-construction meeting or the beginning of any work on this project, The Contractor shall provide to the Department a list of previous clients, including the names, addresses and telephone numbers of successfully completed projects done by the Contractor or Subcontractor. Suitability of the Metallizing Contractor's qualifications and prior experience will be considered by the Department before granting approval to proceed.

Surface Preparation: The surface preparation shall be accomplished in accordance with the requirements of Steel Structures Painting Council (SSPC) Surface Preparation Specifications SP1 for Solvent Cleaning and SP10 for Near White Blast Cleaning. Unless otherwise specified, the surface preparation shall result in 50 to 100 microns (2 to 4 mils) blast profile as determined by the Engineer.

Abrasive shall be hard and sharp in order to produce an angular surface profile. Acceptable abrasives include but are not limited to, angular aluminum oxide, angular steel grit and angular crushed slag. Silica sand shall not be used. Steel shot and other abrasives producing a rounded surface profile are not acceptable. However, the steel can be preblasted with shot provided that the entire surface is reblasted with angular abrasive. A sample of the abrasive shall be submitted to the Engineer two weeks prior to surface preparation for testing and approval.

Prior to surface preparation, the Contractor shall prepare a test section on a representative section of the structural steel. The test section shall be prepared using the same equipment, materials and procedures as the production preparation. The Contractor shall prepare the test section surface to the specified level in accordance with the SSPC visual standards supplied by the Engineer. Only after a test section area has been approved shall the Contractor proceed with surface preparation operations. The test section shall be 1 sq. m. (11 square feet).

The average surface profile produced by the Contractor's surface preparation procedures will be determined at the beginning of the work and as required by the Engineer using a profile depth tape and micrometer. Profile depth tape measurements shall be retained and included with QA documents. Single measurements less than 50 microns (2 mil), or greater than the specified maximum for the metallizing system used will be considered unacceptable. Areas having unacceptable measurements will be further tested to determine the limits of the deficient area. If unacceptable profiles are provided, work will be suspended. The Contractor shall submit a plan for the necessary adjustments to insure the correct surface profile on all surfaces. The Contractor shall not resume work until notified in writing by the Engineer.

The visual standards shall be used in addition to the plans and specifications to determine the degree of conformance with the appearance requirements and to determine acceptance of surface preparation. Additional compensation will not be allowed the Contractor for preparation of test sections.

Abrasive suppliers shall certify that abrasives are not oil contaminated and shall have a water extract pH value within the range of 6 to 8. All surfaces prepared with abrasives which are oil contaminated or have a pH outside the specified range shall be cleaned with solvent cleaner or low pressure water as directed by the Engineer and reblasted by the Contractor at his/her expense.

If the surface is degraded or contaminated subsequent to surface preparation and prior to metallizing, the surface shall be reblasted before metallizing. All surface cleaning shall be approved by the Engineer prior to metallizing.

Metallizing Structural Steel: This procedure governs the methods, requirements and procedures for applying thermal sprayed metal onto new steel surfaces. The process consists of melting metal and spraying it onto a prepared surface by means of compressed gas. All steel surfaces shall be metallized unless otherwise noted. High strength steel bolts, nuts, and washers shall be mechanically galvanized according to Article 1006.08 of the Standard Specifications. The top of the top flange shall be metallized as outlined in Article 506.04 (g) of the Standard Specifications.

The thickness of the metallizing shall be 200-250 microns (8 - 10 mils) measured as specified by SSPC-PA2.

The wire used for metallizing shall be zinc or 85/15 zinc/aluminum per ASTM B-833, Standard Specification for Zinc Wire for Thermal Spraying (Metallizing). The metallizing material shall satisfy the requirements for Class B or better slip coefficient and creep resistance per Appendix A of the "Specification for Structural Joints Using ASTM A325 or A490 Bolts" by the Research Council on Structural Connections. The test results shall be provided to the Engineer by the Contractor prior to the start of work.

The requirements as outlined in the Steel Structure Paint Council's Guide for "Thermal Spray Metallic Coating Systems" (SSPC CS-Guide 23.00) and the American Welding Society's "Guide For The Protection Of Steel With Thermal Sprayed Coatings Of Aluminum And Zinc and their Alloys And Composites" ANSI/AWS C2.18-93 shall be followed and considered as part of this specification.

Before any metallizing is done, the Contractor shall prepare a test section for each batch or lot of wire supplied. The Contractor shall submit to the Engineer a steel plate approximately 300 mm x 300 mm (12 inch x 12 inch) to which the metal has been deposited to the specified thickness, as checked with a magnetic or Eddy Current Gage, for acceptance by the Engineer as to grain size and texture of the sprayed metal. The test plate will be used to determine the acceptance of the finished job.

The Engineer will perform the following test for adhesion on the metallized surface of the test plate. He/she will cut through the coating with a knife or chisel, if the metallizing or any part of it can be lifted from the base metal 6 mm (1/4 inch) or more ahead of the cutting blade without actually cutting the metal, the surface preparation will be deemed improper and the coating will be considered unsatisfactory. Each spray operator shall be qualified to metallize according to ANSI/AWS C2.18-93. Any operator who does not show evidence of qualification shall not be allowed to spray.

Two locations on each beam shall also be tested for adhesion as outlined above. All areas tested shall be repaired and metallized according to this specification. In the event the Contractor's coating is inferior to the sample, he shall be required to correct the coating by an acceptable repair method to produce a surface comparable to the approved test section.

The metallizing unit shall be a gun manufactured by an established domestic company. The gas or arc type is acceptable and recommended. The equipment shall be used according to manufacturer's recommendations. No surface shall be sprayed which shows any sign of rust, scale or moisture. All metallizing shall be applied within a maximum of four hours of the blasting. Spraying shall be done in a block pattern not to exceed 600 mm (two feet) on a side with overlapping passes to ensure uniform coverage.

To produce the required thickness and uniformity, a minimum of two passes are required, overlapping and at right angles to each other. The gun shall be held at such a distance from the work surfaces that the metal is still plastic on impact 125 mm - 230 mm (5 to 9 inches). The coating shall be firmly adherent and free from uncoated spots, lumps or blisters, and have a fine sprayed texture.

The Contractor is required to provide facilities to protect the finished metallized surface from damage during the blasting and thermal spraying work operations on adjacent areas. All damaged coated areas shall be properly repaired and metallized by the Contractor. Surfaces not intended to be metallized shall be suitably protected from the effects of cleaning and metallizing operations.

To the maximum extent practicable, metallizing shall be applied as a continuous film of uniform thickness free of pores. All thin spots or areas missed in the application shall be re-metallized.

The Engineer shall be notified a minimum of one week prior to starting surface preparation and/or metallizing. The Engineer will inspect completed sections of metallizing prior to acceptance. The coatings shall be checked for thickness by means of an approved thickness gauge. The Contractor shall be required to add metallizing to any areas failing to register minimum thickness before any oxidation of the surface occurs.

Weather Conditions: The surfaces to be metallized after surface preparation must remain free of moisture and other contaminants. The Contractor shall control his/her operations to insure that dust, dirt or moisture do not come in contact with surfaces prepared that day. In addition to the metallizing system's manufacturer's written instructions for surface preparation, and metallizing, the following conditions shall apply. (When in conflict, the most restrictive conditions shall govern).

(1) The minimum steel and air temperatures shall be 4° C (40° F). Metallizing shall not be applied to steel which is at a temperature that will cause blistering, porosity or otherwise detrimental to the life of the metallizing. Metallizing shall not be applied in rain, wind, snow, fog or mist, or when the steel surface temperature is less than 3° C (5° F) above the dew point. Metallizing shall not be applied to wet, damp or frosted surfaces. Metallizing shall not be applied when the relative humidity is above 85%.

(2) Metallizing will not be permitted when wind velocities are greater than 24 kph (15 MPH).

These conditions will be verified by the Engineer at locations representative of the surfaces to be cleaned, and metallized. Work accomplished under unfavorable weather conditions will be considered unacceptable and complete recleaning and metallizing of these areas will be required at the Contractor's expense.

Equipment: All cleaning equipment shall include gauges capable of accurately measuring fluid and air pressures and shall have valves capable of regulating the flow of air and or water as recommended by the equipment manufacturer. The equipment shall be maintained in proper working order.

Metallizing and surface preparation equipment shall utilize filters, traps or separators recommended by the manufacturer of the equipment and shall be kept clean to prevent oil, water, dried paint and other foreign materials from being deposited on the surface. The filters, traps and separators shall be cleaned or drained by means, and at intervals, recommended by the manufacturer of the equipment.

Pressure type abrasive air blasting equipment shall be capable of supplying a minimum of 690 kPa (100 psi) pressure and 120 US (250 CFM) capacity with all air blast nozzles being used. If blast nozzle orifice sizes larger than 9.5 mm (3/8") are being used, the minimum capacity of the equipment shall be increased in accordance with the recommendations of SSPC Good Painting Practice, Volume 1, Chapter 2.4, Table 1. The pressure will be measured at the blast nozzle. The equipment shall be capable of providing the minimum required pressure and volume, free of oil, water and other contaminants.

Diesel or gasoline powered equipment shall be positioned or vented in a manner to prevent deposition of combustion contaminants on any part of the structure.

Prior to beginning all metallizing operations, air equipment shall pass the requirements of ASTM D 4285. This test will be repeated as determined by the Engineer.

Quality Control: The Contractor shall conduct a quality control program which ensures that the work accomplished complies with these specifications. The quality control program shall consist of:

Qualified personnel to manage the program and conduct quality control tests.

Proper quality measuring instruments.

Quality Control Plan.

Condition and quality recording procedures.

The personnel managing the quality control program shall have considerable experience and knowledge of metallizing and industrial coatings and the measurements needed to assure quality work. The personnel performing the quality control tests shall be trained in the use of the quality control instruments. These personnel shall not perform metallizing and surface preparation.

The Contractor shall supply all necessary equipment to perform quality control testing of weather conditions, equipment, surface preparation and profile, metallizing thickness. These instruments shall be calibrated by the Contractor's personnel in accordance with the equipment manufacturer's recommendations.

The Contractor shall implement a Quality Control Plan approved by the Engineer including; a schedule of required measurements and tests as outlined herein, procedures for correcting unacceptable work and procedures for improving surface preparation, and metallizing quality as a result of quality control findings. The Contractor shall use forms supplied by the Engineer to record the results of quality control tests. These reports shall be available at the work site for review by the Engineer.

The purpose of the quality control program is to assist the Contractor in the proper performance of the work. Quality control tests performed by the Contractor will not be used as the sole basis for acceptance of the work.

Painting Metallized Structural Steel: When Painting all or portions of the metallized structural steel is specified it shall be done as noted on the plans and according to the special provision for "Cleaning and Painting New Metal Structures" except that the cost of the cleaning and painting shall be included in METALLIZING STRUCTURAL STEEL.

Special Instructions:

Metallizing Date. At the completion of the work, the Contractor shall stencil in contrasting color paint the date of metallizing the bridge. The letters shall be capitals, not less than 50 mm (2 inches) and not more than 75 mm (3 inches) in height.

The stencil shall contain the word "METALLIZED" and shall show the month and year in which the coating was completed. This shall be stenciled on the outside face of an outside stringer near one end of the bridge, or at some equally visible surface near the end of the bridge, as designated by the Engineer.

Removal of all debris, rust and waste generated by this work from the job site is the Contractor's responsibility and included in the Lump Sum Price.

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 shall be paid for at the contract Lump Sum price for METALLIZING STRUCTURAL STEEL, and shall include all work specified herein.

CONDUIT ATTACHED TO STRUCTURE

Description: This item shall consist of furnishing and installing PVC coated rigid steel conduit, fittings and accessories as specified herein and as shown on the Contract Drawings attached to structure.

Materials:

General:

Rigid steel conduit shall be manufactured in accordance with UL Standard 6 and shall be UL Listed and Labeled.

Rigid steel conduit shall meet Federal Specification WWC-581, ANSI Standard C80.1, and the requirements of NEC Article 346-15.

The conduit, after fabrication, shall be thoroughly cleaned and the inside and outside surfaces shall be galvanized.

Couplings and fittings shall meet ANSI Standard C80.1 and shall be hot-dip galvanized. Elbows and nipples shall conform to the specifications for conduit. The cost of fittings, couplings, elbows, nipples, and other such conduit appurtenances shall be included in the bid unit price for conduit. All fittings and couplings for rigid conduit shall be of the threaded type.

PVC Coated Conduit:

PVC coated rigid steel conduit shall be manufactured in conformance to NEMA Standard No. RN1.

PVC coated conduit shall have the following characteristics:

Hardness: 85+ Shore A Durometer
Dielectric Strength: 15748.032 V/mm (400Vmil @ 60 Hz)
Aging: 1,000 Hours Atlas Weatherometer
Temperature: The PVC compound shall conform at -17.78°C (0°F) to Federal Specifications PL-406b, Method 2051. Amendment 1 of 25 September 1952 (ASTMD-746)
Elongation: 200%

The exterior galvanized surfaces shall be coated with primer before 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. The nominal thickness of the PVC coating shall be 1.016mm (40 mils). The PVC shall pass the following bonding test:

Two parallel cuts 12.7mm (1/2 inch) apart and 38.1mm (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 12.7mm (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 any additional PVC coating separating from the substrate.

A two part urethane coating shall be applied to the interior of the conduit. The internal coating shall have a nominal thickness of 51 μm (2 mils). The interior coating shall be applied in a manner so that there are no runs, drips, or pinholes at any point. The coating shall not peel, flake, or chip off after a cut is made in the conduit or a scratch is made in the coating. The urethane interior coating applied shall afford sufficient flexibility to permit field bending without cracking or flaking of the interior coating.

All conduit fitting covers shall be furnished with stainless steel screws which have been encapsulated with a polyester material on the head to ensure maximum corrosion protection.

Liquid-Tight Metal Flexible Conduit:

Liquid-Tight flexible metal conduit shall be manufactured to the requirements of UL 360 and be UL Listed.

The conduit shall have a temperature range of -20°C to $+60^{\circ}\text{C}$.

The thermoplastic covering shall be oil resistant.

Conduit from 9.525mm (3/8 inch) diameter to 31.75mm (1-1/4 inches) diameter shall have an integral copper ground wire.

Installation:

General:

Rigid steel conduit shall be installed in conformance with the requirements of NEC Article 346, except where more stringent requirements are specified herein.

The ends of the conduit shall be cut square and thoroughly reamed before installation. All burrs and rough edges shall be removed.

Bends shall be made with a standard pipe bender. Bends shall be so made that the conduit will not be damaged and that the internal diameter of the conduit will not be effectively reduced. The radius of the curve shall not be less than that shown on Table 346-10 of the National Electrical Code and where larger radii are specified or shown on the Plans, the larger radii shall be used.

Conduit joints shall be threaded. All joints before assembly and exposed threads after assembly shall be coated with low resistance, conductive, joint compound. Running threads in conduit runs will not be permitted. Care shall be used to assure that conduits are not over-threaded. Threading shall be in accordance with the requirements of NEC Article 346-7(b). The protective coatings on all threads must be sufficient to prevent corrosion before installation is made. If threads become corroded before installation, the material shall be replaced with new material or the corroded parts must be thoroughly cleaned and recoated as directed by the Engineer.

Whenever possible, conduits shall be installed so as to drain to the nearest opening, box, or fitting.

Ends of conduits shall be equipped with insulating bushings. Rigid steel conduits terminating in the base of lighting controllers, pedestal bases, transformer bases and other open enclosures shall be equipped with insulating bushing with ground lugs which shall be used to bond the conduits to the enclosure via a copper ground conductor.

Unless otherwise indicated, conduits terminating at cast or malleable iron boxes, or in sheet steel boxes below grade shall be terminated in conduit hubs. Hubs may be integral to the box or may be installed separately. Non-integral hubs or integral hubs which do not provide a flared, smooth entry shall not be used where conductors are number 4 AWG or larger, in compliance with NEC Article 373-6©, and in these cases two locknuts and insulating bushings shall be used.

Threaded conduits terminating at sheet metal boxes or enclosures above grade, or where bushings cannot be brought into firm contact with the box or enclosure or where insulating bushings are required by NEC, shall terminate with two locknuts and an insulating bushing. Conduit bushings constructed wholly of an insulating material shall not be used to secure a raceway.

Conduit connections shall be made tight to assure good ground continuity.

Expansion fittings, as specified herein, shall be installed in all raceway runs crossing structural expansion joints. Unless otherwise indicated or approved by the Engineer, expansion fittings shall include a 203.2mm (8-inch) expansion fitting with a bonding jumper and a deflection fitting allowing not less than 19.05mm (3/4-inch) deflection in any direction.

Bonding jumpers for the conduit attached to structure shall be external type. The drawings shall be examined to determine complete extent of expansion joints.

Fasteners used to mount conduit supports, and other associated items attached to the structure shall be suitable for the weight supported and shall be compatible with the structure material, i.e. wood screws shall be used for wood, toggle bolts shall be used for hollow masonry, expansion bolts or power-set studs shall be used for solid masonry or concrete and clamps shall be used for structural steel. Expansion anchors shall not be less than 6.35mm (1/4-inch) trade size and shall extend at least 50.8mm (2-inches) into the masonry or concrete. Power-set anchors shall not be less than 6.35mm (1/4-inch) trade size and they shall extend at least 31.75mm (1-1/4 inches) into masonry or concrete.

Raceways shall be protected from mechanical and corrosion damage during construction. Open ends shall be capped or fitted with plugs. Before cables are installed, raceways shall be cleared of all obstruction, moisture, and burrs or rough edges. Conduits which have had mud, dirt, or water inside shall be cleaned with a dry swab.

Conduit Attached to Structure:

Unless otherwise indicated or specified, surface-mounted conduits shall be held in place by one-hole clamps and clamp backs. Conduits where mounted to steel beams or columns shall be held in place by suitable beam clamps. Clamps, clamp backs, and beam clamps shall be of electro-plate malleable iron. Aluminum conduits shall not be used.

Unless otherwise indicated, raceways suspended from the structure shall be supported by trapeze or other hangers approved by the Engineer. Trapeze hangers shall be hot-dipped galvanized steel channels or angle irons with conduits held in place by heavy-duty stainless steel U-bolts, nuts, and lock washers. Trapeze hangers shall be hung using threaded stainless steel rods not less than 9.525mm (3/8-inch) diameter and appropriate anchors or by other means approved by the Engineer.

Raceway supports shall be as specified in Article 346-12 of the NEC, with a support within 914.4mm (3 feet) of each cabinet, box, or fitting except the maximum distance between supports shall be as indicated in Table 3.1. The listed exceptions in NEC Article 341-12 shall not apply.

Conduit Diameter	Maximum Distance Between Rigid Metal Conduit Supports
12.7 – 19.05mm (1/2 – 3/4 inch)	1.524m (5 feet)
25.4mm (1 inch)	1.829m (6 feet)
31.75 – 38.1mm (1-1/4 – 1-1/2 inch)	2.134m (7 feet)
50.8 – 63.5mm (2 – 2-1/2 inch)	2.438m (8 feet)
76.2mm and larger (3 inch and larger)	3.048m (10 feet)

Table 3.1
Conduit Support

PVC Coated Conduit Attached to Structure:

In addition to the methods described above, the following methods shall be observed when installing PVC coated conduit:

PVC coated conduit pipe vise jaw adapters must be used when the conduit is being clamped to avoid damaging the PVC coating.

PVC coated conduit shall be cut with a roller cutter or by other means as approved by the conduit manufacturer.

After any cutting or threading operations are completed, the bare steel shall be touched-up with the conduit manufacturer's touch-up compound.

Liquid-Tight Flexible Conduit:

In addition to the methods described above, the following methods shall be observed when installing liquid-tight flexible conduit:

Conduit shall be installed in accordance with NEC Article 350.

Liquid-Tight conduit shall not exceed 914.4mm (36-inches) in length.

Fittings designed for use with liquid-tight flexible conduit shall be used at all connections. Flexible conduit shall not be used as a substitute for the bending of rigid conduit. Flexible conduit shall only be used where movement of the conduit is anticipated or as indicated on the Plans.

Method of Measurement: Conduit shall be measured for payment in feet in place. Measurements shall be made in straight lines along the centerline of the conduit between ends and changes in direction. Vertical conduit shall be measured for payment. Liquid-tight flexible metal conduit shall not be measured for payment, but shall be included in the bid price for conduit attached to structure regardless of size or type.

Basis of Payment: This item shall be paid for at the contract unit price per linear meter for CONDUIT ATTACHED TO STRUCTURE, 1 INCH DIA., GALVANIZED STEEL, PVC COATED, CONDUIT ATTACHED TO STRUCTURE, 1-1/4 INCH DIA., GALVANIZED STEEL, PVC COATED, CONDUIT ATTACHED TO STRUCTURE, 2 INCH DIA., GALVANIZED STEEL, PVC COATED and CONDUIT ATTACHED TO STRUCTURE, 3 INCH DIA., GALVANIZED STEEL, PVC COATED which shall be payment in full for the work as described herein.

REMOVAL OF ASBESTOS CEMENT CONDUIT

Description: This item of work shall consist of the safe removal and disposal of Existing Asbestos Cement Ducts as shown on Structural Drawing SA-02, and as detailed for removal in the Lighting Plans, Drawings No. 29. New electrical manholes are to be installed at the termination of the removal limits. These manholes will be paid for separately

Disposal: It shall be the Contractor's responsibility to safely and effectively remove and dispose of the asbestos cement ducts/conduits, in accordance with all environmental, health and safety codes.

Verification of Utilities: It shall be the Contractor's responsibility to verify the active contents of the bank of four (4) existing 3-1/2 inch diameter Asbestos Cement Ducts/Steel Conduits Spanning FAI-94 and two (2) existing 3-1/2 inch diameter Asbestos Cement Ducts/Steel Conduits crossing 76th Street.

Maintenance of Services: It shall be the Contractor's responsibility to coordinate with the City of Chicago, Commonwealth Edison, Ameritech, and/or all additional utility services for the maintenance of services during construction.

Basis of Payment: This item of Work will be paid for at the Contract Unit Price per Foot of REMOVAL OF ASBESTOS CEMENT CONDUIT.

REMOVE CONDUIT ATTACHED TO STRUCTURE

Description. This item of work shall consist of the removal and disposal of existing rigid galvanized steel conduits attached to structure and spanning FAI-94, of the size and quantity as shown on the plans.

Disposal. It shall be the Contractor's responsibility to safely and effectively remove and dispose of the conduits, in accordance with all environmental, health and safety codes.

Verification of Electrical Service. It shall be the Contractor's responsibility to verify the active contents of the bank of the existing conduits spanning FAI-94.

Maintenance of Services. It shall be the Contractor's responsibility to coordinate with the City of Chicago, and/or all additional utility services for the maintenance of services during construction. The traffic signal plans, specifications, and quantities include provisions for temporary aerial cable, temporary poles, and necessary hardware to maintain existing traffic signals service.

Basis of Payment. This item of Work will be paid for at the Contract Unit Price per Foot of REMOVE CONDUIT ATTACHED TO STRUCTURE.

MEDIAN AND PAVEMENT REMOVAL (SPECIAL)

Work under this item shall be performed in accordance with Section 440 of the Standard Specifications and the Standard Details, except as herein modified.

Description: This item shall consist of the full depth removal and disposal of the existing median and pavement to the limits shown on the plans or as directed by the Engineer. This item shall include excavation of material from the top of the existing median or pavement surface to the bottom of the proposed subgrade elevation for: subbase granular material; porous granular backfill, special; and Pipe Underdrain(PVC) 4 inch, whichever is lower. This work shall include the removal and disposal of granular base and sub-base courses, stabilization stone, earth, slag of all types, curbs of all types, and abandoned structures to the required elevation.

Also included is the removal and disposal of existing street car track including rails, ties, pavement and/or ballast unless a separate pay item has been supplied in the contract for Track Removal, in which case the area of track removal shall not be included in this item.

General Requirements: The Contractor shall sawcut full depth a perpendicular clean joint between that portion of the median or pavement to be removed and that portion of the median, or pavement to remain in place. The cost of this work shall be considered incidental to the contract unit price of this item.

If the Contractor removes or damages the existing median or pavement outside of the limits designated by the Engineer for removal, he will be required to repair that portion at his own expense and to the satisfaction of the Engineer.

Any appurtenant median items including curb around planter cutouts and planter cutout contents, located within the existing medians marked for removal on the drawings, shall be included in this work at no additional cost.

Any trees less than six (6) inches in diameter within the existing medians that are not designated by the Engineer to remain or marked for transplanting on the drawings shall be removed and included in this work at no additional cost.

Removed median and pavement shall not be stockpiled on the job site but disposed of in accordance to Article 202.03.

If, upon removal of the median and pavement, a soft or unstable sub-grade is encountered at a location where pavement is to be replaced, this material shall be excavated and replaced with compacted porous granular material, of the gradation as determined by the Engineer. The cost of the excavation of unstable sub-grade will not be paid for separately but shall be considered incidental to this item. The cost of the replacement material shall be paid under POROUS GRANULAR MATERIAL.

Method of Measurement: Median and Pavement Removal shall be measured for payment in place and the area computed in square yards.

Basis of Payment: MEDIAN AND PAVEMENT REMOVAL (SPECIAL) shall be paid for at the contract unit price per square yard, which price shall include full depth saw cut, removal and disposal of existing median and pavement, removal of existing street car track, aggregate base

and all granular material to required elevation, trees less than six (6) inches in diameter, all types of abandoned structures, steel reinforcement and wire mesh, and compaction and proof rolling of subgrade.

REMOVAL OF EXISTING STRUCTURES NO. 3

This work consists of the existing bridge carrying FAU 1541 (76th Street) over US FAI 90/94 (Dan Ryan Expressway). This work shall be performed in accordance with Section 501 of the Standard Specifications, the details shown on plans and as directed by the Engineer. This work shall consist of the removal and satisfactory disposal of existing structures in accordance with Section 501 of the Standard Specifications and as specified herein.

Removal and disposal of the existing Bridge Structure, SN 016-0890, with skew (2°-54'23") is located at Sta. 73+49.33. This work shall include the removal of the superstructure, piers, abutments, wingwalls, footings and any other appurtenances necessary to perform the required work. This work shall include any necessary grading and shaping.

THE EXISTING STRUCTURE CARRYING 76TH STREET OVER FAI-90/94 (DAN RYAN EXPRESSWAY) IS A 3-SIMPLE-SPAN (74'-6¼" X 41'-6" X 74'-6¼") PRE-CAST PRE-STRESSED CONCRETE GIRDER BRIDGE. THE BRIDGE HAS A TOTAL BACK TO BACK ABUTMENT LENGTH OF 193'-0 ½" AND AN OUT-TO-OUT WIDTH OF 83'-0". THE PROPOSED CLEAR ROADWAY WIDTH IS 66'-0", WHICH INCLUDES A 4' RAISED CONCRETE MEDIAN. THERE ARE 8'-6" SIDEWALKS, INCLUDING PARAPETS ON BOTH SIDES OF THE STRUCTURE.

This work will be paid for at the contract unit price per Each for **REMOVAL OF EXISTING STRUCTURES NO. 3**

PROTECTIVE SHIELD

Description. This work shall consist of furnishing, installing, and removing a protective shield system by the Contractor as required to protect pedestrian, vehicular and/or railroad traffic from falling material or other objects during the removal of portions of the existing structure.

General. The protective shield system shall protect the area shown on the plans and/or as directed by the Engineer. The Protective Shield System shall be designed and constructed to sustain loads of 9.5 kPa (200 lbs./sq. ft.) in addition to its own weight. Protective shield systems comprised of wood members shall be designed for a minimum loading duration of 7 days. The system may be either fixed or mobile. The existing vertical clearances above roadways and/or railroad tracks shall be maintained. The Contractor shall coordinate the installation with municipalities and/or utilities to insure protection of their facilities during the structure removal. Lane closures and other traffic control required during installation and removal shall be according to the contract traffic control plan.

The Contractor shall furnish working drawings and calculations to the Engineer for examination. The drawings shall provide full details, dimensions, and types of materials and shall be prepared and sealed by an Illinois Licensed Structural Engineer. Structure removal shall not commence until the protective shield system is in place and permission is granted by the Engineer.

Upon completion of the work or when directed by the Engineer, the Protective Shield System shall be removed. All material removed shall remain the property of the Contractor.

Existing Protective Shield. Permanent protective shielding may exist in some spans. The Contractor, with the approval of the Engineer, may reuse the existing protective shielding. If the existing protective shielding is to be re-utilized, the Contractor shall evaluate the condition and the loading capacity of the existing protective and demonstrate by calculations that the existing system meets or exceeds the design requirements specified herein. Supplemental and/or replacement of existing shielding may be required to satisfy this special provision and as directed by the Engineer. If existing shielding is to be re-utilized, maintaining and removing of the existing protective shield shall be done as specified for new protective shield and as directed by the Engineer.

The cost of the inspecting, reusing or removing and replacing, maintaining, and final removal of existing protective shield shall be included with PROTECTIVE SHIELD.

Method of Measurement.

(a) Contract Quantities. The requirements for the use of the Contract Quantities shall conform to Article 202.07(a) of the Standard Specifications.

(b) Measured Quantities. Protective Shielding will be measured for payment and the area computed in square meters (square yards). The length will be measured along the centerline of the structure. The width will be the out to out deck width unless otherwise shown on the plans. If the Contractor chooses to extend the Protective Shield System beyond the area shown it will be at his/her own expense.

Basis of Payment. Protective Shield System will be paid for at the contract unit price per square meter (square yard) for PROTECTIVE SHIELD.

BRACED EXCAVATION SPECIAL

Description. This work shall consist of furnishing, installing and removing all necessary sheeting and bracing members required to support the excavation according to the applicable requirements of Section 502 of the Standard Specifications. This item shall also include all excavation of earth necessary to obtain the bottom of footing elevations shown on the plans where braced excavation is indicated. The bracing shall properly support excavations by the use of sheeting, timber or plates etc., to prevent movement of soil, structures, pavements or utilities outside of the excavated area.

Construction Requirements. The Contractor shall submit design calculations and shop drawings prepared and sealed by an Illinois Licensed Structural Engineer for the temporary earth retention system. Shop drawings shall show the design and all necessary details for the construction of the bracing system. The design calculations and shop drawings shall be submitted to the Engineer for approval.

Approval of the Engineer shall be received before the Contractor proceeds with his construction operations. However, in any event, The Contractor shall be fully responsible for the safety,

stability and adequacy of the bracing system and shall be solely responsible and liable for all damages resulting from his construction operations or from failure or inadequacy of the bracing system.

In the event the bracing system protecting the existing embankment fails or is otherwise inadequate, in the judgement of the Engineer, the Contractor shall, at his own expense, take all necessary steps to restore the embankments to a safe operating condition to the satisfaction of the Engineer.

Bracing members shall be installed as soon as an excavation level is reached to permit their installation.

Method of Measurement. This work shall be measured in cubic yards according to the requirements for structure excavation as specified in Section 502.14 of the Standard Specifications.

Basis of Payment. This work, as herein specified and shown on the plans, will be paid for at the contract unit price per cubic meter (cubic yard) for BRACED EXCAVATION. Payment for BRACED EXCAVATION SPECIAL will be limited to those locations shown on the plans. All sheeting and bracing members associated with braced excavation will not be measured for payment but shall be included in the cost for BRACED EXCAVATION SPECIAL. No separate payment will be made for structure excavation where BRACED EXCAVATION SPECIAL is shown.

CONCRETE MEDIAN SURFACE

Work under these items shall be in accordance with the requirements of Section 606 of the Standard Specifications for Road and Bridge Construction and Standard Details, except as herein modified.

Description: This work shall consist of constructing Portland Cement Concrete (PCC) medians and corrugated medians at locations shown on the drawings and as directed by the Engineer.

General Requirements: Concrete shall be placed over improved sub-grade or sub-base or as shown in the plans. Concrete shall not be placed on soft, muddy, frozen or non-compacted sub-grade or sub-base.

Joints shall be in accordance with the drawings and the City Standard Details. Preformed expansion joint material shall conform to Article 1051.03. Concrete shall be CLASS SI and conform to the requirements of Section 1020.

When directed by the Engineer, a protective surface treatment shall be applied, which will be paid for under the item for PROTECTIVE COAT or WATER REPELLENT. Membrane curing will not be permitted where a protective coat or water repellent is to be applied. Concrete at these locations shall be cured by another method specified in Article 1020.13 at no additional cost to the State or City.

When shown on the plans, or directed by the Engineer, decorative scoring patterns whether sawed or hand tooled shall be considered incidental to these items.

Method of Measurement: Concrete Median Surface, (Corrugated) will be measured for payment in place and the area computed in square feet.

Concrete Median Surface, (Special) will be measured for payment and the area computed in square feet.

Basis of Payment: CONCRETE MEDIAN SURFACE (CORRUGATED), will be paid for at the contract unit price per square foot for which price shall include furnishing and placing all concrete, dowels, all joints, scoring patterns, and corrugations.

CONCRETE MEDIAN SURFACE, (SPECIAL) will be paid for at the contract unit price per square foot, which price shall include furnishing and placing all concrete, dowels, welded wire fabric, all joints, scoring patterns, and corrugations.

CONCRETE MEDIAN WALL, 18 INCH WIDE

Work under these items shall be in accordance with the requirements of Section 606 of the Standard Specifications for Road and Bridge Construction and Standard Details, except as herein modified.

Description: This work shall consist of constructing Portland Cement Concrete (PCC) median wall of the specified dimensions at locations shown on the plans and as directed by the Engineer.

General Requirements: Concrete shall be placed on compacted prepared sub-base which will be paid for separately. Concrete shall not be placed on soft, muddy, frozen or non-compacted sub-base. Joints shall be in accordance with the drawings, and Standard Details. Pre-formed expansion joint material shall conform to Article 1051.03. Concrete shall be CLASS SI and conform to the requirements of Section 1020.

When directed by the Engineer, a protective surface treatment or water repellent shall be applied, which will be paid for under the item for PROTECTIVE COAT or WATER REPELLENT. Membrane curing will not be permitted where a protective coat is to be applied. Concrete at these locations shall be cured by another method specified in Article 1020.13 at no additional cost to the State or City.

When shown on the plans, or directed by the Engineer, decorative scoring patterns whether sawed or hand tooled shall be considered incidental to these items.

The use of slip form installation may be allowed when approved by the Engineer.

Epoxy coated reinforcement bars shall be installed as shown on the plans, in accordance with the requirements of Section 508 of the Standard Specifications. Materials shall meet the requirements of Article 1006.10. The reinforcement bars, when delivered on the job, shall be stored above the surface of the ground on wooden or padded steel cribbing, and shall be protected from mechanical injury and from deterioration by exposure. When placed in the work, they shall be free from dirt, paint, oil or other foreign substances. All systems for handling

epoxy-coated reinforcement bars shall have padded contact areas. The bars or bundles shall not be dropped or dragged. Epoxy-coated reinforcement bars to be cut in the field shall be either sawed or sheared but shall not be frame cut. Patching of the bars cuts shall be in accordance with ASTM specifications. Placing and securing of the reinforcement bars shall be in accordance with Article 508.05. All tie wire shall be epoxy coated. The installation of epoxy coated reinforcement bars shall be considered incidental to these items.

Method of Measurement: The concrete median wall will be measured for payment in lineal feet, along the face of the concrete wall.

Basis of Payment: CONCRETE MEDIAN WALL, 18 INCH WIDE will be paid for at the contract unit price per lineal foot of the specified width which price shall include steel reinforcement, furnishing and placing all concrete, joints and decorative scoring.

CHAIN LINK FENCE TO BE REMOVED AND RE-ERECTED (CTA)

Description:

This item consists of removing, salvaging, safeguarding and re-erecting the same fence on a new concrete barrier wall at the locations shown on the plans, or as directed by the Engineer. Any new hardware fasteners, anchors, attachments and incidentals necessary to re-attach the fence shall be included in the work. This work also includes any razor wire which may be attached to the fence.

The ends of the fence shall be securely fastened to the existing fence in a manner approved by the Engineer.

Method of Measurement:

This work will be measured in feet of existing fence, as it is installed in its new location.

Basis of Payment:

This work will be paid for at the contract unit price per foot for CHAIN LINK FENCE TO BE REMOVED AND RE-ERECTED (CTA), which price shall be payment in full for all materials, labor, tools, equipment and incidentals necessary to construct the work as specified.

CITY OF CHICAGO STREET LIGHT AND TRAFFIC SIGNAL SPECIFICATIONS

PROCEDURE:

(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 of 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

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

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

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

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, determined 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

(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 Streets, 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

(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

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

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 108.1 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

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 payment 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

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 replacement, 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.

TEMPORARY TRAFFIC SIGNAL INSTALLATION

Description. This work shall consist of furnishing, installing, maintaining and removing a temporary traffic signal installation at two locations: Lafayette/76th Street at I-94 and at State/76th Street at I-94. Included in this item is the removal of mast arm mounted street name signs from the existing traffic signal mast arms and re-erecting them on the temporary traffic signal span wire or wood poles. After the acceptance of the proposed traffic signal installation, the mast arm mounted street name signs shall be removed from the temporary traffic signal span wire and re-erected on the proposed traffic signal mast arms. If the appurtenances used to attach the signs to the existing mast arms are no longer usable or are not feasible for re-erecting the signs on the temporary traffic signal span wire or proposed traffic signal mast arms, the contractor will provide new appurtenances. The cost of this work shall not be paid for separately, but shall be included in the pay item "TEMPORARY TRAFFIC SIGNAL INSTALLATION". No additional payment will be allowed.

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, removal and re-erection of existing mast arm mounted street name signs, excavation and backfill, concrete and asphalt removal and replacement and other restorations at two locations: Lafayette/76th Street at I-94 and at State/76th Street at I-94, 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 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.

REMOVE EXISTING CONCRETE FOUNDATION

The concrete foundation shall be removed to a level of at least 900 mm (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 will be paid for at the contract unit price each for REMOVE EXISTING CONCRETE FOUNDATION.

REMOVE EXISTING STREET LIGHTING EQUIPMENT

Work under this item shall be performed in accordance with Section 800, 855 and 1085 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 Engineer.

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 Engineer 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.

**ELECTRIC CABLE IN CONDUIT, 1/C #6
ELECTRIC CABLE IN CONDUIT, 1/C #8**

1. Description This work shall consist of furnishing and installing electric cable as specified. The cable shall be rated at 600 volts, be EPR insulated, and shall have a HYPALON jacket. 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 resident 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 resident 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 resident engineer.

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.

Number 8, A.W.G. insulated ground cable: All steel conduits and sleeves entering manholes, furnished and installed under this contract, shall be bonded together on the inside of the manholes. At light standard locations where the conduit enters and leaves the base, the ground cables shall be bonded to the ground lug in the light standard. Where two steel conduits enter a light standard, both conduits shall be bonded to the ground lug.

The insulated ground cable furnished and installed hereunder shall effectively ground all light standards, luminaires, steel conduits and fittings, and junction boxes to the ground bus.

4. Method of Measurement The length of 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.

Number 8, A.W.G. insulated ground cable: The actual length of ground cable furnished and installed in the work will be measured in lineal feet, including the length of slack determined by the Resident Engineer to be necessary for making proper connections. No allowance will be made for waste ends of cable which may have to be cut off for making splices or connections, nor will any allowance be made for bonding the cable as required.

5. Basis of Payment This work shall be paid for at the contract unit price per lineal foot for ELECTRIC CABLE IN CONDUIT of the size specified. Such 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.

MATERIAL
1440

WIRE, AERIAL, 1/C – NO. 6

1. 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.

2. Materials.

The material shall be single conductor #6 AWG aerial wire meeting the requirements of Material Specification 1441 for medium hard-drawn copper aerial wire.

3. 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 dead-end 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.

4. 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
1441

ELECTRICAL SECONDARY RACK

RACK, SECONDARY AERIAL 1_WIRE
RACK, SECONDARY AERIAL 2 OR 3

1. Description.

This item shall consist of furnishing and installing an electrical secondary rack, to which wires may be attached, on a street light pole, as shown on the plans, specified herein, or directed by the Engineer. The secondary rack shall be banded to the pole in the manner as herein described.

2. Materials.

The materials of the secondary rack shall conform to the requirements of Specification 1443.

3. Installation Requirements.

The secondary rack shall be banded securely to the pole at such height as to locate the upper insulating spool at six inches (6") below the top mast arm port of the pole. The banding shall consist of two $\frac{3}{4}$ inch stainless steel bands, one each through the top and bottom clevises in the manner shown on Drawing 11940. The rack shall be banded at a position 90 degrees from the central axis of the street light mast arm, or in the position of direct strain, when the pole is the line termination, and at 180 degrees from the central axis of the street light mast arm when the pole is an intermediate one in the pole line.

4. 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 price shall be payment in full for furnishing and installing a secondary rack of the size stated on the contract plans on an existing pole.

MATERIAL SPECIFICATION
1443

DRAWING
11940

C.S. _ 176 & 177 _ 1/1

CONCRETE FOUNDATION FOR STREET LIGHTS OR TRAFFIC SIGNALS

CONCRETE FOUNDATION, 24" DIAMETER, 1 1/4" ANCHOR RODS, 15" BOLT CIRCLE, 9 FEET

CONCRETE FOUNDATION, 24" DIAMETER, 1 1/4" ANCHOR RODS, 15" BOLT CIRCLE, 7 FEET

CONCRETE FOUNDATION, 28" DIAMETER, 1 1/4" ANCHOR RODS, 15" BOLT CIRCLE, 7 FEET

CONCRETE FOUNDATION, 30" DIAMETER, 1 1/4" ANCHOR RODS, 15" BOLT CIRCLE

CONCRETE FOUNDATION, 30" DIAMETER, 1 1/4" ANCHOR RODS, 17 1/4" BOLT CIRCLE

CONCRETE FOUNDATION, 30" DIAMETER, 1" ANCHOR RODS, 15" BOLT CIRCLE, 7 FEET

CONCRETE FOUNDATION, 30" DIAMETER, 1 1/2" ANCHOR RODS, 16 1/2" BOLT CIRCLE

CONCRETE FOUNDATION, 24" DIAMETER, 1 1/4" ANCHOR RODS, 15" BOLT CIRCLE, OFFSET

1. DESCRIPTION. The foundation will be a poured in place concrete structure used for structurally supporting street light poles or traffic signal poles.

2. MATERIAL. Concrete must be Portland cement concrete meeting the requirements of Article 1020 of the Standard Specifications for SI Class concrete. Reinforcement bars must meet the requirements of Section 1006.10 of the Standard Specifications. Anchor rods must meet the requirements of Material Specification 1467 and the ground rod must meet the requirements of Material Specification 1466. Conduit elbows must be PVC conduit.

3. CONSTRUCTION. Every foundation will be installed at the location designated and in the manner herein specified or in special cases as specifically directed. The contractor will locate foundations as per plan or as directed by the Resident Engineer. A hole must be augered for placement of the concrete form.

Item 151 is a foundation for a traffic pole which can accommodate a 16, 20, or 26 foot monotube arm(Standard Drawing 818). Item 152 is a foundation for a traffic pole which can accommodate a 30 foot monotube arm(Standard Drawing 816). Item 153 is a foundation for a traffic pole which can accommodate a 35, 40, or 44 foot monotube arm(Standard Drawing 817). Item 151A is a foundation for arterial street light poles; either steel or aluminum, conventional or davit(Standard Drawing 818). Item 151B is a foundation for the Chicago 2000 Gateway and Pedestrian ornamental light poles(Standard Drawing 953). Item 152A is a foundation for both the Extended

Loop pole and the Loop pole(Standard Drawing 956). Item 180 is an offset foundation for arterial street light poles(Standard Drawing 937).

Top surface of these foundations in parkway will be at an elevation of two inches (2") above grade or as required by the Engineer. Care must be taken to install a level foundation and to ensure adequate anchor rod projections for double-nut installation. The foundations must be centered back from the face of the curb in accordance with dimensions shown on the construction plans. Foundation raceways must consist of large radius conduit elbow(s) in quantity, size and type specified on the construction plans. The elbow ends above ground will be capped with standard conduit bushings. The Contractor must furnish anchor rods, a ground rod, hardware, conduit elbow(s) and all other material shown on applicable foundation construction drawings. Depth of foundation will be as shown on the appropriate drawing. The foundation top must be chamfered 3/4 of an inch. When the foundation is installed in a sidewalk, 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 will be installed between the sidewalk and the foundation.

Anchor rods must be set in accordance with applicable construction plans so that when poles are mounted on the foundations, the street lighting mast arm will be properly oriented as indicated on the construction plans. The anchor rods will be set by means of a metal template which shall be submitted for approval before any foundation work is begun. The template must hold the rods vertical, and in proper position. Anchor rods must conform in all respects to the appropriate City drawing.

4. METHOD OF MEASUREMENT. This item will be measured per each foundation installed complete.

5. BASIS OF PAYMENT. Payment will be made for foundations installed in place, including elbows, in accordance with construction drawings, constructions plans and these specifications. All necessary excavation and restoration of pavement, sidewalk and fill to their original conditions will be included in the unit price. This work will be paid for at the contract unit price per each for CONCRETE FOUNDATION of the diameter and size specified.

MATERIAL SPECIFICATION

DRAWING

1466	953	818	956
1467	806	837	830
	811	937	11825
	816	817	844

CONCRETE FOUNDATION FOR TYPE "P" BASE MOUNTED TRAFFIC SIGNAL CONTROLLER

1. DESCRIPTION. This item will be for all work necessary for installing a foundation for a "P" cabinet

2. MATERIAL. Concrete will be Portland cement concrete, SI Class, meeting the requirements of Article 1020 of the Standard Specifications. Ground rods will meet the requirements of Material Specification 1465. Conduit will be PVC. Anchor rods will meet the applicable requirements of Material Specification 1467.

3. CONSTRUCTION. The Contractor will install a concrete foundation for a base mounted traffic signal controller cabinet, as shown on City of Chicago Drawing Number 888. Work under this item will be performed in accordance with Article 800 of the Standard Specifications.

The foundation will have a minimum depth of at least forty inches (40") below grade and must have large radius conduit elbows in quantity, size and type shown. The elbow ends above ground will be capped with standard conduit bushings. The Contractor will furnish anchor bolts, hardware, conduit elbows, and all other material shown on the foundation construction drawing.

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.

4. METHOD OF MEASUREMENT. This work will be measured as each for each unit installed complete.

5. BASIS OF PAYMENT. Unit price will include cost of all material and labor required to install this foundation, as per applicable construction plans and these specifications. The conduit elbows will 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 will be included in the unit price. Any sidewalk removal will be paid for as a separate pay item. However, any restoration of sidewalk will be considered as part of this item, including any expansion joint between the sidewalk and the foundation. This work will be paid for at the Contract Unit Price of EACH for CONCRETE FOUNDATION FOR TYPE "P" BASE MOUNTED TRAFFIC SIGNAL CONTROLLER CABINET.

MATERIAL SPECIFICATION	DRAWING
1465	888
1467	11825

CONTROLLER, TRAFFIC, 16 LOAD BAY, P CABINET

CONTROLLER, TRAFFIC, 12 LOAD BAY, M CABINET
CONTROLLER, TRAFFIC, 12 LOAD BAY, P CABINET
CONTROLLER, TRAFFIC, 16 LOAD BAY, P CABINET

1. DESCRIPTION. This work will consist of furnishing and installing a traffic signal controller and associated equipment in a cabinet onto a foundation and making all necessary connections.

2. MATERIAL. The material must meet the requirements of Material Specification 1469. The cabinet will be an M cabinet 50 inches high by 30 inches wide by 17 inches deep, with 12 load bays, or a P cabinet 55 inches high by 44 inches wide by 26 inches deep with 12 load bays or 16 load bays. Each load bay must include a load switch. No communications interface equipment will be included.

3. PROCUREMENT. The contractor must provide Request for Inspection of Material forms for traffic signal controllers and cabinets at the Preconstruction Meeting. The Bureau of Electricity will review and comment on the submitted material. The Bureau of Electricity will approve the purchase of the material from a supplier. Final material approval will be made in accordance with Bureau of Electricity specifications. The Contractor must provide proof of purchase to the Resident Engineer within seven (7) days following approval by the Bureau of Electricity or within seven (7) days of the contract Notice To Proceed, whichever is later. Payment will be withheld in accordance with the terms and conditions of this contract, until such time that the Engineer determines the requirements are met.

The controllers and cabinets are to be delivered to the Bureau of Electricity within ninety (90) days of purchase. If the controllers and cabinets are not delivered, payment will be withheld until such time that the controllers and cabinets are delivered.

The Bureau of Electricity will notify the Contractor when the material has been inspected and approved. Within forty-eight (48) hours of notification, the Contractor will pick-up the controllers and cabinets from the Bureau. The controllers and cabinets will be stored at a facility, approved by the Engineer, at the contractor's expense.

4. INSTALLATION. The controller will be programmed to provide the sequencing and timing of operation as shown on the plans. The controller must be enclosed in a housing and installed in a completely wired cabinet. The model and serial numbers of the controller must be affixed on the front of the controller housing and be readily visible.

The cabinet must be set onto a pad foundation designed specifically for the cabinet, and affixed with four bolts provided with the foundation. Electric cables inside the cabinet must be neatly trained along the base and back of the cabinet. Each conductor used must be connected individually to the proper terminal, and the spare conductors must be insulated and bound into a neat bundle. Each cable must be marked with suitable identification and recorded on a copy of the plans for the intersection and submitted to the Engineer. Signal indications for each direction must be wired to a separate circuit whether or not the signal plans call for a split movement. The absolute zero for the time-base coordinator will be set in the field by City personnel after obtaining the appropriate City time-tone reference.

When properly installed, all signals will be connected and controlled by the controller, and the sequencing and timing of the signals will be as set forth in the plans.

All conduit entrances into the cabinet must be sealed with a pliable waterproof material to restrict moisture entrance into the cabinet.

5. BASIS OF PAYMENT. This work will be paid for at the contract unit price for each CONTROLLER, TRAFFIC, 12 LOAD BAY, M CABINET or CONTROLLER, TRAFFIC, 12 LOAD BAY, P CABINET, or CONTROLLER, TRAFFIC, 16 LOAD BAY, P CABINET, which price will be payment in full for furnishing and installing the controller complete and operational, with all wiring and connections as specified.

SIGNAL HEADS, POLYCARBONATE, LED, BRACKET MOUNTED

SIGNAL HEAD, POLYCARBONATE, LED, 3-SECTION, BRACKET MOUNTED

SIGNAL HEAD, POLYCARBONATE, LED, 4-SECTION, BRACKET MOUNTED

SIGNAL HEAD, POLYCARBONATE, LED, 5-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".

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

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 line equal to the normal distance traversed while stopping.

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 shall meet the requirements of Material Specification 1493. The mounting brackets shall meet the requirements of Material Specification 1495.

3. Installation Requirements.
The signals shall be mounted using pole mounting brackets meeting Material Specification 1495, 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 banding and clips shall be coated with a baked-on black finish. The mounting configuration connecting the signals to the mounting bracket shall consist of sections of 1 1/2" polycarbonate conduit of precise lengths, as indicated on the standard drawing, to create the designated structure, connected with cross fittings per Standard Drawing 741.

When the signals are to be mounted on a square pole of flat surface, the bracket used will be 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 feet, 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.

Cable. The Contractor shall provide and install a length of 8/C #18 AWG, as per Specification 1475, 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 connected in accordance with Specification 1493. 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 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

The signal head housings, the pole mounting brackets, and the crosses shall be of the color specified in the plans.

4. Method Of Measurement. This work shall be measured per each unit installed, complete.
5. Basis of Payment. This work will be paid for at the contract unit price for each "SIGNAL HEAD, POLYCARBONATE, LED, X-SECTION, BRACKET MOUNTED", which price shall be payment in full for furnishing and installing the signal head complete, including all necessary wiring.

MATERIAL SPECIFICATION	DRAWING	
1475	834	12268a
1493	835	740
1495		741

SIGNAL HEADS, POLYCARBONATE, LED, MAST ARM MOUNTED

- SIGNAL HEAD, POLYCARBONATE, LED, 3-SECTION, MAST ARM MOUNTED
- OPTICALLY PROGRAMMED SIGNAL HEAD, 1-FACE,3-SECTION, MAST ARM MOUNTED
- SIGNAL HEAD, POLYCARBONATE, LED, 4-SECTION, MAST ARM MOUNTED
- OPTICALLY PROGRAMMED SIGNAL HEAD, 1-FACE,4-SECTION, MAST ARM MOUNTED
- SIGNAL HEAD, POLYCARBONATE, LED, 5-SECTION, MAST ARM MOUNTED
- OPTICALLY PROGRAMMED SIGNAL HEAD, 1-FACE,5-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 Bureau of Electricity and the Illinois Department of Transportation for installation on Federal-Aid Highway Projects and on Illinois Department of Transportation Projects.

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 Material Specification 1493 for a "Traffic Signal: Twelve-Inch, Three or Single Section; One-Way, for a non-programmed signal.

The material for a programmed head shall meet the Material Specification 1496 for "Optically Programmed Signal Heads".

3. Installation Requirements. The signal shall be mounted on the mast arm using a mounting device meeting the requirements of Material Specification 1463, at the position on the mast arm as indicated on the drawing in the manner shown on Drawing 834. The Bracket shall be banded to the mast arm with the 5/8" banding as shown on Drawing Number 834. The banding and clips shall have a baked-on black finish. The Bracket shall be 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.

Cable. The contractor shall provide and install a length of 8/C #18 flexible electrical cord, as per Specification 1475, 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 Material Specification 1493, for the "Traffic Signal Twelve-Inch Three or Single-Section, One-Way", or Material Specification 1496, for "Optically Programmed Signals". 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 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.

Lamp Requirements. The lamp for the optically programmed signal shall be a General Electric Company product, 150 watt sealed beam lamp, with rated life of 6000 hours, or equivalent. The LED signals shall be equipped with the proper LED optical unit.

Painting. The signal head housings, the pole mounting brackets, and the crosses shall be the color designated by the Engineer. When the signals are mounted on the pole, the mounting hardware shall be painted to match the pole.

Basis of Payment. This work will be paid for at the contract unit price each for SIGNAL HEAD or OPTICALLY PROGRAMMED SIGNAL HEAD of the type specified which price shall be payment in full for furnishing and installing the signal head, or the optically programmed signal head, complete. If a signal head with both conventional and optically programmed signal faces is required, it will be paid for as a COMBINATION SIGNAL HEAD.

MATERIAL SPECIFICATION	DRAWING
1463 1496	834
1475	12268A
1493	

PEDESTRIAN SIGNAL HEAD, POLYCARBONATE, LED, BRACKET MOUNTED

PEDESTRIAN SIGNAL HEAD, POLYCARBONATE, 1 FACE, LED, BRACKET MOUNTED

PEDESTRIAN SIGNAL HEAD, POLYCARBONATE, 2 FACE, LED, 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 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 inclement weather or wind

2. Signal Materials.

The pedestrian signal head material shall be consistent with the requirements of Bureau of Electricity Material Specification 1494. All housing units shall be made of

polycarbonate. Mounting hardware shall meet the requirements of Material specification 1495.

3. Installation Requirements.

The signal shall be mounted using pole mounting brackets meeting Material Specification 1495, 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 banding and clips shall have a baked-on black finish. The mounting configuration connecting the signals to the mounting bracket shall consist of sections of 1-1/2" polycarbonate 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.

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 feet, 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.

Cable.

The Contractor shall provide and install a length of 8/C #18 AWG flexible electric cord, per Material Specification 1475, of sufficient length to extend without strain or stress from the terminal strip in 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 Material Specification 1494. Both ends of the cable shall be carefully stripped of six inches (6") of jacket and one inch (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 head shall enter the pole through the bottom 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.

The signal head housing, the pole mounting brackets, and the crosses shall be of the same color. Any mounting hardware that needs to be touched-up shall be painted to match the pole.

4. Basis of Payment

This work will be paid for at the contract unit price each for PEDESTRIAN SIGNAL HEAD, POLYCARBONATE, 1 FACE, LED, BRACKET MOUNTED or PEDESTRIAN SIGNAL HEAD, POLYCARBONATE, 2 FACE, LED, BRACKET MOUNTED, which price shall be payment in full for furnishing and installing the signal head complete.

MATERIAL SPECIFICATION	DRAWING
1494	12268-A
1495	741
1475	834
835	

SIGN, MESSAGE, ELECTRICALLY ILLUMINATED BRACKET MOUNTED

SIGN, MESSAGE, ELECTRICALLY ILLUMINATED, BRACKET MOUNTED
SIGN, MESSAGE, ELECTRICALLY ILLUMINATED, BLANK OUT, BRACKET MOUNTED
SIGN, MESSAGE, FIBER OPTIC, BRACKET MOUNTED

1. 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 Engineer. 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.
2. 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 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 banding and clips shall have a baked-on black finish. The mounting configuration connecting the sign to the mounting bracket shall consist of sections of 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 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 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.

4. 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

1471
1475
1495
1518

DRAWINGS

834
835
741
12268A

SIGN, MESSAGE, ELECTRICALLY ILLIMINATED, MAST ARM MOUNTED

SIGN, MESSAGE, ELECTRICALLY ILLUMINATED MAST ARM MOUNTED
SIGN, MESSAGE, ELECTRICALLY ILLUMINATED, BLANK OUT, MAST ARM MOUNTED
SIGN, MESSAGE, FIBER OPTIC, MAST ARM MOUNTED

1. 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 Engineer. 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.

2. 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.
3. 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 5/8" stainless steel banding secured with a stainless steel banding clip, as shown on Standard Drawing 834. The banding and clips shall have a baked-on black finish. The bracket shall be placed over a 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.

4. 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

1463
1471
1475
1518

DRAWINGS

834
835
12268A

ELECTRICAL MANHOLE 3' X 4' X 4' WITH 24" FRAME AND LID

ELECTRICAL MANHOLE 3'X4'X4' WITH 24" FRAME AND LID
ELECTRICAL MANHOLE 3'X4'X4' WITH 30" FRAME AND LID
ELECTRICAL MANHOLE 4'X6'X6' WITH 24" FRAME AND LID
ELECTRICAL MANHOLE 4'X6'X6' WITH 30" FRAME AND LID

1. **DESCRIPTION.** This item will consist of furnishing and installing an electrical manhole of the dimensions indicated with either a 24" or 30" frame and lid.
2. **MATERIAL.** The concrete manhole must meet the applicable requirements of Material Specification 1528. The frame and lid must meet the requirements of Material Specification 1458. A 24" frame and lid must meet the requirements of Standard Drawing 872. A 30" frame and lid must meet the requirements of Standard Drawings 874 and 10927. Bricks must meet the requirements of Article 1041 of the Standard Specifications. All other materials used must meet the appropriate material requirements of the Standard Specifications.
3. **METHOD OF CONSTRUCTION.** The manhole will be a precast concrete structure, or, if conditions merit, a cast in place concrete structure, complete with cast iron frame and lid. A 3'X4'X4' manhole with a 24" frame and lid must conform to the requirements of Drawing 730. A 3'X4'X4' manhole with a 30" frame and lid must conform to Drawing 729. A 4'X6'X6' manhole with a 24" frame and lid must conform to Drawing 732. A 4'X6'X6' manhole with a 30" frame and lid must conform to Drawing 733. The number and size of conduit openings will be as shown on the construction plans.

Each manhole will 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 must be properly excavated. All disposable material will be properly disposed of per Section 202.03 of the Standard Specifications. Each manhole must be set or constructed to conform with the appropriate City of Chicago drawings, except that the number and size of conduit openings will be in accordance with the construction plans. The frame casting must be accurately set on a full bed of mortar to the finished elevation so that no subsequent adjustment will be necessary. Mortar and brick, or mortar and concrete rings, may be used to adjust to the proper grade. Adjustment rings, bricks, and frames must be set in a full mortar bed. Use of partial bricks will not be allowed. Bricks must be laid in full header courses only. In no instance will the neck of the manhole exceed two (2) feet in height. Mortar will 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 must be plugged in an approved manner flush with the inner surface. If backfill is required, screenings must be used and properly compacted. Parkway must be restored to the proper grade. Pavement must be restored to the correct grade. Patching of the pavement must be done with high early strength concrete meeting the requirements of Articles 1001 and 1020 of the Standard Specifications. Sidewalks must be restored to the proper grade using a 5 inch thickness of concrete. The inside of the manhole must be clean of all debris.

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

4. METHOD OF MEASUREMENT. This item will be measured per each unit installed.
5. BASIS OF PAYMENT. The unit price for installing manholes will 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 will be covered by separate pay items. New conduit, if necessary, will also be paid for separately. The unit cost will be for complete installation for each unit for ELECTRICAL MANHOLE 3'X 4'X 4' WITH 24" FRAME AND LID, or ELECTRICAL MANHOLE 3'X 4'X 4' WITH 30" FRAME AND LID, or ELECTRICAL MANHOLE 4'X6'X6' WITH 24" FRAME AND LID, or ELECTRICAL MANHOLE 4'X6'X6' WITH 30" FRAME AND LID.

MATERIAL SPECIFICATION
1458 1528

DRAWING
730 872
874 10927
729 733
732

ELECTRICAL MANHOLE AND HANDHOLE REMOVAL

Description. This item shall consist of the removal to an existing 3' x 4' or 4' x 6' concrete manhole or 2.5' I.D. handhole and 2' circular cast iron frame and lid.

Location. Each manhole or handhole shall be removed at locations shown on the plans or as directed by the Engineer.

Installation. Contractor shall carefully excavate all necessary pavement, sidewalk and soil to expose and remove existing manhole or handhole. Existing frame and lid shall be salvaged and returned to City storeroom. Before existing manhole or handhole is removed, cables in manhole or handhole shall be disconnected and removed.

Basis of Payment. The unit price for removing an existing manhole or handhole shall include all necessary excavation, backfilling, and restoration of parkway or pavement in accordance with the project 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 for ELECTRICAL MANHOLE REMOVAL, OR ELECTRICAL HANDHOLE REMOVAL.

DRILL EXISTING MANHOLE OR HANDHOLE

1. DESCRIPTION. This work will consist of drilling a hole in an existing handhole or manhole for the installation of a new conduit. This item must meet the requirements of Article 879 of the Standard Specifications.
2. CONSTRUCTION. The size of the hole must be as close as possible to the size of the conduit. A conduit of the size required must be installed in the drilled hole. A bushing must be provided at the end of the conduit. The space between the conduit and the handhole or manhole wall must be caulked with a waterproof grout. Drawing 814 provides additional information.
3. METHOD OF MEASUREMENT. This work will be measured per each hole drilled.
4. BASIS OF PAYMENT. This work will be paid for at the contract unit price each for DRILL EXISTING MANHOLE OR HANDHOLE, which price will be payment in full for drilling the hole, furnishing and installing the conduit and bushing, grouting, and any additional work required to accomplish this task.

DRAWING 814

ADJUST FRAME AND LID

ADJUST FRAME AND LID
REPLACE 24" FRAME AND LID WITH 30" FRAME AND LID
ELECTRICAL FRAME AND LID, 24"
ELECTRICAL FRAME AND LID, 30"

1. DESCRIPTION. This item will consist of adjusting or replacing an existing or new 24 inch or 30 inch frame and lid for an existing manhole or handhole to the new or existing grade. The existing manhole or handhole may be in the street, in the sidewalk, or in the parkway.
2. MATERIAL. The 24 inch frame and lid must be as shown in Standard Drawing 872. The 30 inch frame and lid must be as shown in Standard Drawings 874 and 10927. All frames and lids must conform to Material Specification 1458. Bricks must meet the requirements of Article 1041 of the Standard Specifications.
3. INSTALLATION. Pavement, sidewalk, and dirt must be removed to the extent necessary to adjust the frame. Material must be disposed of according to the requirements of Section 202.03 of the Standard Specifications. Mortar and brick, or mortar and concrete rings, must be used to adjust to the proper grade. With the approval of the Resident Engineer, the contractor may use precast adjusting rings. Adjustment rings, bricks, and frames are to be set in a full mortar bed. Mortar must be mixed in a proportion of one (1) part cement to three (3) parts sand by volume of dry mix. The interior of the adjustment must be smooth. Use of partial bricks will not be allowed.

Bricks must be laid in full header courses only. In no instance will the neck of the manhole or handhole exceed two (2) feet in depth.

The pavement, sidewalk, or parkway must be restored to the proper grade after adjustment. Patching of pavement around a structure must be with high early strength concrete meeting the requirements of Articles 1001 and 1020 of the Standard Specifications. The bituminous concrete layer must be properly restored. Sidewalk must be replaced to the nearest full slab, or expansion joint, and must be a minimum of 5 inches in thickness. Parkways must be properly backfilled and topped with appropriate soil material.

4. METHOD OF MEASUREMENT. This work will be measured on a per each basis.
5. BASIS OF PAYMENT. This work will be paid for at the contract price per each unit for ADJUST FRAME AND LID, or ELECTRICAL FRAME AND LID 24", or ELECTRICAL FRAME AND LID 30", or REPLACE 24" FRAME AND LID WITH 30" FRAME AND LID. All excavation and restoration, as well as bricks, concrete, mortar, backfill, soil, disposal of surplus excavated material, reinforcement bars, frames and lids, etcetera will be included in the unit price.

MATERIAL
1458

DRAWINGS
872
874
10927

LIGHT POLE, STEEL

Description. This item shall consist of furnishing and installing and setting plumb a steel anchor base pole as illustrated on Drawing Number 808, furnishing and installing a steel pipe mast arm of a specified length to support a street light luminaire, as is shown on Drawing Number 839, and 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 1421 for the 8 1/2" diameter poles, 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. The materials of the mast arm shall conform to the requirements of Specification 1436 dated July 26, 1990 for MAST ARMS: 4_, 8_, 12_ and 15_FOOT; STEEL.

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.

The mast arm shall be installed on either a mast arm support on a City street light pole, or on an acceptable mast arm bracket and clamp assembly, designed to accept the City two_bolt mast arm attachment, which can be securely attached to a City street light pole.

The mast arm shall be secured to the support, or supports, using the screws provided as per Specification 1436. When the installation using a mast arm bracket is called for with an underground distribution system, a one_inch (1") diameter hole for cable entrance shall be drilled into the pole in the proper orientation with the hole in the mast arm mounting bracket.

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, 32'-6" M.H., 12' M.A., 7 GA., 8 ½" DIAMETER, 11 ½" B.C., 1 ¼" ANCHOR RODS; LIGHT POLE, STEEL, 34'-6" M.H., 12' M.A., 7 GA. 10" DIA., 15" B.C., 1 ¼" ANCHOR RODS; LIGHT POLE, STEEL, 34'-6" M.H., 12' M.A., 3 GA. 10" DIA., 15" B.C., 1 ¼" ANCHOR RODS; LIGHT POLE, STEEL, 34'-6" M.H., 12' M.A., 3 GA. 11" DIA., 17 ¼" B.C., 1 ¼" ANCHOR RODS and LIGHT POLE, STEEL, 34'-6" M.H., 12' M.A., 3 GA. 12 ½" DIA., 16 ½" B.C., 1 ½" 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.

LIGHT POLE, STEEL, 32'-6" M.H., 12' M.A., 7 GA., 8 ½" DIAMETER, 11 ½" B.C.
1 ¼" Anchor Rods, Install Only

Description. This item shall consist of furnishing and installing and setting plumb a steel anchor base pole and installing a steel pipe mast arm of a specified length to support a street light luminaire, as is shown on Drawing Number 839, and 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 1421 for the 8 ½" diameter pole. The materials of the mast arm shall conform to the requirements of Specification 1436 for MAST ARMS: 4_, 8_, 12_ and 15_FOOT; STEEL.

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 that 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 with all appurtenances attached for the final plumb check. The bolt covers, handhole cover, and pole cap shall be securely attached.

The mast arm shall be installed on either a mast arm support on a City street light pole, or on an acceptable mast arm bracket and clamp assembly, designed to accept the City two_bolt mast arm attachment, which can be securely attached to a City street light pole.

The mast arm shall be secured to the support, or supports, using the screws provided as per Specification 1436. When the installation using a mast arm bracket is called for with an underground distribution system, a one_inch (1") diameter hole for cable entrance shall be drilled into the pole in the proper orientation with the hole in the mast arm mounting bracket.

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, 32'-6" M.H., 12' M.A., 7 GA., 8 1/2" DIAMETER, 11 1/2" B.C., 1 1/4" ANCHOR RODS, INSTALL ONLY, which shall be payment in full for 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.

LUMINAIRE, STREET LIGHTING, HIGH PR3ESSURE SODIUM VAPOR, 400 WATT, 240 VOLT, INSTALL ONLY

LUMINAIRE, STREET LIGHT, HPS, 400 WATT, 240 VOLT, ARTERIAL, SEMI-CUTOFF, INSTALL ONLY

LUMINAIRE, STREET LIGHT, HPS, 400 WATT, 240 VOLT, ARTERIAL CUT-OFF, INSTALL ONLY

1. DESCRIPTION. This item will consist of furnishing and installing a street lighting luminaire, complete with internal ballast, electronic starting component, and a high pressure sodium vapor lamp of the proper wattage and input voltage, on a street light mast arm attached to a street light pole, or a floodlight mounted to a post top attachment on 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, or as directed by the Engineer.

2. **MATERIAL.** The luminaire must meet the appropriate material specification for the lamp wattage and type of distribution specified. Items 224, 225, 226, 227, 228, 229, 229A, 229B, 230, and 280 must meet Material Specifications 1359, 1359, 1368, 1368, 1382, 1499, 1492, 1501, 1498, and 1498, respectively. Lamps for these items must meet Material Specification 1524.
3. **INSTALLATION.** The luminaire must be securely installed on the mast arm. The vertical axis of the luminaire must be in a vertical plane, and the longitudinal axis must 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. Floodlights must be mounted on the pole top using a bracket supplied with this item. The bracket will be for one or two fixtures, as specified, or as directed by the Engineer. Floodlights must be aimed for proper light distribution.

For an aerial distribution system, the primary wiring to the ballast must consist of 2 1/C #12 AWG wires, with 150 degree C. irradiated polyolefin insulation, connected to the terminal board "line" terminals. They must 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. Connection to the aerial circuit wires must be made with a split bolt type pressure connector for a No. 6 solid copper wire and the connection so formed must be wrapped with two layers of an approved electrical tape.

A cartridge type fuse, type KTK, rated at 10 amperes must be installed in each of the fuse holders. The primary wiring to the ballast must consist of 2 1/C No. 12 AWG wires with 150 degree C. irradiated polyolefin, insulation connected to the terminal board "line" terminals. They must extend through the mast arm raceway and down the inside of the pole to the pole base where they must be spliced to the underground feeder cables. Sufficient wire must be supplied to extend the wires outside of the pole through the access handhole to permit splicing work to be performed outside the pole.

All splice methods must be approved by the Engineer before implemented. All splices, tapes and grounding connections must be inspected by the Engineer's authorized representative before wires are permanently trained in the light pole.

Current, insulation resistance, and voltage readings must 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 must be thoroughly investigated and remedied before acceptance of the installation. Line voltage must be taken at any in-line fused location, within the pole designated by the Engineer's authorized representative. Locations and voltage must be tabulated as directed. Three (3) copies of the tabulated voltage insulation resistance, and current readings must be submitted to the Engineer's authorized representative. Maximum voltage drop must not exceed 10% of nominal source voltage. The insulation resistance must not be less than 2 Megohms, when tested to ground with 500 volts a.c.

The Contractor must submit the manufacturer's certified test reports on all materials used on this project. Any material deemed defective must 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 must be made to insure that all lighting and control equipment are in proper operating condition. This field test must be witnessed by the Engineer.

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

4. METHOD OF MEASUREMENT. This work will be measured per each unit installed, complete. All wiring to the underground feeder cable, including splices, will be included in this measurement.
5. BASIS OF PAYMENT. This work will be paid for at the contract unit price each for a LUMINAIRE, STREET LIGHT, HPS, INSTALL ONLY, of the proper wattage, voltage, and distribution type, which will be payment in full for installing, connecting and testing the unit complete in place.

MATERIAL SPECIFICATION

1357	1359	1360	1368
1370	1376	1382	1492
1498	1499	1501	1519

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

LUMINAIRE, STREET LIGHT, HPS, 400 WATT, 240 VOLT, ARTERIAL, SEMI-CUTOFF
LUMINAIRE, STREET LIGHT, HPS, 400 WATT, 240 VOLT, ARTERIAL CUT-OFF

1. DESCRIPTION. This item will consist of furnishing and installing a street lighting luminaire, complete with internal ballast, electronic starting component, and a high pressure sodium vapor lamp of the proper wattage and input voltage, on a street light mast arm attached to a street light pole, or a floodlight mounted to a post top attachment on 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, or as directed by the Engineer.
2. MATERIAL. The luminaire must meet the appropriate material specification for the lamp wattage and type of distribution specified. Items 224, 225, 226, 227, 228, 229, 229A, 229B, 230, and 280 must meet Material Specifications 1359, 1359, 1368, 1368, 1382, 1499, 1492, 1501, 1498, and 1498, respectively. Lamps for these items must meet Material Specification 1524.
3. INSTALLATION. The luminaire must be securely installed on the mast arm. The vertical axis of the luminaire must be in a vertical plane, and the longitudinal axis must 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. Floodlights must be mounted on the pole top using a bracket supplied with

this item. The bracket will be for one or two fixtures, as specified ,or as directed by the Engineer. Floodlights must be aimed for proper light distribution.

For an aerial distribution system, the primary wiring to the ballast must consist of 2 1/C #12 AWG wires, with 150 degree C. irradiated polyolefin insulation, connected to the terminal board "line" terminals. They must 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. Connection to the aerial circuit wires must be made with a split bolt type pressure connector for a No. 6 solid copper wire and the connection so formed must be wrapped with two layers of an approved electrical tape.

A cartridge type fuse, type KTK, rated at 10 amperes must be installed in each of the fuse holders. The primary wiring to the ballast must consist of 2 1/C No. 12 AWG wires with 150 degree C. irradiated polyefin, insulation connected to the terminal board "line" terminals. They must extend through the mast arm raceway and down the inside of the pole to the pole base where they must be spliced to the underground feeder cables. Sufficient wire must be supplied to extend the wires outside of the pole through the access handhole to permit splicing work to be performed outside the pole.

All splice methods must be approved by the Engineer before implemented. All splices, tapes and grounding connections must be inspected by the Engineer's authorized representative before wires are permanently trained in the light pole.

Current, insulation resistance, and voltage readings must 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 must be thoroughly investigated and remedied before acceptance of the installation. Line voltage must be taken at any in-line fused location, within the pole designated by the Engineer's authorized representative. Locations and voltage must be tabulated as directed. Three (3) copies of the tabulated voltage insulation resistance, and current readings must be submitted to the Engineer's authorized representative. Maximum voltage drop must not exceed 10% of nominal source voltage. The insulation resistance must not be less than 2 Megohms, when tested to ground with 500 volts a.c.

The Contractor must submit the manufacturer's certified test reports on all materials used on this project. Any material deemed defective must 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 must be made to insure that all lighting and control equipment are in proper operating condition. This field test must be witnessed by the Engineer.

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

4. METHOD OF MEASUREMENT. This work will be measured per each unit installed, complete. All wiring to the underground feeder cable, including splices, will be included in this measurement.
5. BASIS OF PAYMENT. This work will be paid for at the contract unit price each for a LUMINAIRE, STREET LIGHT, HPS, of the proper wattage, voltage, and distribution type, which will be payment in full for furnishing, installing, connecting and testing the unit complete in place.

MATERIAL SPECIFICATION

1357	1359	1360	1368
1370	1376	1382	1492
1498	1499	1501	1519

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 feet. 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 foot for REMOVE ELECTRIC CABLE FROM CONDUIT.

JUNCTION BOX, POLE OR POST MOUNTED

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's authorized representative. The junction box, 16" high, 6" Wide and 4" deep shall be installed with appurtenances as shown on Standard Drawing 954 and as described herein.

2. Materials and Assembly.

The Junction Box shall conform to the requirements of Material Specification Number 1407, Detail Specification for a Junction Box, and shall be mounted above and attached by four (4) #10-24x3/4" stainless steel screws, to a long sweep elbow, Leitelt Brothers

Company Item Number LB-16-64-A-2, or equivalent. 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, or equivalent, securely fastened to an Aluminum Terminal Block "Z" Bracket, Leitelt Brother Company Item Number LB-16-6-4B, or equivalent, mounted with two Number 8-24 x 1/2" stainless steel machine screws in tapped holes in the mounting bosses, and located 3/4 inches 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 fifty-eight inches (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. The banding and clips shall have a baked-on black finish.

4. Basis of Payment.

This work will be paid for at the contract unit price each for a JUNCTION BOX, POLE OR POST MOUNTED, 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

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 on an anchor base pole at the locations shown on the plans, or as specified or directed by the Engineer. The length of the mast arm and the angular orientation of the arm relative to the centerline 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 ARM LENGTH (feet)	POLE BASE DIAMETER (inches)
16	10
20	10
26	10
30	11
35	12.5
40	12.5
44	12.5

2. MATERIAL. The mast arm shall be 7gauge steel meeting the requirements of Standard Drawing 870 and the applicable sections of Material Specification 1447.
3. INSTALLATION. The mast arm shall be mounted on the pole at the height specified on Drawing 834, or at a different height if specified on the plans, or as directed by the Engineer. A one inch (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 the 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 signals, signs, and electrical equipment must be attached in the correct relative position to the mast arm, with 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.

The mast arm shall be delivered completely finished with a factory applied powder coat per Material Specification 1447. The contractor shall utilize non-abrasive slinging materials and shall otherwise exercise due care in erecting the pole and mast arm to prevent any 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.

4. BASIS OF PAYMENT. This work shall be paid for at the contract unit price for each MAST ARM, STEEL, MONOTUBE of the length indicated, and shall be payment in full for furnishing and installing a steel mast arm in place, complete. Attachment of signals and signs shall not be part of this pay item.

MATERIAL
1447

DRAWING
870
834

TRENCH AND BACKFILL WITH SCREENINGS

TRENCH AND BACKFILL WITH SCREENINGS

1. **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 815 of the Standard Specifications.
2. **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.
3. **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.
4. **METHOD OF MEASUREMENT**. This work will be measured in feet 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.
5. **BASIS OF PAYMENT**. This work will be paid for at the contract unit price per lineal foot, 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

CONDUIT LATERALS

1. DESCRIPTION - This work will consist of furnishing and installing a conduit lateral of the type and size specified.
2. MATERIALS - Galvanized rigid steel conduit must conform to the requirements of Material Specification 1462.

Polyvinylchloride (PVC) conduit must conform to the requirements of National Electrical Manufacturers Association Standard, Publication Number TC2 for EPC-40, or EPC-80. Conduit color will be determined by the Resident Engineer.

Coilable non-metallic conduit must be a high density polyethylene meeting the requirements of ASTM-D1248, Type III, Grade PE34, Category 5, Class C.. The duct must meet the requirements of Section 1088.01(c) of the Standard Specifications. The average outside diameter of the 1.25 inch duct must be 1.66 inches, with a minimum wall thickness of .15 inches for the Schedule 40 conduit, and a wall thickness of .20 for the Schedule 80 conduit. Conduit color will be as determined by the Resident Engineer.

3. CONSTRUCTION.

DEFINITION OF LATERALS - A lateral will 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 must be installed at the locations shown on the construction plans. Laterals must be installed in the shortest practicable line between points of termination, or under adverse conditions, as directed by the Resident 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 will normally be installed in a trench or attached to a structure. Coilable conduit will be installed in a trench. The Contractor must 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 must have the burrs and rough places smoothed, and all conduit runs must be cleaned and swabbed before installation of electric cables. If cable is not to be installed immediately after cleaning of the conduit, a light weight pulling line such as 1/8" polyethylene line must be placed in the conduit and will remain in the conduit for future work. The excavation for pushing conduit must be located at least two feet (2') from the edge of pavement. All underground conduit must have a minimum cover of thirty inches (30")

below grade. If conduit cannot be installed with a minimum cover of thirty inches (30"), the conduit must be encased in concrete for protection. The method of encasement and protection must be approved by the engineer. Concrete encasement will be paid for as a separate pay item.

When multiple laterals in a common trench are required, no more than three (3) three inch (3") or smaller conduit laterals can be laid on a single, horizontal level. Four or more conduit laterals must be installed on two (2) levels in accordance with instructions of the Resident Engineer.

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

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

Threaded fittings and bends of the same material as conduit must be furnished and installed as required. Threadless couplings may be used only for splicing existing conduit. All conduit splices, where required, will be considered incidental to this pay item.

4. METHOD OF MEASUREMENT - The length measured will be the number of lineal feet of conduit installed and accepted, measured in place. Each conduit will be measured separately even if in a single trench. The length for measurement will be the distance horizontally between changes in the direction of the conduit plus the conduit vertically attached to structures.
5. BASIS OF PAYMENT - This work will be paid for at the contract unit price per lineal foot for Conduit of the type and size as specified, which price will be payment in full for furnishing and installing the conduit and fittings complete. Cleaning, swabbing, and p-lining of new conduit will be incidental to this pay item. Trench and backfill will be paid for separately. Concrete encasement, if required, will be paid for separately. No additional payment will be allowed for pushing under pavements or for jackholes for conduit laterals.

MATERIAL SPECIFICATIONS
1462

DRAWINGS
579 813

CONDUIT SUPPORT SYSTEM

Description. This work shall consist of the construction of a Conduit Support System underneath the bridge to carry the City of Chicago's conduit. The work shall be done in

accordance with the Standard Specifications and the details shown in the plans and as directed by the Engineer.

Basis of Payment. This work will be paid for at the contract unit price per lump sum for CONDUIT SUPPORT SYSTEM which shall include all labor, materials (conduits, rods, clamps, inserts, channels, etc.) and equipment necessary to construct the conduit support system.

ELECTRIC CABLE

1. DESCRIPTION.

This work shall consist of furnishing and installing electric cable for traffic signals 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 SIGNAL CABLE.

All cable shall conform to the requirements of Material Specification number 1474, for Traffic Signal Cable.

3. INSTALLATION.

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 thirty six inches (36") of neoprene jacket.
2. Wrap vinyl electrical tape on two inches (2") of the neoprene jacket and two inches (2") on the exposed conductors.
3. Remove one inch (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 twenty four inches (24") of neoprene jacket.

- 2.Wrap vinyl electrical tape on two inches (2") of neoprene jacket and two inches (2") on the exposed conductors.
- 3.Remove one inch (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 (feet)</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

Cable slack in manholes/handholes shall be trained and racked in the holes. If racks are non-existent, racks shall be provided, and considered incidental and a part of this pay item.

No cable splices shall be allowed for traffic signal cable, with the exception of 7 conductor interconnect cable. These splices shall be indicated on the plans.

5. METHOD OF MEASUREMENT.

The length of measurement shall be the distance horizontally measured between changes in direction, and shall include slack cable. All vertical cables will not be measured for payment.

6. BASIS OF PAYMENT.

This work will be paid for at the contract unit price per lineal foot for ELECTRIC CABLE IN CONDUIT NO. 4, 2/C, ELECTRIC CABLE IN CONDUIT NO. 12, 7/C, ELECTRIC CABLE IN CONDUIT NO. 12 10/C, or ELECTRIC CABLE IN CONDUIT NO. 12 19/C. 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
1474

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.

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 bundy 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.

ROD AND CLEAN DUCT IN EXISTING CONDUIT SYSTEM

ROD AND CLEAN DUCT IN EXISTING CONDUIT SYSTEM

DESCRIPTION AND SCOPE. This work will 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 will 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 must 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 will be incidental to the work of rodding and cleaning of the conduit.

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, will be cleaned at the Engineer's order and payment approved 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 must be attached to the duct rod, which by removal of the duct rod will 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 must be placed and will 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 will not be a part of this pay item.

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

BASIS OF PAYMENT. This work will be paid for at the contract unit price per lineal foot for **ROD AND CLEAN DUCT IN AN EXISTING CONDUIT SYSTEM** for the installation of new electric cables. Such price will 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 will be rodded and cleaned as a separate unit and paid for at the contract unit price.

CLEAN EXISTING MANHOLE OR HANDHOLE

DESCRIPTION. This item will consist of furnishing all labor, materials, tools and equipment necessary to clean a manhole or handhole. Work must include the removal and disposal of all foreign debris and liquids from the manhole or handhole. Manholes or handholes to be cleaned will be identified on the plans or by the Resident Engineer.

CLEANING. The inside dimension of the hand hole will normally be 30 to 36 inches in diameter and three feet in depth. The inside dimension of the manhole will normally be 3'x4'x4' or 4'x6'x6'. Handholes and manholes of other dimensions may be encountered. Cleaning will include opening the lid and placing the lid back in place after cleaning. The cables must not be damaged or disturbed during the cleaning process. All debris removed from the hole must be properly disposed of in an approved manner and not be left in the public way or dumped into the City sewer system. Guidelines outlined in Section 202.03 of the Standard Specifications should be followed.

METHOD OF MEASUREMENT. This work will be measured per each manhole/handhole cleaned.

BASIS OF PAYMENT. This work will be paid at the contract unit price each for CLEAN EXISTING MANHOLE OR HANDHOLE, as directed by the Resident Engineer, which payment will include both cleaning and debris disposal.

STORM SEWERS AND SEWER CONNECTIONS TO CITY OF CHICAGO SEWERS

Effective: September 30, 1985

Revised: July 2, 1994

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 525 mm (21 inches) 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 600 mm (24 inches) 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.

This work will be measured and paid for at the contract unit price per meter (foot) for STORM SEWER in accordance with Articles 550.08 and 550.09 of the Standard Specifications.

CATCH BASINS, TYPE A, 4' DIAMETER, TYPE 1 FRAME, OPEN LID (CITY OF CHICAGO)

Work under these items must be performed in accordance with the applicable portions of Section 602 of the Standard Specifications except as herein modified, and in accordance with the Detail Construction Standards.

Description: This work must consist of constructing a Catch Basin, Type A, 4' Diameter to the proposed grade at the location indicated on the plans or as directed by the Engineer.

General Requirements: Precast reinforced concrete sections must be constructed in horizontal courses. The units must be laid in mortar, sealed with external sealing bands, or sealed using mastic joint sealer. When mastic joint sealer is used, the material must completely fill the joint after the units have been brought together. All precast catch basins must be installed on a 6-inch thick sand cushion of FA2 conforming to Article 1003.01.

CDOT Standard perforated lids must be placed on all catch basins. Backfilling must be done with sand as specified in Article 550.07, however, no separate payment for backfilling will be made under this item and the work will be considered included with the costs of these items.

Where less than 3 feet of cover exists over proposed half traps the half traps must be constructed of ductile iron pipe. No additional payment will be made for ductile iron half traps, but the cost will be considered incidental to this item.

Where proposed catch basins are to be connected to a proposed or existing ductile iron sewer the proposed half trap must be constructed of ductile iron pipe. No additional payment will be made for ductile iron half traps, but the costs will be considered included with this item.

Where proposed catch basins are to be connected to an existing lateral, the lateral is to be cleaned, flushed and approved by an inspector from the Department of Water Management.

All half traps constructed of ESVCP must be encased in concrete as indicated on the Detailed Construction Standard.

Catch basins must be cleaned of any accumulation of silt, debris, or foreign matter of any kind, and must be free from such accumulations at the time of final inspection.

The cost of pavement removal and disposal for proposed catch basins will be considered incidental to this item.

Method of Measurement: CATCH BASINS, TYPE A, 4' DIAMETER, TYPE 1 FRAME, OPEN LID (CITY OF CHICAGO) will be measured on a per each basis.

Basis of Payment: This work will be paid for at the contract unit price per each for CATCH BASINS, TYPE A, 4' DIAMETER, TYPE 1 FRAME, OPEN LID (CITY OF CHICAGO) The contract unit price will include the costs for all work, including but not limited to the costs for labor, materials, supplies, equipment, frames, lids, concrete, 3 inch Sand cushion, catch basin structure, 8" half-traps, trench backfill, removal and disposal, removal and disposal of any miscellaneous abandoned

structures, all excavation and disposal except excavation in rock. Any dewatering and/or sheeting or shoring required to do the work as specified will not be paid for separately, but will be included in the contract unit price of this item.

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."

FRAMES AND LIDS (CITY OF CHICAGO)

Work under this item must be in accordance with Section 604 of the Standard Specifications and the details shown on the plans, except as herein modified.

Description: This item must consist of transporting, furnishing and installing City of Chicago standard manhole, catch basin, water valve, and inlet lids (both circular and rectangular, both perforated and solid).

General Requirements: Frames placed on concrete or masonry surfaces must be set in full mortar beds. The Engineer will determine frames to be replaced. The Contractor must replace in kind and at its expense any existing frame damaged by this work during construction. Unless otherwise shown on the plans or ordered by the Engineer, perforated lids must be placed on catch basins, sewer manholes and inlets. Department of Water Management standard closed lid must be placed on all valve vaults. The Engineer will determine lids to be replaced.

The Contractor must replace in kind and at its expense any existing lid damaged by its work during construction.

The Contractor must deliver all old frames and lids to the City at a facility designated by the Engineer. A receipt for the delivery of the old frames must be given to the Engineer.

Method of Measurement: FRAMES AND LIDS, OPEN LID (CITY OF CHICAGO) or FRAMES AND LIDS, CLOSED LID (CITY OF CHICAGO) will be measured on a per each basis.

Basis of Payment: This work will be paid for at the contract unit price each for FRAMES AND LIDS, OPEN LID (CITY OF CHICAGO) or FRAMES AND LIDS, CLOSED LID (CITY OF CHICAGO), which price will be payment in full for transporting and furnishing the required frame and delivery of the existing frames to the designated facility, and for setting of the frame to the proposed grade. Frames supplied for proposed structures will not be included in this item but considered included in the proposed structure pay items.

STRIP SEAL EXPANSION JOINT ASSEMBLY

Effective: July 7, 2004

Description. This work shall consist of furnishing and installing an expansion joint assembly as shown on the plans and as specified herein. The joint assembly shall be comprised of steel locking edge rails with studs and a preformed elastomeric strip seal.

Materials:

- (a) Steel Locking Edge Rails for the Preformed Elastomeric Strip Seal System. The steel locking edge rails shall be either a one-piece extrusion (rolled section) or a combination of extruded and stock plate, shop welded according to Section 505. All steel shall be AASHTO M270, Grade 250 (Grade 36) minimum. The locking portion of the steel edge rail shall be extruded, with a cavity, properly shaped to allow the insertion of the strip seal gland and the development of a watertight mechanical interlock. This cavity shall also be formed or machined with allowance made for the required galvanizing process. The top edge of the steel edge rails shall not contain any horizontal projections.
- (b) Anchor Studs. The steel locking edge rails shall contain anchor studs and/or anchor plates of the size shown on the plans for the purpose of firmly anchoring the expansion joint system in either portland cement concrete or polymer concrete, depending on the application. The anchor studs shall be according to Article 1006.32 and shall be installed in the shop prior to galvanizing.
- (c) Preformed Elastomeric Strip Seal. The elastomeric gland shall meet the physical requirements of ASTM D5973. The gland material shall have a shallow "V" profile and shall contain "locking ears" that, when inserted in the steel locking edge rails, forms a mechanical interlock. The elastomeric gland shall be of an appropriate size to accommodate the rated movement specified on the plans.
- (d) Adhesive/Lubricant. The adhesive/lubricant shall comply with the requirements of ASTM D4070.

Shop Drawings:

The Contractor must submit shop drawings in accordance with the provisions of 105.04 of the Standard Specifications for all expansion joint devices. No materials detailed in the Plans and/or as described in this Special Provision, or covered by shop drawings, may be delivered to the site of the work until the shop drawings have been approved.

Construction:

- (a) Steel locking edge rails. After fabrication the steel locking edge rails shall be hot dip galvanized according to AASHTO M111 and ASTM A385. The steel components of the joint system shall be properly aligned and set prior to pouring the anchorage material. For expansion joints, the joint opening shall be adjusted according to the temperature at the time of placing so that the specified opening will be secured at a temperature of 10 °C (50 °F).

The joint opening for each 10 m (100 ft.) of bridge between the nearest fixed bearings each way from the joint shall be reduced 1 mm (1/8 in.) from the amount specified, for each 8 °C (15 °F) the temperature at the time of placing exceeds 10 °C (50 °F) and increased 1 mm (1/8 in.) from the amount specified, for each 8 °C (15 °F) the temperature at the time of placing is below 10 °C (50 °F).

(b) Preformed Elastomeric Strip Seal. Once the anchoring material has fully cured according to specifications, preparation for the placement of the gland can begin.

(1) Surface Preparation. The cavity portion of the locking edge rails must be cleaned of all foreign material prior to placement of the strip seal. The cavity shall be cleaned of debris using compressed air with a minimum pressure of 620 kPa (90 psi). The air compressor shall be equipped with traps to prevent the inclusion of water and/or oil in the air line. Any oil left on the surface of the steel extrusion at this stage shall be removed using a solvent recommended by the strip seal manufacturer. Once the surface preparation has been completed, the steel extrusion cavities must be kept clean and dry until the strip seal is placed.

(2) Placement of Elastomeric Strip Seal. The placement of the strip seal will only be permitted when the steel locking edge rail cavities are in a clean and dry state and the ambient air and steel substrate temperature are above the minimum temperature recommended by the strip seal manufacturer. Prior to inserting the strip seal in the steel retainer cavities, the "locking ears" portion of the seal shall be coated with the approved adhesive/lubricant. Only about 1.5 m (5 ft) of gland should be coated at a time to prevent the lubricant/adhesive from drying prior to insertion into the cavities of the steel locking edge rails. After each section is coated, the coated portion of the seal should be inserted in the steel locking edge rail cavities using tools and procedures recommended by the strip seal manufacturer. Under no circumstances shall any uncoated "locking ears" be permitted in the joint.

(c) End Treatment. The end treatment for curbs, parapets and sidewalks must be as detailed on the plans and as recommended by the manufacturer of the joint system. The Contractor must field measure the exact length from toe to toe of curbs, parapets or sidewalks along the joint to ensure proper dimensioning of any required shop fabricated miters. The elastomeric strip seal shall be one continuous piece along the entire length of the joint. The seal should physically be able to navigate the 30° upturn at the parapets as well as some degree of horizontal bridge skew in one continuous piece. If bridge skew angles exceed the physical ability of the strip seal to navigate the change in angle as set forth by the manufacturer's specifications and recommendations, then the seal may be spliced at the mitered ends by factory molding or shop vulcanization by the manufacturer. In addition, this factory spliced seal shall then be verified to fit properly with its corresponding steel locking edge rail assembly prior to delivery. Under no circumstances shall the strip seal be field "vulcanized", glued, or joined in any manner other than by the manufacturer's approved factory process.

(d) Technical Support. The manufacturer shall supply technical support during surface preparation and the installation of the entire joint assembly

Method of Measurement. The completed joint assembly will be measured in meters (feet) along the centerline of the joint.

Basis of Payment. The expansion joint assembly, measured as specified, will be paid for at the contract unit price per meter (foot) for STRIP SEAL EXPANSION JOINT ASSEMBLY, regardless of the design movement specified. This price shall be payment in full for all labor, materials, equipment, and manufacturer's technical support required for surface preparation and joint installation.

CITY OF CHICAGO BUREAU OF ELECTRICITY MATERIAL SPECIFICATIONS

SPECIFICATION 1370

LAMP: 400 WATT, HIGH PRESSURE SODIUM

Type LU 400/BU

SUBJECT

This specification states the requirements for the 400 watt high pressure sodium lamp, base-up burning, for street lighting service.

PHYSICAL REQUIREMENTS

The lamp shall conform to the following physical characteristics:

Base Designation:	Mogul
Bulb Designation:	E-18
Bulb Material:	Borosilicate glass
Bulb Finish:	Clear
Bulb Diameter:	2.25"
Maximum Overall Length:	9.75"
Light Center Length (approx.):	5.75"
Arc Length:	3.4"
Maximum bulb temperature:	400°C
Maximum base temperature:	210°C
Arc tube Material:	Polycrystalline alum. oxide

ELECTRICAL REQUIREMENTS

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:	7.0 amps
Ballast Open Circuit Volts:	230
Min. Open Circuit Voltage:	190
Initial Lamp Voltage Range (100 hr. values):	90-115 volts
Min. Drop Out Voltage:	160 volts

Starting Characteristics:

Pulse Peak Voltage (Min.):	2,500
Pulse Peak Voltage (Max.):	4,000
Pulse Width at 2250:	1 micro-sec. min.
Pulse Peak Current (Min.):	0.2 amps
Pulses Per Second (Min.):	60

The lamp shall conform to the following performance characteristics (Vertical Burning Only):

Initial Lumens:	50,000
Percent Mean Lumens (@10 hours/start):	95
Rated Life-10 hour duty cycle:	20,000 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
Re-start time:	1 minute

GUARANTEE

Any lamps failing to operate for at least 6,000 hours shall be replaced with a new, operable, rated life lamp without charge to the City.

Should the failure rate of lamps furnished under this specifications exceed at any point the percentage of failures given in the table below, the contractor shall replace all lamps in excess of the indicated percentage with new, operable, rated life lamps without charge to the State or City of Chicago.

FAILURE RATE - 400 W. HPS LAMP

<u>Hours of Burning Life</u>	<u>Percentage of Lamps Failing</u>
4,000	1
8,000	2
12,000	5
16,000	10
20,000	20
24,000	33

LUMINAIRE WITH INTEGRAL BALLAST

**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. 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 therefor. 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.

THIS SPECIFICATION MUST NOT BE ALTERED

POLE MOUNTED CAST ALUMINUM BOXES

**SPECIFICATION 1407
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
MARCH 15, 1995**

POLE MOUNTED CAST ALUMINUM BOXES FOR TRAFFIC SIGNALS AND FIRE ALARM TERMINALS

SCOPE

This specification states the requirements for pole mounted, cast aluminum junction boxes to be used as enclosures for traffic signal and fire alarm multiple cable terminals.

GENERAL

(a) Specifications: The junction boxes must 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 will govern.

(b) Drawings: The drawing mentioned herein is a drawing of the Department of Streets and Sanitation, Bureau of Electricity, and will be interpreted as part of these specifications.

(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 must be submitted within fourteen (14) business days after request by the Department of Streets and Sanitation, Bureau of Electricity. If the bidder supplying the sample is awarded a contract, the referenced sample will be credited as part of the order if it meets all requirements of this specification.

(e) Workmanship: All junction boxes must be free of casting flaws and must have neat, smooth exterior surfaces. All holes must be accurately located and drilled to ensure interchangeability of all components.

DESIGN

(a) Drawing. The junction box must conform in detail to the dimensions and requirements shown on drawing number 832.

(b) Material. The body door and plate must 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 must 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 must 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, must 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 must be cast as shown in drawing number 832. The door must be hinged at the left with stainless steel hinge pins and must 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, must hold the door closed and maintain positive pressure against a sponge neoprene gasket cemented in place completely around the door jamb. The door must be finished and painted prior to cementing the gasket into its groove in the door.

(d) End Plate. A flat end plate must be furnished with each body casting. The plate must 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 must 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, must be furnished and installed in each junction box. The bracket must be cast from ANSI alloy 443.0 per ASTM B26.

(f) Gaskets. The gasketing between the body and the door must be of sponge neoprene and must be cemented in place after painting of the door. A cork gasket, 1/8 inch thick, must 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 must 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 must be of stainless steel.

(h) Painting. The exterior surfaces of the junction box must be properly cleaned and given one (1) coat of zinc chromate primer containing ten percent (10%) iron oxide and one (1) coat of enamel. The color of the enamel must be gloss black or as ordered. A color sample must be submitted and approved before manufacturing commences. The primer and enamel must be of an approved grade and quality.

(i) Packing. After the paint is thoroughly dry, and the junction boxes have been assembled, they must be suitably packed to prevent damage to painted surfaces during shipping and handling. All shipments must be fastened to, and shipped on, 48" x 48" hardwood, 4 way, non-returnable pallets. Total height must not exceed 64" and total weight must not exceed 2,000 pounds.

INSPECTION

An inspector representing the City of Chicago must have free access, at all times while work on these junction boxes is being performed, to all parts of the manufacturer's work which are concerned with their manufacture. The manufacturer must afford the inspector, without charge, all reasonable facilities to satisfy him that the junction boxes are being furnished in accordance with this specification. The final inspection must be made at the point of delivery. Any junction boxes rejected must be removed and disposed of by the Contractor at his sole expense.

THIS SPECIFICATION MUST NOT BE ALTERED

MAST ARM MONOTUBE

SPECIFICATION 1454
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
MAY 24, 2001

MAST ARM: MONO-TUBE

SUBJECT

1. This specification states the requirements for tapered, tubular, 7 gauge steel mono-tube arm with mounting brackets. The arm will support traffic signals and signs.

GENERAL

2. (a) Specifications. The arms must 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 will govern.

(b) Acceptance. Arms not conforming to this specification will not be accepted.

(c) Bidders Drawings. Bidders must submit with their bids detailed scale drawings of the mast arm showing actual dimensions, details, and welds. Shop drawings must be original engineering drawings created by the manufacturer. The drawings must show every dimension necessary to show how all parts will fit each other and be properly held in assembly. These drawings must also be submitted in electronic format, preferably Microstation 95, if so requested by the City.

(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.

Sample. If requested by the City, one complete mast arm of the manufacture intended to be furnished must be submitted for review by the Commissioner within 14 working days of receiving Notice-to-Proceed.

Warranty. The manufacturer must warrant the performance and construction of the mast arms 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 three years after the mast arms have been delivered. This will be interpreted particularly to mean structural or mechanical failure of any element or weld, or failure of any portion of the painting system. The warranty must be furnished in writing guaranteeing material replacement including shipment, free of charge to the City. The Commissioner will be the sole judge in determining which replacements are to be made and the Commissioner's decision will be final.

STANDARDS

3. (a) Assembly. Each arm must consist of a tubular tapered steel shaft, mounting brackets, an aluminum cap, and all mounting hardware.
- (b) Interchangeability. Members of each arm type must 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 arm.
- (c) Design. Each arm must meet the requirements as shown on Standard Drawing 870.

ARMS

4. (a) Arm Size. The outside diameters of the arm of each size must be as listed in Standard Drawing 870.
- (b) Material. The arm must be fabricated from one length of No. 7 Standard gauge steel meeting the requirements of ASTM A606 for low alloy high strength coil steel, which, after fabrication, must possess an ultimate tensile strength of not less than 70,000 psi and a yield strength of not less than 60,000 psi, in accordance with ASTM A595, Grade C. Chemistry of the steel must be such as to insure resistance to atmospheric corrosion superior to that of ordinary copper bearing steel. Material certification is required. Manufacturer's steel meeting the specified physical and chemical requirements, and approved by the Commissioner, will be accepted.
- (c) Fabrication. The arm must be fabricated with not more than one (1) longitudinal weld. The weld must be ground smooth so that it is virtually invisible. There must be no lateral welds in the arms other than where the arms are welded to the steel clamp. The completed, unpainted arms must have smooth external surfaces free from protuberances, dents, cracks or other imperfections marring their appearance. Each arm must be straight and centered on its longitudinal axis.
- (d) Clamp. The arm clamp must be of low alloy, high strength steel as noted in Section 4 (b). The clamp must be constructed as shown on Standard Drawing 870.
- (e) Structural Requirements. The mast arm must be manufactured in accordance with AASTHO's 1994 version of the "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals". The arm assembly must be designed to meet AASTHO's 1994 criteria for 80 MPH wind loading with a 30% gust factor. The arms must be designed appropriately for traffic signal applications within the City of Chicago.

CAP

5. (a) Design. The arm cap must 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 must meet the skirted portion of the arm in a smooth filet, the skirt must enclose the top 7/8" inches of the arm. Three stainless steel, or other similar approved material, set screws not less than 3/4 inches long must be equally spaced in tapped holes around the skirt and must hold the cap securely in place on the arm.

(b) Material. The cap must be of aluminum alloy 356-F per ASTM B108. It must have smooth surfaces, neat edges and corners and be free from fins, holes or other casting flaws.

(c) Finish. Tops must be painted as herein specified.

HARDWARE

6. All the hardware necessary to complete the assembly of the arm must be furnished. All hardware must be stainless steel, or equal corrosion-resistant non-seizing metal, subject to approval.

WELDING

7. (a) General. Every welded joint must 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 must submit with his proposal a drawing showing the sizes and types of welds, must state the type of electrode, and must describe the welding methods, he proposes to use in fabricating the arm.

(b) Testing. All welds of five percent (5%) of the arms in every lot must be inspected for penetration and soundness of the welds by the magnetic particle inspection method or by radiography. Acceptance or rejection must be governed by the same conditions as in Section 9. If the magnetic inspection process be used, the dry method with the direct current must be employed. All transverse welds must 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 must be washed with an alkaline detergent to remove any oils or grease.

(b) Metal Cleaning. All exterior metal surfaces must 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-SP 10.

(c) Chemical Pretreatment. The cleaned metal surfaces must then be treated with a hot, pressurized iron phosphate wash and must be dried by convection heat.

(d) Exterior Coat. A thermosetting, weathering, Polyester powder coat must be applied electrostatically to all cleaned and treated surfaces to a uniform eight (8) mil thickness in a one coat application. This powder coat must 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 Commissioner judges such alternate to be equal to the coating herein specified.

(f) Interior Coat. The interior metal surfaces must be powder coated with a thermoplastic hydrocarbon resin containing corrosion inhibitors. The resin must be formulated for application over untreated metal surfaces. The resin must be applied at a temperature of approximately 200°F to a minimum thickness of three (3) mils. The interior thermoplastic coat must overlap the interior, thermosetting base coat by approximately six (6) inches. Alternate interior coatings may be used subject to prior approval of the Commissioner.

(g) Durability. Both the exterior and interior coats must 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 must be scribed with an "X" down to bare metal.

(h) Coating Measurement. Measurement of coating thickness must 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 must not be less than 7.0 mils.

(i) Color. Color must be gloss black unless noted otherwise in the order. A paint chip must be submitted for approval prior to fabrication.

ARM TEST

9. (a) General. All completed arms must be available for testing for maximum deflection and set. Unless specifically authorized in writing, all tests must be made at the works of the manufacturer. A record of every test must be made and a certified copy of the test record must be submitted to the Purchasing Agent before the arms are shipped. If requested by the City, an engineer from the Bureau of Electricity, Engineering Division, will be present during the testing procedures.

(b) Lot. Tests for deflection and set must be made upon five (5%) percent of all the arms in every lot (two (2) min.). If any of the arms in any lot fail to meet the test, an additional three (3%) percent of the arms of the same lot must be tested (two (2) min.). If any of these arms fail to meet the test requirements, the entire lot will be subject to rejection, except that the manufacturer may subject each arm in the lot to the test, and those which fulfill the requirement will be accepted. After testing, each weld must be inspected by the magnetic particle method to determine that the welds have not been affected.

(c) Requirements. With arm rigidly anchored, a test load as indicated in the table in Standard Drawing 870 must be applied at a point approximately two feet (2'0") from the free end. The load must be applied at right angles to the center line of the arm and in the same vertical plane. The deflection must not be greater than that indicated. Within one (1) minute after the test load is released, measurement must be made of the set taken by the arm. The deflection measurement device must be reset to zero and the test load must be reapplied. The deflection must not change from the deflection noted in the first test by more than $\pm 5\%$. No measurable set must be noted within one (1) minute after test load is released.

(d) The contractor must include in his bid, the cost of travel, food and lodging for one (1) engineer. Travel for 150 miles or greater must utilize a major airline. Lodging accommodations must be equal to those provided at a Holiday Inn. The engineer must be given ten (10) working days notice of travel arrangements.

PACKAGING

10. (a) **General.** The arms must be shipped in twelve (12) arm bundles. Each arm must be individually wrapped so that the arm can be bundled for shipping and unbundled for delivery to the job site without damaging the arm or its finish.

(b) **Bundles.** The bundles must consist of twelve (12) arms 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 must 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 arms 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 City of Chicago. The bundles should be capable of being stacked two (2) high without breaking, or shifting of the contents. Each bundle must be capable of being lifted by a fork lift truck or crane and the bundles must be shipped on a flat bed truck to facilitate unloading. Each arm wrapping must be clearly labeled indicating the mast size, i.e. 30' SIGNAL MAST ARM.

(c) **Hardware.** The hardware must be shipped with each bundle and packaged in twelve (12) sets of four (4) each. The package must be placed in a prominent position to facilitate accessibility, and must 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. Arm caps must be attached at the manufacturer's facilities, or be packed separately in a manner similar to the other hardware, and the same payment conditions will prevail. Cracked, broken or chipped parts will be considered as an incomplete delivery as regards payment.

(d) **Delivery.** All mast arms will be delivered to the Bureau of Electricity storage yard at 4101 South Cicero Avenue in Chicago, or to another location within the City as indicated on the order.

INSPECTION

11. An inspector representing the City must have free entry at all times, while the work on the contract is being performed, to all parts of the manufacturer's works which concern the manufacture of arms. The manufacturer must afford the inspector, without charge, all reasonable facilities to satisfy him that the arms are being furnished in accord with these specifications. The final inspection must be made at point of delivery. Any arms rejected as defective must be removed and disposed of by the contractor at his sole cost.

THIS SPECIFICATION MUST NOT BE ALTERED

SELF SUPPORTING SECONDARY CABLE

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 must be bare hard drawn, copper wire meeting the requirements of the latest revision of ASTM B1.

(b) COVERED CONDUCTOR. The covered conductors must be stranded, soft drawn, copper meeting the requirements of the latest revision of ASTM B3.

(c) LAY. The lay of the stranded conductors must 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, must be inserted between the conductor and the covering with the color contrasting with the conductor. The conductor covering must be of such consistency that linemen will 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 the supplier's expense.

INSULATION

4. (a) Compound. The insulation must 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 must be circular and extruded concentrically over the conductor. It must 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.

- (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 must be maintained at $75^{\circ}\text{C} \pm 1^{\circ}\text{C}$, the insulation must 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 must 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 must 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 must pass the "Cold-Bend, Long-Time Voltage Test on Short Specimens" of ASTM D-470 except that the test must be at minus 55°C.

CABLE ASSEMBLY

5. (a) CABLING. The insulated conductors must 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 must be bound to the messenger without fillers. The binder wire or tape must have sufficient strength to support the assembly, but in no case will it be smaller than a #10 AWG equivalent. The binder must be flat without sharp edges. Its strength must be suitable for installation by the use of stringing blocks and must not itself tear, nor cut, or otherwise damage the conductor insulation. The binder wire must be applied with a left hand lay of five and one-half inches (5-1/2") ± 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 must 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 must be seven (7) strand. All stranding to be standard round or compressed only. Compacted stranding will not be acceptable.

TESTING

7. (a) GENERAL. Tests must 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, must apply. All tests must be conducted on cable produced for this order. Where cable insulation thickness precludes obtaining samples of sufficient size for testing, special arrangements must 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 must be conducted on samples taken every 25,000 feet or fraction thereof of each conductor size. In no case will 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 must be witnessed by an engineer from the Bureau of Electricity. In addition to these tests, the engineer must 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 must include in his bid, the cost of travel, food and lodging for one (1) engineer. Travel for 150 miles or greater must utilize a major airline. Lodging accommodations must be equal to those provided at a Holiday Inn. The engineer must be given ten (10) working days 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 will apply:

1. INSULATION OR JACKET TESTS. Samples must be taken from each reel and must 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 must be shipped on non-returnable reels which must be capable of withstanding, without damage, shipping, outside storage and handling during installation. "City of Chicago" must be clearly printed on one (1) outside reel flange, and the insulated conductors on the beginning end must not protrude beyond the reel flange. The bare neutral must be securely stapled on the outside of the flange. The dimension of the reel flange must not be larger than thirty-eight inches (38") in diameter, the drum sixteen inches (16"0) 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 must 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%) must not be shipped as they will not be accepted.

IDENTIFICATION

9. (a) MANUFACTURER'S IDENTIFICATION. A thread or other suitable marker must 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" must be imprinted on each phase conductor respectively at approximately two foot (2') intervals. On the four conductor cable, "600 volt -3" must be imprinted on the additional conductor with the phase identification on the other phase conductors to remain the same. The markings must have minimum height of one-eighth inch (1/8").

(c) REEL MARKING. Each reel must be tagged on both the inside and outside of one reel flange with the following information which must 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:

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 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.

(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 SIZE	STRANDING NO. OF STRANDS	INSULATION THICKNESS	JACKET THICKNESS	A-C TEST VOLTAGE	REEL LENGTH
AWG OR MCM		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 $100 \pm 1^\circ\text{C}$ 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 $70 \pm 1^\circ\text{C}$:

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**

INSULATION RESISTANCE . The insulated conductor shall have an insulation resistance value of not less than that corresponding to a constant of 50,000 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 D470.

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.

(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.

SECONDARY RACK, 2 OR 3 WIRE, WITH INSULATORS

**SPECIFICATION 1443
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
MAY 13, 1991**

SECONDARY RACK, 2 OR 3 WIRE, WITH INSULATORS

SUBJECT

1. This specification covers the requirements for 2 and 3 wire secondary racks complete with insulators for attachment to street lighting poles for the purpose of supporting aerial circuit wires.

GENERAL

2. (a) Specifications. Each 2 or 3 wire secondary rack must conform in detail to the requirements herein stated, and to the specifications of the American Society for Testing Materials, cited by A.S.T.M. Designation number, of which the most recently published revision will govern. Secondary racks not conforming to this specification will not be accepted.

(b) Sample. If requested, each bidder must submit with his proposal one complete sample secondary rack with insulators for approval by the Commissioner. The approved sample will be credited as part of the order. The sample must be submitted within fourteen (14) business days of such request.

(c) Guarantee. Secondary rack and pole clamps furnished under this specification must be guaranteed against failure from defects due to materials or workmanship for a period of one year after delivery.

SECONDARY RACK

3. (a) General Design. The secondary rack must be the medium duty type with extended back. It must be suitable for either 2 or 3 wire, as indicated in the bid proposal, with 8-inch spacing between centers of the clevises. Secondary racks furnished under this specification must be similar and the approval equal of Joslyn Mfg. and Supply Co. part number J767 for a two-wire rack and J768 for a three-wire rack.

(b) Back Section. The back section of the secondary rack must be made from C1010, hot rolled carbon steel strip of 1/8 inch thick; the steel to conform with ASTM Specification A 107. The back must be formed to the shape of an inverted trough, the flat portion of which must be approximately 1-1/4 inches in width. Mounting slots, 11/16 inch by 1-1/4 inch, must be longitudinally centered on the flat of the back section and located so as to coincide with the centers of the clevises, with additional slots provided at the top and bottom.

4. (c) Clevises. Clevises must be made from 1/8 inches thick steel strip of the same material as the back section, and so formed to fit the back snugly. The prongs of the clevis must be approximately 4 inches apart and formed to the shape of an inverted trough, the flat portion of which must be approximately 3/4 inch in width with the edges pitched at an angle of 30° with the flat portion. Each clevis must be fabricated in such a manner that the pitched edges of both prongs must slope in the same direction. The clevises must be riveted to the back section with two (2) 5/16 inch steel rivets.

(d) Rack Bolt. The rack bolt must be a 9/16 inch diameter button head bolt of C1040 steel conforming with the requirements of ASTM Specification A 107, complete with a 1/4 inch by 2 inch brass cotter pin at the bottom end. Centerline of the rack bolt must be located 4 inches out from the face of the back section.

(e) Spool Insulators. Spool insulators must be dry processed porcelain insulators similar to and the approved equal of Joslyn Mfg. and Supply Company No. J101 spool insulator.

FINISH

5. After fabrication, the secondary rack and all hardware must be hot dip galvanized overall in accordance with the requirements of ASTM specification A-155.

TESTS

6. At the discretion of the Commissioner, secondary racks furnished under this specification will be subject to determine compliance with the strength requirements of ANSI medium type secondary racks.

INSPECTION

7. An inspector representing the City must have free entry at all times while work under this specification is being performed, to all parts of the manufacturer's plant which will concern the manufacture of these secondary racks. The manufacturer must afford the inspector, without charge, all reasonable facilities to satisfy him that the secondary racks are being furnished in accord with these specifications. The final inspection must be made at point of delivery. Any secondary rack rejected or found defective because of material deficiency or workmanship must be removed and disposed of by the contractor at his sole cost.

THIS SPECIFICATION MUST NOT BE ALTERED

POLE: ANCHOR BASE, 3 AND 7 GAUGE

**SPECIFICATION 1447
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
REVISED OCTOBER 3 , 2001**

**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 luminaires and/or traffic signal mast arms and will be served by underground cables.

GENERAL

2. (a) Specifications. The poles must 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 will govern.

(b) Acceptance. Poles not conforming to this specification will not be accepted.

(c) Bidders Drawings. Bidders must submit with their bids detailed scale drawings of the mast showing actual dimensions, details, and welds. Shop drawings must be original engineering drawings created by the manufacturer. The drawings must show every dimension necessary to show how all parts will fit each other and be properly held in assembly. These drawings must also be submitted in electronic format, preferably Microstation 95, if so requested by the City.

(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.

Sample. If requested by the City, one completely assembled anchor-base pole of the manufacture intended to be furnished, must be submitted for review by the Commissioner within 14 working days of receiving Notice-to-Proceed.

Warranty. The manufacturer must warrant the performance and construction of the light poles 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 three years after the light poles have been delivered. This will be interpreted particularly to mean structural or mechanical failure of any element or weld, or failure of any portion of the painting system. The warranty must be furnished in writing guaranteeing material

replacement including shipment, free of charge, to the City. The Commissioner will be the sole judge in determining which replacements are to be made and the Commissioner's decision will be final.

STANDARDS

3. (a) Assembly. Each anchor base pole must consist of a steel mast with handhole entry, entry door with machine screws, grounding nut, mast base plate, top cap 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 must 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 must 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 must be as listed in Table A. The mast must be tapered at 0.14 inches per foot.

(b) Material. The mast must be fabricated from one length of No. 3, No. 7, or No. 11 Standard gauge steel meeting the material requirements of ASTM A606 for low alloy high strength coil steel, which, after fabrication, must possess an ultimate tensile strength of not less than 70,000 psi and a yield strength of not less than 60,000 psi, in accordance with ASTM A595, Grade C. Chemistry of the steel must be such as to insure resistance to atmospheric corrosion superior to that of ordinary copper bearing steel. Material certification is required. Manufacturer's steel meeting the specified physical and chemical requirements, and approved by the Commissioner, will be accepted.

(c) Fabrication. The mast must be fabricated with not more than one (1) longitudinal weld. The weld must be ground smooth so that it is virtually invisible. There must be no lateral welds in the masts other than where the masts are welded to the steel bases. The completed, unpainted masts must have smooth external surfaces free from protuberances, dents, cracks or other imperfections marring their appearance. Each mast must be straight and centered on its longitudinal axis.

(d) Base. The mast base must be a steel plate, of low alloy, high strength steel as noted in Par. 4 (b).

Plate Base. The base plate for each pole type must be as listed in Table "A". It must be fabricated from the same ASTM A606 low alloy, high strength steel as is used for the mast. After fabrication the steel must meet the requirements of ASTM A588. The mast must 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 must be made between the mast and the base at both the top and underside of the plate. Non-metallic removable bolt covers which completely cover the anchor bolts and nuts must be provided. The

covers must be attached with non-metallic screws or another type of non-seizing fastener, as approved by the Commissioner. The covers must enclose the anchor bolts and be secured in an approved manner. The base must 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 must be positioned so that no welds for the simplex attachments or the handhole opening will go through the seam.

Anchor Rod Openings. All anchor rod openings for each pole type must have a width as listed in Table "A". Each opening must be sized to have a circumferential slot length equal to 15 degrees of the circumference.

(e) Mast Arm Support Plates. The mast arm support plates will be made of cast steel conforming to the requirements for Grade 65-35 cast steel of ASTM A27, or equivalent, subject to approval. They must neatly fit the external surface of the mast. The upper mast arm support plate must have a hollow protuberance, the hole of which must 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 must 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 must be a two (2) bolt type as shown on Drawing No. 659.

(f) Provision for Ground. a 1/2"-13 square nut must 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 must be welded into a close fitting opening centered approximately 15 inches above the bottom of the base. The doorframe must be formed and welded of steel with a cross section of two and one-quarter(2-1/4) 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 must be four and three-quarter(4-3/4) inches; its internal vertical clearance must be seven(7) inches. Its upper and lower ends must be semi-circular meeting its straight sides tangentially. The radius of this opening must be two and three-eighths(2-3/8) inches. The vertical center line of the entry must be at a right angle clockwise from the vertical center line of the mast arm supports. The frame must have two welded tabs; one at the top and one at the bottom of the door frame. These tabs must be drilled to accept a 1/4" screw. The top hole must be located 13/16 of an inch from the top of the opening. The bottom hole must be located 13/16 of an inch from the bottom of the opening. Steel spring clips must be mounted to the tabs. These clips must be made to accept 1/4"- 20 machine screws. The 1/4"-20 allen head machine screws must have a button head. The screws must have a stainless steel core within a threaded nylon body. Other non-seizing types of screws and fasteners may be considered.(The above requirements apply to all pole masts except those with a 10 inch bolt circle. Poles with 10 inch bolt circles must have handhole openings of 3" by 5". All other requirements apply.)

(h) Door. The removable door must be formed of non-metallic material subject to approval of the Commissioner. It must fit the doorframe closely and be dished so that it will stay in proper position even if its locking screws must be slightly loosened. The door must be drilled top and bottom to accept the 1/4"-20 Allen head machine screws which will fasten the door to the doorframe. All doors must be interchangeable. Alternate methods will 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 must be attached immediately below the handhole, by mechanical means and not by adhesive, a stainless steel tag with a stamped or embossed legend which must include the pole outside diameter at the base, the overall length, and the gauge; i.e., 12.5" X 34'-6" X 3 gauge.

(k) Structural Requirements. The mast must be manufactured in accordance with AASTHO's 1994 version of the "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals". The shaft and base assembly must be designed to meet AASTHO's 1994 criteria for 80 MPH wind loading with a 30% gust factor. The poles must be designed appropriately for Chicago applications for both street lighting and traffic signal applications, including signal mast arms.

TOP

5. (a) Design. The mast top must be essentially conical with a globe-shaped upper-end and having a minimum wall thickness throughout of not less than 1/4 inch. The cone portion must meet the skirted portion of the top in a smooth filet, the skirt must enclose the top 7/8" inches of the mast. Three stainless steel, or other similar approved material, set screws not less than 3/4 inches long must be equally spaced in tapped holes around the skirt and must hold the top securely in place atop the mast. The design of the top must be similar to one shown on Drawing #11420A.

(b) Material. The top must be aluminum alloy 356-F per ASTM B108. It must have smooth surfaces, neat edges and corners and be free from fins, holes or other casting flaws. Non-metallic tops may be substituted if approved by the Commissioner.

(c) Finish. Tops must be painted as herein specified.

HARDWARE

6. All the hardware necessary to complete the assembly of the pole must be furnished. All hardware will be as specified elsewhere in these specifications. Hardware not specified elsewhere must be stainless steel, or equal corrosion-resistant non-seizing metal, or a non-metallic material subject to approval by the Commissioner.

WELDING

7. (a) General. Every welded joint must 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 must submit with his proposal a drawing showing the sizes and types of welds, must state the type of electrode, and must 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 must be inspected for penetration and soundness of the welds by the magnetic particle inspection method or by radiography. Acceptance or rejection will be governed by the same conditions as in Section 9. If the magnetic inspection process is to be used, the dry method with the direct current must be employed. All transverse welds must 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 must be washed with an alkaline detergent to remove any oils or grease.

(b) Metal Cleaning. All exterior metal surfaces must 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 must be the interior base section of the mast to a minimum height of twelve (12) inches.

(c) Chemical Pretreatment. The cleaned metal surfaces must then be treated with a hot, pressurized iron phosphate wash and must be dried by convection heat.

(d) Exterior Coat. A thermosetting, weathering, Polyester powder coat must be applied electrostatically to all cleaned and treated surfaces to a uniform eight (8) mil thickness in a one coat application. This powder coat must 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 Commissioner judges such alternate to be equal to the coating herein specified.

(f) Interior Coat. The interior metal surfaces must be powder coated with a thermoplastic hydrocarbon resin containing corrosion inhibitors. The resin must be formulated for application over untreated metal surfaces. The resin must be applied at a temperature of approximately 200°F to a minimum thickness of three (3) mils. The interior thermoplastic coat must overlap the interior, thermosetting base coat by approximately six (6) inches. Alternate interior coatings may be used subject to prior approval of the Commissioner.

(g) Durability. Both the exterior and interior coats must 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 must be scribed with an "X" down to bare metal.

(h) Coating Measurement. Measurement of coating thickness must 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 must be not less than 7.0 mils.

(i) Color. Color must be gloss black unless otherwise noted in the order. A color sample must be submitted for approval prior to fabrication.

MAST TEST

9. (a) **General.** All completed masts must be available for testing for maximum deflection and set. The masts must meet the structural requirements of section 4(k). Unless specifically authorized in writing, all tests must be made at the works of the manufacturer. A record of every test must be made and a certified copy of the test record must be submitted to the Purchasing Agent before the masts are shipped. An engineer from the Bureau of Electricity, Engineering Division, must be present during the testing procedures, if so requested by the City.

(b) **Lot.** Tests for deflection and set of the mast and of the mast arm supports must be made upon five (5%) percent of all the masts in every lot (two (2) min.). The selection of masts for testing must be random from the entire completed lot. 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 must be tested (two (2) min.). If any of these masts fail to meet the test requirements, the entire lot will 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 must be inspected by the magnetic particle method to determine that the welds have not been affected.

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

(d) **Mast Arm Support (simplex) Requirements.** With an appropriate mast arm firmly attached to the mast, a test load of 300 pounds must 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 on the mast must be tested by the magnetic particle method to determine that they have not been affected.

(e) The contractor must include in his bid, the cost of travel, food and lodging for one (1) engineer. Travel for 150 miles or greater must utilize a major airline. Lodging accommodations must be equal to those provided at a Holiday Inn. The engineer must be given ten (10) working days notice of travel arrangements.

PACKAGING

10. (a) **General.** The poles must be shipped in twelve (12) pole bundles. Each pole must be individually wrapped so that the pole can be bundled for shipping and unbundled for delivery to the City without damaging the pole or its finish.

(b) **Bundles.** The bundles must 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 must 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 City of Chicago. The bundles should be capable of being stacked two (2) high without breaking, or shifting of the contents. Each bundle must be capable of being lifted by a fork lift truck or crane and the bundles must be shipped on a flat bed truck to facilitate unloading. Each pole wrapping must be clearly labeled indicating the pole size, i.e. 34'6", 7 GAUGE, STEEL POLE, 15" B.C.

(c) Hardware. The bolt covers and their attachment devices must be shipped with each bundle and packaged in twelve (12) sets of four (4) each. The package must be labeled and placed in a prominent position to facilitate accessibility, and must 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 must 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 chipped parts will be considered as an incomplete delivery as regards payment.

Delivery. All poles will be delivered to the Bureau of Electricity storage yard at 4101 South Cicero Avenue in Chicago, or to another location within the City as indicated on the order. Light pole information must include any recommendations of the manufacturer for storage.

INSPECTION

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

TABLE A

POLE	GAUGE	BOLT CIRCLE	ANCHOR ROD	BASE PLATE	TEST LOAD	MAX. DEF.	MAX. SET	DRAWING
7.67"x12.5"x34'6"	3	16.5"	1.5"	1.75"	3200#	22"	2.5"	827
6.17"x11"x34'6"	3	17.25"	1.25"	1.5"	2500#	26"	2.5"	824
5.17"x10.0"x34'6"	3	15.0"	1.25"	1.5"	2000#	30"	2.5"	808
5.17"x10.0"x34'6"	7	15.0"	1.25"	1.5"	1500#	30"	2.5"	808
3.95"x8.5"x32'6"	3	11.5"	1.25"	1.5"	1500#	33"	2.5"	763
3.95"x8.5"x32'6"	7	11.5"	1.0"	1.25"	1200#	33"	2.5"	762
3.87"x8.0"x29'6"	3	10.0"	1.0"	1.5"	1500#	28"	1.0"	657
3.87"x8.0"x29'6"	7	10.0"	1.0"	1.25"	1200#	28"	1.0"	656
4.15"x8.0"x27'6"	3	10.0"	1.0"	1.5"	1500#	23"	1.0"	655
4.15"x8.0"x27'6"	7	10.0"	1.0"	1.25"	1200#	23"	1.0"	654
4.20"x7.0"x20'0"	3	10.0"	1.0"	1.0"	1500#	13"	1.0"	653
3.70"x6.5"x20'0"	11	10.0"	1.0"	1.0"	800#	14"	1.0"	652

THIS SPECIFICATION MUST NOT BE ALTERED

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

**SPECIFICATION 1450
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
REVISED SEPTEMBER 25, 2001**

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

2. (a) Specifications. The mast arms must 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 will 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) Bidders Drawings. Bidders must submit with their bids detailed scale drawings of the mast arms and attachments showing actual dimensions, details, and welds. Shop drawings must be original engineering drawings created by the manufacturer. The drawings must give every dimension necessary to show how the parts will fit each other and be properly held in assembly. These drawings must be submitted in electronic format, preferably Microstation 95, if so requested by the City.

(e) Sample. One complete mast arm of each size and of the manufacture intended to be furnished must be submitted within 14 business days upon request of the Commissioner.

(f) Warranty. The manufacturer must warrant the performance and construction of the mast arms 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 three years after the mast arms have been delivered. This will be interpreted particularly to mean structural or mechanical failure of any element or weld, or failure of any portion of the painting system. The warranty must be furnished in writing guaranteeing material replacement including shipment, free of charge to the City. The Commissioner will be the sole judge in determining which replacements are to be made and the Commissioner's decision will be final.

DESIGN

3. (a) 4-Foot Mast Arm. Each 4-foot mast arm must be fabricated from a continuous, single piece, two (2) inch "extra strong" steel pipe conforming to the requirements of ASTM A53, Table X2. It must conform in detail with the mast arm shown on Drawing Number 661.

(b) 8-Foot Mast Arm. Each 8-foot mast arm must be fabricated from a continuous, single piece, two (2) inch "extra strong" steel pipe conforming to the requirements of ASTM A53, Table X2. It must conform in detail with the mast arm shown on Drawing Number 654.

(c) 12-Foot Mast Arm. Each 12-foot mast arm must be fabricated from two (2) continuous, single piece, two (2) inch "standard" steel pipes conforming to the requirements of ASTM A53, Table X2. It must conform in detail with the mast arm shown on Drawing Number 839.

(d) 15-Foot Mast Arm. Each 15-foot mast arm must be fabricated from two (2) continuous, single piece, two (2) inch "standard" steel pipes conforming to the requirements of ASTM A53, Table X2. It must 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 will 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 must 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. The attachment must conform to the details shown on Standard Drawing 724. Provision must be made for fastening the attachment to each mast arm support by two special screws and washers as noted in Section 6.

(f) Entryway for Wires. A drilled opening lined with a neoprene grommet having inserted therein a neoprene plug must be provided on the underside of the upper member of all arms approximately three inches from the point of attachment. The clear opening must not be less than 5/8 inch in diameter. Its design must be submitted for approval by the Commissioner or his authorized representative.

(g) Mast Arm Members. All mast arm members must conform with the type of steel required for the arm specified. The members must 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 must be smooth and even without protrusions, nicks, holes or other imperfections.

PAINTING

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

(b) Metal Cleaning. All exterior metal surfaces must 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 must be one to two inches of the interior section of the mast arm.

(c) Chemical Pretreatment. The cleaned metal surfaces must be treated with a hot, pressurized iron phosphate wash and must be dried by convection heat.

(d) Exterior Coat. A Thermosetting, polyester powder coat must be applied electrostatically to all cleaned and treated surfaces to a uniform eight (8) mil thickness in a one coat application. This powder coat must 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 Commissioner judges such alternate to be equal to the coating herein specified.

(f) Interior Coat. The interior metal surfaces must be powder coated with a thermoplastic hydrocarbon resin containing corrosion inhibitors. The resin must be formulated for application over untreated metal surfaces. The resin must be applied at a temperature of approximately 200°F to a minimum thickness of three (3) mils. The interior thermoplastic coat must overlap the interior, thermosetting base coat by approximately one (1) inch. Alternate interior coatings may be used subject to prior approval of the Commissioner.

(g) Durability. Both the exterior and interior coats must 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 must 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 must be not less than 7.0 mils.

(i) Color. Color must be gloss black, unless otherwise specified in the order. A color chip sample must be submitted for approval prior to fabrication.

WELDING

5. (a) Standards. Every weld must 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 must submit with his proposal a drawing showing the sizes and types of welds, must state the type of electrode, and must describe the welding methods he proposes to employ in fabricating the mast arm.

(b) Testing. The welds must 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 must 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, must 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 must 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, must 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, must 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, must 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 must be tested. If any of these mast arms fail to meet the test requirements the entire lot will 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) An Engineer from the Bureau of Electricity will be present during the testing procedures, if so requested by the City. The contractor must include in his bid, the cost of travel, food and lodging for one (1) engineer. Travel for 150 miles or greater must utilize a major airline. Lodging accommodations must be equal to those provided at a Holiday Inn. The engineer must be given ten (10) working days notice of travel arrangements.

PACKAGING

8. (a) General. The arms must be shipped in bundles. Each arm must be individually wrapped so that the arm can be bundled for shipping and unbundled for delivery without damage to the arm or its finish. Materials such as lumber(2"x4" min.), non-marring banding, and other appropriate bundling materials must be used to make a rigid, long lasting, bundle capable of being handled , shipped and stored without shifting or breaking of the contents. Any bundles, in which either the mast arms 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 at no cost to the City. Each bundle must be capable of being lifted by a fork lift truck or crane and the bundles must be shipped in a flat bed truck to facilitate unloading. Each arm wrapping must be clearly labeled indicating the arm size, i.e. 8' STEEL LUMINAIRE MAST ARM.

(b) The hardware must be shipped with each bundle. The package must be labeled and placed in a prominent position to facilitate accessibility, and must be attached to, or within, the bundle in such a manner as to assure safe delivery.

(c) All mast arms will be delivered to the Bureau of Electricity storage yard at 4101 South Cicero Avenue in Chicago, or to another location within the City as indicated on the order.

THIS SPECIFICATION MUST NOT BE ALTERED

ROUND MANHOLE FRAMES AND COVERS

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

ROUND MANHOLE FRAMES AND COVERS 24 INCH AND 30 INCH DIAMETER

SCOPE

The Contractor must furnish and deliver F.O.B., City of Chicago, 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 must 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 will 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 must be interpreted as part of these specifications. The FRAMES AND COVERS must each conform in detail to the design shown on Drawings 872, 874 and 10927.

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

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

Workmanship: The frames and covers must 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 indicate. In addition, 24" & 30" covers must fit existing 24" & 30" frames, as shown on drawings 872, 874 and 10927. The castings must be neat, true to pattern and free from cracks and casting flaws. No welding of defective castings will be permitted nor must the castings be painted.

SAMPLE

Upon request, one complete manhole frame and cover of the manufacture intended to be furnished must be submitted within fourteen (14) business days after the bid opening date. If the Bidder supplying the samples is awarded a contract, the samples delivered will be credited as part of the order. The samples must be delivered to the Bureau of Electricity Storeroom, 4101 South Cicero Avenue, Chicago, Illinois.

MATERIAL

The frames and covers must 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 must be made and tested for tensile and transverse strength in accordance with ASTM A48. The Metal must be tested at the works of the manufacturer. The manufacturer must furnish a certified copy of all test data sheets to the City prior to delivery of the castings. Where the number of castings on a single order exceeds four hundred (400), a representative from the Bureau of Electricity must witness these tests. Frames and covers must each be considered a separate casting for determining the requirement of witness testing.

The manufacturer must include in his bid the cost of travel, food and lodging for one (1) representative. Travel for 150 miles or greater must utilize a major airline. Lodging arrangements must be equal to those provided at a Holiday Inn. The engineer must be given ten (10) working days' notice of all travel arrangements.

RIGID STEEL CONDUIT

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

RIGID STEEL CONDUIT (HOT DIPPED GALVANIZED)

1. SCOPE

This specification describes rigid steel conduit, zinc coated.

2. GENERAL REQUIREMENTS

Rigid steel conduit must be zinc coated by the hot-dip process. Conduit must 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.

3. STANDARDS

The conduit must be manufactured according to Underwriters Laboratories Standard U.L. - 6 and must meet ANSI Standard C 80.1 and the requirements of NEC Article 244. In addition, conduit must be recognized as an equipment grounding conductor as per NEC Article 250.118(2). There will be no exceptions to meeting these standards.

4. STEEL

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

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

5. THREADING AND CHAMFERING

Each length of conduit, and each nipple, elbow and bend must be threaded on both ends, and each end must 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 must be as indicated in Table 2. The perfect thread must be tapered for its entire length, and the taper must be 3/4 inch per foot.

6. ZINC COATING

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

The conduit must 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 required.

7. COUPLINGS

Couplings must comply with the following requirements:

- (a) The outside surface of couplings must be protected by means of a zinc coating. The zinc content of the coating on the outside surface must be equivalent to a minimum thickness of 3.4 mils.
- (b) Couplings must 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 must be chamfered to prevent damage to the starting threads.
- (d) The outside diameter, length and weight of coupling must be as indicated in Table 3.
- (e) Couplings must be straight tapped, except that the 2 ½ inch and larger sizes may be taper-tapped.

8. PACKING AND IDENTIFICATION

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

- 1) conduit size
- 2) footage of bundle
- 3) gross weight of bundle

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

9. TEST AND INSPECTION

Galvanized rigid conduit must 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 must be sufficiently elastic to prevent their cracking or flaking off when a finished sample of ½ 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 ½ inches.

Tests on sizes other than ½ inch may be conducted within one year after the time of manufacture. If such tests are conducted, the conduit must 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 must 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 will be considered as meeting requirements as follows; the zinc content of the coating on the outside surface must be equivalent to a minimum thickness of 3.4 mils).

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

Each length of conduit must 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 must be tested, both of which must 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, must be removed by the Contractor at his own expense; and such pipe so removed by the Contractor must be replaced by him within ten (10) days of such rejection with other pipe which will conform to these specifications.

TABLE 1

Design Dimension and Weights of Rigid Steel Conduit

Nominal or Trade Size of Conduit	Inside Diameter	Outside Diameter	Wall Thickness	Length Without Coupling	Minimum Weight of Ten Unit Lengths With Couplings
<u>(Inches)</u>	<u>(Inches)</u>	<u>(Inches)</u>	<u>(Inches)</u>	<u>(Feet & Inches)</u>	<u>(Pounds)</u>
½	0.622	0.840	0.109	9-11 ¼	79.00
¾	0.824	1.050	0.113	9-11 ¼	105.0
1	1.049	1.315	0.133	9-11	153.0
1 ¼	1.380	1.660	0.140	9-11	201.0
1 ½	1.610	1.900	0.145	9-11	249.0
2	2.067	2.375	0.154	9-11	334.0
2 ½	2.469	2.875	0.203	9-10 ½	527.0
3	3.068	3.500	0.216	9-10 ½	690.0
3 ½	3.548	4.000	0.226	9-10 ¼	831.0
4	4.026	4.500	0.237	9-10 ¼	982.0

NOTE: The applicable tolerances are:

Length: + ¼ inch (without coupling)

Outside diameter: + 1/64 inch or -1/32 inch for the 1 ½ inch and smaller sizes,
 ± 1 percent for the 2-inch and larger sizes.

Wall thickness: - 12 ½ percent

TABLE 2

Dimensions of Threads

Nominal or Trade Size of Conduit (Inches)	Threads per Inch	Pitch Diameter at end of Thread (Inches) Tapered 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 (INCHES)	Outside Diameter (INCHES)	Minimum Length (INCHES)	Minimum Weight (POUNDS)
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

THIS SPECIFICATION MUST 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.

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 ½" 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 dynamometer, 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.

GROUND RODS

**SPECIFICATION 1465
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
REVISED SEPTEMBER 16, 2004**

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 must be copper clad, stainless steel rods suitable for driving into the ground with deformation of the rod or scoring, separation or other deterioration of the copper cladding.

3. DESIGN

(a) Ground rods must be made of stainless steel core suitable for driving into the earth without deformation.

(b) A heavy, uniform covering of electrolytic copper must be (10 mil), metallurgically bonded to the stainless steel core to provide a corrosion resistant, inseparable bond between the steel core and the copper overlay.

(c) The rod must be processed to work harden the copper providing a scar resistant surface.

(d) The finished rod must be of uniform cross-section; straight, and free of nicks, cuts or protuberances.

(e) The rod must be pointed at one end and chamfered at the other.

(f) All ground rods must be three-quarter inches (3/4") in diameter. The length must be as specified elsewhere. The length of the rod must be clearly and permanently marked near the top of the rod (chamfered end).

(g) All ground rods must conform to U.L. 467 and must be listed as such.

(h) All ground rods must have ground clamp capable of accommodating a No. 6 AWG Copper Wire.

4. TESTING

General. Before final inspection, the electrical equipment, material and work must be tested. Tests may be made progressively as parts of the work are completed or may be when the work is complete. Tests must be made in the presence of the Engineer. Items which fail to test satisfactorily must be repaired or replaced. Tests must include checks of control operation, system voltages, cable insulation and ground resistance and continuity. The forms for recording test readings will be available from the Engineer. The equipment must have the following minimum ranges and accuracies:

<u>Test</u>	<u>Type of Meter</u>	<u>Accuracy</u>
Voltage	Multimeter	+/- 2% of reading
Insulation of Resistance	Megohmmeter	+/- 1% of reading
Current	Ammeter	+/- 1% of reading
Ground Continuity	Low Ohm Meter	+1 least significant digit

Meters must be calibrated within the last year. Verification in the form of calibration certification documents must be made available upon request of the Engineer.

Voltage Measurements. Voltages in the cabinet from phase to phase and phase to neutral at no load end and at full load must be measured and recorded. Voltage readings at the last termination of each circuit must be measured and recorded.

Insulation Resistance. Insulation resistance to ground of each circuit at the cabinet, with all loads connected must be measured and recorded.

On tests of new cable runs, the readings must exceed 50 megohms for phase and neutral conductors with a connected load over 20 A and must exceed 100 megohms for conductors with a connected load of 20 A or less.

On tests of cable runs which include cables which were existing in service prior to this contract, the resistance readings must be the same or better than the readings recorded at the maintenance transfer at the beginning of the contract. Measurements must be taken with a megohm meter approved by the Engineer.

Loads. The current of each circuit, phase main, and neutral must be measured and recorded. The Engineer may direct reasonable circuit rearrangement. The current readings must be within ten percent of the connected load based on equipment ratings.

Ground Continuity. Resistance of the system ground as taken from the farthest extension of each circuit run from the conductor (i.e. check of equipment ground continuity for each circuit) must be measured and recorded. Readings must not exceed 2.0 Ohms regardless of the length of the circuit.

Resistance of Grounding Electrodes. Resistance to ground of all grounding electrodes must be measured and recorded. Measurements must be made with a ground tester during dry soil conditions as approved by the Engineer. Resistance to ground must not exceed 10 Ohms.

Test Data. The Contractor must provide the Engineer with a written report including the following:

Date of test

Number of Days since last rain

Soil condition at the time of the test

Diagram of test set-up showing distances between test equipment and grounding electrodes

Make, model and calibration date of test equipment

Tabulation of measurements taken and calculations made

5. ACCEPTANCE

(a) The contractor must furnish one sample of the ground rod proposed to be furnished within fourteen business days from receipt of notice. The approved sample must be the standard, in all respects, to which all ground rods furnished must conform. The accepted ground rod will be credited as part of the order.

(b) The sample ground rod must be delivered to the Engineer of Electricity, 2451 S. Ashland Avenue, Chicago, Illinois 60608.

(c) Ground rods not accepted must be removed at the sole expense of the contractor.

THIS SPECIFICATION MUST NOT BE ALTERED

ROD: ANCHOR, STEEL, WITH HARDWARE

**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 must conform in detail to the requirements herein stated, and to the specifications of the American Society for Testing and Materials cited by ASTM Designation Number, of which the most recently published revision will 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 must be fabricated in conformity with City of Chicago drawings numbered 806, 811, 830 and 844.

(b) Material. The rods must be fabricated from cold rolled carbon steel bar meeting the requirements of ASTM Specification A-36, except that the Specification must be modified to provide a minimum yield point of 55,000 psi (379 MPa).

(c) Thread. The straight end of each rod must be threaded as shown on City of Chicago drawing for that size rod, and must be American Standard, National Coarse.

HARDWARE

4. Hardware furnished with the anchor rod must be as shown on the applicable drawing. It must include two (2) hexagonal nuts, American Standard Regular, two (2) flat washers, type B, series W, and one (1) lock washer, steel, helical spring. The nuts must have a Class 2 or 3 fit.

FINISH

5. (a) Galvanizing. The threaded end of each rod must be hot dipped galvanized for the distance shown on the applicable drawing. The thickness of the galvanized coating must not be less than 0.0021 inches. Each hexagonal nut and washer must 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 must 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 must be coated with heavy No-Ox-Id or equal rust inhibiting greasy compound.

TESTS

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

INSPECTION

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

THIS SPECIFICATION MUST NOT BE ALTERED

CONTROLLER TRAFFIC SIGNAL, PRE-TIMED, SOLID STATE

**SPECIFICATION 1469
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
REVISED JUNE 1, 2000**

TRAFFIC SIGNAL CONTROLLER AND CABINET LOCAL AND MASTER TYPES

1. GENERAL REQUIREMENTS

1.1 This specification details the requirements for traffic signal control equipment for use in the City of Chicago.

1.2 Within fourteen(14) business days from receipt of notice, the contractor must provide a sample to the General Superintendent of Electrical Operations, Bureau of Electricity, 2451 South Ashland Avenue, Chicago, Illinois 60608. The sample must consist of the controller, cabinet, load switches, conflict monitor and all appurtenant wiring and equipment completely assembled as a working unit. This sample must be regarded as a finished production sample and conformance or non-conformance of the bid to these specifications must be based on the sample submitted. No subsequent modifications to the production sample will be allowed. The sample must become the property of the City of Chicago with a suitable credit issued to this contract.

1.3 All tests as outlined herein must be regarded as minimum requirements. The contractor must submit his testing procedure for approval prior to performing any testing functions. Upon successful completion of all testing, certified test reports must be submitted for each unit. Units not successfully passing these tests or lacking proper documentation will be rejected.

1.4 Standards. Equipment furnished under this specification must meet the appropriate requirements of the following standards, as required within the body of this specification:

American Society for Testing and Materials (ASTM)
Manual on Uniform Traffic Control Devices (MUTCD)
National Electrical Manufacturers Association (NEMA)
Occupational Safety and Health Administration (OSHA)
Underwriters Laboratories (UL)

1.5 Definitions. Where referenced in the specification, the following definitions will apply:

1.5.1 Approval. Approval will mean approval in writing by the Commissioner of Streets and Sanitation, or his duly authorized representative.

2. MATERIALS AND EQUIPMENT REQUIREMENTS

2.1 CONTROLLER

2.1.1 Power Source. The controller must operate on 120 volt, 60 cycle, single phase, alternating current.

2.1.2 Packing. Each controller, with all its component parts, must be suitably packed in a single container in such a manner as to prevent damage to the contents in shipment and handling.

2.1.3 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, must be furnished to the Bureau of Electricity for approval prior to the first shipment of controllers. All information, including photos and schematics, must reference to the controller being furnished on this contract and must be a high quality, completely legible reproduction. Upon approval, one complete set of data must be furnished with each controller.

2.1.4 Warranty. The contractor must warranty the performance and construction of these traffic signal controllers to meet the requirements of this specification, and must 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 solid state devices. In the event of defects or failures during these periods, the contractor must 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.

2.1.5 Pre Shipment Testing. The manufacturer of the controller must 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 must be certified by the manufacturer with supportive documentation and must include the device serial number, dates and times of test periods, and results. Any failed, or nonconforming components must be replaced at this time. The 72 hour function test described in this specification, must 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 must 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 must be replaced and the test repeated in its entirety. Certification of these tests must 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.

2.1.6 Manufacturer. The manufacturer of these controllers must demonstrate a knowledge of past production, or have been actively engaged in the sale and/or service of traffic signal controllers herein described, as demonstrated by a submitted list of comparable projects.

2.2 CONTROLLER TIMING

2.2.1 Controller timing must be accomplished with solid state digital timing referenced to a 60 Hertz power source.

2.2.2 The time cycle must 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.

2.2.3 The cycle length must be capable of operating up to 255 seconds.

2.2.4 The controller must provide consecutive divisions of the time cycle hereinafter termed "intervals", during which combinations of signal indications do not change.

2.2.5 The controller must provide a minimum of 24 consecutive intervals.

2.2.6 Interval set times must be provided in both one-tenth (1/10) second steps and in one (1) second steps.

2.2.7 Offsets must be set in one (1) second steps.

2.2.8 Separate time settings must 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 (up to four) within an interval must be provided.

2.2.9 The front panel of the controller must contain a display which must show the interval number, interval time, and offset for any dial as well as the currently active dial, depending upon the keyboard selection.

2.2.10 All timing entries must be made from a keyboard mounted on the controller front panel. It must be arranged such that a security access code is required before timing entries can be initiated. Two (2) security access by-pass codes must also be provided, one of which will initiate and the other negate this requirement.

2.2.11 Offset Correction. The controller must be capable of offset correction by both the dwell and short way methods. When the dwell method is used, the controller must be capable of a dwell time of up to one-half of the cycle length. Dwell time must be programmable. When the short way method is used, it must be possible to exclude intervals from timing variation.

2.2.12 Manual Operation. Operation of the controller by manual control must 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 must also be possible to guarantee that certain user defined intervals must time out as normal before advancing to the next interval.

2.2.13 Housing. The controller must 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 must be available for viewing by the use of front panel switches. Individual plug-in circuit boards and "mother" boards must be of moisture resistant design and construction.

2.2.14 Replacement. The controller must be capable of being replaced with an identical unit by the use of a standard M.S. type connector.

2.2.15 Marking. The circuit reference designation for each component on each printed circuit board must be clearly marked immediately adjacent to the component. Each board must have a unique serial number for identification purposes.

2.3 SIGNAL CIRCUIT SWITCHING

2.3.1 Interval Programming. Timer units must be supplied with either EEPROM or non-volatile RAM signal drive circuit programming means to allow for the arrangement and rearrangement of signal output interval sequences to energize, or de-energize, any signal circuit during any interval. This program must provide separate, distinct access codes for timing and for sequence.

2.3.2 Outputs. All signal circuit outputs must be capable of reliably switching from five (5) to twenty-four (24) VDC with a steady current of three (3) to ten (10) ma.

2.3.3 Output Circuits. The controller must be capable of forty-eight (48) user defined and individually programmed signal outputs.

2.3.4 Preemption. The controller must be capable of a minimum of six (6) Preemption sequences utilizing separate, or a combination of separate and existing, output sequencing. It must also be capable of defining priority of Preemption inputs as either High or Low.

2.3.5 Actuation. The controller must be capable of responding to a minimum of sixteen (16) actuation inputs. Responses must service user defined intervals in a user defined sequence.

2.3.6 Signal Plans. The controller must be capable of eight (8) separate user defined signal plans.

2.3.7 M.U.T.C.D. Flash. The controller must be capable of M.U.T.C.D. flash without external devices.

2.3.8 Transfer Intervals. The controller's Split, Signal Plan, Start Up, Restart, Enter Flash and Exit Flash must be user defined.

2.4 TIME BASED COORDINATORS

2.4.1 Isolated Intersection (TIME BASE COORDINATOR). Each controller must 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 must be keyboard programmable to one (1) second resolution. Programming must be provided for

controlling operating modes, such as SET CLOCK, RUN, EXAMINE/PROGRAM, etc. Indicators must be provided on the front panel to show day of week, time in hours and minutes, and output circuit activation. This function must meet the requirements:

2.4.2 System Synchronization. System synchronization must 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 Bureau of Electricity 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 must be capable of automatically referencing back a minimum of 100 hours without manual reset.

2.4.3 Dials. This function must provide three (3) outputs for selection of one (1) of eight (8) or more dials. Each dial must offer a minimum of five (5) offsets, four (4) splits and eight (8) signal plans.

2.4.4 Stability of Pulse. The stability of the synchronous pulse output must 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 must maintain synchronization and program functions and not drift more than $\pm 0.005\%$ for a minimum of ten (10) hours.

2.4.5 Outputs. DC outputs: All DC outputs must be capable of reliably switching from five (5) to twenty-four (24) VDC with a steady current of three (3) to ten (10) ma.

2.4.6 Visual Program Verification. When a program instruction is being entered, each element of the program must be visible on the display for verification before the instruction is entered. Provision must be made for correcting any instruction before it is entered. The unit must provide for alteration of any single instruction of an entered program without disturbing any other instruction in that program.

2.5 CONFLICT MONITOR

2.5.1 General. Each controller must be furnished with a NEMA conflict monitor unit for checking for conflicts in the signal output circuits. The conflict monitor must be capable of monitoring a minimum of twelve (12) distinct channels. It must be a self-contained unit with its own power supply and not be located within the timer housing.

2.5.5 Programming Board. A removable programming board must be supplied with the monitor for programming signal compatibility. The circuits for programming must be composed of soldered jumper wires. Diode or dip switch type programming will not be acceptable. The programming board must contain no circuitry or components other than the wire jumpers and the wire jumper soldering devices.

2.5.3 Flashing Circuit Energizing. The conflict monitor must be programmed to put the controller in a flashing sequence upon detection of a failure or conflicting signal display. The controller must also be programmed to energize the flash circuit if the conflict monitor is removed or loses its supply voltage. The conflict monitor must have a manual reset button to return the controller to normal operation after conflict circuit operation is no longer necessary.

2.5.4 Stop Time Circuit. A stop-time control circuit must be supplied from the conflict monitor to force the timer unit to stop timing upon detection of a conflict.

2.5.6 Indicator. The front panel of the conflict monitor housing must have an indicator which will be activated when a conflict or failure occurs as per Section 6 of NEMA Spec. TS1-1983.

2.5.7 Latch Circuit. The conflict monitor must have a latch circuit, insuring that if a voltage monitor failure occurs, the intersection remains in conflict until reset.

2.5.8 Memory. The conflict monitor must have the ability to store, in memory, a minimum of ninety-nine (99) conflict events, including date of conflict and channels conflicting.

2.6 CONFLICT MONITOR ASSIGNMENTS

2.6.1 Conflict monitor channels must 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

2.6.2 It must be possible for the user to change conflict assignments without unsoldering any connections.

2.6.3 All unused channels - vehicle or pedestrian - must 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 must be labeled. If terminal mounted, the terminations must be labeled.

2.6.4 A terminal must be provided for the red enable feature.

2.6.5 A terminal must be provided for the hook up of any unused red channels to AC.

2.6.6 Controller monitoring must consist of; voltage monitor, 24 VDC I, 24 VDC II.

2.6.7 The output relay must operate a sixty (60) ampere, normally open, "A" type mercury contactor without the use of an external or "cabinet interface" relay.

2.7 CABINET

2.7.1. Housing. Each controller must be furnished completely housed in a Type 5052-H32 aluminum housing of 0.125 inch thickness. All cabinets must be provided with Factory installed 1 1/8" x 1/2" deep channels. Four channels must be provided for each cabinet side and back. All shelves, panels and individual equipment items must be mounted to these channels using 1.0" channel nuts with 1/4-20 bolts. All items mounted on panels must be securely fastened by bolting into drilled and tapped holes. No pop rivet or similar fastening methods will be accepted. Cabinets must be M Type with nominal dimensions of 50" high by 30" wide by 17" deep for local controllers, and P Type with nominal dimensions of 55" high by 44" wide by 26" deep for master controllers. Manufacturer will be Erpel, Hennessy, Southern Manufacturing Company, or approved equals.

2.7.2 Door. The cabinet must have a main door and a police door hinged with one-quarter inch (1/4") minimum, continuous, removable stainless steel pins. The doors must be closely fitted to a neoprene gasket making the doors dust, water and weather resistant. The doors must be interchangeable with any other doors from any other controller in this order.

(1) Main Door. Opening of the main door must provide complete access to the cabinet interior. The door must be embossed, subject to approval, with the legend "CITY OF CHICAGO-TRAFFIC CONTROL" in letters at least one (1) inch high. The door must have stops at 90, 150 and 180 degrees, from the closed position. The door latch must have three (3) point locking with rollers at the ends of the latch rods. The latch handle must be capable of being padlocked. The key lock for the latch mechanism must be a Corbin cylinder lock with a #2 key. Two (2) keys must be furnished with each cabinet.

(2) Police Panel Door. The police panel door must be furnished with a lock for a modified Chicago police key per sample to be furnished to the successful bidder. This key must have a shaft of at least one and three quarter inches (1-3/4") in length. Two keys must be furnished with each cabinet.

2.7.3 Cabinet Ventilation. A fan, having a minimum air movement capacity of 100 CFM, must be mounted in the air baffle in the top of the cabinet with an air outlet built into the roof overhang. The main door must be louvered and equipped with a removable, standard, commercially available aluminum dust filter. The ventilation openings must be equipped with removable covers for summer operation. No external fan housings or air outlets will be allowed. Any other method must be approved.

2.7.4 Shelf. The cabinet must contain a vertically adjustable shelf large enough to accept the solid state controller and all other shelf mounted devices.

2.7.5 Size. The exterior dimensions of the cabinets will be approximately fifty (50) inches high by thirty (30) inches wide by seventeen (17) inches deep for M Type cabinets, fifty-five (55) inches high by forty-four (44) inches wide by twenty-six (26) inches deep for P Type cabinets, and must conform to N.E.M.A. 3R pad mounted specifications. The bolt pattern must be a four (4) point pattern with the bolt notches being in the center of each side.

2.7.6 Finish. The exterior surfaces of the cabinet must be smooth. All drilled, tapped, or punched holes on the outer surface must be filled with liquid metal and ground smooth, and slotted screw heads must be ground smooth flush with surface. Bolts extending through cabinet wall must 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 must be thoroughly degreased in a wash process and dried in a heated chamber. A thermosetting, ultra violet resistant, polyester powder coat must 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. Exterior color must conform to Federal Standard 595, and either be City of Chicago green color No. 14110 or gloss black color. Exterior color must be as defined in the PROPOSAL or Contract Plans, and color samples must be submitted for approval prior to acceptance of cabinet. Cabinet interior must be glossy white and may be either baked enamel or thermosetting, polyester powder coat. For either process, the interior must be prepared as described above. If the baked enamel finish is used, it must be preceded by one (1) coat of primer.

2.8 POWER SUPPLY

2.8.1 A sixty (60) ampere main breaker must be inserted in series with the line.

2.8.2 An unfused terminal bus must be provided for ground side of the power supply and signal conductor commons.

2.8.3 Individual circuit breakers must be supplied for: (a) AC+ lights, 50 amperes; (b) AC+ control, 10 amperes; (c) duplex outlet supply, 15 amperes.

2.8.4 The incoming line must contain lightning protection devices consisting of, but not limited to, a metal oxide varistor and gas type arrester. The gas type arrester must be on the line side of the radio interference filter.

2.8.5 Contactor: A sixty (60) ampere Magnacraft, or approved equivalent, normally open, "A" type mercury contactor must be supplied for opening and closing the AC supply to the signal bus. This contactor must be mounted in such a manner on the power supply panel that accidental contact does not produce a safety hazard.

2.8.6 R.I.S. Filter: A radio interference suppression filter rated at sixty (60) amperes minimum must be installed in line with the main power supply, after the sixty (60) ampere circuit breaker.

2.8.7 Ground. The grounded side of the power supply must be continuous throughout the controller and must be grounded to the controller cabinet in an approved manner meeting OSHA requirements.

2.8.8 Polarity. The phase conductors of the signal circuits must have the same polarity as the phase side of the power supply, and the common conductor(s) must be of the same polarity as the grounded side of the power supply.

2.9 LOAD SWITCH BAY

2.9.1 General. A panel must 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.

2.9.2 Wiring. Panel wiring must be neatly laced and properly terminated individual conductors. They must be insulated and properly sized for their application.

2.9.3 Load Circuits. Each load circuit must be capable of carrying fifteen (15) amperes continuously at a temperature of 74 degrees C (165 degrees F).

2.9.4 Bus Feeds. Bus feeds must be capable of carrying fifty (50) amperes continuously at a temperature of 74 degrees C. (165 degrees F).

2.9.5 Equipment. In addition to the items listed in 2(a), the wiring panel must include, but not be limited to, the following:

(1) Ten (10) ampere fuses with barrier type fuse holders must be installed between the load switch signal output circuits and field terminals for signal light conductors. Each terminal must be the barrier type with sufficiently long screws to accept four (4) #12 AWG solid conductors. The terminals must be located at least two inches (2") above the bottom of the cabinet.

(2) Switching Device. The signal load switching device must 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 must be rated for a minimum fifteen (15) ampere continuous resistive load and must mate with an S-2412-SB panel socket. A minimum of twelve(12) and a maximum of sixteen (16) load switches to be provided with each cabinet, as defined in the PROPOSAL or Contract Plans.

(3) User Programmable Interface. Two (2) sets of terminal blocks must 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 must be conveniently located in close proximity to each other and must 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 must be equipped with twelve (12) load switch jacks for a minimum of thirty-six (36) signal circuits.

b. Sixteen (16) load bay panel. Each panel must be equipped with sixteen (16) load switch jacks for a minimum of forty-eight (48) signal circuits.

c. All unused signal circuits must be neatly tied or terminated. If tied, the harness wire must be labeled. If terminated, each termination must be identified.

2.9.6 Identification. All field terminals must be suitably identified, subject to approval.

2.10 FLASHING FEATURE

2.10.1 General. The flasher must 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 must be mounted on a type P-406-SB plug which will mate with an S-406-SB socket on the controller panel. The flasher must utilize zero-point switching, with turn-on at the zero voltage point (± 5 degrees) of the power line sinusoid.

2.10.2 Flasher Panel. A panel must be provided with one (1) terminal wired to the flasher and marked "FL". The panel must be equipped with terminals to provide or omit flashing of all red and yellow outputs.

2.10.3 Flasher Circuits. Flashers must provide two (2) output circuits to permit alternate flashing of signal phases and must be capable of carrying a minimum of twenty (20) amperes per circuit at 120 volts. The flasher must operate continuously so that flashing power will be available at the field terminal marked "FL". The flasher wiring must divide the loads imposed on the two (2) circuit flasher alternately on each phase.

2.10.4 Manual Flash. A manual flash switch must provide flashing indication for all circuits. The flash change combination terminals must 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.

2.11 POLICE PANEL

2.11.1 Auto-Off Flash Switch. Each controller must 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 must be located on the side of the police switch panel that faces outward when the police door is open.

2.11.2 Auto-Hand Switch. Each controller will have an auto-hand switch on the back side of the police switch panel. This switch must be so arranged that the switch can be physically rotated 180 degrees to provide usage after opening the police panel door. It must be so mounted that the act of rotation does not affect the police switch panel. Switch terminals must not be exposed on either position.

2.11.3 Terminal Block. A two point terminal block must be mounted on the back side of the police switch panel and the hand control circuit terminated on this block. This will be for installation of a hand control cord by others, as required.

2.11.4 Space Requirement. Adequate room must be provided in the police panel section to store the manual switch and retractable cord.

2.12 MANUAL OPERATION

2.12.1 General. The auto-hand switch must provide a means of manually timing the signals by use of a separate, momentary contact, hand switch. Operation of the timer by manual control must provide the same color sequence as an automatic operation with no momentary undesirable indications appearing. Manual control must be possible with the door of the cabinet closed. The hand switch required for manual control must only be supplied when specified in the PROPOSAL. It must 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 must not be possible to manually step through a vehicle clearance interval.

2.13 RELAYS

2.13.1 Transfer Relays. Six (6) double pole, double throw, flash transfer relays must be furnished with each controller. These relays must be jack mounted into an S-408-SB, or equivalent, socket mounted on the controller panel.

2.13.2 Contact Arm. Each contact arm must have over travel on the front and back contacts and be independent of any other contact arms. No adjustment of contact pressure or wipe must be necessary. Load capability must be a minimum of fifteen (15) amperes per contact continuously and thirty (30) amperes for one (1) minute. Contacts must be of coin or fine silver or an approved alternate.

2.13.3 Dust Cover. A suitable dust cover must be furnished for each relay.

2.13.4 Relay Mounting and Endurance. All relays supplied must meet their approved specified requirements and must 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 must be mounted on a molded base with eleven (11) or eight (8) pins for jack mounting to their respective panel or sub-base, and must be electrically interchangeable with those presently used by the City of Chicago ("MIDTEX", Model 158-92T200 or equal).

2.14 COMMUNICATIONS INTERFACE PANEL

2.14.1 Where a communications interface has been specified in the PROPOSAL or contract plans to allow a controller to function as a Master or Secondary controller, then one of the specified options must be provided:

(1) Fiber Optic Communications Interfaces must meet the following requirements:

a. General. The fiber optic communications components must consist of, but not be limited to, an internal fiber optic modem within the controller, a fiber optic patch panel to interface the modem to field fiber optic cables, and fiber optic jumpers between the modem and patch panel.

b. The modem in Master controllers must either be a multi-directional "star" type or a bi-directional type, as specified in the PROPOSAL or contract plans. The modem in Secondary (i.e., local) controllers must be bi-directional type. All modems must be Electronic Industries Association (EIA) compatible for RS-232 data communications via fiber optic link. Modems must be multi-mode, operate at 850nm wavelength, and provide full-duplex, frequency modulated, asynchronous transmission at data rates of up to 38.4 kbps.

c. The fiber optic patch panel must consist of a 14" long by 5-3/4" wide by 3-1/4" high rack constructed in accordance with City of Chicago BOE Drawing #909. The rack must be designed to mount on the controller cabinet rails. "ST" type terminals, suitably labeled, must be provided for the connection of field fibers and Modem.

d. The fiber optic jumpers (i.e., optical patch cords) must consist of a single multi-mode fiber in 900 micron orange jacket, with "ST" type connectors factory installed on each end. The jumpers must be 3' long in Secondary (i.e., local) controller cabinets and 6' long in Master controller cabinets. The jumpers must be connected to the patch panel and supported in such a manner that the minimum bending radius is ten (10) times the diameter of the cable, and the cables exert no strain on the connectors. Each jumper must have a minimum tensile strength of 50 lbs.

(2) Copper Wire Interconnect Panels (Seven Wire, VAC) must meet the following requirements:

a. General. The interconnect panel must serve to isolate interconnect VAC from the controller. The panel must consist of, but not be limited to, seven (7) relays. Each relay interconnect circuit must 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 must provide a seven (7) wire interface with the T.B.C. functions described below and must provide barrier type terminals suitably labeled for these functions.

b. The secondary interconnect panel must be wired in such a manner that an VAC input activates a relay sending an input from that relay to the controller. It must 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 must provide a means to establish outgoing VAC for a seven (7) wire interconnect system using eight (8) relays. The relays must have 24 VDC coils and 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 must be wired in such a manner that it provides the offset pulse to the contacts of the three (3) Offset relays.

d. Each relay must be a double pole type, with one pole designated as field interconnect output, and the other designated as controller input. Relay coils must be rated for continuous duty. Relay contacts must be rated for a continuous fifteen (15) AMP resistive load.

e. A terminal strip must be mounted on the top of the master interconnect panel for controller interface.

f. The master panel must interface with the T.B.C. terminals as described above.

g. Each output must be fused as outlined above.

2.15 WIRING

2.15.1 General. All electrical conductors must 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, must be No. 10 AWG. Signal circuit wire must be No. 14 AWG. The wires must be provided with lugs or other approved terminal fittings for attachment to binding posts. All wiring between various parts of the controller must be neatly cabled. All wiring and terminal blocks must 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 must be provided to the timing device to allow the timer to be placed on top of the cabinet when required.

2.15.2 All VAC connections to load switches, flasher, and flash transfer relays must be soldered. All VAC connections on back of terminals must be soldered.

2.15.3 All VDC connections on back of terminals, and load switches must be soldered or connected with pre-approved terminations. All VDC connections to load switches are to be soldered or connected in a manner pre-approved by the City of Chicago's Bureau of Electricity.

3. TESTING REQUIREMENTS

3.1 General. The following test requirements must utilize, but not be limited to, the following outline:

3.1.1 N.E.M.A. Environmental Test. One controller, the submitted sample unless approved otherwise, must be tested, at the manufacturer's expense, in accordance with Part 2 of NEMA Standards Publication TS1-1983. All of the tests listed must be performed with all data properly recorded and certified. If the manufacturer changes the design, fabrication or components of a previously tested and approved controller, then a sample of the controller containing the new design, fabrication or components must be retested at the manufacturer's expense. Any N.E.M.A. environmental test references to minimum recall must include but not be limited to: All thirty-six (36) output circuits must be "burned in" a test prom in a sequence to simulate the normal functioning of the entire controller cabinet assembly; The conflict monitor must have a test board with the allowable channel jumpers installed to simulate normal operation; All twenty-four (24) intervals must be programmed with a minimum of two (2) seconds per interval. A copy of the test prom must be approved by the City of Chicago, Bureau of Electricity prior to testing.

3.1.2 Functional "Burn In" Testing. The "burn in" requirement must include a test 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 must be programmed with a minimum of two (2) seconds per interval. The test program or PROM in a sequence to simulate the normal functioning of the entire controller-cabinet assembly. A copy of the test program or PROM must be approved by the City of Chicago, Bureau of Electricity prior to testing.

3.1.3 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 must be demonstrated prior to shipment from the factory. The manufacturer must submit five (5) copies of his proposed "Test Procedure Document" for approval with the sample

requested above. The test procedure must consist of two (2) sections; Physical inspection and functional testing. If the test procedure is judged by the Commissioner or his duly authorized representative to be incomplete, inadequate or otherwise deficient, the contractor must revise and resubmit his "test procedure document" until it is approved. No contract can be awarded until the "test procedure document" has been approved.

3.1.4 Performance Testing Documentation. Upon completion of the performance testing, two (2) certified copies of the final results of the approved "Test Procedure Document" must be included with all traffic signal controller production shipments.

3.1.5 Testing, Certification and Observation. Each traffic signal controller ordered must be tested in accordance with the approved "Test Procedure" document. The City's representative(s) must observe the manufacturer's testing in progress. The City must be notified at least thirty (30) calendar days prior to testing. and no testing will 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, must be signed by the individual(s) performing the tests and their immediate engineering supervisor. Two (2) copies of each certification document must be delivered with each production traffic signal controller. The contractor must include in his bid the cost of travel, food and lodging for two (2) engineers. Travel for 150 miles or greater must utilize a major airline. Lodging accommodations must be equal to those provided at a Holiday Inn.

3.1.6 Physical Inspection. The "physical inspection" portion of the test procedure document must require the manufacturer to perform a physical inspection of workmanship and specification compliance for each traffic signal controller assembly. The inspection must be done using a detailed check list defining items to be inspected and criteria for acceptance. The inspection must 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.

3.1.7 Functional Testing. The "functional testing" portion of the Test Procedure must 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 must 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 must be tested. All load switch and interconnect relay positions must be tested, regardless of the number of load switches and interconnect relays being purchased.

The functions tested must 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.

THIS SPECIFICATION MUST NOT BE ALTERED

CONTROL: PHOTOELECTRIC, FOR ROADWAY LIGHTING

**SPECIFICATION 1471
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
REVISED APRIL 23, 2002**

**CONTROL: PHOTOELECTRIC, FOR ROADWAY LIGHTING,
BUTTON, AND TWIST LOCK TYPE**

SUBJECT

1. This specification states the requirements for photoelectric lighting controls, consisting essentially of a photocell, relay, and a surge arrester, all enclosed in an approved housing, to control the "ON-OFF" schedule of roadway lighting.

GENERAL

2. (a) Information Required. Each bidder must submit with his proposal the following information relative to the photoelectric control he proposes to furnish.

- (1) Outline drawing.
- (2) Complete environmental, electrical, physical, and operating data on the control unit.
- (3) Data by the photocell manufacturer including sensitivity, operating temperature and load rating.
- (4) Manufacturer's name and catalogue designation.

(b) Assembly. Each photoelectric control must be delivered completely assembled, wired, and ready for installation.

(c) Size and Weight. (1). Button Control - the unit must not be more than 2.3" high and 1.3" square with a maximum weight of eight (8) ounces. It must be provided with a .75" long, 3/8-18 NPSM threaded nipple fitted with two nylon lock nuts and a neoprene or other approved washer. (2). Twist Lock Control - the unit must not be more than 3.5" high or 3.25" in diameter with a maximum weight of eight (8) ounces.

(d) Photoelectric control must meet or exceed all requirements of ANSI Standard C136-10-1996 for Twist Lock Controls. The button control must be Dark-To-Light Model No. DBE120-1.0-1746 (120 volt) DBE240-1.0-1746 (240 volt) or approved equal.

(e) Warranty. The contractor must unconditionally warrant every photoelectric control against any defects due to design, workmanship or materials developing within a period of four (4) years after the control has been placed in service. This will be interpreted particularly to mean failure of any component impairing the proper operation or protection of the unit. Any control, or part thereof, developing defects within this period must be replaced by the contractor at his sole expense and without cost to the City.

(f) Sample. A sample photoelectric control of the manufacture intended to be furnished must be submitted within 14 business days upon request of the Department of Purchasing, Contracts, and Supplies.

(g) Compliance with Specifications. The photoelectric control must conform in detail to the requirements herein stated, and to other standards and specifications, as cited, of which the most recently published revision will govern. Certified test results must be submitted to the Commissioner as indicated below, prior to shipping of photocells. All shipments not meeting specification requirements will not be accepted.

(h) Approved. Wherever "approved" is specified herein, it will be construed to mean "approved by the Commissioner or the Commissioner's authorized representative."

CONSTRUCTION

3. (a) Photoconductive Cell. The photocell must consist of a suitable substrate, a chemically inert electrode material and a thin layer of photosensitive cadmium sulfide or other acceptable photosensitive material. It must be hermetically sealed in a glass to metal package to prevent moisture and contamination damage. Plastic cased cells are not acceptable. Filtered silicon sensors in clear epoxy cases are also acceptable. Cell dissipation over a 24 hour period must not exceed the recommended allowable levels specified by the cell manufacturer. If the cell operates on D.C. an affidavit must be submitted giving the cell manufacturer's certification that such operation will not adversely affect the sensitivity, stability, or the life of the cell. The cell must not be subject to overloading due to the demand of the design circuit nor the ambient temperatures surrounding the cell. Color response of the cell or silicon sensor must be such that maximum sensitivity is in the blue-green portion of the color spectrum.

(b) Switching Relay. The ON-OFF switching operations must be accomplished by normally closed contacts which must be opened by means of a rugged, properly rated, magnetic relay, subject to approval. The switching must be positive and free of chatter and/or sticking of contacts. The contractor must provide test data verifying that contact chatter does not exceed 5 milliseconds when operated under loads as herein specified. The relay must have contacts of silver alloy, tungsten, or other specifically approved material.

(c) Surge Arrestor. Over voltage protection must be provided for the control components and the load circuit by means of a metal oxide varistor (MOV) or other specifically approved type arrestor. It must limit high voltage surges to a value at least 20% below the basic impulse insulation level (BIL in accordance with EEI-NEMA) of the control. For the button control, the MOV must be rated for a minimum of 100 joules wired line to neutral. For the twist lock control the MOV must be rated for minimum of 160 joules wired line to neutral; a secondary MOV or zener diode of at least 6 joules must be provided to protect the electronic circuit. In both the button and twist lock controls, the MOV must be mounted internally of the control housing.

(d) Printed Circuit Boards. A conformal coating must be applied to all printed circuit boards for environmental protection.

(e) Housing. The housing must be molded of an approved, impact resistant, UV resistant weatherproof material such as acrylic, butyrate or polycarbonate, pigmented to an approved color. Impact resistance of greater than 1.0 ft-lbs at -40° C is required. Year and manufacturer must be molded in cover.

(f) Fail-Safe. Relay contacts must be normally closed so that when circuit failure occurs the lights are turned on, or remain on.

(g) Dating. A weatherproof, permanent label must be attached to each unit indicating manufacturer's name, month and year of manufacture, model and serial numbers, voltage and load ratings, and, on twist lock control, provision for marking installation and removal dates.

(h) Lead Wires.

(1). Button Control - lead wires must be #18 AWG (Min); rated for 105°C; and 12" long. They must be color coded as follows:

Red - Load

White - Neutral (on 120 volt controls)

Black - Line

Yellow - Common (on 240 volt controls)

(2). Twist Lock Control - the base must provide an integral, locking type, brass three prong plug in accordance with ANSI C136-10-1996. A neoprene or other approved gasket must be attached to the base to effectively seal the connections against weather, insects and dust.

(i) 240 volt button photocontrols must have a permanent black on orange label 0.5"x2.0" in size that reads "240 VOLT".

CHARACTERISTICS

4. (a) Electrical. The control must be stable and reliable over the range of 105 to 130 volts A.C., at 60 cycles. The twist lock control's direct load rating must be 1000 watts tungsten, 1800 VA ballast; the button control must be rated for 1000 VA ballast. Current inrush rating of the control must be not less than 100 amperes. Control must operate relay/contacter assemblies used by the City of Chicago.

(b) Environmental. The control must be stable and reliable over an operating temperature range of -40°C (-40°F) to + 70°C (+158 °F).

(c) Operating Levels. Each control furnished must be pre-aged in intense light for a period of not less than 10 hours, after which it must be calibrated using a photometer whose accuracy is traceable to the N.I.S.T. 100% quality control inspection must be performed after calibration and final assembly.

(1). The button control must be calibrated at 120 VAC for a "turn-on" setting of $.50 \pm 0.1$ horizontal foot candles of natural illumination with a 7-15 second turn OFF delay. The "turn-off" setting must be adjusted to one and one half (1.5) times the "turn-on" setting. Button controls must have a 7-15 second turn ON delay. The control must have a delayed turn ON of 3 or more seconds on initial power-up in darkness.

(2). The twist lock control must be calibrated at 120 VAC for a "turn-on" setting of 1.50 ± 0.30 horizontal foot candles of natural illumination with a 2-5 second turn OFF delay. The "turn-off" setting must be adjusted to one and one half (1.5) times the "turn-on" setting. The control must have a 1-2 second turn ON delay.

TESTS

5. (a) Procedures. Test procedures must conform to these specifications, and to ANSI Standards C136-10-1996, except as otherwise herein indicated.

(b) Performance Test. The control must be subject to an accelerated performance test which will consist of cycling ON (30 seconds) and OFF (30 seconds) sixty times per hour at rated load for 2000 cycles. The control must not exceed the limits indicated for the nominal or rated operating levels, and relay contact points must not stick or show high resistance due to excessive pitting and/or erosion.

(c) Dielectric Strength Test. The control unit complete with enclosure must be subject to a D.C. hypot test for dielectric strength. It must successfully withstand a 5.0 KV test for one (1) minute dry.

(d) Drop Test. The control must be capable of withstanding a drop of 3 feet to a concrete floor without causing damage to the housing or changing electrical operation.

(e) Surge Protection Test. The control must be subject to a test for surge protection in accordance with UL 1449 and ANSI C62. By means of a surge generator, a 6.0 KV, 1.2 x 50 microsecond voltage wave impulse test must be made. The surge test must have a short circuit current average of at least 3 KA for 8.0 x 20 microseconds. The control must withstand the impulse testing, and change in calibration levels must not exceed the limits indicated for the nominal or rated operating levels.

(f) Temperature and Humidity Tests. The control will be subject to specified calibration tests immediately following conditioning of the control at extremes of temperature and humidity, as indicated below:

(1) Condition the control for a period of 24 hours at 98% relative humidity and 70° C temperature.

(2) Condition the control for a period of 10 hours at -40° C (-40° F).

(g) Calibration Test. After completion of all specified testing, the control unit must be recalibrated and must be within the operating parameters of this specification. During this test, the manufacturer must demonstrate that there is no cycling during either "turn-on" or "turn-off."

(h) Testing. One (1) unit from each lot of 500 photocontrols, with a minimum of 2 photocontrols per contract, must be subject to test. In the event any photocontrol fails to meet test requirements, the entire lot will be subject to rejection, except that the manufacturer, may subject a minimum of five (5) additional photocontrols in the lot to test and if all fulfill the requirements, the lot will be accepted. Should any of the additional five (5) photocontrols fail, then the entire lot will be rejected. Certified test reports must be submitted to the Commissioner for approval prior to shipment of material. All units subjected to test will remain the property of the Contractor and may not be included as part of this contract.

PACKAGING

6. (a) Carton. Each photoelectric unit must be individually packed in a carton of adequate strength and properly secured and protected to prevent damage to unit during shipment, handling and storage.

(b) Marking. Each carton into which a number of individually packed photoelectric units are packed must be clearly marked on the outside in letters not less than one-quarter (1/4) inch tall with the legend "OUTDOOR ELECTRONIC BUTTON PHOTO CONTROL" or "OUTDOOR ELECTRONIC TWIST LOCK PHOTO CONTROL" (as appropriate), preceded by the number of units in the carton in numbers of the same height as the letters: volt-ampere lamp load rating, voltage, manufacturer's name and catalogue number, contract or order number, and shipping date.

**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.

ACCEPTANCE. Cable not conforming to this specification will not be accepted.

REELS. The cable shall be shipped on non-returnable reels. No charge shall be made for wood lagging.

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:

<u>No. of Conductors</u>	<u>Outer Diameter (inches)</u>
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

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

(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 AWG conductors shall be solid.

(a) TYPE. The insulation shall be an ethylene propylene compound meeting 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:

Base Color	First Tracer	Second Tracer	2 Conductor No. 6 AWG	2 Conductor No. 4 AWG	7 Conductor	10 Conductor	14 Conductor	19 Conductor	22 Conductor
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

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

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

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.

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 (-) 250 C.

ELECTRICAL REQUIREMENTS

Voltage Test. The completed cable shall meet an A.C. and D.C. voltage test in accordance with ASTM D-470 and D-2655.

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 +1⁰C 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 SBSORPTION. After 168 hours at 70⁰ + 1⁰ C:

(1)	Milligrams per square inch, maximum	20
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(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.

FOOTAGE. Each reel shall contain the length of cable as set forth below. A tolerance limit of plus or minus five percent ($\pm 5\%$) shall be adhered to.

- | | | |
|-----|----------------------|-----------|
| (1) | Two-Conductor | 2000 feet |
| (2) | Seven-Conductor | 2000 feet |
| (3) | Ten-Conductor | 2000 feet |
| (4) | Fourteen-Conductor | 2000 feet |
| (5) | Nineteen-Conductor | 1000 feet |
| (6) | 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 |

TRAFFIC SIGNAL: VEHICULAR, TWELVE-INCH

**SPECIFICATION 1493
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
MARCH 20, 2000**

**TRAFFIC SIGNAL: VEHICULAR, TWELVE-INCH
SINGLE FACE, SINGLE OR MULTIPLE-SECTION,
POLYCARBONATE, LED OR INCANDESCENT**

GENERAL REQUIREMENTS

1.1 This specification states the requirements for twelve-inch, single face, single and multiple-section, traffic signals with polycarbonate housings, using LED or incandescent light source, for use in the traffic control system of the City of Chicago. Units include red ball, yellow ball, green ball, red arrow, yellow arrow, and green arrow.

1.2 Sample and Certified Test Reports. One complete signal, fully assembled and wired, of the manufacture proposed to be furnished, must be submitted along with the required certified test reports, within fourteen (14) working days upon request of the Commissioner. The sample must be delivered to the Engineer of Electricity, Bureau of Electricity, 2451 South Ashland Avenue, Chicago, Illinois 60608.

1.3 Standards. Equipment furnished under this specification must meet the appropriate requirements of the following standards, as required within the body of this specification:

American Association of State Highway and Transportation Officials (AASHTO)
American Society for Testing and Materials (ASTM)
Institute of Transportation Engineers (ITE)
National Electrical Manufacturers Association (NEMA)
Underwriters Laboratories (UL)

1.4 Definitions. Where referenced in the specification, the following definitions will apply:

1.4.1 Approval. Approval will mean approval in writing by the Commissioner or his/her duly authorized representative.

MATERIALS AND EQUIPMENT REQUIREMENTS

2.1 The traffic signal heads must conform to ITE Standard "Vehicle Traffic Control Signal Heads" (VTCSH), in which the most recently published revisions will govern.

2.2 Housing. The housing of each section must be one piece, ultraviolet stabilized polycarbonate resin of the specified color, injection molded complete with integral top, bottom, and sides, having a minimum thickness of 0.1 inch.

(a) The polycarbonate must meet or exceed the following tests:

TEST	REQUIRED	METHOD
Specific gravity	1.17 minimum	ASTM D 792
Vicat Softening temp	310-320 deg. F	ASTM D 1525
Brittleness temp.	Below-200 deg. F	ASTM D 746
Flammability	Self-extinguishing	ASTM D 635
Tensile strength, yield	8,500 PSI	ASTM D 638
Elongation at yield	5.5-8.5%	ASTM D 638
Shear strength, yield	5,500 PSI min.	ASTM D 732
Izod impact strength (notched, 1/8" thick)	12-16 ft. lbs./in.	ASTM D 256
Fatigue strength (at 2.5 mm cycles)	950 PSI min.	ASTM D 671

(b) Assembly. A traffic signal section must be comprised of, but not limited to, the housing, hinged door, visor, optical unit and all necessary gaskets and hardware. The multi-section, single face, traffic signal must be comprised of single face single sections assembled together, containing an internally mounted terminal block. Arrow indications must be shipped as single sections. The traffic signals must be designed and constructed to permit sections to be assembled together, one above the other, forming a weatherproof and dust-tight unit.

(c) Individual sections must be fastened together with a coupling washer assembly composed of two washers, three zinc plated bolts, nuts, and lock washers which lock the individual sections together. As an alternative, individual sections may be fastened together with four cadmium plated bolts, lock washers, and nuts. The hole in the coupling washer assembly must accommodate three 3/4 inch cables.

(d) Height. The overall height of an assembled traffic signal must be fourteen (14) inches for a single-section signal, forty-two (42) inches for a three-section signal, and seventy (70) inches for a five-section, plus or minus one (1) inch.

(e) Mounting. The traffic signal must be designed for mounting with standard traffic signal brackets using 1-1/2 inch pipe size fittings.

(f) Positioning Device. The top and bottom opening of each housing must have integral serrated bosses that will provide positive positioning of the signal head in five degree increments. A total of 72 teeth must be provided in the serrated bosses to allow the signal face to be rotated 360 degrees about its axis. The teeth must be clean and well defined to provide positive positioning.

(g) Hinges. The signal housing must be sectional; one section for each optical unit. Each housing must have four integral hinge lugs, with stainless steel hinge pins (AISI 304 or equivalent), located on the left side for mounting the door. The hinge pins must be straight and not protrude past the outside of the housing lugs. The housing must have two integral latching bolt lugs on the right side each with a stainless steel hinge pin to which a latching bolt (AISI 304 or equivalent), washer, and wing nut will be attached. The wing nuts must be captive. Each housing must be equipped with holes to be used for mounting backplates.

(h) Door. The door must be a one piece ultraviolet stabilized polycarbonate resin of the specified color, injection molded complete with a minimum thickness of 0.1 inch. 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, must be integrally cast with the housing door. The door must be hinged to the housing with two (2) stainless steel hinge pins, drive fitted. Two (2) stainless steel latch screws and wing nut and washer assemblies on the latch side of the housing body must provide for opening and closing the door without the use of tools. The door must have eight (8) holes with threaded metal inserts for stainless steel machine screws to secure the visor(4 holes) and the lens(4 holes). The inside of the door must be grooved to accommodate a one piece, air-cored EPDM (ethylene propylene diene monomer) gasket to provide a weatherproof and dust proof seal when the door is closed. The inside of the door must have four equally spaced threaded metal inserts for the lens attachment. The outside of the door must have an integral rim completely encircling the lens opening to prevent leakage between the door and the lens. The rim must have four equally spaced tabs around the circumference with threaded metal inserts for the visor.

(i) Visor Each traffic signal must have a visor for each signal indication (section). The visor must be the tunnel type, nine and one-quarter inches (9-1/4") long, fabricated of ultraviolet stabilized polycarbonate resin of the specified color, injection molded. The visor must 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 the visor must be of stainless steel. The visor must have four mounting lugs for attaching the visor to the door. Screws must go through the visor lugs into the metal inserts in the door to secure the visor.

2.2 The traffic signal heads must be provided with incandescent and/or LED optical units as specified in the PROPOSAL or Contract Plans.

2.2.1 INCANDESCENT OPTICAL UNITS

(a) Incandescent Optical Unit. The incandescent optical unit consists of the lens, reflector and lamp holder. The optical unit and visor must 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 must be designed and assembled so that no light can escape from one indication to another.

(b) Lenses. The red, yellow and green polycarbonate lenses must be round with a nominal twelve (12) inch diameter and must conform to all requirements set forth under the heading "Traffic Signal Lenses" in the ITE standard. The red, green or yellow arrow lenses must be round with a nominal twelve (12) inch diameter and the outside surface must be covered, except for the arrow, with a dull or dark grey 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 must be hard and durable and must 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 must be of an approved design with a minimum stroke of fifteen-sixteenths (15/16) inch. The arrow must 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 lens must be enclosed by an air-cored EPDM (ethylene propylene diene monomer) gasket providing a weather proof and dust proof seal between the lens, door, and reflector assembly. The gasketed lens must be

secured to the housing door by four (4) stainless steel screws (AISI 304 or equivalent) and clamps equally spaced around the lens opening. The door must have threaded metal inserts to receive the screws.

(c) Reflector. The reflector must be fabricated of high-purity, clad-type aluminum sheet formed to a parabolic shape and cut to fit in a circular polycarbonate, hinged frame for rigid mounting within the housing. The circular rim of the reflector must 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 must 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 must 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 must 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 must be washed from the surface with running water. No stain must remain after the surface is lightly rubbed with a soft cloth wet with mild soap and water, and rinsed with water. The reflector must have an opening in the back to accommodate the lamp holder.

(d) Lamp Holder. The lamp holder must 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 must 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 must have a grip to prevent the lamp from working loose due to vibration. A gasket must be furnished at the junction of the lamp holder and the reflector.

2.2.2 LIGHT EMITTING DIODE (LED) OPTICAL UNITS

(a) Light emitting diode (LED) optical units must consist of an integral unit containing the following components: power leads, housing, integral lens, matrix of light emitting diodes (LEDs) emitting monochromatic light of desired signal color, and electronic and electrical components necessary to permit operation at nominal 120 volt, 60 hertz power.

(b) The LED unit must be of such dimensions as to permit mounting in any standard traffic signal housing, be interchangeable with incandescent optical units, and must include appropriate gasket for this purpose. Gasketing provided must provide a watertight seal meeting existing ITE standard for signal heads, and exclude the infiltration of moisture into either the signal housing or into the LED optical unit case.

(c) The LED unit must meet the applicable requirements of the ITE standards for Vehicle Traffic Control Signal Heads(VTCSH) Part 2: LED Vehicle Signal Modules, for color (chromaticity), signal brightness (luminance), and beam spread (luminance at various vertical and horizontal angles). Yellow LED modules must meet the green module requirements for brightness.

(d) Minimum brightness of LED signal units must be in accordance with the luminous requirements in a standard testing procedure as defined by Section 4 of the VTCSH Part 2: LED Vehicle Signal Modules. During the required operating life of LED signal units, the luminance output of the units must not be less than 60 percent (.60) of the values specified in the standard.

- (e) Unit lenses must be twelve inches in diameter and be constructed of ultraviolet (UV) stabilized, impact resistant polycarbonate, acrylic or other approved material. Lenses must be clear or tinted.
- (f) Units must consist of LEDs uniformly distributed to present a homogeneous appearance on the face of the lens from a wide viewing angle.
- (g) LEDs must be wired so that the loss of a single LED or a string of LEDs will not reduce the luminescence below the minimum requirement.
- (h) For purposes of this specification, failure of a single unit is defined as an occurrence where the luminescence of the signal measured in candela in standard test procedures is less than the required initial luminance or luminance at time points and conditions specified; or where minimum required brightness is achieved, but two or more series strings of LEDs or in excess of twenty percent of 20% of LEDs are not operable.
- (i) Unit power supply must be constant current regulated and filtered to provide instant on indications, and to prevent momentary signal outages or flicker. Units must be fully operable over a range of 90 volts to 130 volts at 60 hertz, plus or minus 3 hertz.
- (j) Surge protection: Each unit must be provided with integral surge protection to withstand transient of 600 volt, 100 microsecond rise and 1 millisecond pulse width. The surge protector must provide full electrical and physical protection to all unit components.
- (k) Maximum permissible power consumption at ambient conditions (nominal 120 volts, 60 hertz, 70 degrees F.) must be 30 watts at a minimum 90 percent power factor. Power consumed must not vary by more than ten (10) percent from nominal power consumption over voltage range of 105 volts to 125 volts, and over permissible environmental ranges.
- (l) Units must be fully operable at temperature ranges of -40 degrees F. (-40 deg C) to +165 degrees F. (+74 deg C) at up to 100 percent relative humidity.
- (m) Units must be clearly marked on the back surface of the unit in a permanent manner showing information required for warranty and long term performance. Information to be shown must include manufacturer name, date of manufacture, electric power requirements, signal model type including color and indication type, and signal serial number.
- (n) The LED unit must be compatible with the traffic signal controller equipment currently in use by the City of Chicago, and meeting the City's latest specifications for traffic signal control equipment. In particular the LED unit must be compatible with the NEMA TS-1 and later traffic signal load switches and conflict monitors.
- (o) Units must meet applicable sections of Title 47, SubPart B, Section 15 of the Federal Communications Commission (FCC) rules as applies to electronic noise limitation and electromagnetic interference.
- (p) Total harmonic distortion (THD) induced into the voltage and current AC power line sine waves must not exceed 20 percent.

(q) LED optical units must meet the requirements of VTCSH Part 2: LED Vehicle Signal Modules Section 6.3.1 for signal burn-in.

2.3 Wiring. Each lamp holder must 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
Red with Black Tracer	Red Arrow Lens Section

The lead must 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 must connect to the terminal strip without being spliced. The ends of the lamp leads must be stripped of one-half inch ($\frac{1}{2}$ ") of insulation and tinned.

2.4 Terminal Strip. A dual-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) must be securely attached at both ends to the housing body inside the "Green" section of the signal head.

2.5 Cable. One, eleven foot (11') length of flexible electric cord, medium duty, type SO, No. 16 AWG stranded copper conductor, color coded, rubber insulated, neoprene jacketed, must be furnished with each signal head. The number of conductors must include neutral, ground, and one switch leg for each section. Both ends of each cable length must be carefully stripped of six inches (6") of jacket and one inch (1") of insulation, and each conductor properly tinned.

2.6 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 must be provided.

2.7 Packing. Each traffic signal assembly must be packed in a suitable carton so secured that the signal will not be damaged during shipment, handling or storage.

2.8 Marking. Each carton containing a traffic signal must be clearly marked on the outside in letters not less than three-eighths ($\frac{3}{8}$) inch tall with the legend: "TRAFFIC SIGNAL, TWELVE-INCH, POLYCARBONATE" or "TRAFFIC SIGNAL, TWELVE INCH, POLYCARBONATE, LED OPTICS" and the number of Sections as required, the color and indication types, the name of the manufacturer, the pertinent Contract Number and the appropriate City Commodity Code Number.

TESTING AND DOCUMENTATION REQUIREMENTS

3.1 Documentation. The contractor must provide certified manufacturing and testing documentation to demonstrate that the traffic signals being supplied meet or exceed the specification requirements. The LED Optical Units must be tested by an independent and certified testing laboratory.

3.2 Inspection. The signals will be subject to inspection at the discretion of the Commissioner. Final inspection must be made at point of delivery. Any signal rejected must be removed and disposed of by the contractor at his sole cost.

3.3 Warranty. The contractor must warrant the signals to meet the requirements of this specification, and must 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 addition, LED optical units must carry a seven(7) year warranty against failure or loss of color (chromicity) and signal brightness (luminance) below minimum acceptable VTCSH standard levels from date of final acceptance for contract construction, or date of delivery on a specific order. In the event defects and failures occur in the LED units during the first three(3) years of the warranty period, the Contractor must repair or replace such defects and failures at no expense to the City and reimburse the City for any labor costs associated with replacing defective LED units. In the event defects or failures occur in the LED units during the last four(4) years of the warranty period, the contractor must repair and/or replace all defective materials at no expense to the City. This warranty must be evidenced by a letter or certificate of warranty submitted to the City at the time delivery is made. The LED warranty must cover all units delivered in an order or installed by contract, and must include unit serial numbers. The warranty must be signed and dated by an official of the manufacturer who is empowered by the manufacturer to enter into such a warranty.

THIS SPECIFICATION MUST NOT BE ALTERED

PEDESTRIAN TRAFFIC SIGNAL, 16 INCH

**SPECIFICATION 1494
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
MARCH 20, 2000**

PEDESTRIAN TRAFFIC SIGNAL, 16 INCH WITH SYMBOLIC LED WALK/DON'T WALK LENSES POLYCARBONATE HOUSING

GENERAL REQUIREMENTS

1.1 This specification states the requirements for a single section pedestrian signal with light emitting diode (LED) symbolic messages on nominal sixteen inch by eighteen inch lenses and enclosed in a polycarbonate housing.

1.2 Sample and Certified Test Reports. One complete pedestrian signal, fully assembled and wired, of the manufacture proposed to be furnished, must be submitted along with the required certified test reports, within fourteen (14) working days upon request of the Commissioner. The sample must be delivered to the Engineer of Electricity, Bureau of Electricity, 2451 South Ashland Avenue, Chicago, Illinois 60608.

1.3 Standards. Equipment furnished under this specification must meet the appropriate requirements of the following standards, as required within the body of this specification:

American Association of State Highway and Transportation Officials (AASHTO)
American Society for Testing and Materials (ASTM)
Institute of Transportation Engineers (ITE)
National Electrical Manufacturers Association (NEMA)
Underwriters Laboratories (UL)

1.4 Definitions. Where referenced in the specification, the following definitions will apply:

1.4.1 Approval. Approval will mean approval in writing by the Commissioner or his/her duly authorized representative.

MATERIALS AND EQUIPMENT REQUIREMENTS

2.1 The pedestrian signal heads must conform to ITE Standard "Pedestrian Traffic Control Signal Indications" (PTCSI), in which the most recently published revisions will govern.

2.2 HOUSING DESIGN The housing must be one piece, ultra violet stabilized polycarbonate resin of the specified color, injection molded complete with integral top, bottom, and sides, having a minimum thickness of 0.100 inches.

(a) The polycarbonate formulation used must provide these physical properties in the housing (Tests may be performed on separately molded specimens).

<u>TEST</u>	<u>REQUIRED</u>	<u>METHOD</u>
Specific gravity	1.17 minimum	ASTM D 792
Vicat Softening temp	310-320 deg. F	ASTM D 1525
Brittleness temp.	Below-200 deg. F	ASTM D 746
Flammability	Self-extinguishing	ASTM D 635
Tensile strength, yield	8,500 PSI	ASTM D 638
Elongation at yield	5.5-8.5%	ASTM D 638
Shear strength, yield	5,500 PSI min.	ASTM D 732
Izod impact strength (notched, 1/8" thick)	12-16 ft. lbs./in.	ASTM D 256
Fatigue strength (at 2.5 mm cycles)	950 PSI min.	ASTM D 671

(b) **POSITIONING DEVICE** The top and bottom opening of each housing must have integral serrated bosses that will provide positive positioning of the signal head in five degree increments to eliminate undesirable rotation or misalignment of the signal head between sections. A total of 72 teeth must be provided in the serrated bosses to allow the signal face to be rotated 360 degrees about its axis. The teeth must be clean and sharp to provide positive positioning with the grooves of the mating section or framework. Each opening must accommodate standard 1 ½" pipe fittings and brackets.

(c) **HINGES.** The housing must have four integral hinge lugs, with stainless steel hinge pins (AISI 304 or equivalent), located on the left side for mounting the door. The hinge pins must be straight and not protrude past the outside of the housing lugs. The housing must have two integral latching bolt lugs on the right side each with a stainless steel hinge pin to which a latching bolt (AISI 304 or equivalent), washer, and wing nut will be attached. The wing nuts must be captive.

(d) **DOOR.** The door must be a one piece ultraviolet stabilized polycarbonate resin of the specified color, injection molded complete with a minimum thickness of 0.1 inch. 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, must be integrally cast with the housing door. The door must be hinged to the housing with two (2) stainless steel hinge pins, drive fitted. Two (2) stainless steel latch screws and wing nuts and washer assemblies on the latch side of the housing body must provide for opening and closing the door without the use of tools. The door must have four (4) holes with threaded metal inserts for stainless steel machine screws to secure the lens.

The inside of the door must be grooved to accommodate a one piece, air-cored EPDM (ethylene propylene diene monomer) gasket to provide a weatherproof and dust proof seal when the door is closed. The inside of the door must have four equally spaced threaded metal inserts for the lens attachment. The outside of the door must have an integral rim completely encircling the lens opening to prevent leakage between the door and the lens. The rim must have equally spaced tabs around the circumference with threaded metal inserts for the visor attachment.

2.3 LED OPTICAL UNIT

2.3.1 **LED OPTICAL UNIT.** The light emitting diode (LED) optical unit must consist of a lens, reflector and lamp holder. All units must 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.

(a) Light emitting diode (LED) optical units must consist of an integral unit containing the following components: power leads, housing, integral lens, matrix of light emitting diodes (LEDs) emitting monochromatic light of desired colors, and electronic and electrical components necessary to permit operation at nominal 120 volt, 60 hertz power.

(b) The LED unit must meet the applicable requirements of the VTCSH standards for color (chromaticity) and brightness (luminance). During the required operating life of LED signal units, the luminance output of the units must not be less than 60 percent (.60) of the values specified in the standard.

(c) Unit power supply must be constant current regulated and filtered to provide instant on indications, and to prevent momentary signal outages or flicker.

(d) Units must consist of LEDs uniformly distributed to present a homogeneous appearance on the face of the lens from a wide viewing angle.

(e) LEDs must be wired so that the loss of a single LED or a string of LEDs will not reduce the luminescence below the minimum requirement.

(f) For purposes of this specification, failure of a single unit is defined as an occurrence where the luminescence of the signal measured in candela in standard test procedures is less than the required initial luminance or luminance at time points and conditions specified; or where minimum required brightness is achieved, but two or more series strings of LEDs or in excess of twenty percent of 20% of LEDs are not operable.

(g) Units must be fully operable over a range of 90 volts to 130 volts at 60 hertz, plus or minus 3 hertz.

(h) Surge protection: Each unit must be provided with integral surge protection to withstand transient of 600 volt, 100 microsecond rise and 1 millisecond pulse width. The surge protector must provide full electrical and physical protection to all unit components.

(i) Maximum permissible power consumption at ambient conditions (nominal 120 volts, 60 hertz, 70 degrees F.) must be 18 watts at a minimum 90 percent power factor. Power consumed must not vary by more than ten (10) percent from nominal power consumption over voltage range of 105 volts to 125 volts, and over permissible environmental ranges.

(j) Units must be fully operable at temperature ranges of -40 degrees F. (-40 deg C) to +165 degrees F. (+74 deg C) at up to 100 percent relative humidity.

(k) Units must be clearly marked on the back surface of the unit in a permanent manner showing information required for warranty and long term performance. Information to be shown must include manufacturer name, date of manufacture, electric power requirements, signal model type, and signal serial number.

(l) The LED unit must be compatible with the traffic signal controller equipment currently in use by the City of Chicago, and meeting the City's latest specifications for traffic signal control equipment. In particular the LED unit must be compatible with the NEMA TS-1 and later traffic signal load switches and conflict monitors.

(m) Units must meet applicable sections of Title 47, SubPart B, Section 15 of the Federal Communications Commission (FCC) rules as applies to electronic noise limitation and electromagnetic interference.

(n) Total harmonic distortion (THD) induced into the voltage and current AC power line sine waves must not exceed 20 percent.

(o) **BURN-IN.** LED Optical units must be energized for a minimum 24 hour burn-in at 100% on-time duty cycle.

2.3.2 **SYMBOLIC MESSAGES.** Symbols for "Walk" (Man) and "Don't Walk" (Hand) must conform in style and color to those of the "Institute of Transportation Engineers" (I.T.E.). The messages must be approximately 16 inches square and display the "Don't Walk" and "Walk" symbols. The symbols must be applied in such a manner as to provide an opaque polycarbonate background and illuminated legends. The symbols must be not less than nine and one-half inches (9 ½") tall with proportional width. The "Don't Walk" symbol must be Portland Orange, and the "Walk" symbol must be of lunar white, conforming to the specifications of the PTCSI.

2.4 **LENS.** The unit lenses must be constructed of ultraviolet (UV) stabilized , impact resistant polycarbonate, acrylic or other approved material. Lenses must be anti-glare, smooth texture, and clear.

2.5 **WIRING.** Each lamp holder must have three (3) leads color coded as follows:

White - Common
Red - "Don't Walk" Indication
Green - "Walk" Indication

The leads must 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 must be stripped of one-half inch (½") of insulation and tinned. The leads must be splice-free and connected to one side of the terminal strip.

2.6 **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, must be securely attached at each end to the housing body inside the walk section.

2.7 **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, must be furnished with each two (2) section signal. Both ends of each cable length must be carefully stripped of six inches (6") of jacket and one inch (1") of insulation, and each conductor properly tinned.

2.8 **PACKING.** Each pedestrian signal assembly must be packed in a suitable carton so secured that the signal will not be damaged during shipment, handling, or storage.

2.9 **MARKING.** Each carton containing a pedestrian signal must be clearly marked on the outside in letters not less than three-eighths inch (3/8") tall with the legend: "PEDESTRIAN SIGNAL, SIXTEEN-INCH, SYMBOLIC LED WALK-DON'T WALK," the appropriate City Commodity Code Number, the name of the manufacturer, and the pertinent contract number.

TESTING AND DOCUMENTATION REQUIREMENTS

3.1 **DOCUMENTATION.** The contractor must provide certified manufacturing and testing documentation to demonstrate that the pedestrian signals being supplied meet or exceed the specification requirements. Testing must be conducted by an independent and certified testing laboratory.

3.2 **INSPECTION.** The signals must be subject to inspection at the discretion of the Commissioner. Final inspection must be made at point of delivery. Any signal rejected must be removed and disposed of by the contractor at his sole cost.

3.3 **WARRANTY.** The contractor must warrant the signals to meet the requirements of this specification, and must 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 addition, LED optical units must carry an additional warranty against failure or loss of color (chromaticity) and signal brightness (luminance) below minimum acceptable VTCSH standard levels for a period of seven (7) years from date of final acceptance for contract construction, or date of delivery on a specific order. In the event defects or failures occur in the LED unit during the first three(3) years of the warranty, the Contractor must repair or replace such defects and failures at no expense to the City and reimburse the City for any labor costs associated with replacing defective units. In the event defects or failures in the LED units occur during the last four(4) years of the warranty period, the contractor must repair and/or replace all defective materials at no expense to the City. This warranty must be evidenced by a letter or certificate of warranty submitted to the City at the time final delivery is made. The warranty must cover all units delivered in an order or installed by contract, and must include unit serial numbers for all LED units. The warranty must be signed by an official of the manufacturer who is empowered by the manufacturer to enter into such an agreement.

THIS SPECIFICATION MUST NOT BE ALTERED

TRAFFIC SIGNAL MOUNTING BRACKET

**SPECIFICATION 1495
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
MARCH 20, 2000**

TRAFFIC SIGNAL MOUNTING BRACKET POLYCARBONATE, SIDE OF POLE

GENERAL REQUIREMENTS

This specification states the requirements for polycarbonate brackets designed for mounting 12 inch traffic and pedestrian signal heads from side of poles.

1.2 Sample and Certified Test Reports. One complete signal bracket of the manufacture proposed to be furnished, must be submitted along with the required certified test reports, within fourteen (14) working days upon request of the Commissioner. The sample must be delivered to the Engineer of Electricity, Bureau of Electricity, 2451 South Ashland Avenue, Chicago, Illinois 60608.

1.3 Standards. Equipment furnished under this specification must meet the appropriate requirements of the following standards, as required within the body of this specification:

American Association of State Highway and Transportation Officials (AASHTO)
American Society for Testing and Materials (ASTM)
Institute of Transportation Engineers (ITE)
National Electrical Manufacturers Association (NEMA)

1.4 Definitions. Where referenced in the specification, the following definitions will apply:

1.4.1 Approval. Approval will mean approval in writing by the Commissioner or his/her duly authorized representative.

MATERIALS AND EQUIPMENT REQUIREMENTS

2.1 The bracket must be one piece, ultra violet stabilized polycarbonate resin of the specified color, injection molded complete with integral top, bottom, and sides.

(a) The polycarbonate formulation used must provide these physical properties in the bracket (Tests may be performed on separately molded specimens).

<u>TEST</u>	<u>REQUIRED</u>	<u>METHOD</u>
Specific gravity	1.17 minimum	ASTM D 792
Vicat Softening temp	310-320 deg. F	ASTM D 1525
Brittleness temp.	Below-200 deg. F	ASTM D 746
Flammability	Self-extinguishing	ASTM D 635
Tensile strength, yield	8,500 PSI	ASTM D 638
Elongation at yield	5.5-8.5%	ASTM D 638
Shear strength, yield	5,500 PSI min.	ASTM D 732
Izod impact strength (notched, 1/8" thick)	12-16 ft. lbs./in.	ASTM D 256
Fatigue strength (at 2.5 mm cycles)	950 PSI min.	ASTM D 671

(b) **GLASS.** The polycarbonate must be glass impregnated between 30% and 40% to increase strength.

2.2 **POSITIONING DEVICE** The top and bottom opening of the bracket must have integral serrated bosses that will provide positive positioning of the signal head in five degree increments to eliminate undesirable rotation or misalignment of the signal head between sections. A total of 72 teeth must be provided in the serrated bosses to allow the signal head to be rotated 360 degrees about its axis. The teeth must be clean and sharp to provide positive positioning with the grooves of the signal head.

2.3 **HARDWARE.** The mounting brackets must be provided complete with one (1) polycarbonate shim, 1/4" thick, one (1) 1-1/2" chase nipple with rubber gasket, and one (1) pinnacle cap with rubber gasket.

2.4 **DIMENSIONS.** The bracket must have nominal dimensions of 12 inches long, by 6 inches high, by 3 inches wide, plus or minus 1/4 inch.

2.5 **WIRING SPACE.** The bracket must have an integral molded wireway with a minimum 1-1/2 inch diameter opening suitable for installation of multi-conductor cables.

2.6 **DESIGN STRENGTH.** The bracket must be designed to support a 12 inch, single face, five-section, polycarbonate signal head with a 100 mile-per-hour wind

2.7 **PACKING.** Each bracket must be packed in a suitable carton so secured that the bracket will not be damaged during shipment, handling, or storage.

2.8 **MARKING.** Each carton containing brackets must be clearly marked on the outside in letters not less than three-eighths inch (3/8") tall with the legend: "POLYCARBONATE SIGNAL BRACKET, SIDE OF POLE" the appropriate City Commodity Code Number, the name of the manufacturer, and the pertinent contract number.

TESTING AND DOCUMENTATION REQUIREMENTS

3.1 **DOCUMENTATION.** The contractor must provide certified manufacturing and testing documentation to demonstrate that the brackets being supplied meet or exceed the specification requirements.

3.2 **INSPECTION.** The brackets will be subject to inspection at the discretion of the Commissioner. Final inspection must be made at point of delivery. Any bracket rejected must be removed and disposed of by the contractor at his sole cost.

3.3 **WARRANTY.** The contractor must warrant the signal bracket to meet the requirements of this specification, and must 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 must repair or replace such defects and failures at no expense to the City. This warranty must be evidenced by a letter or certificate of warranty submitted to the City at the time final delivery is made.

THIS SPECIFICATION MUST NOT BE ALTERED

INTERNALLY ILLUMINATED SIGN

**SPECIFICATION 1518
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
APRIL 17, 2001**

INTERNALLY ILLUMINATED SIGN

SUBJECT

1. This specification states the requirements for an internally illuminated sign. The sign legend will read "NO LEFT TURN", "NO RIGHT TURN", "NO TURNS", or "DO NOT ENTER", or as required. The sign will be legible at all times or will be a blank out type sign which must only be legible when illuminated.

GENERAL

2. (a) Specifications. The illuminated sign must conform in detail to the requirements herein stated, to the specifications of the MUTCD, and to Article 1085.56 of the Standard Specifications.

(b) Acceptance. Illuminated signs not conforming to this specification will not be accepted.

(c) Warranty. The contractor must warrant the signs against defective design, material, and workmanship for a period of one(1) year from date of acceptance. In the event of defects or failure during this period, the contractor must repair or replace such defects or failures at no expense to the City. This warranty must be evidenced by a letter or certificate of warranty submitted to the City at the time of final delivery.

(d) Bidders Drawings. Bidders must submit with their bids detailed scale drawings of the illuminated sign proposed to be used. The drawings must show every dimension necessary to indicate how parts will fit each other and be properly held in assembly.

(e) Sample. One complete illuminated sign assembly of the manufacture intended to be furnished must be submitted within fourteen (14) business days upon request of the Purchasing Agent.

DETAIL REQUIREMENTS

3. (a) Housing. The case must be formed from 3003H14 sheet aluminum at least .1 inch thick with 2 inch corner radii. The painting must be done in accordance with Section 851 of the Standard Specifications. The case must be primed inside and out with one coat of zinc

primer. The inside must be white enamel. The outside must be painted with two coats of baked on enamel of a matte black finish. The case will be furnished with 1 ½" hubs, top and bottom. All nuts and bolts are to be 18-8 stainless steel.

(b) Sign Face. The sign face must be fabricated of material meeting the requirements of Article 1085.56 of the Standard Specifications. The face must be held in place by a formed aluminum channel. The message must read "NO LEFT TURN", "NO RIGHT TURN", "NO TURNS", "DO NOT ENTER", or other message as required by the Commissioner. The message must meet the requirements of the MUTCD. Each sign face must be 24" wide by 30" long.

(c) Illumination. The sign must be illuminated by 8 incandescent lamps of 25 watts each for the non-fiber optic signs. Fiber optic signs must be illuminated by a minimum of two 42 watt lamps, so wired so that if one lamp burns out the sign will still be legible. Fiber optic signs must meet the requirements of Article 1085.56 of the Standard Specifications.

(d) Photo-cell. The sign case must be modified by the installation of a NEMA standard receptacle for a photo-cell on top of the sign case. The photo-cell must meet Material Specification 1471. The socket must be connected using #12 AWG 90 degree Centigrade wire into the line side of the service to provide photoelectric control over all the lamps in the sign.

Legibility. The sign must be legible 24 hours a day or only for specific time periods depending upon the requirements for the internally illuminated sign. Signs that are legible for specific time periods must be switched on and off from the traffic controller.

PACKAGING

4. (a) General. The signs must be shipped fully assembled and ready for installation. Each assembly must be individually wrapped and boxed so that the assembly is not damaged in shipment.

(b) Labeling. Each box must be labeled in 3/8 inch high letters "ILLUMINATED SIGN" with "BLANK OUT" or "FIBER OPTIC" also in 3/8 inch high letters; the message also should be in 3/8" high letters. The City Commodity Code, contract number, manufacturer, and date of manufacture must be clearly labeled on the box.

THIS SPECIFICATION MUST NOT BE ALTERED

CORD EIGHT CONDUCTOR NO. 16AWG 600V

**SPECIFICATION 1475
BUREAU OF ELECTRICITY
DEPARTMENT OF STREETS AND SANITATION
CITY OF CHICAGO
JULY 22, 2004**

**CORD: EIGHT CONDUCTOR NO. 16AWG., 600 VOLT
90 DEGREE C LSZH INSULATION AND 90 DEGREE C JACKET**

SUBJECT

1. This specification states the requirements for an eight (8) conductor number 16AWG, electrical cable, to be installed in conduit and used to electrically energize traffic signal faces at street intersections within the City of Chicago.

SCOPE

2. This specification sets forth construction details and test requirements of the cable to be furnished. The cable must be flame retardant, have low acid gas content, good resistance to oil, moisture and mechanical abuse, and exhibit excellent heat aging and electrical characteristics.

GENERAL

3. (a) SPECIFICATIONS. The cable must 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, the Underwriters Laboratories, Inc. Standard or Style number and any other recognized Standardization group's specifications referred to by the appropriate designation, of which the most recently published revision will govern.

(b) ACCEPTANCE. Cable not conforming to this specification will not be accepted.

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

CABLE

4. (a) CONSTRUCTION. This cable must consist of stranded, coated, conductors each concentrically encased with a "free stripping," ethylene propylene rubber insulation. Suitable fillers must be used to produce an essentially round cross-section. The insulated

conductors and the fillers must be cabled with a suitable left-hand lay as close together as is consistent with forming a core of minimum diameter. A Mylar tape must be wrapped over the conductor assembly, and a jacket applied overall.

(b) OUTER DIAMETER. The maximum allowable outer diameter must be one-half (0.50) inch.

(c) SEALING. Both ends of each length of cable must be thoroughly sealed to prevent the entrance of moisture or other foreign matter.

MARKING

5. (a) CONDUCTORS. Identification must be provided by colors in accordance with I.M.S.A. Standards.

(b) JACKET The outer jacket must be marked as follows: "8/C 16 AWG 600V 90 degrees C LSZH name of manufacturer and date of manufacture. The height of letters must not be less than 1/8 inch in height and the message must repeat at approximately two (2) foot intervals. A sequential footage marking must be located on the opposite side of the jacket. All marking must be perfectly legible with permanent white ink.

CONDUCTOR

6. (a) MATERIALS. Round, Soft or annealed, stranded copper wire in accordance with ASTM B-3 and B-8, and coated in accordance with ASTM B33 (tin coated) or ASTM B-189 (lead or lead-alloy coated), must be furnished.

(b) SIZE. The stranded conductor must consist of stranded wires twisted with an appropriate lay to form a No. 16 AWG conductor with an approximate diameter of 0.048 inches.

INSULATION

7. (a) TYPE. The insulation must be an easily strippable low smoke zero hypalon compound meeting or exceeding the requirements of ICEA S-68-516 and the additional requirements of this specification.

(b) RATING. The insulation must be rated for continuous duty at 90 degrees C in accordance with U.L. AWM Style 3400.

(c) THICKNESS. The insulated conductor must be circular in cross-section, concentric to the conductor, with a nominal insulation thickness of 0.031 inches (2/64") and a minimum spot thickness of 90% of the nominal thickness.

(d) INITIAL PHYSICAL REQUIREMENTS:

- | | |
|----------------------------------|-------|
| 1. Tensile strength, min., PSI | 1,600 |
| 2. Elongation at rupture, min. % | 250 |

(e) AIR OVEN EXPOSURE TEST. After conditioning in an air oven at 158 ± 1 degree C for 168 hours using methods of test described in ASTM-D 573:

Tensile strength, minimum percent
of unaged value85

Elongation at rupture, minimum
Percent of unaged value65

(f) MECHANICAL WATER ABSORPTION:

1. GRAVIMETRIC METHOD. After 168 hours in water at 70 ± 1 degree C:

Water absorption, maximum,
Milligrams Per square inch5.0

(g) COLD BEND TEST REQUIREMENTS. The completed cable must pass the "Cold-Bend," Long-Time Voltage Test on Short Specimens of ASTM D-470 except that the test temperature must be minus (-) 25 degrees C.

(h) ELECTRICAL REQUIREMENTS:

1. Voltage Test. The completed cable must meet an A.C. and D.C. voltage test in accordance with ASTM D-470 and D-2655.

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

(i) FLEXIBILITY TESTS. A sample length of insulated conductor must be formed in a loose coil, placed in a circulating air oven, and aged for 168 hours at $158 \text{ degrees C} \pm 1$ degree C. The sample must then be allowed to cool to room temperature for one (1) hour and tightly wrapped around a 3X metal mandrel. The sample must show no cracks and must pass the same voltage test specified for the "Cold-Bend Test."

JACKET

8. (a) TYPE The jacket must be a thermosetting low smoke zero halogen (LSZH) compound or equal meeting the physical and electrical requirements specified herein. In lieu of CPE, LSZH instead of Hypalon.

(b) RATING. The jacket must be rated for continuous duty at 90 degrees C.

(c) THICKNESS. The jacket must be circular in cross-section, concentric with the insulation, must have an average thickness not less than 45 mils and a spot thickness not less than ninety percent (90%) of the average thickness.

(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 121 ± 1 degree C for 168 hours for hypalon or 136 ± 1 degree C for CPE:

- | | | |
|----|---|----|
| 1. | Tensile strength, minimum percent of unused value | 75 |
| 2. | Elongation at rupture, minimum percent of unaged valued | 55 |

(f) MECHANICAL WATER ABSORPTION. After 168 hours at 70 ± 1 degree C:

- | | | |
|----|-------------------------------------|----|
| 1. | Milligrams per square inch, maximum | 20 |
|----|-------------------------------------|----|

TESTING

(a) GENERAL. Tests must be performed on insulation, jacket and completed cables in accordance with applicable standards as listed in this specification. 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 will apply. All tests must 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 must 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 must be conducted on samples taken every 25,000 feet or fraction thereof of each conductor size. In no case must samples be taken closer than 15,000 feet apart.

(c) WITNESS TESTS. Where the quantity of cable on a single purchase order is 100,000 feet or more, all insulation and jacket tests must be witnessed by an engineer from the Bureau of Electricity. In addition to these tests, the engineer must also witness tests on completed cables for approximately five percent (5%) of the cable. Reels to be tested will be selected at random by the engineer. The contractor must include in his bid, the cost of travel, food and lodging for one (1) engineer. Travel for 150 miles or greater must utilize a major airline. Lodging accommodations must be equal to those provided at a Holiday, Inn. The engineer must be given ten (10) working days notice of all travel arrangements.

(d) TEST REPORTS. No cable must 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 must apply:

1. Insulation or Jacket Tests. Samples must be taken from each reel and must 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

11. (a) REELS. The completed cord must be delivered on sound, substantial reels. The ends of the cable must be securely fastened so that they will not become loose during shipment and handling.
- (b) FOOTAGE. The number of feet per reel must be five hundred (500) feet plus or minus ten percent ($\pm 10\%$).
- (c) MARKING. A metal tag, or an approved indelible marking material such as alkyd enamel paint, must be used to mark the reel. The marking information must include, but not be limited to, the following: reel number, contract number, a description of the cord, and the footage of that particular reel.

STORM WATER POLLUTION PREVENTION PLAN



Storm Water Pollution Prevention Plan

Route	I-90/94 Dan Ryan Expressway	Marked	Dan Ryan Expressway I-57 at Illinois Route 1 (Halsted St) & I-90 at MLK to 31st Street
Section	See individual contract	Project No.	Various Contract Numbers – Refer to Attachment
County	Cook		

This plan has been prepared to comply with the provisions of the MSY-Phase II NPDES Permit Number ILR40, issued by the Illinois Environmental Protection Agency for storm water discharges.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature	Date
-----------	------

Title

1. Site Description

a. The following is a description of the construction activity which is the subject of this plan:

The project is located at Interstate 94 (the Dan Ryan Expressway) from the I-57 interchange to Illinois 1 (Halsted Street) to the west and Martin Luther King (MLK) Drive to the east, and continues in a northerly direction to 31st Street.

Construction Descriptions

The Dan Ryan Expressway project consists of roadway improvements including added lanes, mainline and shoulder reconstruction, construction of retaining walls, new collector-distributor roadways, new and relocated exit and entrance ramps, lighting, drainage, signing, and surveillance improvements.

The Dan Ryan Expressway reconstruction project was designed in three segments in Phase I. The three segments are described from south to north.

The segment from 95th to 67th Streets (U.S. Route 20 / 45), the improvement includes reconstruction of the eight traffic lanes of the existing Dan Ryan Expressway pavement, the addition of a through travel lane in each direction, and modifications to entrance and exit ramps. The improvement involves the addition of a through travel lane along both northbound and southbound Dan Ryan onto Interstate 57 to the interchange with Halsted Street (Illinois Route 1). There are intersection improvements at 79th Street.

The segment from 67th to 47th Street includes reconstruction of the existing northbound and southbound express lanes (four lanes in each direction) and local lanes (two lanes in each direction). The improvement will also provide for an additional through travel lane in each direction to the local traffic lanes, and modifications to all entrance and exit ramps. There are intersection improvements at 67th Street. Frontage roads will be reconstructed both northbound and southbound from 63rd to 47th Streets. Additional work will involve bridge construction and reconfiguration of the Chicago Skyway / Dan Ryan Expressway interchange to provide an additional entrance ramp from the Chicago Skyway to connect directly to the northbound Dan Ryan Expressway express lanes.

The scope of the roadway work between 47th and 31st Streets will include reconstruction of the existing northbound and southbound express lanes (four lanes in each direction) and local lanes (three lanes in each direction) to the Dan Ryan Expressway pavement, and the reconstruction and/or reconfiguration of entrance and exit ramps. The Root Street structure (41st Street) will be removed.

The drainage work consists of removing or abandoning the existing collector storm sewer system and surface water collection system and constructing a new collector storm sewer and surface water collection system. The existing main drain will remain in place and remain functional, with new connections for the proposed storm sewer system. New collector sewers to drain the area directly tributary to the Dan Ryan Expressway (CTA tracks, local lanes, and adjacent ramps and grass areas), and overflows from offsite tributary areas (frontage roads) are planned. Separate collector sewers are required to drain the northbound and southbound lanes of the Dan Ryan Expressway. These proposed collector sewers are to be designed to convey the 50-year storm event.

The work will include the construction of new retaining walls and the rehabilitation, and/or modifications of several existing retaining walls and any roadway and traffic signal improvements required at cross streets and alternate routes. In addition, other improvements include:

A new highway lighting system (110 foot towers with lights on 11-foot mounting rings).
New expressway signing (provides four new and upgrade three changeable message signs).
Replacement of traffic surveillance equipment with upgraded technology.
Closed circuit television for traffic conditions and crash incident monitoring.
Accident investigation sites.
Other incidental work as required completing the reconstruction of this segment of the expressway to AASHTO and IDOT criteria.

The improvement will also consolidate several points of access and improve the unsafe weaving conditions created by the existing substandard weaving distances. Currently, ramps are spaced evenly at one-half mile increments, resulting in weaving distances in the range of 300 feet. This is a major safety concern and suspected cause for the high incidence of sideswipe collisions in the ramp influence areas. The proposed access consolidation plan improves many of the mainline weaving movements while minimally influencing the local access to the Dan Ryan Expressway through the addition of collector-distributor roadways and both entrance and exit ramp removals. The presence of parallel city street frontage roads facilitates local access without substantive changes in through and local travel patterns. The proposals for ramp closure are:

Northbound (NB) exit and southbound (SB) entrance at 76th Street (2 ramps)
Northbound (NB) and southbound (SB) exits and entrances at 59th Street (4 ramps)
Northbound (NB) and southbound (SB) exits and entrances at 51st Street (4 ramps)
Northbound (NB) exit and southbound (SB) entrance at 43rd Street (2 ramps)

Capacity analyses indicate unsatisfactory conditions at the intersections of 55th Street (Garfield Boulevard) / Wells Street and 55th Street (Garfield Boulevard) / Wentworth Avenue. The improvements necessary to make this interchange operate effectively require right-of-way acquisition from three separate parcels. The parcels on the southwest quadrant of 55th Street (Garfield Boulevard) / Wells Street is occupied by a "Mobil Service Station" in which a portion of each of the two parcels must be acquired to construct an eastbound to southbound right turn lane. In addition, dual right turn lanes are proposed for the northbound to eastbound movement at the intersection of 55th Street (Garfield Boulevard) / Wentworth Avenue. These right turn lanes require securing property, the portion of the parcel that is currently vacant.

To construct the proposed two-lane, left-hand exit to the Chicago Skyway from the southbound lanes on the Dan Ryan Expressway, Wells Street needs to be relocated from 64th Street to 65th Street. The improvement requires reconstruction of an 18 foot high retaining wall adjacent to the

mainline and the full replacement of the frontage road (Wells Street) pavement. The realignment shifts the centerline of the road approximately 10 feet west. A relocation and reconstruction of the west sidewalk bordering Wells Street does encroach into a parcel currently owned by the Chicago Housing Authority for the "Yale Street Apartment". The corner parcel would facilitate the relocation and reconstruction of the 5 foot sidewalk and modifications to the bituminous parking lot.

The right-of-way uses are summarized in the tabulation below:

Right-of-Way Acquisition	Acres	Number of Parcels
SW Corner of 55 th / Wells Street	0.05	6
SE Corner of 55 th / Wentworth Avenue	0.10	1
NE Corner of 57 th / Wentworth Avenue	0.12	2
SE Corner of 57 th / Wentworth Avenue	0.24	1
NE Corner of 59 th / Wentworth Avenue	0.007	1
SE Corner of 59 th / Wentworth Avenue	0.014	1
NW Corner of 63 rd / Wells Street	0.05	1
Along West edge of Wells Street From 65 th Street to 64 th Street	0.11	1
Temporary Construction Easement	Acres	Number of Parcels
Along west edge of Wells Street From 65 th Street to 64 th Street	0.07	1

The Total Acquired Right-of-Way (ROW) is 0.691 acres involving eight parcels, with a Temporary Construction Easement (TCE) of 0.07 acres involving one parcel.

Environmental Descriptions

Special waste for the Dan Ryan project has **HIGH** risk for the occurrence of regulated substances or natural hazards at twelve sites. A Preliminary Environmental Site Assessment (PESA #1106) with stipulations for excavation depths varies for twelve high risk locations. Depth stipulations can be met at Sites: 808-10A, 1106-17B, 1106-25B, 1106-44A, and 1106-51. A request for Preliminary Site Investigation (PSI) will be required for Sites: 1106-2B, 1106-4A, 1106-6A, and 1106-9, 1106-33B, 1106-47, and 1106-52.

Besides special waste, there are no ecologically sensitive areas in the Dan Ryan project area. The Environmental Survey Request Form (ESRF) on 10/15/99 requested only biological and special waste survey because all of the ground had been previously disturbed and no new right-of-way is to be involved with areas not previously occupied, excavated, or disturbed. The project, as described on the ESRF, does not require biological or wetland surveys. The Illinois Department of Natural Resources (IDNR) Natural Heritage Database has no records of listed species, natural areas or nature preserves within the Dan Ryan project corridor (IDNR Agency Action Report dated September 20, 1999). By agreement, no coordination with the Illinois Department of Natural Resources (IDNR) and the U.S. Fish and Wildlife Service (USFWS) are necessary.

No streams or rivers are involved with this project. There is no water resources in the area involved with the project. A closed drainage system for storm water and urban roadway cross section, including pavement and shoulder, will continue.

The project will result in the disturbance of 0.4 or more hectares (1.0 acre). Permit coverage for the project is secured either under the IEPA Phase II General Permit for Storm-water Discharges (NPDES Permit No. ILR40) or under an individual NPDES permit. Requirements applicable for a permit will be followed, including the preparation of a Storm-water Pollution Prevention Plan. The plan shall identify potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the construction site. The plan shall describe and ensure the implementation of practices that will reduce the pollutants in discharges associated with construction site activity and assure compliance with terms of the permits.

Although there may be a remote possibility (not likely) of a potable water well within 200 feet (60 meters) of the centerline, this threshold is only relevant for routes and sources of groundwater pollution. Since this project will not introduce any new routes of groundwater pollution (dry wells, "French drains", or borrow pits) or sources (bulk road oil or deicing storage facilities), then there will be no violation of the wellhead setback requirements.

According to the National Flood Insurance Rate Maps (FIRM), there are no flood plains involved within this project limits.

From field inspection by project team environmental and wetland specialists, and their review of the available and published National Wetlands Inventory (NWI) maps, and the most recent available aerial photography of the area, determined wetlands are not involved. The project is within the existing rights-of-way, and no wetlands are located within or adjacent to the required parcels, which include: west edge of Wells Street from 65th to 64th Street; 63rd Street and South Wells Street, 59th Street and Wentworth Avenue; 57th Street and Wentworth Avenue; 55th Street and South Wentworth Avenue, and 55th Street and South Wells Street.

There is no use or proposed use of protected Section 4(f), Section 6f lands, or lands that have OSLAD funds involved with their purchase and/or development.

b. The following is a description of the intended sequence of major activities for the reconstruction of the Dan Ryan Expressway. The construction year, contract number, description, duration of construction, and highlights of work to be completed follow.

Contract # – Name/Description
Contract Duration
Major Activities

Construction Year 2003

62573 – Shoulder Repair and Median Cross-Over
August 18 – October 31, 2003
Reconstruction of the 65th to 47th Street local lane inside shoulder

62591 – Storm Sewer Jacking
November 15, 2003 – June 4, 2004
Storm sewer jacking from 95th to 67th Streets

Construction Year 2004 to 2005

62594 – 83rd to 79th Street C-D System and Ramps
March 1 – October 31, 2004
Reconstruction and reconfiguration of the collector-distributor (C-D) ramps between 83rd and 79th Streets
Replacement of the storm sewer
Retaining wall construction

62691 – Reconstruct Watermain Crossing under the Dan Ryan from 32nd Street to 63rd Street
May 3, 2004 – June 20, 2005

62590 – 71st to 67th Street C-D System and Ramps
June 21, 2004 – August 15, 2005
Reconstruction of the collector-distributor (C-D) ramps between 71st and 67th Street
Improvements to 67th Street / State Street intersection
Retaining wall construction
Reconstruction of the 67th Street bridge

62587 – Wentworth Avenue Overpass and Wells Street Realignment
June 21, 2004 – June 30, 2005
Reconstruction of Wells Street from 67th to 63rd Street
Reconstruction of Wentworth Avenue bridge

62589 – Skyway Interchange Bridges and Local Lanes Wentworth Avenue to 67th Street
June 21, 2004 – August 15, 2005
Dan Ryan / Skyway interchange
Reconstruction of local lanes from 67th to 63rd Street
Retaining wall construction

62586 – 57th Street Bridge, Retaining Walls, Ramps and Frontage Roads 63rd to 47th Streets
August 1, 2004 – October 31, 2005
Reconstruction of the frontage roads, Wells Street and Wentworth Avenue, between 63rd and 47th Street
Construction of eight (8) new ramps between 63rd and 47th Street
Construction of the new 57th Street bridge over the Dan Ryan
Retaining walls

62585 – Reconstruct SB Ramps between 39th and 31st Street and Shoulder Reconstruction
September 13, 2004 – November 30, 2005
Reconstruction of the SB ramps between 39th and 31st Street

62584 – Reconstruct NB Ramps between 39th and 31st Street and Shoulder Reconstruction
September 13, 2004 – November 30, 2004
Reconstruction of the NB ramps between 39th and 31st Street

62692 – Reconstruct Watermain Crossings under the Dan Ryan from 75th Street to the I-57 Interchange
September 27, 2004 – July 1, 2005

TBA – Reconstruct I-57 Bridge over WB Cross Connection from I-94 and Tunnel over SB I-94
December 21, 2004 – July 4, 2005

62694 – NB Retaining Walls and Ramps from 71st to I-57 and 71st to 75th Street C-D System
February 28, 2005 – December 30, 2005

62695 – SB Retaining Walls and Ramps from 71st Street to I-57 and 71st to 75th Street C-D System
February 28, 2005 – December 30, 2005

Construction Year 2006

62592 – NB Outside Lanes (4, 5, and Shoulder), 71st to I-57 and Miscellaneous Ramps
March 6 – October 27, 2006
Reconstruction of the local lanes 4, 5, and the outside shoulder for the Dan Ryan I-57 interchange
Replacement of the storm sewer
Retaining wall construction

62593 – SB Outside Lanes (4, 5, and Shoulder), 71st to I-57 and Miscellaneous Ramps
March 6 – October 27, 2006
Reconstruction of the local lanes 4, 5, and the outside shoulder for the Dan Ryan I-57 interchange
Replacement of the storm sewer
Retaining wall construction

62302 – SB Express Lanes 71st to 47th Streets
March 6 – October 27, 2006
Reconstruction of the express lanes between 67th and 47th Street
Construction of lanes 4 & 5 between 71st and 67th Street

62300 – NB Express Lanes 71st to 31st Streets
March 6 – October 27, 2006
Reconstruction of the NB and SB express lanes between 71st to 31st Street

Construction Year 2007

62304 – NB Inside Lanes (1, 2 and 3, shoulder and barrier wall) from 71st Street and the I-57 Interchange and Miscellaneous Ramps
March – November 2007
Reconstruction of the NB local lane 3
Reconstruction of the I-57 interchange
Replacement of the storm sewer
Reconstruction of NB Dan Ryan inside Lanes 1 and 2
Reconstruction of CTA wall

62305 – SB Inside Lanes (1, 2 and 3, shoulder and barrier wall) from 71st Street and the I-57 Interchange and Miscellaneous Ramps
March – November 2007
Reconstruction of the SB local lanes 3
Reconstruction of the I-57 interchange
Replacement of the storm sewer
Reconstruction of SB Dan Ryan inside Lanes 1 and 2
Reconstruction of CTA wall

62303 – SB Local Lanes 71st to 31st Streets and Miscellaneous Ramps
March – November 2007
Reconstruction of the local lanes between 67th and 47th Street
Reconstruction of the local lanes 1, 2, and 3 between 71st and 67th Street
Construction of the WB Skyway ramp to NB Dan Ryan Local

62301 – NB Local Lanes 71st to 31st Streets and Miscellaneous Ramps
March 7 – November 2007
Reconstruction of the NB and SB local lanes between 47th to 31st Street

c. The total area of the construction site is estimated to be 612 acres.

The total area of the site that it is estimated will be disturbed by excavation, grading or other activities is acres 433.

d. The estimated runoff coefficients of the various areas of the site after construction activities are completed are contained in the project drainage study, which is hereby incorporated by reference in this plan. Information describing the soils at the site is contained in individual Soils Reports for each construction contract.

e. The design/project report, hydraulic report, or plan documents, hereby incorporated by reference, contain site map(s) indicating drainage patterns and approximate slopes anticipated after major grading activities, areas of major soil disturbance, the location of major structural and nonstructural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands), and locations where storm water is discharged to a surface water.

f. The names of receiving water(s) and areal extent of wetland acreage at the site are in the design/project report or plan documents, which are incorporated by reference as a part of this plan.

2. Controls

This section of the plan addresses the various controls that will be implemented for each of the major construction activities described in 1.b. above. For each measure discussed, the contractor that will be responsible for its implementation is indicated. Each such contractor has signed the required certification on forms which are attached to, and a part of, this plan:

a. Erosion and Sediment Controls

(i) **Stabilization Practices.** Provided below is a description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Except as provided in 2.a.(i).(A) and 2.b., stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased on all disturbed portions of the site where construction activity will not occur for a period of 21 or more calendar days.

(A) Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceases is precluded by snow cover, stabilization measures shall be initiated as soon as practicable thereafter.

Description of Stabilization Practices:

1. Temporary Erosion Control Seeding shall be applied in accordance with the Special Provision. Seed mixture will depend on the time of year it is applied. Oats will be applied from January 1 to July 31 and Hard Red Winter Wheat from August 1 to December 31.
2. Short Term Seeding - Seeding Class 2A shall be used to protect bare earth from more than just one or two summer-winter cycles. Due to the length and complexity of this project, it is necessary that short term, final graded slopes be short term seeded as directed by the Engineer.
3. Stone Riprap - Class A4 stone riprap with filter fabric will be used as protection at the discharge end of most storm sewer and culvert end sections to prevent scouring at the end of pipes and to prevent downstream erosion.
4. Temporary Tree Protection - Shall consist of items "temporary fencing" and "tree trunk protection" as directed by the engineer and in accordance with Article 201.05 of the Illinois Department of Transportation's Standard Specifications for Road and Bridge Construction.
5. Permanent Stabilization - All areas disturbed by construction will be stabilized as soon as permitted with permanent seeding following the finished grading, but always within seven days with Temporary Erosion Control Seeding. Erosion Blankets will be installed over fill slopes, which have been brought to final grade and have been seeded to protect the slopes from rill and gully erosion and allow seeds to germinate properly.
6. Erosion Control Blankets and Mulching - Erosion control blankets will be installed over fill slopes and in high velocity areas that have been brought to final grade and seeded to protect slopes from erosion and allow seeds to germinate. Mulch will be applied in relatively flat areas to prevent further erosion.

(ii) Structural Practices. Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions and temporary or permanent sediment basins. The installation of these devices may be subject to Section 404 of the Clean Water Act.

Description of Structural Practices:

1. Sediment Control, Stabilized Construction Access - Coarse aggregate overlaying a geotextile fabric will be placed in locations necessary for contractor access. The aggregate surface of the access points will capture soil debris, reducing the amount of soil deposits placed on to the roadway by vehicles leaving the work zones.
2. Inlet Filters - Inlet and Pipe Protection will be provided for storm sewers. These filters will be placed in every inlet, catch basin or manhole with an open lid, which will drain water during at least a 10-year storm event. The Erosion Control Plan will identify the structures requiring Inlet filters.
3. Sediment Control, Silt Fence - A silt fence will be placed adjacent to the areas of construction to intercept waterborne silt and prevent it from leaving the site. These areas are marked on the erosion control plans in each contract.
4. Sediment Control, Temporary Ditch Checks - Rolled excelsior ditch checks will be placed in swales at the rate of one for every 0.3 meters (1 foot) in vertical drop, or as directed by the Engineer, in order to prevent downstream erosion.
5. Sediment Control, Temporary Stream Crossing - Coarse aggregate overlaying a geotextile fabric will be placed in locations necessary for contractor access over water channels. The aggregate surface of the crossing will reduce the amount of soil disturbance in the streams.
6. Sediment Control, Temporary Pipe Slope Drain - This item consists of a pipe with flared end sections, placed daily, along with anchor devices in conjunction with temporary berms that direct runoff down an unstabilized slope.

7. Sediment Control, Dewatering Basins will be provided at wherever the contractor is removing and discharging water from excavated areas and the water is not being routed through a sediment trap or basin.
8. Stone riprap will be provided at several storm and culvert outlets as a measure for erosion and sediment control where needed during and after the project.
9. Bridges will be designed to reduce the potential for scouring.
10. Underdrains will be used to minimize potential erosion caused by surface water flows by reducing the subsurface water which can cause failed pavements, unstable shoulders and other disturbed areas.
11. Covers will be placed on open ends of pipes in trenches.

The structural practices indicated above may not be used in every contract. The Erosion Control Plans included in every contract will indicate which structural practices are required for that contract.

b. Storm Water Management

Provided below is a description of measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water Act.

Such practices may include: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff on site; and sequential systems (which combine several practices). **The practices selected for implementation were determined on the basis of the technical guidance in Section 10-300 (Design Considerations) in Chapter 10 (Erosion and Sedimentation Control) of the Illinois Department of Transportation Drainage Manual. If practices other than those discussed in Section 10-300 are selected for implementation or if practices are applied to situations different from those covered in Section 10-300, the technical basis for such decisions will be explained below.**

Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., maintenance of hydrologic conditions, such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

The Department proposes to remove vegetation within the project limits as necessary for construction. The Department proposes to revegetate according to the City of Chicago Landscape Framework Plan.

c. Other Controls

- (i) Waste Disposal. No solid materials, including building materials, shall be discharged into Waters of the State, except as authorized by a Section 404 permit.
- (ii) The provisions of this plan shall ensure and demonstrate compliance with applicable State and/or local waste disposal, sanitary sewer or septic system regulations.

d. Approved State or Local Plans

The management practices, controls and provisions contained in this plan will be in accordance with IDOT specifications, which are at least as protective as the requirements contained in the Illinois Environmental Protection Agency's Illinois Urban Manual, 1995. Procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials shall be described or incorporated by reference in the space provided below. Requirements specified in sediment and erosion site plans or site permits or storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI to be authorized to discharge under permit ILR40 incorporated by reference and are enforceable under this permit even if they are not specifically included in the plan.

Description of procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials: See Landscape Design and Erosion Control for further details. In addition, Guidance Memorandums #02-14 and #02-22 leading up to the ILR40NPDES Permit Requirements IDOT Strategies of Storm Water Management will be complied with along with Construction Memorandum 02-60.

3. Maintenance

The following is a description of procedures that will be used to maintain, in good and effective operating conditions, vegetation, erosion and sediment control measures and other protective measures identified in this plan:

Construction equipment shall be stored and fueled only at designated locations. All necessary measures shall be taken to contain any fuel or pollution runoff in compliance with environmental law and EPA Water Quality Regulations. Leaking equipment or supplies shall be immediately repaired or removed from the site. The construction field engineer on a weekly basis shall inspect the project to determine that erosion controls efforts are in place and effective and if other control is necessary. Sediment collected during construction by the various temporary erosion systems shall be disposed on the site on a regular basis as directed by the Engineer.

All erosion and sediment control measures will be checked weekly and after each significant rainfall (13 mm (0.5 inch) or greater in a 24 hour period). The following items will be checked:

Seeding - all erodable bare earth areas will be temporarily seeded and inspected on a weekly basis to minimize the amount of erodable surface within the contract limits.

Silt Filter Fence, all types

Erosion Control Blanket

Tree Protection

Ditch Checks

Temporary slope drains

Sediment/dewatering basins

Stabilized construction entrances

All maintenance of the erosion control systems will be the responsibility of the contractor. All locations where vehicles enter and exit the construction site and all other areas subject to erosion should also be inspected periodically. Inspection of these areas shall be made at least once every seven days and within 24 hours of the end of each 13 mm (0.5 inch) or greater rainfall, or an equivalent snowfall.

4. Inspections

Qualified personnel shall inspect disturbed areas of the construction site, which have not been finally stabilized, structural control measures, and locations where vehicles enter or exit the site. Such inspections shall be conducted at least once every seven (7)-calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater or equivalent snowfall.

a. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off site sediment tracking.

b. Based on the results of the inspection, the description of potential pollutant sources identified in section 1 above and pollution prevention measures identified in section 2 above shall be revised as appropriate as soon as practicable after such inspection. Any changes to this plan resulting from the required inspections shall be implemented within 7 calendar days following the inspection.

c. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of this storm water pollution prevention plan, and actions taken in accordance with section 4.b. shall be made and retained as part of the plan for at least three (3) years after the date of the inspection. The report shall be signed in accordance with Part VI. G of the general permit.

d. If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer or Resident Technician shall complete and file an "Incidence of Noncompliance" (ION) report for the identified violation. The Resident Engineer or Resident Technician shall use forms provided by the Illinois Environmental Protection Agency and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of noncompliance shall be signed by a responsible authority in accordance with Part VI. G of the general permit.

The report of noncompliance shall be mailed to the following address:

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

5. Non-Storm Water Discharges

Except for flows from fire fighting activities, sources of non-storm water that is combined with storm water discharges associated with the industrial activity addressed in this plan must be described below. Appropriate pollution prevention measures, as described below, will be implemented for the non-storm water component(s) of the discharge.

Dewatering activities for footing and pier construction of retaining walls and bridges will be a source of non-storm water discharge during construction. Contractors should discharge dewatering activities to a temporary settling basing surrounded by silt fence. The cutting of joints in PCC pavements or bridge deck grooving will result in slurry. This slurry must be contained on the deck/pavement and cleaned up.

An additional source of non-storm water discharge during construction is the slurry from washing out redi-mix concrete trucks. Redi-mix concrete trucks should wash out in in designated areas surrounded by silt fence. After all PCC items have been constructed, the dried concrete wash material should be cleaned up and properly disposed of. It will be the contractor's responsibility to secure these designated areas for the duration of their use. The Engineer must approve the locations.

On site maintenance of equipment must be performed in accordance with environmental law, such as proper storage and no dumping of old engine oil or other fluids on site.

Good Housekeeping

1. An effort will be made to store only enough product required to do the job.
2. All materials stored on site will be stored in a neat, orderly manner in their appropriate containers, and if possible, under a roof or other enclosure.
3. Products will be kept in their original containers with the original manufacturer's label.
4. Substances will not be mixed with one another unless recommended by the manufacturer.
5. The site superintendent will inspect daily to ensure proper use and disposal of materials on the site.
6. Whenever possible, all of a product will be used up before disposing of the container.
7. Follow manufacturer's recommended practices for use and disposal.



Contractor Certification Statement

This certification statement is a part of the Storm Water Pollution Prevention Plan for the project described below, in accordance with NPDES Permit No. ILR40, issued by the Illinois Environmental Protection Agency on _____, 2003.

Project Information:

Route	I-90/94 Dan Ryan Expressway	Marked	Dan Ryan Expressway I-57 at Illinois Route 1 (Halsted St) & I-90 at MLK to 31st Street
Section	See individual contract	Project No.	Various Contract Numbers – Refer to Attachment
County	Cook		

I certify under penalty of law that I understand the terms of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR 40) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

_____ Signature	_____ Date
_____ Title	
_____ Name of Firm	
_____ Street Address	
_____ City	_____ State
_____ Zip Code	
_____ Telephone Number	

Storm Water Pollution Prevention Plan – Attachment

Project Limits: Dan Ryan Expressway I-57 at Illinois Route 1 (Halsted St) & I-90 at MLK to 31st Street

Attachment: Contract Numbers and Description. Note that the contract numbers are listed in numerical order.

IDOT Contract No.	Description
62300	Reconstruct NB Express Lanes from 31st Street to 71st Street
62301	Reconstruct NB Local Lanes from 31st St. to Wentworth Ave. and Misc. Ramps
62302	Reconstruct SB Express Lanes from 31st Street to 71st Street
62303	Reconstruct SB Local Lanes from 31st St. to Wentworth Ave. and Misc. Ramps
62304	Reconstruct NB Inside Lanes (1-3, shoulder and barrier wall) from 71st Street to I-57 Interchange
62305	Reconstruct SB Inside Lanes (1-3, shoulder and barrier wall) from 71st Street to I-57 Interchange
62573	Shoulder Rehabilitation from 47th St. to 71st St.
62584	Reconstruct NB ramps between 31st and 39th Street and Shoulder Rehabilitation
62585	Reconstruct SB ramps between 31st and 39th Street and Shoulder Rehabilitation
62586	Reconstruct 57th St. Bridge, and Frontage Rds., Retaining Walls, and Ramps between 47th and 59th. Streets
62587	Wentworth Avenue Overpass Reconstruction and Wells Street Realignment
62589	Skyway Interchange Bridges and Local Lanes from Wentworth Avenue to 67th Street
62590	Reconstruct 67th St. Bridge and NB and SB C-D System between 67th and 71st St.
62591	Storm Sewer Jacking & Collector Sewers from 67th Street to 95th Street.
62592	Reconstruct NB Outside Lanes (4, 5, shoulder) from 71st to I-57 Interchange
62593	reconstruct SB Outside Lanes (4, 5, shoulder) from 71st to I-57 Interchange
62594	Reconstruct NB and SB C-D System and Ramps between 79th and 83rd Streets
62691	Reconstruct Watermain crossings under Dan Ryan from 32nd to 63rd
62692	Reconstruct Watermain Crossings Under the Dan Ryan from 75th St. to I-57 Interchange
62693	Frontage Rds., Retaining Walls, and Ramps between 59th. and 63rd.
62694	Reconstruct NB Retaining Walls & Ramps from 71st to I-57 Interchange, and 71st to 75th C-D System
62695	Reconstruct SB Retaining Walls & Ramps from 71st to I-57 Interchange, and 71st to 75th C-D System
TBA	Reconstruct NB I-57 Bridge over WB cross connection from I-94 & tunnel over SB I-94

DRILLED SHAFTS

Effective: May 1, 2001

Revised: February 7, 2005

Description. This work shall consist of all labor, materials, equipment and services necessary to complete the drilled shaft installation according to the details and dimensions shown on the plans, this specification and as directed by the Engineer.

Submittals. The Contractor shall submit the following:

(a) Qualifications. At the time of the preconstruction conference, the Contractor shall provide the following documentation:

- (1) A list containing at least 3 projects completed within the 3 years prior to this project's bid date which the Contractor performing this work has installed drilled shafts of similar diameter, length and site conditions to those shown in the plans. The list of projects shall contain names and phone numbers of owner's representatives who can verify the Contractor's participation on those projects.
- (2) Name and experience record of the drilled shaft supervisor, responsible for all facets of the shaft installation, and the drill operator(s) who will be assigned to this project. The supervisor and driller shall each have a minimum of 3 years experience in the construction of drilled shafts.
- (3) A signed statement that the drilled shaft supervisor has inspected both the project site and all the subsurface information available. In addition to the subsurface information in the contract documents, rock core specimens and/or geotechnical reports, when available, should be requested for evaluation.

(b) Installation Procedure. A submittal detailing the installation procedure will be required for all drilled shafts, unless directed otherwise by the Engineer. The Contractor, meeting the above qualifications, shall prepare the installation procedure, addressing all items shown below and will be responsible for directing all aspects of the shaft construction. The installation procedure shall be submitted to the Engineer at least 45 days prior to drilled shaft construction and shall address each of the following items:

- (1) List of proposed equipment to be used including cranes, drill rigs, augers, belling tools, casing, core barrels, bailing buckets, final cleaning equipment, slurry equipment, tremies or concrete pumps, etc.
- (2) Details of the overall construction operation sequence, equipment access, and the sequence of individual shaft construction within each substructure bent or footing group. The submittal shall address the Contractor's proposed time delay and/or the minimum concrete strength necessary before initiating a shaft excavation adjacent to a recently installed drilled shaft.

- (3) A step by step description of how the Contractor anticipates the shaft excavation to be advanced based on their evaluation of the subsurface data and conditions expected to be encountered. This sequence shall note the method of casing advancement, anticipated casing lengths, tip elevations and diameters, the excavation tools used and drilled diameters created. The Contractor shall indicate whether wet or dry drilling conditions are expected or if the water table will be sealed from the excavation.
- (4) When slurry is proposed, details covering the measurement and control of the hardness of the mixing water, agitation, circulation, de-sanding, sampling, testing and chemical properties of the slurry shall be submitted.
- (5) Method(s) and sequence proposed for the shaft cleaning operation as well as recommendations on how the shaft excavation will be inspected under the installation conditions anticipated.
- (6) Details of reinforcement placement including cage centralization devices to be used and method to maintain proper elevation and plan location of cage within the shaft excavation during concrete placement. The method(s) of adjusting the cage length if rock is encountered at an elevation other than as estimated in the plans.
- (7) Details of concrete placement including proposed operational procedures for free fall, tremie or pumping methods. The sequence and method of casing removal shall also be stated along with the top of pour elevation, and method of forming through water above streambed.
- (8) The proposed concrete mix design(s).

The Engineer will evaluate the drilled shaft installation plan and notify the Contractor of acceptance, or if additional information is required, or if there are concerns with the installation's effect on the existing or proposed structure(s).

Materials. The materials used for the construction of the drilled shaft shall satisfy the following requirements:

- (a) The drilled shaft portland cement concrete shall be according to Section 1020, except the mix design shall be as follows:
 - (1) A Type I or II cement shall be used at 395 kg/cu m (665 lb/cu yd). When specified in the plans that soil and ground water sulfate contaminates exceed 500 parts per million, a Type V cement shall be required.
 - (2) Class C or F fly ash may replace Type I or II cement. The cement replacement shall not exceed 15 percent by mass (weight) at a minimum replacement ratio of 1.5:1. The fly ash shall not be used in combination with ground granulated blast- furnace slag.

- (3) Grade 100 or 120 ground granulated blast-furnace slag may replace Type I or II cement. The cement replacement shall not exceed 25 percent by mass (weight) at a minimum replacement ratio of 1:1. The ground granulated blast-furnace slag shall not be used in combination with fly ash.
- (4) The maximum water/cement ratio shall be 0.44.
- (5) The mortar factor shall be a value which produces a coarse aggregate content comprising between 55 and 65 percent of total aggregate by mass (weight).
- (6) The slump at point of placement shall be 175 mm \pm 25 mm (7 \pm 1 in.). If concrete is placed to displace drilling fluid, or against temporary casing, the slump shall be 200 mm \pm 25 mm (8 \pm 1 in.) at point of placement. The concrete mix shall be designed to remain fluid throughout the anticipated duration of the pour plus 1 hour.
- (7) An air entraining admixture shall be required and the air content range shall be 4.0 to 7.0 percent.
- (8) The minimum compressive strength shall be 27,500 kPa (4000 psi) at 14 days. The minimum flexural strength shall be 4,650 kPa (675 psi) at 14 days.
- (9) A retarding admixture shall be required.
- (10) A water-reducing or high range water-reducing admixture shall be required.
- (11) An accelerating admixture may be used with the permission of the Engineer in extraordinary situations.
- (12) The coarse aggregate shall be a CA 13, CA 14, CA 16 or a blend of these gradations. The fine aggregate shall consist of sand only according to Article 1003.01(a).

At the Engineers discretion, and at no additional cost to the Department, the Contractor may be required to conduct a minimum 0.76 cu m (1 cu yd) trial batch to verify the mix design.

- (b) The sand-cement grout mix used to fill any visible gaps, which may exist between the permanent casing and either the drilled excavation or temporary casing, shall be as follows:
 - (1) A Type I or II cement shall be used at 110 kg/cu m (185 lb/cu yd). When specified in the plans that soil and ground water sulfate contaminates exceed 500 parts per million, a Type V cement shall be required. The cement shall be according to Section 1001.
 - (2) The fine aggregate shall be according to Articles 1003.01 and 1003.02.
 - (3) The water shall be according to Section 1002.

(4) The maximum water shall be sufficient to provide a flowable mixture with a typical slump of 254 mm (10 in.).

(c) Reinforcement shall be according to Section 508 of the Standard Specifications.

(d) Drilling slurry, when required, shall consist of a polymer or mineral base material. Mineral slurry shall have both a mineral grain size that will remain in suspension with sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. The percentage and specific gravity of the material used to make the suspension shall be sufficient to maintain the stability of the excavation and to allow proper concrete placement. For polymer slurry, the calcium hardness of the mixing water shall not exceed 100 mg/L.

(e) Permanent casing, when required, shall be fabricated from steel satisfying ASTM A252 Grade 2, produced by electric seam, butt, or spiral welding to satisfy the outside diameter(s) and lengths shown in the contract plans or as shown in the Contractor's installation procedure. The minimum wall thickness shall be as required to resist the anticipated installation and dewatering stresses, as determined by the Contractor, but in no case less than 6 mm (1/4 in.).

Equipment. The drilling equipment shall have adequate capacity, including power, torque and down thrust, to create a shaft excavation of the maximum diameter specified to a depth of 20 percent beyond the depths shown on the plans. Standby equipment of sufficient capacity shall be available so that there will be no delay in placing of the concrete once the operation has started. Concrete equipment shall be according to Article 1020.03 of the Standard Specifications.

Construction Requirements. Excavation for drilled shaft(s) shall not proceed until written authorization is received from the Engineer. The Contractor shall furnish an installation log for each shaft installed. Excavation by blasting shall not be permitted unless authorized in writing by the Engineer.

No shaft excavation shall be made within 4 shaft diameters center to center of a shaft with concrete that has a compressive strength less than 10,342 kPa (1500 psi) unless otherwise approved in the Contractor's installation procedure. The site-specific soil strengths and installation methods selected will determine the actual required minimum spacing, if any, to address vibration and blow out concerns.

Materials removed or generated from the shaft excavations shall be disposed of by the Contractor according to Article 202.03 of the Standard Specifications.

The Contractor's methods and equipment shall be suitable for the anticipated conditions and the following requirements noted below:

(a) Construction Tolerances. The following construction tolerances shall apply to all drilled shafts unless otherwise stated in the contract documents:

- (1) The center of the drilled shaft shall be within 75 mm (3 in.) of the plan station and offset at the top of the shaft.
 - (2) The center of the reinforcement cage shall be within 38 mm (1 1/2 in.) of plan station and offset at the top of the shaft.
 - (3) The out of vertical plumbness of the shaft shall not exceed 1.5 percent.
 - (4) The out of vertical plumbness of the shaft reinforcement cage shall not exceed 0.83 percent.
 - (5) The top of the reinforcing steel cage shall be no more than 25 mm (1 in.) above and no more than 75 mm (3 in.) below the plan elevation.
 - (6) The top of the shaft shall be no more than 25 mm (1 in.) above and no more than 75 mm (3 in.) below the plan elevation.
 - (7) Excavation equipment and methods used to complete the shaft excavation shall have a nearly planar bottom. The cutting edges of excavation equipment used to create the bottom of shafts in rock shall be normal to the vertical axis of the shaft within a tolerance of 6.25 percent.
- (b) Construction Methods. The construction of drilled shafts may involve the use of one or more of the following methods to support the excavation during the various phases of shaft drilling, cleaning and concrete placement dependent on the site conditions encountered. The following are general descriptions indicating the conditions when these methods may be used:
- (1) Dry Method. The dry method consists of drilling the shaft excavation, removing accumulated water and loose material from the excavation, placing the reinforcing cage, and concrete in a predominately dry excavation. This method shall be used only at sites where the groundwater and soil conditions are suitable to permit the drilling and dewatering of the excavation without causing excessive water infiltration, boiling, squeezing, or caving of the shaft side walls. This method allows the concrete placement by tremie or concrete pumps, or if the excavation can be dewatered, the concrete can be placed by free fall within the limits specified for concrete placement.
 - (2) Wet Method. The wet construction method may be used at sites where dewatering the excavation would cause collapse of the shaft sidewalls or when the volume and head of water flowing into the shaft is likely to contaminate the concrete during placement resulting in a shaft defect. This method uses water or slurry to maintain stability of the shaft perimeter while advancing the excavation. After the excavation is completed, the water level in the shaft is allowed to seek equilibrium, the base is cleaned, the reinforcing cage is set and the concrete is discharged at the base using a tremie pipe or concrete pump, displacing the drilling fluid upwards.

- (3) Temporary Casing Method. Temporary casing shall be used when either the wet or dry methods provide inadequate support to prevent sidewall caving or ensure excessive deformation of the hole. Temporary casing may also be used to reduce the flow of water into the excavation to allow dewatering, adequate cleaning and inspection, or to insure proper concrete placement. Temporary casing left in place may constitute a shaft defect; no temporary casing will be allowed to remain permanently in place without the specific approval of the Engineer.

Before the temporary casing is broken loose, the level of concrete in the casing shall be a minimum of 1.5 m (5 ft) above the bottom of the casing. After being broken loose and as the casing is withdrawn, additional concrete shall be added to maintain sufficient head so that water and soil trapped behind the casing can be displaced upward and discharged at the ground surface without contaminating the concrete in the shaft or at the finished construction joint.

- (4) Permanent Casing Method. When called for on the plans or proposed as part of the Contractor's accepted installation procedure, the Contractor shall install a permanent casing of the diameter, length, thickness and strength specified. When permanent casings are used, the lateral loading design requires intimate contact between the casing and the surrounding soils. If the installation procedure used to set the permanent casing results in annular voids between the permanent casing and the drilled excavation, the voids shall be filled with a sand-cement grout to maintain the lateral load capacity of the surrounding soil, as assumed in the design. No permanent casing will be allowed to remain in place beyond the limits shown on the plans without the specific approval of the Engineer.

- (5) Removable Forms. When the shaft extends above streambed through a body of water and permanent casing is not shown, the portion above the streambed shall be formed with removable casings, column forms, or other forming systems as approved by the Engineer. The forming system shall not scar or spall the finished concrete or leave in place any forms or casing within the removable form limits as shown on the plans unless approved as part of the installation procedure. The forming system shall not be removed until the concrete has attained a minimum compressive strength of 17,237 kPa (2500 psi) and cured for a minimum of 72 hours. For shafts extending through water, the concrete shall be protected from water action after placement for a minimum of 7 days.

- (c) Slurry. If the Contractor proposes to use a method of slurry construction, it shall be submitted with the installation plan. During construction, the level of the slurry shall be maintained at a height sufficient to prevent caving of the hole. In the event of a sudden or significant loss of slurry to the hole, the construction of that foundation shall be stopped and the shaft excavation backfilled or supported by temporary casing, until a method to stop slurry loss, or an alternate construction procedure has been approved by the Engineer.

- (d) Obstructions. Obstructions shall be defined as any object (such as but not limited to, boulders, logs, old foundations etc.) that cannot be removed with normal earth drilling procedures but requires special augers, tooling, core barrels or rock augers to remove the obstruction. When obstructions are encountered, the Contractor shall notify the Engineer and upon concurrence of the Engineer, the Contractor shall begin working to core, break up, push aside, or remove the obstruction. Lost tools or equipment in the excavation as a result of the Contractor's operation shall not be defined as obstructions and shall be removed at the Contractor's expense.
- (e) Top of Rock. The actual top of rock will be defined as the point when material is encountered which can not be drilled with a conventional earth auger and/or underreaming tool, and requires the use of special rock augers, core barrels, air tools, blasting or other methods of hand excavation.
- (f) Sidewall overreaming. Sidewall overreaming shall be required when the sidewall of the hole is determined by the Engineer to have either softened due to the excavation methods, swelled due to delay in concreting, or degraded because of slurry cake buildup. It may also be required to correct a shaft excavation which has been drilled out of tolerance. Overreaming thickness shall be a minimum of 13 mm (1/2 in.). Overreaming may be accomplished with a grooving tool, overreaming bucket or other approved equipment. Any extra concrete needed as a result of the overreaming shall be furnished and installed at the Contractor's expense.
- (g) Excavation Inspection. The Contractor shall be responsible for verification of the dimensions and alignment of each shaft excavation as directed by the Engineer. Unless otherwise specified in the contract documents, the Contractor's cleaning operation shall be adjusted so that a minimum of 50 percent of the base of each shaft shall have less than 13 mm (1/2 in.) of sediment or debris at the time of placement of the concrete. The maximum depth of sediment or any debris at any place on the base of the shaft shall not exceed 38 mm (1 1/2 in.).

Shaft cleanliness will be determined by the Contractor using the methods as submitted in their installation procedure. Visual inspection coupled with the use of a weighted tape may also be used to confirm adequate cleanliness.

- (h) Design Modifications. If the top of rock elevation differs from that shown on the plans by more than 10 percent of the length of the shaft above the rock, the Engineer shall be contacted to determine if any drilled shaft design changes may be required. In addition, if the type of soil or rock encountered is not similar to that shown in the subsurface exploration data, the Contractor may be required to extend the drilled shaft length(s) beyond those specified in the plans. In either case, the Engineer will determine if revisions are necessary and the extent of the modifications required.

- (i) Reinforcement Cage Construction and Placement. The shaft excavation shall be cleaned, inspected and accepted prior to placing the reinforcement cage. The reinforcement cage shall be completely assembled prior to drilling and be ready for adjustment in length as required by the conditions encountered. The cage shall be lifted using multiple point sling straps or other approved methods to avoid cage distortion or stress. Additional cross frame stiffeners may also be required for lifting or to keep the cage in proper position during lifting and concrete placement.

The Contractor shall attach suitable centralizers to keep the cage away from the sides of the shaft excavation and ensure that at no point will the finished shaft have less than the minimum concrete cover(s) shown on the plans. The cage centralizers or other approved non-corrosive spacing devices shall be used at sufficient intervals (near the bottom and at intervals not exceeding 3 m (10 ft) throughout the length of the shaft) to ensure proper cage alignment and clearance for the entire shaft.

If the top of rock encountered is deeper than estimated in the plans, and/or if the conditions differ such that the length of the shaft is increased, additional longitudinal bars shall be either mechanically spliced or lap spliced to the lower end of the cage and confined with either hoop ties or spirals to provide the additional length. If the additional shaft length is less than the lap splice shown, subject to the approval of the Engineer, a mechanical splice may be used in lieu of the lap splice in order to take advantage of or utilize that lap length in the extension of the shaft reinforcement. The Contractor shall have additional reinforcement available or fabricate the cages with additional length as necessary to make the required adjustments in a timely manner as dictated by the encountered conditions. The additional reinforcement may be non-epoxy coated at the option of the Contractor. Any reinforcement fabricated in advance but not incorporated into the installed shaft(s) shall not be paid for but shall remain the property of the Contractor.

- (j) Concrete placement. Concrete work shall be performed according to the applicable portions of Section 503 of the Standard Specifications and as specified herein.

Concrete shall be placed as soon as possible after reinforcing steel is set and secured in proper position. The pour shall be made in a continuous manner from the bottom to the top elevation of the shaft as shown on the contract plan or as approved in the Contractor's installation procedure. Concrete placement shall continue after the shaft excavation is full and until good quality, uncontaminated concrete is evident at the top of shaft. The elapsed time from the beginning of concrete placement in the shaft to the completion of the placement shall not exceed 2 hours. The Contractor may request a longer placement time provided the concrete mix maintains the minimum slump requirements over the longer placement time as demonstrated by trial mix and slump loss tests. Concrete shall be placed either by free fall, or through a tremie or concrete pump subject to the following conditions:

- (1) The free fall placement shall only be permitted in shafts that can be dewatered to ensure less than 75 mm (3 in.) of standing water exist at the time of placement without causing side wall instability. The maximum height of free fall placement shall not exceed 18.3 m (60 ft). Concrete placed by free fall shall fall directly to the base without contacting either the rebar cage or hole sidewall. Drop chutes may be used to direct concrete to the base during free fall placement.

Drop chutes used to direct placement of free fall concrete shall consist of a smooth tube of either one continuous section or multiple pieces that can be added and removed. Concrete may be placed through either a hopper at the top of the tube or side openings as the drop chute is retrieved during concrete placement. The drop chute shall be supported so that the free fall does not exceed 18.3 m (60 ft) at all times and to ensure the concrete does not strike the rebar cage. If placement cannot be satisfactorily accomplished by free fall in the opinion of the Engineer, the Contractor shall use either tremie or pumping to accomplish the pour.

- (2) Tremies shall consist of a tube of sufficient length, weight, and diameter to discharge the initial concrete at the base of the shaft. The tremie shall be according to Article 503.08 of the Standard Specifications and contain no aluminum parts that may have contact with the concrete. The inside and outside surfaces of the tremie shall be clean and smooth to permit both flow of concrete and unimpeded withdrawal during concrete placement.
- (3) Concrete pumps: Pumps and lines may be used for concrete placement and shall have a minimum 100 mm (4 in.) diameter.

The tremie or pump lines used for wet method concrete placement shall be watertight and not begin discharge until placed within 250 mm (10 in.) of the shaft base. Valves, bottom plates or plugs may be used only when they can be removed from the excavation or be of a material approved by the Engineer that will not cause a defect in the shaft if not removed. The discharge end shall be immersed at least 1.5 m (5 ft) in concrete at all times after starting the pour. Sufficient concrete head shall be maintained in the tremie at all times to prevent water or slurry intrusion in the shaft concrete.

If at any time during the concrete pour in the "wet" hole, the tremie or pump line orifice is removed from the fluid concrete and discharges through drilling fluid or water above the rising concrete level, the shaft may be considered defective.

Vibration of concrete is not recommended when placed while displacing drilling fluid or water. In dry excavations, vibration is allowed only in the top 3 m (10 ft) of the shaft.

Conformity with Contract. In addition to Article 105.03, the Contractor shall be responsible for correcting all out of tolerance excavations and completed shafts as well as repairing any defects in the shaft to the satisfaction of the Engineer at no additional cost to the Department. No time extensions will be allowed to repair or replace unacceptable work. When a shaft excavation is

completed with unacceptable tolerances, the Contractor will be required to submit for approval his/her proposed corrective measures. Any proposed design modification with computations submitted by the Contractor shall be signed and sealed by an Illinois licensed Structural Engineer.

Method of Measurement. The items Drilled Shaft in Soil and Drilled Shaft in Rock, will be measured for payment and the length computed in meters (feet) for all drilled shafts installed according to the plans, specifications, and accepted by the Engineer. The length shall be measured at each shaft. The length in soil will be defined as the difference in elevation between the top of the drilled shaft shown on the plans, or as installed as part of the Contractor's installation procedure, and the bottom of the shaft or the top of rock (when present) whichever is higher. The length in rock will be defined as the difference in elevation between the measured top of rock and the bottom of the shaft. When permanent casing is installed as specified on the plans, it will be measured in meters (feet) and shall be the length of casing installed.

Basis of Payment. This work will be paid for at the contract unit price per meter (foot) for DRILLED SHAFT IN SOIL, and/or DRILLED SHAFT IN ROCK, of the diameter(s) specified. The price shall be payment in full for all labor, materials, equipment, and services necessary to complete the work as specified. When the shaft is detailed with a belled base, furnishing and installing it shall not be paid for separately but shall be included in the cost of the appropriate drilled shaft item(s).

When permanent casing is furnished and installed as specified, it will be paid for at the contract unit price per meter (foot) for PERMANENT CASING. Permanent casing installed at the Contractor's option shall not be included in this item, but shall be considered as included in the appropriate drilled shaft item(s) above.

Obstruction mitigation shall be paid for according to Article 109.04 of the Standard Specifications.

No additional compensation, other than noted above, will be allowed for removing and disposing of excavated materials, for furnishing and placing concrete, bracing, lining, temporary casings placed and removed or left in place, for grouting of any voids, or for any excavation made or concrete placed outside of the plan diameter(s) of the shaft(s) specified.

Reinforcement bars, spirals and ties shall be as specified and paid for under the items, REINFORCEMENT BARS or REINFORCEMENT BARS EPOXY COATED, according to Section 508 of the Standard Specifications.

DRAINAGE SYSTEM

Effective : June 10, 1994

Revised: January 1, 2002

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

Material. The pipe and fittings shall be reinforced fiberglass according to ASTM D 2996 RTRP with a 207 MPa (30,000 psi) minimum short-time rupture strength hoop tensile stress. The reinforced fiberglass shall also have an apparent stiffness factor at 5 percent deflection exceeding 22.6 cu mm-kPa (200 cu in.-lbf/sq in) and a minimum wall thickness of 2.54 mm (0.10 in.). All pipe supports and associated hardware shall be hot dip galvanized according to AASHTO M 232. The fiberglass pipe and fittings furnished shall be pigmented through out, or have a resin-rich pigmented exterior coat, specifically designed for overcoating fiberglass, as recommended by the manufacturer. The color shall be as specified by the Engineer. The resin in either case shall have an ultraviolet absorber designed to prevent ultraviolet degradation. The supplier shall certify the material supplied meets or exceeds these requirements.

Installation. All connections of pipes and fittings shown on the plans to facilitate future removal for maintenance cleanout or flushing shall be made with a threaded, gasketed coupler or a bolted gasketed flange system. Adhesive bonded joints will be permitted for runs of pipe between such connections. The end run connection shall feature a minimum nominal 150 mm (6 in.) female threaded fiberglass outlet. Straight runs may utilize a 45 degree reducing saddle bonded to the pipe. The female outlet shall be filled with a male threaded PVC plug.

Runs of pipe shall be supported at spacings not exceeding those recommended by the manufacturer of the pipe. Supports that have point contact or narrow supporting areas shall be avoided. Standard slings, clamps, clevis hangers and shoe supports designed for use with steel pipe may be used. A minimum strap width for hangers shall be 40 mm (1 1/2 in.) for all pipe under 300 mm (12 in.) in diameter and 50 mm (2 in.) for diameters 300 mm (12 in.) or greater. Straps shall have 120 degrees of contact with the pipe. Pipes supported on less than 120 degrees of contact shall have a split fiberglass pipe protective sleeve bonded in place with adhesive.

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

Basis of Payment. This work will be paid for at the contract lump sum price for DRAINAGE SYSTEM.

TEMPORARY SHEET PILING

Effective: September 2, 1994

Revised: December 13, 2002

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 265 MPa (38.5 ksi) 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 300 mm (12 in.) 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 meters (square feet). 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 meter (square foot) 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.

DRILLED SOLDIER PILE RETAINING WALL

Effective: September 20, 2001

Revised: March 30, 2005

Description. This work shall consist of providing all labor, materials, and equipment necessary to fabricate and furnish the soldier piles, create and maintain the shaft excavations, set and brace the soldier piles into position and encase the soldier piles in concrete to the specified elevation. Also included in this work is the backfilling of the remainder of the shaft excavation with Controlled Low-Strength Material (CLSM), the furnishing and installation of the timber lagging, and the furnishing and installation of CLSM secant lagging. All work shall be according to the details shown on the plans and as directed by the Engineer.

The remainder of the retaining wall components as shown on the plans, such as concrete facing, shear studs, reinforcement bars, tie backs, hand rails, and various drainage items etc., are not included in this Special Provision but are paid for as specified elsewhere in this Contract.

Materials. The materials used for the soldier piles and lagging shall satisfy the following requirements:

- (a) The structural steel components for the soldier piles shall conform to the requirements of AASHTO M270, Grade 250 (36), unless otherwise designated on the plans.
- (b) The soldier pile encasement concrete shall be portland cement concrete according to Section 1020, except the mix design shall be as follows:
 - (1) A Type I or II cement shall be used at 395 kg/cu m (665 lb/cu yd). When the plans specify that soil and ground water sulfate contaminates exceed 500 parts per million, a Type V cement shall be required. The cement shall be increased 35 kg/cu m (60 lb/cu yd) if the concrete is to be placed under water.

- (2) Class C or F fly ash may replace Type I or II cement. The cement replacement shall not exceed 15 percent by mass (weight) at a minimum replacement ratio of 1.5:1. The fly ash shall not be used in combination with ground granulated blast-furnace slag.
 - (3) Grade 100 or 120 ground granulated blast-furnace slag may replace Type I or II cement. The cement replacement shall not exceed 25 percent by mass (weight) at a minimum replacement ratio of 1:1. The ground granulated blast-furnace slag shall not be used in combination with fly ash.
 - (4) The maximum water/cement ratio shall be 0.44.
 - (5) The mortar factor shall be a value which produces a coarse aggregate content comprising between 55 and 65 percent of total aggregate by mass (weight).
 - (6) The slump at point of placement shall be 175 mm \pm 25 mm (7 \pm 1 in.). If concrete is placed to displace drilling fluid or against temporary casing, the slump shall be 200 mm \pm 25 mm (8 \pm 1 in.) at point of placement. The concrete mix shall be designed to remain fluid throughout the anticipated duration of the pour plus 1 hour.
 - (7) An air entraining admixture shall be required and the air content range shall be 4.0 to 7.0 percent.
 - (8) The minimum compressive strength shall be 27,500 kPa (4000 psi) at 14 days. The minimum flexural strength shall be 4,650 kPa (675 psi) at 14 days.
 - (9) A retarding admixture shall be required.
 - (10) A water-reducing or high range water-reducing admixture shall be required.
 - (11) An accelerating admixture may be used with the permission of the Engineer in extraordinary situations.
 - (13) The coarse aggregate shall be CA 13, CA 14, CA 16 or a blend of these gradations. The fine aggregate shall consist of sand only according to Article 1003.01(a).
- (c) The Controlled Low-Strength Material (CLSM), used for backfilling shaft excavations above the soldier pile encasement concrete and for backfilling secant lagging excavations, to the existing ground surface, shall be according to the Recurring Special Provisions for CLSM.
- (d) Temporary casing shall be produced by electric seam, butt, or spiral welding to produce a smooth wall surface, fabricated from steel satisfying ASTM A252 Grade 2. The minimum wall thickness shall be as required to resist the anticipated installation and dewatering stresses, as determined by the Contractor, but in no case less than 6 mm (1/4 in.).
- (e) Drilling slurry shall consist of a polymer or mineral base material. Mineral slurry shall have both a mineral grain size that will remain in suspension with sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. The percentage and specific gravity of the material used to make the suspension shall be sufficient to maintain the stability of the excavation and to allow proper concrete placement.

For polymer slurry, the calcium hardness of the mixing water shall not exceed 100 mg/L.

- (f) Timber Lagging. The minimum tabulated unit stress in bending (F_b), used for the design of the timber lagging, shall be 6.9 MPa (1000 psi) unless otherwise specified on the plans. When treated timber lagging is specified on the plans, the method of treatment shall be according to Article 1007.12.

Equipment. The drilling equipment shall have adequate capacity, including power, torque and down thrust, to create a shaft excavation of the maximum diameter specified to a depth of 20 percent beyond the depths shown on the plans. Concrete equipment shall be according to Article 1020.03.

Construction Requirements. The shaft excavation for each soldier pile shall extend to the tip elevation indicated on the plans for soldier piles terminating in soil or to the required embedment in rock when rock is indicated on the contract plans. The Contractor shall satisfy the following requirements:

- (a) Drilling Methods. The soldier pile installation may involve the use of one or more of the following drilling methods to maintain excavation side wall stability during the various phases of shaft excavation and concrete placement, dependent on the site conditions encountered:
- (1) Dry Method. The dry method consists of drilling the shaft excavation, removing accumulated water and loose material from the excavation, placing the soldier pile and concrete in a predominately dry excavation. This method shall be used only at sites where the groundwater and soil conditions are suitable to permit the drilling and dewatering of the excavation without causing excessive water infiltration, boiling, squeezing, or caving of the excavation side walls. This method allows the concrete placement by tremie or concrete pumps, or if the excavation can be dewatered, the concrete can be placed by free fall.
 - (2) Wet Method. The wet construction method may be used at sites where dewatering the excavation would cause collapse of the excavation sidewalls or when the volume and head of water flowing into the shaft excavation is likely to contaminate the concrete during placement. This method uses water or slurry to maintain stability of the shaft perimeter while advancing the excavation. After the excavation is completed, the water level in the shaft is allowed to seek equilibrium, the base is cleaned, the soldier pile is set and the concrete is discharged at the base using a tremie pipe or concrete pump, displacing the drilling fluid upward.
 - (3) Temporary Casing Method. Temporary casing shall be used when either the wet or dry methods provide inadequate support to prevent sidewall caving or to ensure there is not excessive deformation of the hole. Temporary casing may also be used to reduce the flow of water into the excavation to allow dewatering, adequate cleaning, or to ensure proper concrete placement.

Temporary casing will not be allowed to remain permanently in place without the approval of the Engineer. Before the temporary casing is broken loose, the level of soldier pile encasement concrete in the casing shall be a minimum of 1.5 m (5 ft) above the bottom of the casing. After being broken loose, and as the casing is withdrawn,

additional concrete shall be added to maintain sufficient head so that water and soil trapped behind the casing can be displaced upward and discharged at the ground surface.

No shaft excavation shall be made adjacent to a soldier pile with encasement concrete that has a compressive strength less than 10.35 MPa (1500 psi), nor adjacent to secant lagging until the CLSM has reach sufficient strength to maintain it's position and shape unless otherwise approved by the Engineer. Materials removed or generated from the shaft excavations shall be disposed of by the Contractor according to Article 202.03. Excavation by blasting will not be permitted.

- (b) Drilling Slurry. During construction, the level of the slurry shall be maintained at a height sufficient to prevent caving of the hole. In the event of a sudden or significant loss of slurry to the hole, the construction of that shaft shall be stopped and the shaft excavation backfilled or supported by temporary casing until a method to stop slurry loss, or an alternate construction procedure, has been developed and approved by the Engineer.
- (c) Obstructions. Obstructions shall be defined as any object (such as but not limited to, boulders, logs, old foundations, etc.) that cannot be removed with normal earth drilling procedures, but requires special augers, tooling, core barrels or rock augers to remove the obstruction. When obstructions are encountered, the Contractor shall notify the Engineer and upon concurrence of the Engineer, the Contractor shall begin working to core, break up, push aside, or remove the obstruction. Lost tools or equipment in the excavation, as a result of the Contractor's operation, shall not be defined as obstructions and shall be removed at the Contractor's expense.
- (d) Top of Rock. The actual top of rock will be defined as the point where material is encountered which can not be drilled with a conventional earth auger and/or under-reaming tool, and requires the use of special rock augers, core barrels, air tools or other methods of hand excavation.
- (e) Design Modifications. If the top of rock elevation encountered is below that estimated on the plans, such that the soldier pile length above rock is increased by more than 10 percent, the Engineer shall be contacted to determine if any soldier pile design changes are required. In addition, if the type of soil or rock encountered is not similar to that shown in the subsurface exploration data, the Engineer shall be contacted to determine if revisions are necessary.
- (f) Soldier Pile Fabrication and Placement. The soldier pile is defined as the structural steel section(s) shown on the plans as well as any connecting plates used to join multiple sections. Cleaning and painting of all steel components, when specified, shall be as shown on the plans and accomplished according to the special provision for "Cleaning and Painting New Metal Structures". This work will not be paid for separately, but shall be considered included in the cost of Furnishing Soldier Piles of the type specified.

The soldier pile shall be shop fabricated such that no field welding is required. The Contractor shall attach suitable bracing or support to maintain the position of the soldier pile within the shaft excavation such that the final location will satisfy the Construction Tolerances portion of this Special Provision. The bracing or supports shall remain in place until the concrete for encasement has reached a minimum compressive strength of 10.35 MPa (1500 psi).

When embedment in rock is indicated on the plans, modification to the length of a soldier pile may be required to satisfy the required embedment. The modification shall be made to the top of the soldier pile unless otherwise approved by the Engineer. When the top of rock encountered is above the estimated elevation indicated on the plans, the soldier piles shall be cut to the required length. If the top of rock encountered is below that estimated on the plans, the Contractor shall either furnish longer soldier piles or splice on additional length of soldier pile per Article 512.05(b) to satisfy the required embedment in rock. In order to avoid delays, the Contractor may have additional soldier pile sections fabricated as necessary to make the required adjustments. Additional soldier pile quantities, above those shown on the plans, shall not be furnished without prior written approval by the Engineer.

- (g) Concrete Placement. Concrete work shall be performed according to the applicable portions of Section 503 and as specified herein.

The soldier pile encasement concrete pour shall be made in a continuous manner from the bottom of the shaft excavation to the elevation indicated on the plans. Concrete shall be placed as soon as possible after the excavation is completed and the soldier pile is secured in the proper position. Uneven levels of concrete placed in front, behind, and on the sides of the soldier pile shall be minimized to avoid soldier pile movement, and to ensure complete encasement. Concrete shall be placed either by free fall, or through a tremie or concrete pump subject to the following conditions:

- (1) The free fall placement shall only be permitted in shaft excavations that can be dewatered without causing side wall instability and where no more than 75 mm (3 in.) of standing water exists at the time of concrete placement. The maximum height of free fall placement shall not exceed 18.3 m (60 ft.) and the concrete shall be directed to the base to minimize contact with either the soldier pile or the shaft excavation side wall. Drop chutes may be used to direct concrete to the base during free fall placement.
- (2) Tremies shall be according to Article 503.08 and contain no aluminum parts that may have contact with the concrete. The inside and outside surfaces of the tremie shall be clean and smooth to permit both flow of the concrete and unimpeded withdrawal during concrete placement.
- (3) Concrete pumps. Pumps and lines may be used for concrete placement and shall have a minimum 100 mm (4 in.) diameter.

The tremie or pump lines used for wet method concrete placement shall be watertight and shall not begin discharge until placed within 250 mm (10 in.) of the base of the excavation. Valves, bottom plates or plugs may be used only when they can be removed from the excavation unless approved by the Engineer. The discharge end shall be immersed at least 1.5 m (5 ft.) in concrete at all times after starting the pour.

Following the soldier pile encasement concrete pour, the remaining portion of the shaft excavation shall be backfilled with CLSM.

CLSM Secant lagging placement shall be placed as soon as practical after the shaft excavation is cleared.

- (h) Construction Tolerances. The soldier piles shall be drilled and located within the excavation to satisfy the following tolerances:

- (1) The center of the soldier pile shall be within 38 mm (1 1/2 in.) of plan station and 13 mm (1/2 in.) offset at the top of the shaft.
 - (2) The out of vertical plumbness of the soldier pile shall not exceed 0.83 percent.
 - (3) The top of the soldier pile shall be within ± 25 mm (± 1 in.) of the plan elevation.
- (i) **Timber Lagging.** Timber lagging, when required by the plans, installed below the original ground surface, shall be placed from the top down as the excavation proceeds. Lagging shown above grade shall be installed and backfilled against prior to installing any permanent facing to minimize post construction deflections. Over-excavation required to place the timber lagging behind the flanges of the soldier piles shall be the minimum necessary to install the lagging. When the plans require the Contractor to design the timber lagging, the design shall be based on established practices published in FHWA or AASHTO documents considering lateral earth pressure, construction loading, traffic surcharges and the lagging span length(s). The nominal thickness of the lagging selected shall not be less than 75 mm (3 in.) and shall satisfy the minimum tabulated unit stress in bending (F_b) stated elsewhere in this Special Provision. The Contractor shall be responsible for the successful performance of the lagging system until the concrete facing is installed. When the nominal timber lagging thickness(s) and allowable stress are specified on the plans, the timber shall be rough cut or surfaced and in accordance with Article 1007.03.
- (j) **Structure Excavation.** When structure excavation is necessary to place a concrete facing, it shall be made and paid for according to Section 502 except that the horizontal limits for structure excavation shall be from the face of the soldier pile to a vertical plane 600 mm (2 ft) from the finished face of the wall. The depth shall be from the top of the original ground surface to the bottom of the concrete facing. The additional excavation necessary to place the lagging whether through soil or CLSM shall be included in this work.
- (k) **Geocomposite Wall Drain.** When required by the plans, the geocomposite wall drain shall be installed and paid for according to Section 591 except that, in the case where a concrete facing is specified on the plans, the wall drain shall be installed on the concrete facing side of the timber lagging with the pervious (fabric) side of the drain installed to face the timber. When a concrete facing is not specified on the plans, the pervious (fabric) side of the drain shall be installed to face the soil. In this case, the drain shall be installed in stages as the timber lagging is installed. The wall drain shall be placed in sections and spliced, or kept on a continuous roll, so that as each timber is placed, the drain can be properly located as the excavation proceeds.

Method of Measurement. The furnishing of soldier piles will be measured for payment in meters (feet) along the centerline of the soldier pile for each of the types specified. The length shall be determined as the difference between the plan top of soldier pile and the final as built shaft excavation bottom.

The drilling and setting of soldier piles in soil and rock, will be measured for payment and the volumes computed in cubic meters (cubic feet) for the shaft excavation required to set the soldier piles according to the plans and specifications, and accepted by the Engineer. These

volumes shall be the theoretical volumes computed using the diameter(s) of the shaft(s) shown in the plans and the depth of the excavation in soil and/or rock as appropriate. The depth in soil will be defined as the difference in elevation between the ground surface at the time of concrete placement and the bottom of the shaft excavation or the top of rock (when present), whichever is encountered first. The depth in rock will be defined as the difference in elevation between the measured top of rock and the bottom of the shaft excavation.

Drilling and placing CLSM secant lagging shall be measured for payment in cubic meters (cubic feet) of the shaft excavation required to install the secant lagging as shown in the plans. This volume shall be the theoretical volume computed using the diameter(s) shown on the plans and the difference in elevation between the as built shaft excavation bottom and the ground surface at the time of the CLSM placement.

Timber lagging shall be measured for payment in square meters (square feet) of timber lagging installed to the limits as shown on the plans. The quantity shall be calculated using the minimum lagging length required on the plans multiplied by the as installed height of timbers, for each bay of timber lagging spanning between the soldier piles.

Basis of Payment. The furnishing of soldier piles will be paid for at the contract unit price per meter (foot) for FURNISHING SOLDIER PILES, of the type specified, for the total number of meters (feet) furnished to the job site. The cost of any field splices required due to changes in top of rock elevation shall be paid for according to Article 109.04.

The drilling and setting of soldier piles will be paid for at the contract unit price per cubic meter (cubic foot) for DRILLING AND SETTING SOLDIER PILES (IN SOIL) and DRILLING AND SETTING SOLDIER PILES (IN ROCK). The required shaft excavation, soldier pile encasement concrete and any CLSM backfill required around each soldier pile will not be paid for separately but shall be included in this item.

The timber lagging will be paid for at the contract unit price per square meter (square foot) for UNTREATED TIMBER LAGGING, or TREATED TIMBER LAGGING as detailed on the plans.

The secant lagging will be paid for at the contract unit price per cubic meter (cubic foot) for SECANT LAGGING. The required shaft excavation and CLSM backfill required to fill that excavation shall be included in this item.

Obstruction mitigation shall be paid for according to Article 109.04.

No additional compensation, other than noted above, will be allowed for removing and disposing of excavated materials, for furnishing and placing concrete, bracing, lining, temporary casings placed and removed or left in place, or for any excavation made or concrete placed outside of the plan diameter(s) of the shaft(s) specified.

REMOVAL OF EXISTING NON COMPOSITE BRIDGE DECKS

Effective: June 21, 2004

Revised: February 7, 2005

Revise the fifth sentence of the third paragraph of Article 501.03 of the Standard Specifications to read:

"Saw cutting directly over the top of beam or girder flanges may be permitted only if shown on the plans. The maximum saw cut depth allowed directly over a flange shall be to the bottom of the top mat of reinforcing steel but shall not exceed half the deck thickness. The Contractor shall provide positive control for controlling the depth of cut into the slab. The Contractor shall provide sawing equipment adequate in size and horsepower to complete the sawing operation."

AUTHORITY OF RAILROAD ENGINEER (BDE)

Effective: July 1, 2004

Revise Article 105.02 of the Standard Specifications to read:

"105.02 Authority of Railroad Engineer. Whenever the safety of railroad traffic is concerned, the Railroad Engineer will have jurisdiction over safety measures to be taken and his/her decision as to the methods, procedures, and measures used shall be final, and any and all Contractors performing work near or about the railroad shall be governed by such decision. Instructions to the Contractor by the Railroad Engineer will be given through the Engineer. Work ordered as specified herein will be classified and paid for according to Article 104.02. Work performed for the Contractor's convenience will not be paid for separately but shall be considered as included in the contract."

BITUMINOUS BASE COURSE / WIDENING SUPERPAVE

Effective: April 1, 2002

Revised: April 1, 2004

Description. This work shall consist of constructing bituminous base course Superpave and bituminous concrete base course widening Superpave according to Sections 355 and 356 respectively, of the Standard Specifications and the special provision, "Quality Control/Quality Assurance of Bituminous Concrete Mixtures" except as modified herein.

Revise Article 355.02(d) of the Standard Specifications to read:

" (d) RAP Material (Note3)"

Revise Note 2 of Article 355.02 of the Standard Specifications to read:

" Note 2. Unless otherwise specified on the plans, the bituminous material shall be performance graded (PG) asphalt cement (AC) , PG58-22. When more than 15 percent RAP is used, a softer PG binder may be required as determined by the Engineer. When the pavement has a structural number (D_t) of 3.00 or less, the low temperature grade of the asphalt cement shall be lowered one grade (i.e. PG58-28 replaces PG58-22)."

Add the following to the end Article 355.02 of the Standard Specifications:

" Note 3. RAP shall meet the requirements of the special provision "RAP for Use in Bituminous Concrete Mixtures"."

Revise Article 355.05 of the Standard Specifications to read:

"355.05 Mixture Design. The Contractor shall submit mix designs for approval, for each required mixture. Mix designs shall be developed by Level III personnel who have completed the course, "Superpave Mix Design Upgrade". The mixtures shall be designed according to the respective Illinois Modified AASHTO references listed below:

- AASHTO MP 2 Standard Specification for Superpave Volumetric Mix Design
- AASHTO R 30 Standard Practice for Mixture Conditioning of Hot-Mix Asphalt (HMA)
- AASHTO PP 28 Standard Practice for Designing Superpave HMA
- AASHTO T 209 Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- AASHTO T 312 Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyration Compactor
- AASHTO T 308 Determining the Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method

(a) Job Mix Formula (JMF). The JMF shall be according to the following limits:

<u>Ingredient</u>	<u>Percent by Dry Weight</u>
Aggregate	93.0 to 96.0
Asphalt Cement	4.0 to 7.0
Dust/AC Ratio	1.4

When RAP material is being used, the JMF shall be according to the following limits:

<u>Ingredient</u>	<u>Percent by Dry Weight</u>
Virgin Aggregate(s)	46.0 to 96.0
RAP Material(s) (Note 1)	0 to 50
Mineral Filler (if required)	0 to 5.0
Asphalt Cement	4.0 to 7.0
Dust/AC Ratio	1.4

Note 1. If specified on the plans, the maximum percentage of RAP shall be as specified therein.

It is recommended that the selected combined aggregate gradation not pass through the restricted zones specified in Illinois Modified AASHTO MP 2.

Bituminous concrete binder course Superpave mixture IL-25.0 or IL-19.0 meeting the requirements of the special provision, "Superpave Bituminous Concrete Mixtures" may also be used. The minimum compacted lift thickness specified therein shall apply.

(b) Volumetric Requirements.

Design Compactive Effort	Design Air Voids Target (%)
N _{DES} =50	2.0

(c) Determination of Need for Anti-Stripping Additive. The mixture designer shall determine if an additive is needed in the mix to prevent stripping. The determination will be made on the basis of tests performed according to Illinois Modified AASHTO T 283 using 4 in. Marshall bricks. To be considered acceptable by the Engineer as a mixture not susceptible to stripping, the ratio of conditioned to unconditioned split tensile strengths (TSR) shall be equal to or greater than 0.75. Mixtures, either with or without an additive, with TSR values less than 0.75 will be considered unacceptable.

If it is determined that an additive is required, the additive may be hydrated lime, slaked quicklime, or a liquid additive, at the Contractor's option. The liquid additive shall be selected from the Department's list of approved additives and may be limited to those which have exhibited satisfactory performance in similar mixes.

Dry hydrated lime shall be added at a rate of 1.0 to 1.5 percent by weight of total dry aggregate. Slurry shall be added in such quantity as to provide the required amount of hydrated lime solids by weight of total dry aggregate. The exact rate of application for all anti-stripping additives will be determined by the Engineer. The method of application shall be according to Article 406.12 of the Standard Specifications."

Revise Article 355.06 of the Standard Specifications to read:

"355.06 Mixture Production. The asphalt cement shall be transferred to the asphalt tanks and heated to a temperature of 120 °C (250 °F) to 175 °C (350 °F). If the loading temperature exceeds 175 °C (350 °F), the asphalt shall not be used until it has cooled to 175 °C (350 °F). Wide variations in temperature which affect the amount of asphalt delivered will not be permitted.

When a hot-mix plant conforming to Article 1102.01 is used, the aggregate shall be dried and heated in the revolving dryer to a temperature of 120 °C (250 °F) to 175 °C (350 °F).

The aggregate and bituminous material used in the bituminous aggregate mixture shall be measured separately and accurately by weight or by volume. When the aggregate is in the mixer, the bituminous material shall be added and mixing continued for a minimum of 30 seconds and until a homogeneous mixture is produced in which all particles of the aggregate are coated. The mixing period, size of the batch and the production rate shall be approved by the Engineer.

The ingredients shall be heated and combined in such a manner as to produce a mixture which, when discharged from the mixer, shall be workable and vary not more 10 °C (20 °F) from the temperature set by the Engineer.

When RAP material(s) is used in the bituminous aggregate mixture, the virgin aggregate(s) shall be dried and heated in the dryer to a temperature that will produce the specified resultant mix temperature when combined with the RAP material.

The heated virgin aggregates and mineral filler shall be combined with RAP material in such a manner as to produce a bituminous mixture which when discharged from the mixer shall not vary more than 15 °C (30 °F) from the temperature set by the Engineer. The combined ingredients shall be mixed for a minimum of 35 seconds and until a homogeneous mixture as to composition and temperature is obtained. The total mixing time shall be a minimum of 45 seconds consisting of dry and wet mixing. Variation in wet and dry mixing times may be permitted, depending on the moisture content and amount of salvaged material used. The mix temperature shall not exceed 175 °C (350 °F). Wide variations in the mixture temperature will be cause for rejection of the mix.

(a) Personnel. The QC Manager and Level I Technician shall have successfully completed the Department's "Superpave Field Control Course".

(b) Required Tests. Testing shall be conducted to control the production of the bituminous mixture using the test methods identified and performed at a frequency not less than indicated in the following table.

Parameter	Frequency of Tests Non-Class I Mixtures	Test Method
Aggregate Gradation Hot bins for batch and continuous plants. Individual cold-feeds or combined belt-feed for drier-drum plants. (% passing sieves: 12.5 mm (1/2 In.), 4.75 mm (No. 4), 75 µm (No. 200))	1 gradation per day of production. The first day of production shall be washed ignition oven test on the mix. Thereafter, the testing shall alternate between dry gradation and washed ignition oven test on the mix. The dry gradation and the washed ignition oven test results shall be plotted on the same control chart.	Illinois Procedure (See Manual of Test Procedures for Materials).
Asphalt Content by ignition oven (Note 1.)	1 per day	Illinois-Modified AASHTO T 308
Air Voids Bulk Specific Gravity of Gyratory Sample	1 per day	Illinois-Modified AASHTO T 312
Maximum Specific Gravity of Mixture	1 per day	Illinois-Modified AASHTO T 209

Note 1. The Engineer may waive the ignition oven requirement for AC content if the aggregates to be used are known to have ignition AC content calibration factors which exceed 1.5 percent. If the ignition oven requirement is waived, other Department approved methods shall be used to determine AC content.

During production, the ratio of minus 75 µm (#200) sieve material to total asphalt cement shall be not less than 0.6 nor more than 1.6, and the moisture content of the mixture at discharge from the mixer shall not exceed 0.5 percent. If at any time the ratio of minus 75 µm (#200) material to asphalt or moisture content of the mixture falls outside the stated limits, production of the mix shall cease. The cause shall be determined and corrective action satisfactory to the Engineer shall be initiated prior to resumption of production.

During production, mixture containing an anti-stripping additive will be tested by the Engineer for stripping according to Illinois Modified AASHTO T 283. If the mixture fails to meet the TSR criteria for acceptance, no further mixture will be accepted until the Contractor takes such action as is necessary to furnish a mixture meeting the criteria.

(c) Control Charts/Limits. Control charts/limits shall be according to QC/QA requirements for Non-Class I Mixtures, except air voids shall be plotted on the control charts within the following control limits:

Air Void Control Limits	
Mixture	Individual Test
Shoulders	± 1.2 %
Others	± 1.2 %"

Revise Article 355.08 of the Standard Specifications to read:

" **355.08 Placing.** The bituminous mixture shall be placed with a spreading and finishing machine. The minimum compacted thickness of each lift shall be according to the following table:

Nominal Maximum Aggregate Size of Mixture	Minimum Compacted Lift Thickness
CA 10 - 19 mm (3/4 in.)	57 mm (2 1/4 in.)
CA 6 - 25 mm (1 in.)	76 mm (3 in.)

The maximum compacted thickness of each lift shall be 100 mm (4 in.). If the Contractor elects to substitute an approved vibratory roller for one of the required rollers, the maximum compacted thickness of the each lift, excluding the top lift, may be increased to 150 mm (6 in.) provided the required density is obtained.

The surface of each lift shall be clean and dry before succeeding lifts are placed."

Revise Article 355.13 of the Standard Specifications to read:

" **355.13 Basis of Payment.** This work will be paid for at the contract unit price per square meter (square yard) for BITUMINOUS BASE COURSE SUPERPAVE of the thickness specified."

Revise Article 356.02 of the Standard Specifications to read:

" **356.02 Materials.** The materials for the bituminous concrete mixture shall meet the requirements of Article 355.02, be designed according to Article 355.05 and produced according to Article 355.06. Bituminous concrete binder course Superpave mixture IL-25.0 or IL-19.0

meeting the requirements of the special provision, "Superpave Bituminous Concrete Mixtures" may also be used. The minimum compacted lift thickness specified therein shall apply."

Revise the first paragraph of Article 356.06 of the Standard Specifications to read:

" **356.06 Base Course Widening.** The bituminous concrete mixture shall be transported according to Article 406.14."

Revise the second sentence of the fifth paragraph of Article 356.06 of the Standard Specifications to read:

" The minimum compacted thickness of each lift shall be according to the table shown in Article 355.08."

Revise the first paragraph of Article 356.11 of the Standard Specifications to read:

" **356.11 Basis of Payment.** Where the Department requires that bituminous concrete be used, this work will be paid for at the contract unit price per square meter (square yard) for BITUMINOUS CONCRETE BASE COURSE WIDENING SUPERPAVE of the thickness specified."

BITUMINOUS CONCRETE SURFACE COURSE (BDE)

Effective: April 1, 2001

Revised: April 1, 2003

Replace the fourth paragraph of Article 406.23(b) of the Standard Specifications with the following:

"Mixture for cracks, joints, flangeways, leveling binder (machine method), leveling binder (hand method) and binder course in excess of 103 percent of the quantity specified by the Engineer will not be measured for payment.

Surface course mixture in excess of 103 percent of adjusted plan quantity will not be measured for payment. The adjusted plan quantity for surface course mixtures will be calculated as follows:

Adjusted Plan Quantity = C x quantity shown on the plans or as specified by the Engineer.

where C = metric: $C = \frac{G_{mb} \times 24.99}{U}$ English: $C = \frac{G_{mb} \times 46.8}{U}$

and where:

G_{mb} = average bulk specific gravity from approved mix design.

U = Unit weight of surface course shown on the plans in kg/sq m/25 mm (lb/sq yd/in.), used to estimate plan quantity.

24.99 = metric constant.

46.8 = English constant.

If project circumstances warrant a new surface course mix design, the above equations shall be used to calculate the adjusted plan quantity for each mix design using its respective average bulk specific gravity.”

BITUMINOUS EQUIPMENT, SPREADING AND FINISHING MACHINE (BDE)

Effective: January 1, 2005

Revise the fourth paragraph of Article 1102.03 of the Standard Specifications to read:

“The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The hopper shall be equipped with a distribution system to uniformly place a non-segregated mixture in front of the screed. The distribution system shall have chain curtains, deflector plates, and/or other devices designed and built by the paver manufacturer to prevent segregation during distribution of the mixture from the hopper to the paver screed. The Contractor shall submit a written certification that the devices recommended by the paver manufacturer to prevent segregation have been installed and are operational. Prior to paving, the Contractor, in the presence of the Engineer, shall visually inspect paver parts specifically identified by the manufacturer for excessive wear and the need for replacement. The Contractor shall supply a completed check list to the Engineer noting the condition of the parts. Worn parts shall be replaced. The Engineer may require an additional inspection prior to the placement of a surface course or at other times throughout the work.”

BRIDGE DECK CONSTRUCTION (BDE)

Effective: April 1, 2002

Revised: April 1, 2004

Add the following to Article 503.03 of the Standard Specifications:

“(h).Fogging Equipment.....1103.17(k)”

Add the following after the first sentence of the second paragraph to Article 503.07 of the Standard Specifications:

“When placing Class BD concrete, the discharge end of the pump shall have attached an “S” shaped flexible or rigid conduit, a 90 degree elbow with a minimum of 3 m (10 ft) of flexible conduit placed parallel to the deck, or a similar configuration approved by the Engineer.”

Add the following after the second sentence of the ninth paragraph of Article 503.07 of the Standard Specifications:

“When consolidating concrete in bridge decks, the vibrator shall be vertically inserted into the concrete for 3 - 5 seconds, or for a period of time determined by the Engineer.”

Add the following after the first paragraph of Article 503.17 of the Standard Specifications:

“For the bridge deck pour, fogging equipment shall be in operation unless the evaporation rate is less than 0.5 kg/sq m/hour (0.1 lb/sq ft/hour) and the Engineer gives permission to turn off the equipment. The evaporation rate shall be determined according to the figure in the

Portland Cement Association's publication, "Design and Control of Concrete Mixtures" (refer to the section on plastic shrinkage cracking). The Contractor shall provide temperature, relative humidity, and wind speed measuring equipment.

The fogging equipment shall be adjusted to adequately cover the entire width of the pour.

If there is a delay of more than ten minutes during bridge deck placement, wet burlap shall be used to protect the concrete until operations resume.

Concrete placement operations shall be coordinated to limit the distance between the point of concrete placement and concrete covered with cotton mats for curing. The distance shall not exceed 10.5 m (35 ft). For bridge deck widths greater than 15 m (50 ft), the distance shall not exceed 7.5 m (25 ft)."

Add the following to the end of the first paragraph of Article 503.17(b) of the Standard Specifications to read:

"The concrete in these areas shall be struck off during the deck pour and excess material from the finishing machine shall not be incorporated."

In the Coarse Aggregate Gradation table of Article 1004.01(c) of the Standard Specifications revise the percent passing the 12.5 mm (1/2 in.) sieve for gradation CA 7 to "45±15^{4/ 9/}".

In the Coarse Aggregate Gradation table of Article 1004.01(c) of the Standard Specifications revise the percent passing the 12.5 mm (1/2 in.) sieve for gradation CA 11 to "45±15^{6/ 9/}".

Add the following to the Coarse Aggregate Gradation table of the Standard Specifications:

"9/ When Class BD concrete is to be pumped, the coarse aggregate gradation shall have a minimum of 45 percent passing the 12.5 mm (1/2 in.) sieve. The Contractor may combine two or more coarse aggregate sizes, consisting of CA-7, CA-11, CA-13, CA-14, and CA-16, provided a CA-7 or CA-11 is included in the blend."

Revise Article 1020.05(d) of the Standard Specifications to read:

"(d) Class BD Concrete. The maximum mortar factor shall be 0.86."

Add the following to Article 1103.17 of the Standard Specifications:

"(k) Fogging Equipment. Fogging equipment shall consist of a mechanically operated, pressurized system using a triple headed nozzle or an equivalent nozzle. The fogging nozzle shall be capable of producing a fine fog mist that will increase the relative humidity of the air just above the fresh concrete surface without accumulating any water on the concrete. The fogging equipment shall be mounted behind the roller and pan of finishing machine or on a separate foot bridge. Controls shall be designed to vary the volume of water flow, be easily accessible and immediately shut off the water when in the off position. Hand held fogging equipment will not be allowed."

BUTT JOINTS (BDE)

Effective: April 1, 2004

Revised: April 1, 2005

Revise Article 406.18 of the Standard Specifications to read:

“406.18 Butt Joints. Butt joints shall be constructed according to the details shown on the plans. The surface removal shall be performed according to Section 440. Construction of butt joints shall not begin prior to beginning general operations on the project.

When butt joints are to be constructed under traffic, temporary ramps shall be constructed and maintained at both the upstream and downstream ends of the surface removal areas immediately upon completion of the surface removal operation. The temporary ramps shall be constructed by the following methods.

- (a) Temporary Bituminous Ramps. Temporary bituminous ramps shall have a minimum taper rate of 1:40 (V:H). The bituminous material used shall meet the approval of the Engineer. Cold-milled bituminous tailings will not be acceptable.
- (b) Temporary Rubber Ramps. Temporary rubber ramps shall only be used on roadways with permanent posted speeds of 55 mph or less. The ramps shall have a minimum taper rate of 1:30 (V:H). The leading edge of the rubber ramp shall have a maximum thickness of 6 mm (1/4 in.) and the trailing edge shall match the height of the adjacent pavement \pm 6 mm (1/4 in.).

The rubber material shall conform to the following.

Property	Test Method	Requirement
Durometer Hardness, Shore A	ASTM D 2240	80 \pm 10
Tensile Strength	ASTM D 412	5500 kPa (800 psi) min.
Elongation, percent	ASTM D 412	100 min.
Specific Gravity	ASTM D 297	1.1-1.3
Brittleness	ASTM D 746	-40 °C (-40 °F)

The rubber ramps shall be installed according to the manufacturer’s specifications and fastened with the anchors provided. Rubber ramps that fail to stay in place or create a traffic hazard shall be replaced immediately with temporary bituminous ramps at the Contractor’s expense.

The temporary ramps shall be removed just prior to placing the proposed surface course. If work is suspended for the winter season prior to completion of surface course construction, precut butt joints shall be filled to the elevation of the existing pavement surface with compacted bituminous concrete surface course or binder course.”

COARSE AGGREGATE FOR TRENCH BACKFILL, BACKFILL AND BEDDING (BDE)

Effective: April 1, 2001

Revised: November 1, 2003

Revise Article 208.02 of the Standard Specifications to read:

“208.02 Materials. Materials shall be according to the following Articles of Section 1000 – Materials:

- (a) Fine Aggregate (Note 1)..... 1003.04
- (b) Coarse Aggregate (Note 2) 1004.06

Note 1. The fine aggregate shall be moist to the satisfaction of the Engineer.

Note 2. The coarse aggregate shall be wet to the satisfaction of the Engineer.”

Revise the first sentence of the second paragraph of subparagraph (b) in Article 208.03 of the Standard Specifications to read:

"Any material meeting the requirements of Articles 1003.04 or 1004.06 which has been excavated from the trenches shall be used for backfilling the trenches."

Add the following to the end of Article 542.02 of the Standard Specifications:

- “(bb) Fine Aggregate (Note 1)..... 1003.04
- (cc) Coarse Aggregate (Note 2) 1004.06

Note 1. The fine aggregate shall be moist to the satisfaction of the Engineer.

Note 2. The coarse aggregate shall be wet to the satisfaction of the Engineer.”

Revise the first and second sentences of the second paragraph of subparagraph (a) of Article 542.04 of the Standard Specifications to read:

"The unstable and unsuitable material shall be removed to a depth determined by the Engineer and for a width of one diameter (or equivalent diameter) of the pipe on each side of the pipe culvert, and replaced with aggregate. Rock shall be removed to an elevation 300 mm (1 ft) lower than the bottom of the pipe or to a depth equal to 40 mm/m (1/2 in./ft) of ultimate fill height over the top of the pipe culvert, whichever is the greater depth, and for a width as specified in (b) below, and replaced with aggregate."

Revise the second paragraph of subparagraph (c) of Article 542.04 of the Standard Specifications to read:

"Well compacted aggregate, at least 100 mm (4 in.) in depth below the pipe culvert, shall be placed the entire width of the trench and for the length of the pipe culvert, except well compacted impervious material shall be used for the outer 1 m (3 ft) at each end of the pipe. When the trench has been widened by the removal and replacement of unstable or unsuitable material, the foundation material shall be placed for a width not less than

the above specified widths on each side of the pipe. The aggregate and impervious material shall be approved by the Engineer and shall be compacted to the Engineer's satisfaction by mechanical means."

Revise subparagraph (e) of Article 542.04 of the Standard Specifications to read:

"(e) Backfilling. As soon as the condition of the pipe culvert will permit, the entire width of the trench shall be backfilled with aggregate to a height of at least the elevation of the center of the pipe. The aggregate shall be placed longitudinally along the pipe culvert, except at the outer 1 m (3 ft) at each end of the culvert which shall be backfilled with impervious material. The elevation of the backfill material on each side of the pipe shall be the same. The space under the pipe shall be completely filled. The aggregate and impervious material shall be placed in 200 mm (8 in.) layers, loose measurement. When using PVC, PE, or corrugated metal pipe, the aggregate shall be continued to a height of at least 300 mm (1 ft) above the top of the pipe and compacted to a minimum of 85 percent of standard lab density by mechanical means. When reinforced concrete pipes are used and the trench is within 600 mm (2 ft) of the pavement structure, the backfill shall be compacted to a minimum of 85 percent of standard lab density by mechanical means.

When using PVC, PE, or corrugated metal pipe a minimum of 300 mm (1 ft) of cover from the top of the pipe to the top of the subgrade will be required.

The installed pipe and its embedment shall not be disturbed when using movable trench boxes and shields, sheet pile, or other trench protection.

The remainder of the trench shall be backfilled with select material, from excavation or borrow, free from large or frozen lumps, clods or rock, meeting the approval of the Engineer. The material shall be placed in layers not exceeding 200 mm (8 in.) in depth, loose measurement and compacted to 95 percent of the standard laboratory density. Compaction shall be obtained by use of mechanical tampers or with approved vibratory compactors. Before compacting, each layer shall be wetted or dried to bring the moisture content within the limits of 80 to 110 percent of optimum moisture content determined according to AASHTO T 99 (Method C). All backfill material shall be deposited in the trench or excavation in such a manner as not to damage the culvert. The filling of the trench shall be carried on simultaneously on both sides of the pipe. The Contractor may, at his/her expense, backfill the entire trench with aggregate in lieu of select material. The aggregate shall be compacted to the satisfaction of the Engineer by mechanical means.

The backfill material for all trenches and excavations made in the subgrade of the proposed improvement, and for all trenches outside of the subgrade where the inner edge of the trench is within 600 mm (2 ft) of the edge of the proposed pavement, curb, gutter, curb and gutter, stabilized shoulder, or sidewalk shall be according to Section 208. The trench backfill material shall be compacted to a minimum of 85 percent of standard lab density by mechanical means.

The Contractor may, at his/her expense, backfill the entire trench with controlled low strength material meeting the approval of the Engineer.

When the trench has been widened for the removal and replacement of unstable or unsuitable material, the backfilling with aggregate and impervious material, will be required for a width of at least the specified widths on each side of the pipe. The remaining width of each layer may be backfilled with select material. Each 200 mm (8 in.) layer for the entire trench width shall be completed before beginning the placement of the next layer."

Revise subparagraph (b) of Article 542.05 of the Standard Specifications to read:

"(b) Embankment. Embankment extending to an elevation of 300 mm (1 ft) over the top of the pipe shall be constructed according to Article 542.04(f), except the material up to the elevation of the center of the pipe and extending to a width of at least 450 mm (18 in.) on each side of the pipe, exclusive of the outer 1 m (3 ft) at each end of the pipe, shall consist of aggregate. At the outer 1 m (3 ft) at each end of the culvert, impervious material shall be used."

Add the following paragraph after the first paragraph of Article 542.10 of the Standard Specifications:

"Trench backfill will be measured for payment according to Article 208.03."

Add the following paragraph after the third paragraph of Article 542.11 of the Standard Specifications:

"Trench backfill will be paid for according to Article 208.04."

Add the following to of Article 550.02 of the Standard Specifications:

"(m) Fine Aggregate (Note 2)..... 1003.04
(n) Coarse Aggregate (Note 3) 1004.06

Note 2. The fine aggregate shall be moist to the satisfaction of the Engineer.

Note 3. The coarse aggregate shall be wet to the satisfaction of the Engineer."

Revise the first two sentences of the third paragraph of Article 550.04 of the Standard Specifications to read:

"Well compacted, aggregate bedding material at least 100 mm (4 in.) in depth below the pipe, shall be placed for the entire width of the trench and length of the pipe. The aggregate shall be compacted to the satisfaction of the Engineer by mechanical means."

Revise Article 550.07 of the Standard Specifications to read:

"550.07 Backfilling. As soon as the condition of the pipe will permit, the entire width of the trench shall be backfilled with aggregate to a height of at least the elevation of the center of the pipe. The aggregate shall be placed longitudinally along the pipe. The elevation of the backfill material on each side of the pipe shall be the same. The space under the pipe shall be completely filled. The aggregate backfill material shall be placed in 200 mm (8 in.) layers, loose measurement and compacted to the satisfaction of the Engineer by mechanical means. When using PVC pipe, the aggregate shall be continued to a height of at least 300 mm (12 in.) above the top of the pipe.

The installed pipe and its embedment shall not be disturbed when using movable trench boxes and shields, sheet pile, or other trench protection.

The remainder of the trench and excavation shall be backfilled to the natural line or finished surface as rapidly as the condition of the sewer will permit. The backfill material shall consist of suitable excavated material from the trench or of trench backfill as herein specified. All backfill material shall be deposited in the trench or excavation in such a manner as not to damage the sewer and shall be compacted to the satisfaction of the Engineer by mechanical means. The filling of the trench shall be carried on simultaneously on both sides of the pipe.

The backfill material for trenches and excavation made in the subgrade of the proposed improvement, and for all trenches outside of the subgrade where the inner edge of the trench is within 600 mm (2 ft) of the edge of the proposed pavement, curb, gutter, curb and gutter, stabilized shoulder or sidewalk shall be according to Section 208. The backfill material shall be compacted to 85 percent of standard lab density by mechanical means.

All backfill material up to a height of 300 mm (1 ft) above the pipe shall be deposited in uniform layers not exceeding 200 mm (8 in.) thick, loose measurement. The material in each layer shall be compacted to the satisfaction of the Engineer by mechanical means. The backfilling above this height shall be done according to Method 1, 2 or 3 as described below, with the following exceptions.

When trench backfill or excavated material meeting the requirements of Section 208 is required above the first 300 mm (1 ft) of the pipe, the layers shall not exceed 200 mm (8 in.). Gradations CA6 or CA10 shall not be used with Method 2 or Method 3.

Method 1. The material shall be deposited in uniform layers not exceeding 300 mm (1 ft) thick, loose measurement, and each layer shall be compacted to the satisfaction of the Engineer by mechanical means.

Method 2. The material shall be deposited in uniform layers not exceeding 300 mm (1 ft) thick, loose measurement, and each layer shall be either inundated or deposited in water.

Method 3. The trench shall be backfilled with loose material, and settlement secured by introducing water through holes jetted into the backfill to a point approximately 600 mm (2 ft) above the top of the pipe. The holes shall be spaced as directed by the Engineer but shall be no farther than 2 m (6 ft) apart.

The water shall be injected at a pressure just sufficient to sink the holes at a moderate rate of speed. The pressure shall be such that the water will not cut cavities in the backfill material nor overflow the surface. If water does overflow the surface, it shall be drained into the jetted holes by means of shallow trenches.

Water shall be injected as long as it will be absorbed by the backfill material and until samples taken from test holes in the trench show a satisfactory moisture content. The Contractor shall bore the test holes not more than 15 m (50 ft) apart and at such other locations in the trench designated by the Engineer. As soon as the watersoaking has been completed, all holes shall be filled with soil and compacted by ramming with a tool approved by the Engineer.

Backfill material which has been watersoaked shall be allowed to settle and dry for at least 10 days before any surface course or pavement is constructed on it. The length of time may be altered, if deemed desirable, by the Engineer. Where the inner edge of the trench is within 600 mm (2 ft) of the edge of the proposed pavement, curb, gutter, curb and gutter, stabilized shoulder or sidewalk, the provisions of this paragraph shall also apply.

At the end of the settling and drying period, the crusted top of the backfill material shall be scarified and, if necessary, sufficient backfill material added, as specified in Method 1, to complete the backfilling operations.

The method used for backfilling and compacting the backfill material shall be the choice of the Contractor. If the method used does not produce results satisfactory to the Engineer, the Contractor will be required to alter or change the method being used so the resultant backfill will be satisfactory to the Engineer. Should the Contractor be required to alter or change the method being used, no additional compensation will be allowed for altering or changing the method.

The Contractor may, at his/her expense, backfill the entire trench with controlled low strength material meeting the approval of the Engineer.

When sheeting and bracing have been used, sufficient bracing shall be left across the trench as the backfilling progresses to hold the sides firmly in place without caving or settlement. This bracing shall be removed as soon as practicable. Any depressions which may develop within the area involved in the construction operation due to settlement of the backfilling material shall be filled in a manner approved by the Engineer.

When the Contractor constructs the trench with sloped or benched sides according to Article 550.04, backfilling for the full width of the excavation shall be as specified, except no additional compensation will be allowed for trench backfill material required outside the vertical limits of the specified trench width.

Whenever excavation is made for installing sewer pipe across earth shoulders or private property, the topsoil disturbed by excavation operations shall be replaced as nearly as possible in its original position, and the whole area involved in the construction operations shall be left in a neat and presentable condition.

When using any PVC pipe, the pipe shall be backfilled with aggregate to 300 mm (1 ft) over the top of the pipe and compacted to a minimum of 85 percent of standard lab density by mechanical means.

When reinforced concrete pipes are used and the trench is within 600 mm (2 ft) of the pavement structure, the backfill shall be compacted to a minimum of 85 percent of standard lab density by mechanical means.

Deflection Testing for Storm Sewers. All PVC storm sewers will be tested for deflection not less than 30 days after the pipe is installed and the backfill compacted.

For PVC storm sewers with diameters 600 mm (24 in.) or smaller, a mandrel drag shall be used for deflection testing. For PVC storm sewers with diameters over 600 mm (24 in.), deflection measurements other than by a mandrel drag shall be used.

Where the mandrel is used, the mandrel shall be furnished by the Contractor and pulled by hand through the pipeline with a suitable rope or cable connected to each end. Winching or other means of forcing the deflection gauge through the pipeline will not be allowed.

The mandrel shall be of a shape similar to that of a true circle enabling the gauge to pass through a satisfactory pipeline with little or no resistance. The mandrel shall be of a design to prevent it from tipping from side to side and to prevent debris build-up from occurring between the channels of the adjacent fins or legs during operation. Each end of the core of the mandrel shall have fasteners to which the pulling cables can be attached. The mandrel shall have 9, various sized fins or legs of appropriate dimension for various diameter pipes. Each fin or leg shall have a permanent marking that states its designated pipe size and percent of deflection allowable.

The outside diameter of the mandrel shall be 95 percent of the base inside diameter, where the base inside diameter is:

For all PVC pipe (as defined using ASTM D 3034 methodology):

If the pipe is found to have a deflection greater than specified, that pipe section shall be removed, replaced, and retested."

Revise subparagraph (c) of Article 1003.04 of the Standard Specifications to read:

"(c) Gradation. The fine aggregate gradation shall be as follows:

| Backfill, bedding and trench backfill for pipe culverts and storm sewers FA 1, FA 2, FA 6, or FA 21
| Porous granular embankment and backfill, french drains, and sand backfill for
| underdrains FA 1, FA 2, or FA20 (Note 1)

| Note 1: For FA 1, FA 2, and FA 20 the percent passing the 75 m (No. 200) sieve shall be 2 ± 2 ."

Revise the title of Article 1004.06 of the Standard Specifications to read:

"Coarse Aggregate for Blotter, Embankment, Backfill, Trench Backfill, French Drains, and Bedding."

Add the following to the end of subparagraph (c) of Article 1004.06 of the Standard Specifications:

"Backfill, bedding, and trench backfill for pipe culverts and storm sewers CA 6, CA 10, and CA 18"

80051

CONCRETE ADMIXTURES (BDE)

Effective: January 1, 2003

Revised: July 1, 2004

Revise Article 1020.05(b) of the Standard Specifications to read:

“(b) Admixtures. Except as specified, the use of admixtures to increase the workability or to accelerate the hardening of the concrete will be permitted only when approved in writing by the Engineer. The Department will maintain an Approved List of Concrete Admixtures. When the Department permits the use of a calcium chloride accelerator, it shall be according to Article 442.02, Note 5.

When the atmosphere or concrete temperature is 18 °C (65 °F) or higher, a retarding admixture meeting the requirements of Article 1021.03 shall be used in the Class BD Concrete and portland cement concrete bridge deck overlays. The amount of retarding admixture to be used will be determined by the Engineer. The proportions of the ingredients of the concrete shall be the same as without the retarding admixture except that the amount of mixing water shall be reduced, as may be necessary, in order to maintain the consistency of the concrete as required. In addition, a high range water-reducing admixture shall be used in Class BD Concrete. The amount of high range water-reducing admixture will be determined by the Engineer. At the option of the Contractor, a water-reducing admixture may be used. Type I cement shall be used.

For Class PC and PS Concrete, a retarding admixture may be added to the concrete mixture when the concrete temperature is 18 °C (65 °F) or higher. Other admixtures may be used when approved by the Engineer, or if specified by the contract. If an accelerating admixture is permitted by the Engineer, it shall be the non-chloride type.

At the Contractor's option, admixtures in addition to an air-entraining admixture may be used for Class PP-1 concrete. The accelerator shall be the non-chloride type. If a water-reducing or retarding admixture is used, the cement factor may be reduced a maximum 18 kg/cu m (0.30 hundredweight/cu yd). If a high range water-reducing admixture is used, the cement factor may be reduced a maximum 36 kg/cu m (0.60 hundredweight/cu yd). Cement factor reductions shall not be cumulative when using multiple admixtures. An accelerator shall always be added prior to a high range water-reducing admixture, if both are used.

If Class C fly ash or ground granulated blast-furnace slag is used in Class PP-1 concrete, a water-reducing or high range water-reducing admixture shall be used. However, the cement factor shall not be reduced if a water-reducing, retarding, or high range water-reducing admixture is used. In addition, an accelerator shall not be used.

For Class PP-2 or PP-3 concrete, a non-chloride accelerator followed by a high range water-reducing admixture shall be used, in addition to the air-entraining admixture. For Class PP-3 concrete, the non-chloride accelerator shall be calcium nitrite.

For Class PP-2 or PP-3 concrete, the Contractor has the option to use a water-reducing admixture. A retarding admixture shall not be used unless approved by the Engineer. A water-reducing, retarding, or high range water-reducing admixture shall not be used to reduce the cement factor.

When the air temperature is less than 13 °C (55 °F) for Class PP-1 or PP-2 concrete, the non-chloride accelerator shall be calcium nitrite.

For Class PP-4 concrete, a high range water-reducing admixture shall be used in addition to the air-entraining admixture. The Contractor has the option to use a water-reducing admixture. An accelerator shall not be used. For stationary or truck mixed concrete, a retarding admixture shall be used to allow for haul time. The Contractor has the option to use a mobile portland cement concrete plant according to Article 1103.04, but a retarding admixture shall not be used unless approved by the Engineer. A water-reducing, retarding, or high range water-reducing admixture shall not be used to reduce the cement factor.

If the Department specifies a calcium chloride accelerator for Class PP-1 concrete, the maximum chloride dosage shall be 1.0 L (1.0 quart) of solution per 45 kg (100 lb) of cement. The dosage may be increased to a maximum 2.0 L (2.0 quarts) per 45 kg (100 lb) of cement if approved by the Engineer. If the Department specifies a calcium chloride accelerator for Class PP-2 concrete, the maximum chloride dosage shall be 1.3 L (1.3 quarts) of solution per 45 kg (100 lb) of cement. The dosage may be increased to a maximum 2.6 L (2.6 quarts) per 45 kg (100 lb) of cement if approved by the Engineer.

For Class PV, MS, SI, RR, SC and SH concrete, at the option of the Contractor, or when specified by the Engineer, a water-reducing admixture or a retarding admixture may be used. The amount of water-reducing admixture or retarding admixture permitted will be determined by the Engineer. The air-entraining admixture and other admixtures shall be added to the concrete separately, and shall be permitted to intermingle only after they have separately entered the concrete batch. The sequence, method and equipment for adding the admixtures shall be approved by the Engineer. The water-reducing admixture shall not delay the initial set of the concrete by more than one hour. Type I cement shall be used.

When a water-reducing admixture is added, a cement factor reduction of up to 18 kg/cu m (0.30 hundredweight/cu yd), from the concrete designed for a specific slump without the admixture, will be permitted for Class PV, MS, SI, RR, SC and SH concrete.

When an approved high range water-reducing admixture is used, a cement factor reduction of up to 36 kg/cu m (0.60 hundredweight/cu yd), from a specific water cement/ratio without the admixture, will be permitted based on a 14 percent minimum water reduction. This is applicable to Class PV, MS, SI, RR, SC and SH concrete. A cement factor below 320 kg/cu m (5.35 hundredweight/cu yd) will not be permitted for Class PV, MS, SI, RR, SC and SH concrete. A cement factor reduction will not be allowed for concrete placed underwater. Cement factor reductions shall not be cumulative when using multiple admixtures.

For use of admixtures to control concrete temperature, refer to Articles 1020.14(a) and 1020.14(b).

The maximum slumps given in Table 1 may be increased to 175 mm (7 in.) when a high range water-reducing admixture is used for all classes of concrete except Class PV and PP.”

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 may 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 to the satisfaction of the Engineer as to manufacturer and trade name of the material they contain.

Prior to inclusion of a product on the Department's Approved List of Concrete Admixtures, the manufacturer shall submit a report prepared by an independent laboratory accredited by the AASHTO Accreditation Program. 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.

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 335 kg/cu m (5.65 cwt/cu yd). Compressive strength test results for six months and one year will not be required.

In addition to the report, 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 335 kg/cu m (5.65 cwt/cu yd). The manufacturer may select their lab or an independent lab to perform this testing. The laboratory is not required to be accredited by the AASHTO Accreditation Program.

Prior to the approval of an admixture, the Engineer may conduct all or part of the applicable tests on a sample that is representative of the material to be furnished. The test and reference concrete mixtures tested by the Engineer will contain a cement content of 335 kg/cu m

(5.65 cwt/cu yd). For freeze-thaw testing, the Department will perform the test according to Illinois Modified AASHTO T 161, Procedure B.

The manufacturer shall include in the submittal the following information according to ASTM C 494; the average and manufacturing range of specific gravity, the average and manufacturing range of solids in the solution, and the average and manufacturing range of pH. The submittal shall also include an infrared spectrophotometer trace no more than five years old.

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 the AASHTO Accreditation Program.

All admixtures, except chloride-based accelerators, shall contain no more than 0.3 percent chloride by mass (weight).

1021.02 Air-Entraining Admixtures. Air-entraining admixtures shall conform to the requirements of AASHTO M 154.

If the manufacturer certifies that the air-entraining admixture is an aqueous solution of Vinsol resin that has been neutralized with sodium hydroxide (caustic soda), testing for compliance with the requirements may be waived by the Engineer. In the certification, the manufacturer shall show complete information with respect to the formulation of the solution, including the number of parts of Vinsol resin to each part of sodium hydroxide. Before the approval of its use is granted, the Engineer will test the solution for its air-entraining quality in comparison with a solution prepared and kept for that purpose.

1021.03 Retarding and Water-Reducing Admixtures. The admixture shall comply with the following requirements:

- (a) The retarding admixture shall comply with the requirements of AASHTO M 194, Type B (retarding) or Type D (water-reducing and retarding).
- (b) The water-reducing admixture shall comply with the requirements of AASHTO M 194, Type A.
- (c) The high range water-reducing admixture shall comply with the requirements of AASHTO M 194, Type F (high range water-reducing) or Type G (high range water-reducing and retarding).

When a Type F or Type G high range water-reducing admixture is used, water-cement ratios shall be a minimum of 0.32.

Type F or Type G admixtures may be used, subject to the following restrictions:

For Class MS, SI, RR, SC and SH concrete, the water-cement ratio shall be a maximum of 0.44.

The Type F or Type G admixture shall be added at the jobsite unless otherwise directed by the Engineer. The initial slump shall be a minimum of 40 mm (1 1/2 in.) prior to addition of the Type F or Type G admixture, except as approved by the Engineer.

When a Type F or Type G admixture is used, retempering with water or with a Type G admixture will not be allowed. An additional dosage of a Type F admixture, not to exceed 40 percent of the original dosage, may be used to retemper concrete once, provided set time is not unduly affected. A second retempering with a Type F admixture may be used for all classes of concrete except Class PP and SC, provided that the dosage does not exceed the dosage used for the first retempering, and provided that the set time is not unduly affected. No further retempering will be allowed.

Air tests shall be performed after the addition of the Type F or Type G admixture.

1021.04 Set Accelerating Admixtures. The admixture shall comply with the requirements of AASHTO M 194, Type C (accelerating) or Type E (water reducing and accelerating)”

80094

CORRUGATED METAL PIPE CULVERTS (BDE)

Effective: August 1, 2003

Revised: July 1, 2004

Revise the fourth paragraph of Article 542.04(d) of the Standard Specifications to read:

“When corrugated steel or aluminum alloy culvert pipe (including bituminous coated steel or aluminum and pre-coated steel) is used, the pipe shall be placed such that the longitudinal lap is placed at the sides and separate sections of pipe shall be joined with a hugger-type band. When the pipes are fabricated with a smooth sleeve-type coupler, the gasket shall meet the requirements of Article 1006.01.”

Add the following paragraph after the first paragraph of Article 1006.01 of the Standard Specifications:

“Round pipes 1200 mm (48 in.) in diameter and smaller may be fabricated with a smooth sleeve-type coupler. Gasket material on the smooth sleeve-type coupler shall be polyisoprene or equal with a durometer hardness of 45±5 (ASTM D 2240, Shore A). Pipe used with smooth sleeve-type couplers shall contain a homing mark that indicates when the joint is tight. The homing mark shall consist of a painted stripe around the circumference of the male end of the pipe.”

Delete the last sentence of the first paragraph of Article 1006.01(a) of the Standard Specifications.

Add the following paragraph after the first paragraph of Article 1006.03 of the Standard Specifications:

“Round pipes 1200 mm (48 in.) in diameter and smaller may be fabricated with a smooth sleeve-type coupler. Gasket material on the smooth sleeve-type coupler shall be polyisoprene or equal with a durometer hardness of 45±5 (ASTM D 2240, Shore A). Pipe used with smooth sleeve-type couplers shall contain a homing mark that indicates when the joint is tight. The homing mark shall consist of a painted stripe around the circumference of the male end of the pipe.”

80102

CURING AND PROTECTION OF CONCRETE CONSTRUCTION (BDE)

Effective: January 1, 2004

Revise the second and third sentences of the eleventh paragraph of Article 503.06 of the Standard Specifications to read:

“Forms on substructure units shall remain in place at least 24 hours. The method of form removal shall not result in damage to the concrete.”

Delete the twentieth paragraph of Article 503.22 of the Standard Specifications.

Revise the “Unit Price Adjustments” table of Article 503.22 of the Standard Specifications to read:

“UNIT PRICE ADJUSTMENTS	
Type of Construction	Percent Adjustment in Unit Price
For concrete in substructures, culverts (having a waterway opening of more than 1 sq m (10 sq ft)), pump houses, and retaining walls (except concrete pilings, footings and foundation seals):	
When protected by:	
Protection Method II	115%
Protection Method I	110%
For concrete in superstructures:	
When protected by:	
Protection Method II	123%
Protection Method I	115%
For concrete in footings:	
When protected by:	
Protection Method I, II or III	107%
For concrete in slope walls:	
When protected by:	
Protection Method I	107%”

Delete the fourth paragraph of Article 504.05(a) of the Standard Specifications.

Revise the second and third sentences of the fifth paragraph of Article 504.05(a) of the Standard Specifications to read:

“All test specimens shall be cured with the units according to Article 1020.13.”

Revise the first paragraph of Article 504.06(c)(6) of the Standard Specifications to read:

“Curing and Low Air Temperature Protection. The curing and protection for precast, prestressed concrete members shall be according to Article 1020.13 and this Article.”

Revise the first sentence of the second paragraph of Article 504.06(c)(6) of the Standard Specifications to read:

“For curing, air vents shall be in place, and shall be so arranged that no water can enter the void tubes during the curing of the members.”

Revise the first sentence of the third paragraph of Article 504.06(c)(6) of the Standard Specifications to read:

“As soon as each member is finished, the concrete shall be covered with curing material according to Article 1020.13.”

Revise the eighth paragraph of Article 504.06(c)(6) of the Standard Specifications to read:

“The prestressing force shall not be transferred to any member before the concrete has attained the compressive strength of 28,000 kPa (4000 psi) or other higher compressive release strength specified on the plans, as determined from tests of 150 mm (6 in.) by 300 mm (12 in.) cylinders cured with the member according to Article 1020.13. Members shall not be shipped until 28-day strengths have been attained and members have a yard age of at least 4 days.”

Delete the third paragraph of Article 512.03(a) of the Standard Specifications.

Delete the last sentence of the second paragraph of Article 512.04(d) of the Standard Specifications.

Revise the “Index Table of Curing and Protection of Concrete Construction” table of Article 1020.13 of the Standard Specifications to read:

"INDEX TABLE OF CURING AND PROTECTION OF CONCRETE CONSTRUCTION"			
TYPE OF CONSTRUCTION	CURING METHODS	CURING PERIOD DAYS	LOW AIR TEMPERATURE PROTECTION METHODS
Cast-in-Place Concrete: ^{11/}			
Pavement			
Shoulder	1020.13(a)(1)(2)(3)(4)(5) ^{3/ 5/}	3	1020.13(c)
Base Course			
Base Course Widening	1020.13(a)(1)(2)(3)(4)(5) ^{1/ 2/}	3	1020.13(c)
Driveway			
Median			
Curb			
Gutter	1020.13(a)(1)(2)(3)(4)(5) ^{4/ 5/}	3	1020.13(c) ^{16/}
Curb and Gutter			
Sidewalk			
Slope Wall			
Paved Ditch			
Catch Basin			
Manhole	1020.13(a)(1)(2)(3)(4)(5) ^{4/}	3	1020.13(c)
Inlet			
Valve Vault			
Pavement Patching	1020.13(a)(1)(2)(3)(4)(5) ^{2/}	3 ^{12/}	1020.13(c)
Pavement Replacement	1020.13(a)(1)(2)(3)(4)(5) ^{1/ 2/}	3	442.06(h) and 1020.13(c)
Railroad Crossing	1020.13(a)(3)(5)	1	1020.13(c)
Piles	1020.13(a)(3)(5)	7	1020.13(e)(1)(2)(3)
Footings			
Foundation Seals	1020.13(a)(1)(2)(3)(4)(5) ^{4/6/}	7	1020.13(e)(1)(2)(3)
Substructure	1020.13(a)(1)(2)(3)(4)(5) ^{1/7/}	7	1020.13(e)(1)(2)(3)
Superstructure (except deck)	1020.13(a)(1)(2)(3)(5) ^{8/}	7	1020.13(e)(1)(2)
Deck	1020.13(a)(5)	7	1020.13(e)(1)(2) ^{17/}
Retaining Walls	1020.13(a)(1)(2)(3)(4)(5) ^{1/7/}	7	1020.13(e)(1)(2)
Pump Houses	1020.13(a)(1)(2)(3)(4)(5) ^{1/}	7	1020.13(e)(1)(2)
Culverts	1020.13(a)(1)(2)(3)(4)(5) ^{4/6/}	7	1020.13(e)(1)(2) ^{18/}
Other Incidental Concrete	1020.13(a)(1)(2)(3)(5)	3	1020.13(c)
Precast Concrete: ^{11/}			
Bridge Beams			
Piles			
Bridge Slabs	1020.13(a)(3)(5) ^{9/10/}	As required.	^{13/} 504.06(c)(6), 1020.13(e)(2) ^{19/}
Nelson Type Structural Member			
All Other Precast Items	1020.13(a)(3)(4)(5) ^{2/9/10/}	As required.	^{14/} 504.06(c)(6), 1020.13(e)(2) ^{19/}
Precast, Prestressed Concrete: ^{11/}			
All Items	1020.13(a)(3)(5) ^{9/10/}	Until strand	504.06(c)(6), 1020.13(e)(2) ^{19/} tensioning is released. ^{15/}

Notes-General:

- 1/ Type I, membrane curing only
- 2/ Type II, membrane curing only
- 3/ Type III, membrane curing only
- 4/ Type I, II and III membrane curing
- 5/ Membrane curing will not be permitted between November 1 and April 15.
- 6/ The use of water to inundate footings, foundation seals or the bottom slab of culverts is permissible when approved by the Engineer, provided the water temperature can be maintained at 7 °C (45 °F) or higher.
- 7/ Asphalt Emulsion for Waterproofing may be used in lieu of other curing methods when specified and permitted according to Article 503.18.
- 8/ On non-traffic surfaces which receive protective coat according to Article 503.19, a linseed oil emulsion curing compound may be used as a substitute for protective coat and other curing methods. The linseed emulsion curing compound will be permitted between April 16 and October 31 of the same year, provided it is applied with a mechanical sprayer according to Article 1101.09 (b), and meets the material requirements of Article 1022.07.
- 9/ Steam curing (heat and moisture) is acceptable and shall be accomplished by the method specified in Article 504.06(c)(6).
- 10/ A moist room according to AASHTO M 201 is acceptable for curing.
- 11/ If curing is required and interrupted because of form removal for cast-in-place concrete items, precast concrete products, or precast prestressed concrete products, the curing shall be resumed within two hours from the start of the form removal.
- 12/ Curing maintained only until opening strength is attained, with a maximum curing period of three days.
- 13/ The curing period shall end when the concrete has attained the mix design strength. The producer has the option to discontinue curing when the concrete has attained 80 percent of the mix design strength or after seven days. All strength test specimens shall remain with the units and shall be subjected to the same curing method and environmental condition as the units, until the time of testing.
- 14/ The producer shall determine the curing period or may elect to not cure the product. All strength test specimens shall remain with the units and shall be subjected to the same curing method and environmental condition as the units, until the time of testing.
- 15/ The producer has the option to continue curing after strand release.
- 16/ When structural steel or structural concrete is in place above slope wall, Article 1020.13(c) shall not apply. The protection method shall be according to Article 1020.13(e)(1).
- 17/ When Article 1020.13(e)(2) is used to protect the deck, the housing may enclose only the bottom and sides. The top surface shall be protected according to Article 1020.13(e)(1).
- 18/ For culverts having a waterway opening of 1 sq m (10 sq ft) or less, the culverts may be protected according to Article 1020.13(e)(3).
- 19/ The seven day protection period in the first paragraph of Article 1020.13(e)(2) shall not apply. The protection period shall end when curing is finished. For the third paragraph of Article 1020.13(e)(2), the decrease in temperature shall be according to Article 504.06(c)(6)."

Add the following to Article 1020.13(a) of the Standard Specifications:

“(5) Wetted Cotton Mat Method. After the surface of concrete has been textured or finished, it shall be covered immediately with dry cotton mats. The cotton mats shall be placed in a manner which will not mar the concrete surface. A texture resulting from the cotton mat material is acceptable. The cotton mats shall then be wetted immediately and thoroughly soaked with a gentle spray of water. For bridge decks, a foot bridge shall be used to place and wet the cotton mats.

The cotton mats shall be maintained in a wetted condition until the concrete has hardened sufficiently to place soaker hoses without marring the concrete surface. The soaker hoses shall be placed on top of the cotton mats at a maximum 1.2 m (4 ft) spacing. The cotton mats shall be kept wet with a continuous supply of water for the remainder of the curing period. Other continuous wetting systems may be used if approved by the Engineer.

After placement of the soaker hoses, the cotton mats shall be covered with white polyethylene sheeting or burlap-polyethylene blankets.

For construction items other than bridge decks, soaker hoses or a continuous wetting system will not be required if the alternative method keeps the cotton mats wet. Periodic wetting of the cotton mats is acceptable.

For areas inaccessible to the cotton mats on bridge decks, curing shall be according to Article 1020.13(a)(3).”

Revise the first paragraph of Article 1020.13(c) of the Standard Specifications to read:

“Protection of Portland Cement Concrete, Other Than Structures, From Low Air Temperatures. When the official National Weather Service forecast for the construction area predicts a low of 0 °C (32 °F), or lower, or if the actual temperature drops to 0 °C (32 °F), or lower, concrete less than 72 hours old shall be provided at least the following protection.”

Delete Article 1020.13(d) and Articles 1020.13(d)(1),(2),(3),(4) of the Standard Specifications.

Revise the first five paragraphs of Article 1020.13(e) of the Standard Specifications to read:

“Protection of Portland Cement Concrete Structures From Low Air Temperatures. When the official National Weather Service Forecast for the construction area predicts a low below 7 °C (45 °F), or if the actual temperature drops below 7 °C (45 °F), concrete less than 72 hours old shall be provided protection. Concrete shall also be provided protection when placed during the winter period of December 1 through March 15. Concrete shall not be placed until the materials, facilities and equipment for protection are approved by the Engineer.

When directed by the Engineer, the Contractor may be required to place concrete during the winter period. If winter construction is specified, the Contractor shall proceed with

the construction, including concrete, excavation, pile driving, steel erection and all appurtenant work required for the complete construction of the item, except at times when weather conditions make such operations impracticable.

Regardless of the precautions taken, the Contractor shall be responsible for protection of the concrete placed and any concrete damaged by cold temperatures shall be removed and replaced by the Contractor at his/her own expense.”

Add the following at the end of the third paragraph of Article 1020.13(e)(1) of the Standard Specifications:

“The Contractor shall provide means for checking the temperature of the surface of the concrete during the protection period.”

Revise the second sentence of the first paragraph of Article 1020.13(e)(2) of the Standard Specifications to read:

“The Contractor shall provide means for checking the temperature of the surface of the concrete or air temperature within the housing during the protection period.”

Delete the last sentence of the first paragraph of Article 1020.13(e)(3) of the Standard Specifications.

Add the following Article to Section 1022 of the Standard Specifications:

“1022.06 Cotton Mats. Cotton mats shall consist of a cotton fill material, minimum 400 g/sq m (11.8 oz/sq yd), covered with unsized cloth or burlap, minimum 200 g/sq m (5.9 oz/sq yd), and be tufted or stitched to maintain stability.

Cotton mats shall be in a condition satisfactory to the Engineer. Any tears or holes in the mats shall be repaired.

Add the following Article to Section 1022 of the Standard Specifications:

“1022.07 Linseed Oil Emulsion Curing Compound. Linseed oil emulsion curing compound shall be composed of a blend of boiled linseed oil and high viscosity, heavy bodied linseed oil emulsified in a water solution. The curing compound shall meet the requirements of a Type I, II, or III according to Article 1022.01, except the drying time requirement will be waived. The oil phase shall be 50 ± 4 percent by volume. The oil phase shall consist of 80 percent by mass (weight) boiled linseed oil and 20 percent by mass (weight) Z-8 viscosity linseed oil. The water phase shall be 50 ± 4 percent by volume.”

Revise Article 1020.14 of the Standard Specifications to read:

“1020.14 Temperature Control for Placement. Temperature control for concrete placement shall conform to the following requirements:

- (a) Temperature Control other than Structures. The temperature of concrete immediately before placing, shall be not less than 10 °C (50 °F) nor more than 32 °C (90 °F). Aggregates and/or water shall be heated or cooled as necessary to produce concrete within these temperature limits.

When the temperature of the plastic concrete reaches 30 °C (85 °F), an approved retarding admixture shall be used or the approved water reducing admixture in use shall have its dosage increased by 50 percent over the dosage recommended on the Department's Approved List of Concrete Admixtures for the temperature experienced. The amount of retarding admixture to be used will be determined by the Engineer. This requirement may be waived by the Engineer when fly ash compensated mixtures are used.

Plastic concrete temperatures up to 35 °C (96 °F), as placed, may be permitted provided job site conditions permit placement and finishing without excessive use of water on and/or overworking of the surface. The occurrence within 24 hours of unusual surface distress shall be cause to revert to a maximum 32 °C (90 °F) plastic concrete temperature.

Concrete shall not be placed when the air temperature is below 5 °C (40 °F) and falling or below 2 °C (35 °F), without permission of the Engineer. When placing of concrete is authorized during cold weather, the Engineer may require the water and/or the aggregates to be heated to not less than 20 °C (70 °F) nor more than 65 °C (150 °F). The aggregates may be heated by either steam or dry heat prior to being placed in the mixer. The apparatus used shall heat the mass uniformly and shall be so arranged as to preclude the possible occurrence of overheated areas which might damage the materials. No frozen aggregates shall be used in the concrete.

For pavement patching, refer to Article 442.06(e) for additional information on temperature control for placement.

- (b) Temperature Control for Structures. The temperature of concrete as placed in the forms shall be not less than 10 °C (50 °F) nor more than 32 °C (90 °F). Aggregates and/or water shall be heated or cooled as necessary to produce concrete within these temperature limits. When insulated forms are used, the temperature of the concrete mixture shall not exceed 25 °C (80 °F). If the Engineer determines that heat of hydration might cause excessive temperatures in the concrete, the concrete shall be placed at a temperature between 10 °C (50 °F) and 15 °C (60 °F), per the Engineer's instructions. When concrete is placed in contact with previously placed concrete, the temperature of the concrete may be increased as required to offset anticipated heat loss.

Concrete shall not be placed when the air temperature is below 7 °C (45 °F) and falling or below 4 °C (40 °F), without permission of the Engineer. When placing of concrete is authorized during cold weather, the Engineer may require the water and/or the aggregates to be heated to not less than 20 °C (70 °F) nor more than 65 °C (150 °F). The aggregates may be heated by either steam or dry heat prior to being placed in the mixer. The apparatus used shall heat the mass uniformly and shall be so arranged as to preclude the possible occurrence of overheated areas which might damage the materials. No frozen aggregates shall be used in the concrete.

When the temperature of the plastic concrete reaches 30 °C (85 °F), an approved retarding admixture shall be used or the approved water reducing admixture in use shall have its dosage increased by 50 percent over the dosage recommended on the Department's Approved List of Concrete Admixtures for the temperature experienced. The amount of retarding admixture to be used will be determined by the Engineer. This requirement may be waived by the Engineer when fly ash compensated mixtures are used.

- (c) Temperature. The concrete temperature shall be determined according to ASTM C 1064."

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (BDE)

Effective: September 1, 2000

Revised: June 1, 2004

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. 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. 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 DBE Directory or most recent addendum.

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 federally-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the 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 firms 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 35.00% 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 DBE Directory as a reference source for DBE companies certified by the Department. 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.state.il.us.

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 nonresponsive.

- (a) In order to assure the timely award of the contract, the as-read low bidder must submit a Disadvantaged Business Utilization Plan on Department form SBE 2026 within seven (7) working days after the date of letting. To meet the seven (7) day requirement, the bidder may send the Plan by certified mail or delivery service within the seven (7) 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 as-read low bidder to ensure that the postmark or receipt date is affixed within the seven (7) 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 (7) day submittal requirement, and the bid will be declared nonresponsive. In the event the bid is declared nonresponsive 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 firms and non-DBE firms, 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 (5) 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% 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 firm does not count toward the DBE goals.
- (b) DBE as a joint venture Contractor: 100% 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% 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 firm does not count toward the DBE goal.
- (d) DBE as a trucker: 100% 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% goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.
 - (2) 100% goal credit for the cost of materials or supplies obtained from a DBE manufacturer.
 - (3) 100% 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 prime contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Prime contractors 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 contractor'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 contractor'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 Contractor 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 (5) 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 (5) 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 (10) 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 nonresponsive.

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 and provide a full accounting of the efforts undertaken to obtain substitute DBE participation. The Bureau 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 therefor to the DBE by the Contractor, but not later than thirty (30)

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 Report on Department form SBE 2115 to the District Engineer. If full and final payment has not been made to the DBE, the Report 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.

ELASTOMERIC BEARINGS (BDE)

Effective: April 1, 2005

Revise Section 1083 of the Standard Specifications to read:

“SECTION 1083. ELASTOMERIC BEARINGS

1083.01 Description. Elastomeric bearings shall consist of steel laminated elastomeric pads or assemblies of steel laminated elastomeric pads with externally bonded structural steel bearing plates, structural steel top bearing plate, and required stainless steel and TFE sheets, as shown on the plans and as specified herein.

Shop drawings of the bearing assemblies shall be submitted to the Engineer. The bearing assemblies shall be furnished as a complete unit from one manufacturing source.

1083.02 Materials. Materials shall be according to the following.

- (a) Properties of the Elastomer. The elastomer compound used in the construction of the bearings shall contain only virgin crystallization resistant polychloroprene (neoprene) or virgin natural polyisoprene (natural rubber) as the raw polymer. All materials shall be new with no reclaimed material incorporated in the finished bearing. The elastomer compounds shall be classified as being of low-temperature, Grade 3, as specified by the minimum grade requirements of Table 14.7.5.2-2, “Low Temperature Zones and Minimum Grade of Elastomer”, of the AASHTO LRFD Bridge Design Specification. Low temperature zones used in this table are as defined in Figure 14.7.5.2-1, “Temperature Zones”, of the same publication.

The cured elastomer shall be according to the following requirements. The properties of the cured elastomeric compound material shall be determined using samples taken from actual bearings.

Material ^{1/2/} Property	ASTM Standard	Test Requirements	Polyisoprene (Natural Rubber)	Polychloroprene (Neoprene)
Physical Properties	D 2240	Hardness	55 ± 5 Shore "A" points	55 ± 5 Shore "A" points
	D 412	Min. Tensile Strength	15,500 kPa (2250 psi)	15,500 kPa (2250 psi)
		Min. Ultimate Elongation	400%	400%
Heat Resistance	D 573 at Specified Temp.	Specified Temperature of Test	70 °C (158 °F)	100 °C (212 °F)
		Aging Time	168 hours	70 hours
		Max. Change in Durometer hardness	+10 Shore "A" points	+15 Shore "A" points
		Max. Change in Tensile Strength	-25%	-15%
		Max. Change in Ultimate Elongation	-25%	-40%
Adhesion ^{3/} to Steel	Illinois Test Procedure 603	Bond Strength (Peel Test)	7 N/mm (40 lb/in.)	7 N/mm (40 lb/in.)
	D 429, B	Adhesion Failure	R-80%	R-80%

1/ All material tests shall be conducted at 23 ± 2°C (73 ± 4°F) unless otherwise noted.

2/ For the purpose of determining conformance with this specification, an observed or calculated value shall be rounded off to the nearest 100 kPa (10 psi) for tensile strength, to the nearest ten percent of elongation, and to the nearest one percent for change in aged tensile and aged elongation. Hardness and aged hardness shall be rounded off to nearest point according to AASHTO R 11.

3/ The adhesion failure requirement is waived if bond strength equals or exceeds 14 N/mm (80 lb/in.).

(b) TFE Material. The TFE resin shall be 100 percent virgin material, premium grade, meeting the requirements of ASTM D 4894. The TFE sheet (polytetrafluoroethylene sheet, premium grade) shall consist of pure TFE resin, compression molded and skived into sheets of the required thickness. The finished sheet shall conform to the following.

ASTM Standard	Physical Properties
D 638M (D 638)	Tensile strength min, kPa (psi) 19,300 (2800)
D 638M (D 638)	Elongation, min % 200
D 792	Specific Gravity 2.15-2.20
D 2240	Hardness, Durometer D 50-65
D 621	Deformation Under Load 23 °C/690 kPa/24 hrs (73 °F/100 psi/24 hrs), % 2-3 50 °C/8,300 kPa/24 hrs (122 °F/1200 psi/24 hrs), % 4-8 23 °C/13,800 kPa/24 hrs (73 °F/2000 psi/24 hrs), % 15 max.
D 570	Water Absorption, % 0.01 max. Static Coef. of Friction at 3450 kPa (500 psi) bearing pressure on stainless steel, max 0.07
D 429, B	Adhesion to Steel Peel Strength, N/mm (lb/in.) 4.4 (25)

(c) Stainless Steel Sheets. The stainless steel sheets shall be of the thickness specified and shall conform to ASTM A 240, Type 304. The sliding surface shall have a Type 2B finish or smoother as per the American Society of Metals.

(d) Structural Steel. Structural steel components shall be according to the following.

- (1) Structural Steel Bearing Plates. The structural steel bearing plates shall conform to the requirements of AASHTO M 270M Grade 250 (M 270, Grade 36).
- (2) Internal Steel Laminates. The internal steel laminates for the laminated elastomeric bearings shall be rolled mild steel sheets conforming to AISI 1015 - 1025, inclusive, ASTM A 1008 (A 1008M) or ASTM A 1011 (A 1011M) for less than 5 mm (3/16 in.) thick sheets, or AASHTO M 270M, Grade 250 (M 270, Grade 36) or ASTM A 283M (A 283) Grade D for 5 mm (3/16 in.) and thicker sheets.
- (3) Shear Restrictor Pin. The shear restrictor pin, when required, shall be press fit into the bearing plate and shall be alloy steel, quenched, and tempered to a minimum yield strength 1,450,000 kPa (210,000 psi) or RC hardness of 50 to 55.
- (4) Threaded Stud. The threaded stud, nuts and washers, when required, shall conform to the requirements of ASTM A 449 or A 193-B7 and shall be galvanized according to Article 1006.08 of the Standard Specifications.

1083.03 Fabrication Requirements. Bearings with steel laminates shall be cast as a unit in a mold and bonded and vulcanized under heat and pressure. The molds shall have standard shop practice mold finish. The internal steel laminates shall be blast cleaned to a condition matching that of SSPC-Vis 1-01, Pictorial Standard SP6, and additionally cleaned of any oil or grease before bonding. External load plates shall be protected from rusting by the manufacturer, and shall be hot bonded to the bearing during vulcanization. The bond of steel components to and within the elastomeric pads shall be continuous throughout the plan area with no voids or air spaces greater than 2.5 mm (0.10 in.) within the bonding material. Bearings

with steel laminates which are designed to act as a single unit with a given shape factor must be manufactured as a single unit. Corners and edges may be rounded with a radius at the corners not exceeding 10 mm (3/8 in.) and a radius at the edges not exceeding 6 mm (1/4 in.).

Bonding of TFE sheets shall be done as noted on the plans. No rubber flash will be permitted on the edges of TFE bearing surfaces. All burrs or raised edges along the perimeter of the TFE surface shall be removed before shipment.

All dimension tolerances shall be according to the following.

Dimensions	Tolerances	
	mm	(in.)
Overall vertical dimensions:		
Design thickness; 32 mm (1 1/4 in.) or less	-0, + 3	(-0, + 1/8)
Design thickness; over 32 mm (1 1/4 in.)	-0, + 6	(-0, + 1/4)
Overall horizontal dimensions:		
For measurements 914 mm (36 in.) and less	-0, + 6	(-0, + 1/4)
For measurements over 914 mm (36 in.)	-0, + 12	(-0, + 1/2)
Thickness of individual layers of elastomer at any point within the bearing:	± 20 % of design value but no more than ± 3 mm (1/8 in.)	
Variation from a plane parallel to the theoretical surface: (as determined by measurements at the edge of the bearings)		
Top	Slope relative to the bottom of no more than 0.005 radians.	
Sides	6	(1/4)
Position of exposed connection members:	± 3	(± 1/8)
Edge cover of embedded steel laminates, restraining devices, holes and slots:	+ 3 min. + 6 max.	(+ 1/8 min.) (+ 1/4 max.)
Size of holes, slots, or inserts:	± 3	(± 1/8)
Position of holes, slots, or inserts:	± 3	(± 1/8)

Structural steel bearing plates shall be fabricated according to Article 505.04 of the Standard Specifications. Prior to shipment of the bearing assemblies, the exposed edges and other exposed portions of the structural steel bearing plates shall be cleaned and painted in accordance with Articles 506.03 and 506.04 of the Standard Specifications. Painting shall be with the zinc-silicate primer according to Article 1008.22 of the Standard Specifications. During the cleaning and painting, the stainless steel and TFE sheet sliding surfaces and the elastomer shall be protected from abrasion and paint.

1083.04 Testing and Acceptance. The rubber laminates shall be of uniform integral units, capable of being separated by mechanical means into separate, well-defined elastomeric layers. The ultimate breakdown limit of the elastomeric bearing under compressive loading shall be not less than 13,800 kPa (2000 psi).

The bearing manufacturer shall load test each completed steel laminated elastomeric bearing pad assembly prior to shipment. The bearings shall be loaded to 10,300 kPa (1500 psi) and under this loading shall exhibit relatively uniform bulging of the rubber layers on all sides and shall show no bond loss or edge splitting. Bearing assemblies under this loading showing

nonuniform bulging from one side of the pad to the other, nonuniform bulging along any vertical face of a pad, bulging extending across the specified location of one or more of the internal steel laminates or edge splitting shall be replaced. Nonuniform bulging from one side of the pad to the other may be an indication of lateral misalignment of the internal steel laminates and would not be cause for replacement if probing shows that the edge cover of the steel laminates are within the specified tolerances. Nonuniform bulging along any vertical face of the pad may be an indication of vertical misalignment of the steel laminates and would not be cause for replacement if measurement of the bases of the nonuniform bulges show that the thickness of the elastomeric layers are within the specified ± 20 percent tolerance. Bulging across the specified location of one or more steel laminates indicates missing steel laminates or lack of bond and pads exhibiting these characteristics shall always be replaced.

The Contractor shall furnish certified copies of the bearing manufacturer's test reports on the physical properties of the component materials for the bearings to be furnished and a certification by the bearing manufacturer that the bearings furnished have been load tested and conform to all requirements.

When directed by the Engineer, the Contractor shall furnish random samples of component materials used in the bearings for testing. In addition, when requested in writing by the Engineer, the Contractor shall furnish an additional project bearing assembly to the Department for testing. When the additional bearing assembly is requested, the Engineer retains the right to select the bearing assembly for testing at random from the project lot. The Contractor will be paid for the additional bearing assembly as specified in Article 503.22 of the Standard Specifications. If the bearing assembly tested is found to be unacceptable, two additional bearing assemblies will be tested. If both are acceptable, the lot will be accepted. If either of the two additional bearing assemblies are unacceptable, the lot will be rejected. The Contractor shall have a new lot produced, including one additional test bearing. No payment will be made for the original failed bearing assembly or any subsequent test assemblies."

EPOXY PAVEMENT MARKING (BDE)

Effective: January 1, 2001

Revised: August 1, 2003

Revise Article 1095.04(b) of the Standard Specifications to read:

"(b) The Epoxide Value (WPE) of Component A shall be tested according to ASTM D 1652 on a pigment free basis. The WPE shall not vary more than plus or minus 50 units of the qualification samples."

Revise Article 1095.04(c) of the Standard Specifications to read:

"(c) The Total Amine Value of Component B shall be tested according to ASTM D 2074. The Total Amine Value shall not vary more than plus or minus 50 units of the qualification samples."

Revise Article 1095.04(g) of the Standard Specifications to read:

“(g) The epoxy pavement marking material, when mixed in the proper mix ratio and applied at 0.35 mm to 0.41 mm (14 to 16 mils) wet film thickness and with the proper saturation of glass spheres, shall exhibit a dry no pick-up time of twenty minutes or less when tested according to ASTM D 711.”

Revise Article 1095.04(m) of the Standard Specifications to read:

“(m) The glass beads meet the requirements of Article 1095.07 and the following:

- (1) 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.

Sieve Size	U.S. Standard Sieve Number	% Passing (by weight)
1.70 mm	12	95-100
1.40 mm	14	75-95
1.18 mm	16	10-47
1.00 mm	18	0-7
850 µm	20	0-5

- (2) The second drop glass beads shall be Type B.”

Revise the second sentence of the first paragraph of Article 1095.04(n) of the Standard Specifications to read:

“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).”

EROSION AND SEDIMENT CONTROL DEFICIENCY DEDUCTION (BDE)

Effective: August 1, 2001

Revised: November 1, 2001

When the Engineer is notified or determines an erosion and/or sediment control deficiency(s) exists, he/she will direct the Contractor in writing to correct the deficiency. The Contractor shall then correct the deficiency within 24 hours. The 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 National Pollutant Discharge Elimination System (NPDES) Storm Water Permit for Construction Site Activities.

If the Contractor fails to correct the deficiency(s) within 24 hours, a daily monetary deduction will be imposed for each calendar day or fraction thereof the deficiency exists. The time period will begin with the initial written notification to the Contractor and end with the Engineer's acceptance of the corrected work. The per calendar day deduction will be either \$1000.00 or 0.05 percent of the awarded contract value, whichever is greater.

If the Contractor fails to respond, the Engineer may correct the deficiencies and deduct the cost from monies due or which may become due the Contractor. This corrective action shall in no way relieve the Contractor of his/her contractual requirements or responsibilities.

EXPANSION JOINTS (BDE)

Effective: August 1, 2003

Add the following paragraph after the second paragraph of Article 420.10(e) of the Standard Specifications:

“After the dowel bars are oiled, plastic expansion caps shall be secured to the bars maintaining a minimum expansion gap of 50 mm (2 in.) between the end of the bar and the end of the cap. The caps shall fit snugly on the bar and the closed end shall be watertight. For expansion joints formed using dowel bar basket assemblies, the caps shall be installed on the alternating free ends of the bars. For expansion joints formed using a construction header, the caps shall be installed on the exposed end of each bar once the header has been removed and the joint filler material has been installed.”

FLAGGER VESTS (BDE)

Effective: April 1, 2003

Revised: April 1, 2005

Revise the first sentence of Article 701.04(c)(1) of the Standard Specifications to read:

“The flagger shall be stationed to the satisfaction of the Engineer and be equipped with a fluorescent orange, fluorescent yellow/green or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of the American National Standards Institute specification ANSI/ISEA 107-1999 for Conspicuity Class 2 garments and approved flagger traffic control signs conforming to Standard 702001 and Article 702.05(e).”

Revise Article 701.04(c)(6) of the Standard Specifications to read:

“(6) Nighttime Flagging. The flagger station shall be lit by additional overhead lighting other than streetlights. The flagger shall be equipped with a fluorescent orange, fluorescent yellow/green, or a combination of fluorescent orange and fluorescent yellow/green garment meeting the requirements of the American National Standards Institute specification ANSI/ISEA 107-1999 for Conspicuity Class 3 garments.”

FREEZE-THAW RATING (BDE)

Effective: November 1, 2002

Revise the first sentence of Article 1004.02(f) of the Standard Specifications to read:

“When coarse aggregate is used to produce portland cement concrete for base course, base course widening, pavement, driveway pavement, sidewalk, shoulders, curb, gutter,

combination curb and gutter, median, paved ditch or their repair using concrete, the gradation permitted will be determined from the results of the Department's Freeze-Thaw Test."

HAND VIBRATOR (BDE)

Effective: November 1, 2003

Add the following paragraph to Article 1103.17(a) of the Standard Specifications:

"The vibrator shall have a non-metallic head for areas containing epoxy coated reinforcement. The head shall be coated by the manufacturer. The hardness of the non-metallic head shall be less than the epoxy coated reinforcement, resulting in no damage to the epoxy coating. Slip-on covers will not be allowed."

IMPACT ATTENUATORS (BDE)

Effective: November 1, 2003

Description. This work shall consist of furnishing and installing 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).....	1003.01
(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

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. Fully redirective and partially redirective attenuators shall also be designed for bi-directional impacts.

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. For sand modules, the perimeter of each module and the specified mass (weight) of sand in each module shall be painted on the surface of the base.

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.

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 (FULLY REDIRECTIVE, NARROW); IMPACT ATTENUATORS (FULLY REDIRECTIVE, WIDE); IMPACT ATTENUATORS (SEVERE USE, NARROW); IMPACT ATTENUATORS (SEVERE USE, WIDE); IMPACT ATTENUATORS (PARTIALLY REDIRECTIVE); or IMPACT ATTENUATORS (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.

IMPACT ATTENUATORS, TEMPORARY (BDE)

Effective: November 1, 2003

Revised: April 1, 2004

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).....	1003.01
(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) Rapid Set Mortar (Note 2)	

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.

Note 2. Rapid set mortar shall be obtained from the Department's approved list of Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repairs. For a rapid set mortar mixture, one part packaged rapid set cement shall be combined with two parts fine aggregate, by volume or a packaged rapid set mortar shall be used. Mixing of the rapid set mortar shall be according to the manufacturer's instructions.

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 (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.

INLET FILTERS (BDE)

Effective: August 1, 2003

Add the following to Article 280.02 of the Standard Specifications:

“(k) Inlet Filters..... 1081.15(h)”

Add the following paragraph after the first paragraph of Article 280.04(c) of the Standard Specifications:

“When specified, drainage structures shall be protected with inlet filters. Inlet filters shall be installed either directly on the drainage structure or under the grate of the drainage structure resting on the lip of the frame. The fabric bag shall hang down into the drainage structure. Prior to ordering materials, the Contractor shall determine the size and shape of the various drainage structures being protected.”

Revise Article 280.07(d) of the Standard Specifications to read:

“(d) Inlet and Pipe Protection. This work will be paid for at the contract unit price per each for INLET AND PIPE PROTECTION.

Protection of drainage structures with inlet filters will be paid for at the contract unit price per each for INLET FILTERS.”

Add the following to Article 1081.15 of the Standard Specifications:

“(h) Inlet Filters. An inlet filter shall consist of a steel frame with a two piece geotextile fabric bag attached with a stainless steel band and locking cap that is suspended from the frame. A clean, used bag and a used steel frame in good condition meeting the approval of the Engineer may be substituted for new materials. Materials for the inlet filter assembly shall conform to the following requirements:

(1) Frame Construction. Steel shall conform to Article 1006.04.

Frames designed to fit under a grate shall include an overflow feature that is welded to the frame's ring. The overflow feature shall be designed to allow full flow of water into the structure when the filter bag is full. The dimensions of the frame shall allow the drainage structure grate to fit into the inlet filter assembly frame opening. The assembly frame shall rest on the inside lip of the drainage structure frame for the full variety of existing and proposed drainage structure frames that are present on this contract. The inlet filter assembly frame shall not cause the drainage structure grate to extend higher than 6 mm (1/4 in.) above the drainage structure frame.

(2) Grate Lock. When the inlet is located in a traffic lane, a grate lock shall be used to secure the grate to the frame. The grate lock shall conform to the manufacturer's requirements for materials and installation.

(3) Geotextile Fabric Bag. The sediment bag shall be constructed of an inner filter bag and an outer reinforcement bag.

a. Inner Filter Bag. The inner filter bag shall be constructed of a polypropylene geotextile fabric with a minimum silt and debris capacity of 0.06 cu m (2.0 cu ft). The bag shall conform to the following requirements:

Inner Filter Bag		
Material Property	Test Method	Minimum Avg. Roll Value
Grab Tensile Strength	ASTM D 4632	45 kg (100 lb)
Grab Tensile Elongation	ASTM D 4632	50%
Puncture Strength	ASTM D 4833	29 kg (65 lb)
Trapezoidal Tear	ASTM D 4533	20 kg (45 lb)
UV Resistance	ASTM D 4355	70% at 500 hours
Actual Open Size	ASTM D 1420	212 μm (No. 70 sieve US)
Permittivity	ASTM D 4491	2.0/sec
Water Flow Rate	ASTM D 4491	5900 Lpm/sq m (145 gpm/sq ft)

b. Outer Reinforcement Bag. The outer reinforcement bag shall be constructed of polyester mesh material that conforms to the following requirements:

Outer Reinforcement Bag		
Material Property	Test Method	Value
Content	ASTM D 629	Polyester
Weight	ASTM D 3776	155 g/sq m (4.55 oz/sq yd) ±15%
Whales (holes)	ASTM D 3887	7.5 ± 2 holes/25 mm (1 in.)
Chorses (holes)	ASTM D 3887	15.5 ± 2holes/25 mm (1 in.)
Instronball Burst	ASTM D 3887	830 kPa (120 psi) min.
Thickness	ASTM D 1777	1.0 ± 0.1 mm (0.040 ± 0.005 in.)

- (4) Certification. The manufacturer shall furnish a certification with each shipment of inlet filters, stating the amount of product furnished, and that the material complies with these requirements.”

MINIMUM LANE WIDTH WITH LANE CLOSURE (BDE)

Effective: January 1, 2005

Add the following paragraph after the eighth paragraph of Article 701.04(a) of the Standard Specifications.

“The minimum lane width adjacent to a closed lane during paving, patching, and other moving operations on freeways and expressways shall be a minimum of 3 m (10 ft). The 3 m (10 ft) shall be clear, unobstructed, and free of channelizing devices or other obstacles.”

PARTIAL PAYMENTS (BDE)

Effective: September 1, 2003

Revise Article 109.07 of the Standard Specifications to read:

“**109.07 Partial Payments.** Partial payments will be made as follows:

- (a) Progress Payments. At least once each month, the Engineer will make a written estimate of the amount of work performed in accordance with the contract, and the value thereof at the contract unit prices. The amount of the estimate approved as due for payment will be vouchered by the Department and presented to the State Comptroller for payment. No amount less than \$1000.00 will be approved for payment other than the final payment.

The failure to perform any requirement, obligation, or term of the contract by the Contractor shall be reason for withholding any progress payments until the Department determines that compliance has been achieved. Furthermore, progress payments may be reduced by liens filed pursuant to Section 23(c) of the Mechanics Lien Act, 770 ILCS 60/23(c).

- (b) Material Allowances. At the discretion of the Department, payment may be made for materials, prior to their use in the work, when satisfactory evidence is presented by the Contractor. Satisfactory evidence includes justification for the allowance (to expedite the work, meet project schedules, regional or national material shortages, etc.), documentation of material and transportation costs, and evidence that such material is properly stored on the project or at a secure location acceptable and accessible to the Department.

Material allowances will be considered only for nonperishable materials when the cost, including transportation, exceeds \$10,000 and such materials are not expected to be utilized within 60 days of the request for the allowance. For contracts valued under \$500,000, the minimum \$10,000 requirement may be met by combining the principal

(material) product of no more than two contract items. An exception to this two item limitation may be considered for any contract regardless of value for items in which material (products) are similar except for type and/or size.

Material allowances shall not exceed the value of the contract items in which used and shall not include the cost of installation or related markups. Amounts paid by the Department for material allowances will be deducted from estimates due the Contractor as the material is used. Two-sided copies of the Contractor's cancelled checks for materials and transportation must be furnished to the Department within 60 days of payment of the allowances or the amounts will be reclaimed by the Department."

PAVEMENT AND SHOULDER RESURFACING (BDE)

Effective: February 1, 2000

Revised: July 1, 2004

Revise Article 406.20 of the Standard Specifications to read:

"406.20 Resurfacing Sequence. The resurfacing operations shall satisfy the following requirements:

- (a) Before paving in a lane, the adjacent lane and its shoulder must be at the same elevation.
- (b) Each lift of resurfacing shall be completed, including shoulders, before the next lift is begun.
- (c) Elevation differences between lanes shall be eliminated within twelve calendar days.

Revise the first paragraph of Article 406.23 of the Standard Specifications to read:

"406.23 Method of Measurement. This work will be measured for payment according to the following:"

Revise the first sentence of the ninth paragraph of Article 406.23 of the Standard Specifications to read:

"When a Superpave Binder and Surface Course mixture is used on shoulders and is placed simultaneously with the traffic lane as specified in Section 482, the quantity of bituminous mixture placed on the traffic lane that will be paid for will be limited to a calculated tonnage based upon actual mat width and length, plan thickness or a revised thickness authorized by the Engineer, and design mix weight per millimeter (inch) of thickness."

Delete the tenth paragraph of Article 406.23 of the Standard Specifications.

Revise the second paragraph of Article 482.06 of the Standard Specifications to read:

"On pavement and shoulder resurfacing projects, the resurfacing sequence shall be according to Article 406.20. When the Superpave mixture option is used, the shoulders may be placed, at the Contractor's option, simultaneously with the adjacent traffic lane for both the

binder and surface courses, provided the specified density, thickness and cross slope of both the pavement and shoulder can be satisfactorily obtained.”

PAVEMENT THICKNESS DETERMINATION FOR PAYMENT (BDE)

Effective: April 1, 1999

Revised: January 1, 2004

Description. This work shall consist of determining pavement thickness for payment for full depth bituminous concrete and all pcc pavements. Pavement pay items that individually contain at least 840 sq m (1000 sq yd) of contiguous pavement will be subject to this Special Provision with the following exclusions: temporary pavements; variable width pavement; radius returns and side streets less than 125 m (400 ft) in length; and turn lanes of constant width less than 125 m (400 ft) in length. The areas of pavement excluded from the pay adjustment as described in this Special Provision will be cored according to Article 407.10 of the Standard Specifications. Temporary pavements are defined as pavements constructed and removed under this contract.

Materials. Rapid set materials shall be obtained from the Department's approved list of Packaged, Dry, Rapid Hardening Cementitious Materials For Concrete Repairs. Coarse aggregate may be added to the mortar if allowed by the manufacturer's instructions on the package. Mixing shall be according to the manufacture's recommendations.

Equipment. Cores shall be taken utilizing an approved coring machine. The cores shall have a diameter of 50 mm (2 in.). The cores shall be measured utilizing an approved measuring device.

CONSTRUCTION REQUIREMENTS

Tolerance in Thickness. Determination of the pavement thickness shall be performed after the pavement surface tests and all corrective grinding are complete according to Article 407.09 of the Standard Specifications. Adjustments made in the contract unit price for pavement thickness will be in addition to and independent of those made for the Profile Index.

The pavement will be divided into approximately equal lots of not more than 1500 m (5000 ft) in length. When the length of a continuous strip of pavement is less than 1500 m (5000 ft), these short lengths of pavement, ramps, turn lanes, and other short sections of continuous pavement shall be grouped together to form lots of approximately 1500 m (5000 ft) in length. Short segments between structures will be measured continuously with the structure segments omitted. Each lot will be subdivided into ten equal sublots. The width of a subplot and lot will be the width from the pavement edge to the adjacent lane line, from one lane line to the next, or between pavement edges for single-lane pavements.

Fifty millimeter (Two inch) cores shall be taken from the pavement by the Contractor at random locations selected by the Engineer. When computing the thickness of a lot, one core will be taken per subplot. Core locations will be specified by the Engineer prior to beginning the coring operations.

The Contractor and the Engineer shall witness the coring operations, the measurement, and recording of the cores. Core measurements will be determined immediately upon removal from

the core bit and prior to moving to the next core location. Upon concurrence of the length, the core samples may be discarded.

Patching Holes. Upon completion of coring, all core holes shall be filled with a rapid set mortar or concrete. Only enough water to permit placement and consolidation by rodding shall be used, and the material shall be struck-off flush with the adjacent pavement.

For a rapid set mortar mixture, one part packaged rapid set cement shall be combined with two parts fine aggregate, by volume; or a packaged rapid set mortar shall be used. For a rapid set concrete mixture, a packaged rapid set mortar shall be combined with coarse aggregate according to the manufacturer's instructions or a packaged rapid set concrete shall be used. Mixing of a rapid set mortar or concrete shall be according to the manufacturer's instructions.

Deficient Sublot. When the thickness of the core in a sublot is deficient by more than ten percent of plan thickness, the Contractor will have the option of taking three additional cores selected at random by the Engineer within the same sublot at the Contractor's expense. The thickness of the additional three cores will be averaged with the original core thickness. When the average thickness shows the sublot to be deficient by ten percent or less, no additional action is necessary. If the Contractor chooses not to take additional cores, the pavement in the sublot shall be removed and replaced at the Contractor's expense. When additional cores are taken and the average thickness of the additional cores show the sublot to be deficient by more than ten percent, the pavement in that sublot shall be removed and replaced at the Contractor's expense. When requested in writing by the Contractor, the Engineer, at his/her option, may permit in writing such thin pavement to remain in place. For Bituminous Concrete Pavement (Full Depth) allowed to remain in place, additional lift(s) may be placed, at the Contractor's expense, to bring the deficient pavement to plan thickness when the Engineer determines grade control conditions will permit such lift(s). The material thickness(es), areas to be overlaid, and method of placement used for additional lift(s) will be approved by the Engineer. When the thin pavement is removed and replaced or additional lifts are placed, the replacement pavement will be retested for thickness at the Contractor's expense. When the thin pavement is left in place and no additional lift(s) are placed, no payment will be made for the deficient pavement sublot. The thickness of the original core taken in the sublot will be used in determining the payment for the entire lot and no adjustment to the pay factor will be made for any corrective action taken.

Deficient Lot. After analyzing the cores, the Percent Within Limits will be calculated. A lot of pavement represented by the Percent Within Limits (PWL) of 60 percent or less, shall be removed and replaced at the Contractor's expense. When requested in writing by the Contractor, the Engineer, at his/her option, may permit in writing such pavement to remain in place. For Bituminous Concrete Pavement (Full Depth), allowed to remain in place, additional lift(s) may be placed, at the Contractor's expense, to bring the deficient pavement to plan thickness when the Engineer determines grade control conditions will permit such lift(s). The material, thickness(es), areas to be overlaid and method of placement used for the additional lift(s) will be approved by the Engineer. After either corrective action, the Contractor shall core the lot according to the "Coring Procedures" at no additional cost to the Department. The PWL will then be recalculated for the lot, however, the pay factor for the lot will be a maximum of 100 percent. When requested in writing by the Contractor, the Engineer, at his/her option, may permit in writing, the lot to remain in place. When the lot is left in place and no additional lifts are placed the pay factor for the lot will be based on the calculated PWL.

Right of Discovery. When the Engineer has reason to believe the random core selection process will not accurately represent the true conditions of the work, he/she may order cores in addition to those specified. The additional cores shall be taken at specific locations determined by the Engineer. The Engineer will provide notice to the Contractor containing an explanation of the reasons for his/her action. These additional cores and locations will be determined prior to commencement of coring operations. When the additional cores show the pavement to be deficient by more than ten percent, additional cores shall be taken at locations determined by the Engineer to determine the limits of the deficient pavement area. The deficient pavement area will be defined as the area between two acceptable cores. An acceptable core is a core with a thickness of 90 percent or more of plan thickness. The defined pavement area shall be removed and replaced at the Contractor's expense. When requested by the Contractor, the Engineer, at his/her option, may permit in writing such thin pavement to remain in place. On Bituminous Concrete Pavement (Full Depth) allowed to remain in place, additional lift(s) may be placed to bring the deficient pavement to plan thickness when the Engineer determines that grade control conditions will permit such lift(s). The material, thickness(es), areas to be overlaid and method of placement for the additional lift(s) will be approved by the Engineer. When the thin pavement is removed and replaced or additional lifts are placed, the replacement pavement will be retested for thickness at the Contractor's expense. When the thin pavement is left in place and no additional lift(s) are placed, no payment will be made for the deficient pavement. When the additional cores show the pavement to be deficient by ten percent or less the additional cores will be paid for according to Article 109.04. When the additional cores show the pavement to be deficient by more than ten percent the additional cores taken in the deficient area shall be at the Contractor's expense.

Profile Index Adjustment. After any section of pavement is removed and replaced or any additional lifts are added, the corrected areas shall be tested for pavement smoothness and any necessary Profile Index adjustments and/or corrections will be made based on these final profile readings. Such surface testing shall be performed at the Contractor's expense.

Core Analysis. Cores will be analyzed according to the following:

(a) Definition:

- x_i = Individual values (core lengths) under consideration
- n = Number of individual values under consideration
(10 per lot)
- \bar{x} = Average of the values under consideration
- LSL = Lower Specification Limit (LSL = 0.98 plan thickness for pavement)
- Q_L = Lower Quality Index
- S = Sample Standard Deviation
- PWL = Percent Within Limits

Determine \bar{x} for the lot to the nearest two decimal places.

Compute the sample standard deviation to the nearest three decimal places using:

$$S = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}} \quad \text{where} \quad \Sigma(x_i - \bar{x})^2 = (x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \dots + (x_{10} - \bar{x})^2$$

Determine the Lower Quality Index to the nearest two decimal places using:

$$Q_L = \frac{(\bar{x} - LSL)}{S}$$

Determine the percentage that will fall above the Lower Specification Limit (LSL) by going to the attached Table and utilizing calculated Q_L . Read the appropriate PWL value from the Table. For Q_L values less than zero the value shown in the table must be subtracted from 100 to obtain PWL.

Pay Adjustment. The following pay adjustment equation will be used to determine (to the nearest two decimal places) the pay factor for each lot.

Pay Factor (PF) in percent = 55 + 0.5 (PWL)

If \bar{x} for a lot is less than the plan thickness, the maximum pay factor for that lot will be 100 percent.

Total Payment. The payment will be based on the appropriate pay items in Sections 407, 420, and 421. The final payment will be adjusted according to the following equation:

$$\text{Total Payment} = \text{TPF}[\text{CUP} (\text{TOTPAVT} - \text{DEFPAVT})]$$

TPF = Total Pay Factor

CUP = Contract Unit Price

TOTPAVT = Area of Pavement Subject to Coring

DEFPAVT = Area of Deficient Pavement

The TPF for the entire pavement will be the average of the PF for all the lots, however, not more than 102 percent of plan quantity will be paid.

Deficient pavement is defined as an area of pavement represented by a subplot deficient by more than 10 percent which is left in place with no additional thickness added.

All work involved in determining the total payment will be included in the contract unit prices of the pay items involved.

Percent Within Limits							
Quality Index (Q _L)*	Percent Within Limits (PWL)	Quality Index (Q _L)*	Percent Within Limits (PWL)	Quality Index (Q _L)*	Percent Within Limits (PWL)	Quality Index (Q _L)*	Percent Within Limits (PWL)
0.00	50.00	0.40	65.07	0.80	78.43	1.20	88.76
0.01	50.38	0.41	65.43	0.81	78.72	1.21	88.97
0.02	50.77	0.42	65.79	0.82	79.02	1.22	89.17
0.03	51.15	0.43	66.15	0.83	79.31	1.23	89.38
0.04	51.54	0.44	66.51	0.84	79.61	1.24	89.58
0.05	51.92	0.45	66.87	0.85	79.90	1.25	89.79
0.06	52.30	0.46	67.22	0.86	80.19	1.26	89.99
0.07	52.69	0.47	67.57	0.87	80.47	1.27	90.19
0.08	53.07	0.48	67.93	0.88	80.76	1.28	90.38
0.09	53.46	0.49	68.28	0.89	81.04	1.29	90.58
0.10	53.84	0.50	68.63	0.90	81.33	1.30	90.78
0.11	54.22	0.51	68.98	0.91	81.61	1.31	90.96
0.12	54.60	0.52	69.32	0.92	81.88	1.32	91.15
0.13	54.99	0.53	69.67	0.93	82.16	1.33	91.33
0.14	55.37	0.54	70.01	0.94	82.43	1.34	91.52
0.15	55.75	0.55	70.36	0.95	82.71	1.35	91.70
0.16	56.13	0.56	70.70	0.96	82.97	1.36	91.87
0.17	56.51	0.57	71.04	0.97	83.24	1.37	92.04
0.18	56.89	0.58	71.38	0.98	83.50	1.38	92.22
0.19	57.27	0.59	71.72	0.99	83.77	1.39	92.39
0.20	57.65	0.60	72.06	1.00	84.03	1.40	92.56
0.21	58.03	0.61	72.39	1.01	84.28	1.41	92.72
0.22	58.40	0.62	72.72	1.02	84.53	1.42	92.88
0.23	58.78	0.63	73.06	1.03	84.79	1.43	93.05
0.24	59.15	0.64	73.39	1.04	85.04	1.44	93.21
0.25	59.53	0.65	73.72	1.05	85.29	1.45	93.37
0.26	59.90	0.66	74.04	1.06	85.53	1.46	93.52
0.27	60.28	0.67	74.36	1.07	85.77	1.47	93.67
0.28	60.65	0.68	74.69	1.08	86.02	1.48	93.83
0.29	61.03	0.69	75.01	1.09	86.26	1.49	93.98
0.30	61.40	0.70	75.33	1.10	86.50	1.50	94.13
0.31	61.77	0.71	75.64	1.11	86.73	1.51	94.27
0.32	62.14	0.72	75.96	1.12	86.96	1.52	94.41
0.33	62.51	0.73	76.27	1.13	87.20	1.53	94.54
0.34	62.88	0.74	76.59	1.14	87.43	1.54	94.68
0.35	63.25	0.75	76.90	1.15	87.66	1.55	94.82
0.36	63.61	0.76	77.21	1.16	87.88	1.56	94.95
0.37	63.98	0.77	77.51	1.17	88.10	1.57	95.08
0.38	64.34	0.78	77.82	1.18	88.32	1.58	95.20
0.39	64.71	0.79	78.12	1.19	88.54	1.59	95.33

*For Q_L values less than zero, subtract the table value from 100 to obtain PWL

Percent Within Limits (continued)					
Quality Index (Q _L)*	Percent Within Limits (PWL)	Quality Index (Q _L)*	Percent Within Limits (PWL)	Quality Index (Q _L)*	Percent Within Limits (PWL)
1.60	95.46	2.00	98.83	2.40	99.89
1.61	95.58	2.01	98.88	2.41	99.90
1.62	95.70	2.02	98.92	2.42	99.91
1.63	95.81	2.03	98.97	2.43	99.91
1.64	95.93	2.04	99.01	2.44	99.92
1.65	96.05	2.05	99.06	2.45	99.93
1.66	96.16	2.06	99.10	2.46	99.94
1.67	96.27	2.07	99.14	2.47	99.94
1.68	96.37	2.08	99.18	2.48	99.95
1.69	96.48	2.09	99.22	2.49	99.95
1.70	96.59	2.10	99.26	2.50	99.96
1.71	96.69	2.11	99.29	2.51	99.96
1.72	96.78	2.12	99.32	2.52	99.97
1.73	96.88	2.13	99.36	2.53	99.97
1.74	96.97	2.14	99.39	2.54	99.98
1.75	97.07	2.15	99.42	2.55	99.98
1.76	97.16	2.16	99.45	2.56	99.98
1.77	97.25	2.17	99.48	2.57	99.98
1.78	97.33	2.18	99.50	2.58	99.99
1.79	97.42	2.19	99.53	2.59	99.99
1.80	97.51	2.20	99.56	2.60	99.99
1.81	97.59	2.21	99.58	2.61	99.99
1.82	97.67	2.22	99.61	2.62	99.99
1.83	97.75	2.23	99.63	2.63	100.00
1.84	97.83	2.22	99.66	2.64	100.00
1.85	97.91	2.25	99.68	≥ 2.65	100.00
1.86	97.98	2.26	99.70		
1.87	98.05	2.27	99.72		
1.88	98.11	2.28	99.73		
1.89	98.18	2.29	99.75		
1.90	98.25	2.30	99.77		
1.91	98.31	2.31	99.78		
1.92	98.37	2.32	99.80		
1.93	98.44	2.33	99.81		
1.94	98.50	2.34	99.83		
1.95	98.56	2.35	99.84		
1.96	98.61	2.36	99.85		
1.97	98.67	2.37	99.86		
1.98	98.72	2.38	99.87		
1.99	98.78	2.39	99.88		

*For Q_L values less than zero, subtract the table value from 100 to obtain PWL

PAYMENTS TO SUBCONTRACTORS (BDE)

Effective: June 1, 2000

Revised: September 1, 2003

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 no later than 30 days from the receipt of each payment made to the Contractor.

State law addresses the timing of payments to be made to subcontractors. Section 7 of the Prompt Payment Act, 30 ILCS 540/7, generally requires that when a Contractor receives any payment from the Department, the Contractor is required to make corresponding, proportional payments to each subcontractor performing work within 15 calendar days after receipt of the state payment. Section 7 of the State Prompt Payment Act further provides that interest in the amount of 2% per month, in addition to the payment due, shall be paid to any subcontractor 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 throughout the contracting chain.

This Special Provision establishes the required federal contract clause, and adopts the 15 calendar day requirement of the Act for purposes of compliance with the federal regulation regarding payments to subcontractors. This contract is subject to the following payment obligations.

As progress payments are made to the Contractor in accordance with Article 109.07 of the Standard Specifications for Road and Bridge Construction, the Contractor shall make a corresponding partial payment within 15 calendar days to each subcontractor in proportion to the work satisfactorily completed by each subcontractor. The proportionate amount of partial payment due to each subcontractor 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 shall be paid in full within 15 calendar days after the subcontractor's work has been satisfactorily completed. The Contractor shall hold no retainage from the subcontractors.

This Special Provision does not create any rights in favor of any subcontractor against the State of Illinois or authorize any cause of action against the State of Illinois on account of any payment, nonpayment, delayed payment or interest claimed by application of the State Prompt Payment Act. The Department will neither determine the reasonableness of any cause for delay of payment nor enforce any claim to payment, including interest. Moreover, the Department will not approve any delay or postponement of the 15 day requirement. State law creates 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 in accordance with the Public Construction Bond Act, 30 ILCS 550.

PERSONAL PROTECTIVE EQUIPMENT (BDE)

Effective: July 1, 2004

All personnel, excluding flaggers, working outside of a vehicle (car or truck) within 7.6 m (25 ft) of pavement open to traffic shall wear a fluorescent orange, fluorescent yellow/green or a combination of fluorescent orange and fluorescent yellow/green vest meeting the requirements of the American National Standards Institute specification ANSI/ISEA 107-1999 for Conspicuity Class 2 garments. Other types of garments may be substituted for the vest as long as the garments have manufacturers tags identifying them as meeting the ANSI Class 2 requirement.

PLASTIC BLOCKOUTS FOR GUARDRAIL (BDE)

Effective: November 1, 2004

Add the following to Article 630.02 of the Standard Specifications:

“(h) Plastic Blockouts (Note 1.)

Note 1. Plastic blockouts, 150 mm (6 in.) deep, may be used in lieu of 150 mm (6 in.) deep wood block-outs for steel plate beam guardrail. The plastic blockouts shall be on the Department’s approved list.”

POLYUREA PAVEMENT MARKING (BDE)

Effective: April 1, 2004

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 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 0.35 to 0.41 mm (14 to 16 mils) 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 50 °C (122 °F) and four hours of condensation at 40 °C (104 °F). 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 0.35 to 0.41 mm (14 to 16 mils) 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 100 x 100 x 50 mm (4 x 4 x 2 in.) 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 24,100 kPa (3500 psi). A 50 mm (2 in.) square film of the mixed polyurea shall be applied to the brushed surface and allowed to cure for 72 hours at room temperature. A 50 mm (2 in.) 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 50 mm (2 in.) 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 0.35 to 0.41 mm (14 to 16 mils) 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 0.35 to 0.41 mm (14 to 16 mils) 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:

Sieve Size	U.S. Standard Sieve Number	% Passing (By Weight)
1.70 mm	12	95-100
1.40 mm	14	75-95
1.18 mm	16	10-47
1.00 mm	18	0-7
850 µm	20	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) of sulfuric acid. Adding 5.7 ml (0.2 oz) of concentrated acid into the water shall make the one percent acid

solution. This test shall be performed by taking a 25 x 50 mm (1 x 2 in.) 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 66 °C (150 °F) 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:

Sieve Size	U.S. Standard Sieve Number	% Passing (By Weight)
850 μm	20	100
600 μm	30	75-95
300 μm	50	15-35
150 μm	100	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 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 25 °C (77 °F).

- (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 12.7 mm (1/2 in.) 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 22.7 kg (50 lb) 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 50 mm (2 in.) 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 1 x 1 m (38 x 38 in.), contain 910 kg (2000 lb) 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 1/2 L (1 pt) 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 1/2 L (1 pt) 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 5.7 to 11.4 L/min (1.5 to 3 gal/min) to compensate for a typical range of application speeds of 10 to 13 km/h (6 to 8 mph). 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 415 L (110 gal) 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 ± 2.8 °C (± 5 °F) 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 PCC 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 0.4 mm (15 mils) according to the manufacturer's installation instructions. On new bituminous course surfaces the pavement markings shall be applied at a minimum uniform wet thickness of 0.5 mm (20 mils). 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 4 °C (40 °F) 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 50 mm (2 in.) from a longitudinal crack or joint. Edge lines shall be approximately 50 mm (2 in.) from the edge of pavement. The finished center and lane lines shall be straight, with the lateral deviation of any 3 m (10 ft) line not to exceed 25 mm (1 in.).

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 in place, in meters (feet). 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 meter (foot) 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.

PORTABLE CHANGEABLE MESSAGE SIGNS (BDE)

Effective: November 1, 1993

Revised: April 2, 2004

Description. This work shall consist of furnishing, placing, and maintaining changeable message sign(s) at the locations(s) shown on the plans or as directed by the Engineer.

The sign(s) shall be trailer mounted. The message panel shall be at least 2.1 m (7 ft) above the pavement, present a level appearance, and be capable of displaying up to eight characters in each of three lines at a time. Character height shall be 450 mm (18 in.).

The message panel shall be of either a bulb matrix or disc matrix design controlled by an onboard computer capable of storing a minimum of 99 programmed messages for instant recall. The computer shall be capable of being programmed to accept messages created by the operator via an alpha-numeric keyboard and able to flash any six messages in sequence. The message panel shall also be capable of being controlled by a computer from a remote location via a cellular linkage. The Contractor shall supply the modem, the cellular phone, and the necessary software to run the sign from a remote computer at a location designated by the Engineer. The Contractor shall promptly program and/or reprogram the computer to provide the messages as directed by the Engineer.

The message panel shall be visible from 400 m (1/4 mile) under both day and night conditions. The letters shall be legible from 250 m (750 ft).

The sign shall include automatic dimming for nighttime operation and a power supply capable of providing 24 hours of uninterrupted service.

The Contractor shall provide all preventive maintenance efforts s(he) deems necessary to achieve uninterrupted service. If service is interrupted for any cause and not restored within 24 hours, the Engineer will cause such work to be performed as may be necessary to provide this service. The cost of such work shall be borne by the Contractor or deducted from current or future compensation due the Contractor.

When the sign(s) are displaying messages, they shall be considered a traffic control device. At all times when no message is displayed, they shall be considered equipment.

Basis of Payment. When portable changeable message signs are shown on the Standard, this work will not be paid for separately but shall be considered as included in the cost of the Standard.

For all other portable changeable message signs, this work will be paid for at the contract unit price per calendar month for each sign as CHANGEABLE MESSAGE SIGN.

PORTLAND CEMENT (BDE)

Effective: January 1, 2005

Replace the first sentence of the second paragraph of Article 1001.01 of the Standard Specifications with the following:

“For portland cement according to ASTM C 150, the addition of up to 5.0 percent limestone by mass (weight) to the cement will not be permitted. Also, the total of all organic processing additions shall not exceed 1.0 percent by mass (weight) of the cement and the total of all inorganic processing additions shall not exceed 4.0 percent by mass (weight) of the cement.”

PORTLAND CEMENT CONCRETE (BDE)

Effective: November 1, 2002

Add the following paragraph after the fourth paragraph of Article 1103.01(b) of the Standard Specifications:

“The truck mixer shall be approved before use according to the Bureau of Materials and Physical Research’s Policy Memorandum, “Approval of Concrete Plants and Delivery Trucks”.”

Add the following paragraph after the first paragraph of Article 1103.01(c) of the Standard Specifications:

“The truck agitator shall be approved before use according to the Bureau of Materials and Physical Research’s Policy Memorandum, “Approval of Concrete Plants and Delivery Trucks”.”

Add the following paragraph after the first paragraph of Article 1103.01(d) of the Standard Specifications:

“The nonagitator truck shall be approved before use according to the Bureau of Materials and Physical Research’s Policy Memorandum, “Approval of Concrete Plants and Delivery Trucks”.”

Revise the first sentence of the first paragraph of Article 1103.02 of the Standard Specifications to read:

“The plant shall be approved before production begins according to the Bureau of Materials and Physical Research’s Policy Memorandum, “Approval of Concrete Plants and Delivery Trucks”.”

PORTLAND CEMENT CONCRETE PATCHING (BDE)

Effective: January 1, 2001

Revised: January 1, 2004

Revise Note 1 of Article 442.02 of the Standard Specifications, to read:

"Note 1. When patching ramp pavements and two lane pavements with two way traffic, Class PP-2, PP-3, or PP-4 concrete shall be used for Class A, Class B and Class C patching. For all other pavements, Class PP-1, PP-2, PP-3, or PP-4 concrete shall be used, at the Contractor’s option, for Class A, Class B and Class C patching."

Delete Note 2 of Article 442.02 of the Standard Specifications.

Add the following to Article 442.02 of the Standard Specifications:

“(l) Calcium Chloride (Note 5)..... 1013.01

Note 5. The calcium chloride accelerator, when permitted by the Department, shall be Type L (Liquid) with a minimum of 32.0 percent by mass (weight) of calcium chloride.”

Revise the first paragraph of Article 442.06(e) of the Standard Specifications to read:

"(e) Concrete Placement. For Class A, Class B and Class C Patches, concrete shall be placed according to Article 420.07 and governed by the limitations set forth in Article 1020.14, except that the maximum temperature of the mixed concrete immediately before placing shall be 35 °C (96 °F), the required use of an approved retarding admixture when the plastic concrete reaches 30 °C (85 °F) shall not apply."

Revise the first paragraph of Article 442.06(h) of the Standard Specifications to read:

"(h) Curing and Protection. In addition to Article 1020.13, when the air temperature is less than 13 °C (55 °F), the Contractor shall cover the patch with minimum R12 insulation until opening strength is reached. Insulation is optional when the air temperature is 13 °C - 35 °C (55 °F - 96 °F). Insulation shall not be placed when the air temperature is greater than 35 °C (96 °F)."

Revise the second paragraph of Article 701.05(e)(1)d.1. of the Standard Specifications to read:

"No open holes, broken pavement, or partially filled holes shall remain overnight for bituminous patching or when the Department specifies only Class PP-2, PP-3, or PP-4 concrete be used. The only exception is conditions beyond the control of the Contractor."

Revise Article 701.05(e)(2)b. of the Standard Specifications to read:

"b. Strength Tests. For patches constructed with Class PP-1, PP-2, PP-3, or PP-4 concrete, the pavement may be opened to traffic when test specimens cured with the patches have obtained a minimum flexural strength of 4150 kPa (600 psi) or a minimum compressive strength of 22,100 kPa (3200 psi) according to Article 1020.09.

For patches constructed with Class PP-2, PP-3, or PP-4 concrete which can obtain a minimum flexural strength of 4150 kPa (600 psi) or a minimum of compressive strength of 22,100 kPa (3200 psi) in 16 hours, the pavement may be opened to traffic at a lower opening strength. The specimens cured with the patches shall have obtained a minimum flexural strength of 2050 kPa (300 psi) or a minimum compressive strength of 11,000 kPa (1600 psi) according to Article 1020.09, to permit opening pavement to traffic.

With the approval of the Engineer, concrete strength may be determined according to AASHTO T 276. The strength-maturity relationship shall be developed from concrete which has an air content near the upper specification limit. The strength-maturity relationship shall be re-established if the mix design or materials are changed."

Revise Article 701.05(e)(2)c. of the Standard Specifications to read:

- "c. Construction Operations. For Class PP-2, PP-3, or PP-4 concrete used on ramp pavements and two lane pavements with two way traffic, or when the Department specifies only Class PP-2, PP-3, or PP-4 concrete be used for other pavements, Contractor construction operations shall be performed in a manner which allows the patches to be opened the same day and before nightfall. If patches are not opened before nightfall, the additional traffic control shall be at the Contractor's expense. Any time patches cannot be opened before nightfall, the Contractor shall change subsequent construction operations or the mix design. The changes shall be at no additional cost to the Department."

Revise Table 1 of Article 1020.04 of the Standard Specifications by replacing Class PP concrete with the following:

"TABLE 1. CLASSES OF PORTLAND CEMENT CONCRETE AND MIX DESIGN CRITERIA				
Class of Concrete	Use	Specification Section Reference	Cement Factor kg/cu m (cwt/cu yd)	Max. Water/Cement Ratio kg/kg (lb/lb)
PP-1	PCC Pavement Patching Bridge Deck Patching	442	Type I Cement 385 to 445 (6.50 to 7.50) Type III Cement 365 to 425 (6.20 to 7.20)	0.44
PP-2	PCC Pavement Patching Bridge Deck Patching	442	Type I Cement 435 (7.35)	0.38
PP-3	PCC Pavement Patching Bridge Deck Patching	442	Type III Cement 435 (7.35)	0.35
PP-4	PCC Pavement Patching Bridge Deck Patching	442	Rapid Hardening Cement 355 to 370 (6.00 to 6.25)	0.50

For PP-1, the Contractor has the option to replace the Type I Cement with Class C fly ash or ground granulated blast-furnace slag. The amount of cement replaced shall not exceed 15 percent by mass (weight), at a minimum replacement ratio of 1.5:1.

For PP-2, the Contractor has the option to replace the Type I cement with ground granulated blast-furnace slag. The amount of cement replaced shall not exceed 30 percent by mass (weight), at a minimum replacement ratio of 1:1.

For PP-3, in addition to the cement, 60 kg/cu m (100 lb/cu yd) of ground granulated blast-furnace slag and 30 kg/cu m (50 lb/cu yd) of microsilica are required. For an air temperature greater than 30 °C (85 °F), the Contractor has the option to replace the Type III cement with Type I cement.

For PP-4, the cement shall be from the Department's "Approved List of Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repairs".

TABLE 1. (CONT'D) CLASSES OF PORTLAND CEMENT CONCRETE AND MIX DESIGN CRITERIA					
Class of Concrete	Slump, mm (in.)	Mix Design Compressive Strength, kPa (psi)	Mix Design Flexural Strength, kPa (psi)	Air Content, %	Coarse Aggregate Gradations Permitted
		Hours	Hours		
		48	48		
PP – 1	100 (4) Max	22,100 (3200)	4150 (600)	4.0 – 7.0	CA-7, CA-11, CA-13, CA14, or CA-16
PP – 2	150 (6) Max	22,100 (3200)	4150 (600)	4.0 – 6.0	CA-7, CA-11, CA-13, CA14, or CA-16
PP – 3	100 (4) Max	22,100 (3200)	4150 (600)	4.0 – 6.0	CA-7, CA-11, CA-13, CA14, or CA-16
PP – 4	150 (6) Max	22,100 (3200)	4150 (600)	4.0 – 6.0	CA-7, CA-11, CA-13, CA14, or CA-16

For PP-1, PP-2, PP-3 or PP-4; only CA-13, CA-14, or CA-16 may be used for bridge deck patching. In addition, the mix design strength at 48 hours shall be increased to 27,500 kPa (4,000 psi) compressive or 4,650 kPa (675 psi) flexural for bridge deck patching.

For PP-1, the slump may be increased to 150 mm (6 in.) Max if a high range water-reducing admixture is used."

Delete Article 1020.05(g) of the Standard Specifications.

PRECAST CONCRETE PRODUCTS (BDE)

Effective: July 1, 1999

Revised: November 1, 2004

Product Approval. Precast concrete products shall be produced according to the Department's current Policy Memorandum, "Quality Control/Quality Assurance Program for Precast Concrete Products". The Policy Memorandum applies to precast concrete products listed under the Products Key of the "Approved List of Certified Precast Concrete Producers".

Precast Concrete Box Culverts. Add the following sentence to the end of the fourth paragraph of Article 540.06:

“After installation, the interior and exterior joint gap between precast concrete box culvert sections shall not exceed 38 mm (1 1/2 in.)”

Portland Cement Replacement. For precast concrete products using Class PC concrete or other mixtures, portland cement replacement with fly ash or ground granulated blast-furnace (GGBF) slag shall be governed by the AASHTO or ASTM standard specification referenced in the Standard Specifications.

For all other precast concrete products using Class PC concrete or other mixtures, portland cement replacement with fly ash or GGBF slag shall be approved by the Engineer. Class F fly ash shall not exceed 15 percent by mass (weight) of the total portland cement and Class F fly ash. Class C fly ash shall not exceed 20 percent by mass (weight) of the total portland cement and Class C fly ash. GGBF slag shall not exceed 25 percent by mass (weight) of the total portland cement and GGBF slag.

Concrete mix designs, for precast concrete products, shall not consist of portland cement, fly ash and GGBF slag.

Ready-Mixed Concrete. Delete the last paragraph of Article 1020.11(a) of the Standard Specifications.

Shipping. When a precast concrete product has attained the specified strength, the earliest the product may be loaded, shipped, and used is on the fifth calendar day. The first calendar day shall be the date casting was completed.

Acceptance. Products which have been lot or piece inspected and approved by the Department prior to July 1, 1999, will be accepted for use on this contract.

PREFORMED RECYCLED RUBBER JOINT FILLER (BDE)

Effective: November 1, 2002

Revise Article 503.02(c) of the Standard Specifications to read:

“(c) Prefomed Expansion Joint Filler 1051”

Revise Article 637.02(d) of the Standard Specifications to read:

“(d) Prefomed Expansion Joint Filler 1051”

Add the following Article to Section 1051 of the Standard Specifications:

“1051.10 Prefomed Recycled Rubber Joint Filler. Prefomed recycled rubber joint filler shall consist of ground tire rubber, free of steel and fabric, combined with ground scrap or waste polyethylene. It shall not have a strong hydrocarbon or rancid odor and shall meet the physical property requirements of ASTM D 1752. Water absorption by volume shall not exceed 5.0 percent.”

RAP FOR USE IN BITUMINOUS CONCRETE MIXTURES (BDE)

Effective: January 1, 2000

Revised: April 1, 2002

Revise Article 1004.07 to read:

“1004.07 RAP Materials. RAP is reclaimed asphalt pavement resulting from cold milling or crushing of an existing dense graded hot-mix asphalt pavement. RAP must originate from routes or airfields under federal, state or local agency jurisdiction. The Contractor shall supply documentation that the RAP meets these requirements.

(a) Stockpiles. The Contractor shall construct individual, sealed RAP stockpiles meeting one of the following definitions. No additional RAP will be allowed on top of the pile after the pile has been sealed.

(1) Homogeneous. Homogeneous RAP stockpiles shall consist of RAP from Class I/ Superpave, or equivalent mixtures only and represent the same aggregate quality, but shall be at least C quality or better, the same type of crushed aggregate (either crushed natural aggregate, ACBF slag, or steel slag), similar gradation and similar AC content. If approved by the Engineer, combined single pass surface/binder millings may be considered “homogenous”, with a quality rating dictated by the lowest coarse aggregate quality present in the mixture. Homogenous stockpiles shall meet the requirements of Article 1004.07(d). Homogeneous RAP stockpiles not meeting these requirements may be processed (crushing and screening) and retested.

(2) Conglomerate. Conglomerate RAP stockpiles shall consist of RAP from Class I/ Superpave, or equivalent mixtures only. The coarse aggregate in this RAP shall be crushed aggregate only and may represent more than one aggregate type and/or quality but shall be at least C quality or better. This RAP may have an inconsistent gradation and/or asphalt cement content prior to processing. All conglomerate RAP shall be processed prior to testing by crushing to where all RAP shall pass the 16 mm (5/8 in.) or smaller screen. Conglomerate RAP stockpiles shall not contain steel slag or other expansive material as determined by the Department. Conglomerate RAP stockpiles shall meet the requirements of Article 1004.07(d).

(3) Conglomerate “D” Quality (DQ). Conglomerate DQ RAP stockpiles shall consist of RAP containing coarse aggregate (crushed or round) that is at least D quality or better. This RAP may have an inconsistent gradation and/or asphalt content. Conglomerate DQ RAP stockpiles shall not contain steel slag or other expansive material as determined by the Department. Conglomerate DQ RAP shall meet the requirements of Article 1004.07(d).

Reclaimed Superpave Low ESAL IL-9.5L surface mixtures shall only be placed in conglomerate DQ RAP stockpiles due to the potential for rounded aggregate.

(4) Other. RAP stockpiles that do not meet the requirements of the stockpile categories listed above shall be classified as “Other”. “Other” RAP stockpiles shall not be used in any of the Department’s bituminous mixtures.

- (b) Use. The allowable use of a RAP stockpile shall be set by the lowest quality of coarse aggregate in the RAP stockpile. Class I/Superpave surface mixtures are designated as containing Class B quality coarse aggregate only. Superpave Low ESAL IL-19.0L binder and IL-9.5L surface mixtures are designated as Class C quality coarse aggregate only. Class I/Superpave binder mixtures, bituminous base course mixtures, and bituminous base course widening mixtures are designated as containing Class C quality coarse aggregate only. Bituminous stabilized subbase and BAM shoulders are designated as containing Class D quality coarse aggregate only. Any mixture not listed above shall have the designated quality determined by the Department.

RAP containing steel slag or other expansive material, as determined by the Department, shall be homogeneous and will be approved for use in Class I/Superpave (including Low ESAL) surface mixtures only. RAP stockpiles for use in Class I/Superpave mixtures (including Low ESAL), base course, base course widening and Class B mixtures shall be either homogeneous or conglomerate RAP stockpiles except conglomerate RAP stockpiles shall not be used in Superpave surface mixture Ndesign 50 or greater. RAP for use in bituminous aggregate mixtures (BAM) shoulders and BAM stabilized subbase shall be from homogeneous, conglomerate, or conglomerate DQ stockpiles.

Additionally, RAP used in Class I/Superpave surface mixtures shall originate from milled or crushed mixtures only, in which the coarse aggregate is of Class B quality or better. RAP stockpiles for use in Class I/Superpave (including Low ESAL) binder mixes as well as base course, base course widening and Class B mixtures shall originate from milled or processed surface mixture, binder mixture, or a combination of both mixtures uniformly blended to the satisfaction of the Engineer, in which the coarse aggregate is of Class C quality or better.

- (c) Contaminants. RAP containing contaminants, such as earth, brick, sand, concrete, sheet asphalt, bituminous surface treatment (i.e. chip seal), pavement fabric, etc., will be unacceptable unless the contaminants are removed to the satisfaction of the Engineer. Sheet asphalt shall be stockpiled separately.
- (d) Testing. All RAP shall be sampled and tested either during or after stockpiling.

For testing during stockpiling, washed extraction samples shall be run at the minimum frequency of one sample per 450 metric tons (500 tons) for the first 1800 metric tons (2,000 tons) and one sample per 1800 metric tons (2,000 tons) thereafter. A minimum of five tests shall be required for stockpiles less than 3600 metric tons (4,000 tons).

For testing existing stockpiles, the Contractor shall submit a plan for approval to the District proposing a satisfactory method of sampling and testing the RAP pile either in-situ or by restockpiling. The sampling plan shall meet the minimum frequency required above and detail the procedure used to extract representative samples throughout the pile for testing.

Before extraction, each field sample shall be split to test sample size. One of the two test samples from the final split shall be labeled and stored for Department use. The

Contractor shall extract the other test sample according to Department procedure. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

All of the extraction results shall be compiled and averaged for asphalt content and gradation. Individual extraction test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	Homogeneous / Conglomerate	Conglomerate "D" Quality
25 mm (1 in.)		± 5%
12.5 mm (1/2 in.)	± 8%	± 15%
4.75 mm (No. 4)	± 6%	± 13%
2.36 mm (No. 8)	± 5%	
1.18 mm (No. 16)		± 15%
600 μm (No. 30)	± 5%	
75 μm (No. 200)	± 2.0%	± 4.0%
AC	± 0.4%	± 0.5%

If more than 20 percent of the individual sieves are out of the gradation tolerances, or if more than 20 percent of the asphalt content test results fall outside the appropriate tolerances, the RAP will not be allowed to be used in the Department's bituminous concrete mixtures unless the RAP representing the failing tests is removed from the stockpile to the satisfaction of the Engineer. All test data and acceptance ranges shall be sent to the District for evaluation.

With the approval of the Engineer, the ignition oven may be substituted for extractions according to the Illinois Test Procedure, "Calibration of the Ignition Oven for the Purpose of Characterizing Reclaimed Asphalt Pavement (RAP)".

- (e) Designs. At the Contractor's option, bituminous concrete mixtures may be constructed utilizing RAP material meeting the above detailed requirements. The amount of RAP included in the mixture shall not exceed the percentages specified in the plans.

RAP designs shall be submitted for volumetric verification. If additional RAP stockpiles are tested and found that no more than 20 percent of the results, as defined under "Testing" herein, are outside of the control tolerances set for the original RAP stockpile and design, and meets all of the requirements herein, the additional RAP stockpiles may be used in the original mix design at the percent previously verified.

- (f) Production. The coarse aggregate in all RAP used shall be equal to or less than the nominal maximum size requirement for the bituminous mixture being produced.

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

adversely affects the mix production or quality of the mix, the sizing device shall be set at a size specified by the Engineer.

If the RAP control tolerances or QC/QA test results require corrective action, the Contractor shall cease production of the mixture containing RAP and either switch to the virgin aggregate design or submit a new RAP design.

SEEDING AND SODDING (BDE)

Effective: July 1, 2004

Revised: November 1, 2004

Revise Class 1A and 2A seeding mixtures shown in Table 1 of Article 250.07 of the Standard Specifications to read:

"Table 1 - SEEDING MIXTURES		
Class – Type	Seeds	kg/hectare (lb/acre)
1A Salt Tolerant Lawn Mixture 7/	Bluegrass	70 (60)
	Perennial Ryegrass	20 (20)
	Audubon Red Fescue	20 (20)
	Rescue 911 Hard Fescue	20 (20)
	Fults Salt Grass*	70 (60)
2A Salt Tolerant Roadside Mixture 7/	Alta Fescue or Ky 31	70 (60)
	Perennial Ryegrass	20 (20)
	Audubon Red Fescue	20 (30)
	Rescue 911 Hard Fescue	20 (30)
	Fults Salt Grass 1/	70 (60)"

Revise Note 7 of Article 250.07 of the Standard Specifications to read:

"Note 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 coverage over the entire seeded area(s) after one growing season. The guarantee shall be submitted to the Engineer in writing prior to performing the work. After one growing season, areas not sustaining 75 percent growth shall be interseeded or reseeded, as determined by the Engineer, at the Contractor's expense."

Add the following sentence to Article 252.04 of the Standard Specifications:

"Sod shall not be placed during the months of July and August."

Revise the first paragraph of Article 252.08 of the Standard Specifications to read:

"252.08 Sod Watering. Within two hours after the sod has been placed, water shall be applied at a rate of 25 L/sq m (5 gal/sq yd). Additional water shall be applied every other day at

a rate of 15 L/sq m (3 gal/sq yd) for a total of 15 additional waterings. During periods exceeding 26 °C (80 °F) or subnormal rainfall, the schedule of additional waterings may be altered with the approval of the Engineer.”

Revise Article 252.09 of the Standard Specifications to read:

“**252.09 Supplemental Watering.** During periods exceeding 26 °C (80 °F) or subnormal rainfall, supplemental watering may be required after the initial and additional waterings. Supplemental watering shall be performed when directed by the Engineer. Water shall be applied at the rate specified by the Engineer within 24 hours of notice.”

Revise the first and third paragraphs of Article 252.12 of the Standard Specifications to read:

“**252.12 Method of Measurement.** Sodding will be measured for payment in place and the area computed in square meters (square yards). To be acceptable for final payment, the sod shall be growing in place for a minimum of 30 days in a live, healthy condition. When directed by the Engineer, any defective or unacceptable sod shall be removed, replaced and watered by the Contractor at his/her own expense.”

“Supplemental watering will be measured for payment in units of 1000 L (1000 gal) of water applied on the sodded areas. Waterings performed in addition to those required by Article 252.08 or after the 30 day establishment period will be considered as supplemental watering.”

Replace the first paragraph of Article 252.13 of the Standard Specifications with the following:

“**252.13 Basis of Payment.** Sodding will be paid for at the contract unit price per square meter (square yard) for SODDING or SODDING, SALT TOLERANT according to the following schedule.

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

Revise Article 1081.03(b) of the Standard Specifications to read:

“(b) Salt Tolerant Sod.

Variety	Percent by Weight
Buffalo Grass	30%
Buchloe Dactyloides	
Amigo Fineleaf Tall Fescue	20%
Audubon Red Fescue	15%
Rescue 911 Hard Fescue	15%
Rugby Kentucky Bluegrass	5%
Fults Pucinnellia Distans	15%”

Revise Table II of Article 1081.04(c)(6) of the Standard Specifications to read:

TABLE II						
Variety of Seeds	Hard Seed Percent Maximum	Purity Percent Minimum	Pure, Live Seed Percent Minimum	Weed Percent Maximum	Secondary Noxious Weeds No. per kg (oz) Max. Permitted*	Remarks
Alfalfa	20	92	89	0.50	211 (6)	1/
Brome Grass	-	90	75	0.50	175 (5)	-
Clover, Alsike	15	92	87	0.30	211 (6)	2/
Clover, Crimson	15	92	83	0.50	211 (6)	-
Clover, Ladino	15	92	87	0.30	211 (6)	-
Clover, Red	20	92	87	0.30	211 (6)	-
Clover, White Dutch	30	92	87	0.30	211 (6)	3/
Audubon Red Fescue	0	97	82	0.10	105 (3)	-
Fescue, Alta or Ky. 31	-	97	82	1.00	105 (3)	-
Fescue, Creeping Red	-	97	82	1.00	105 (3)	-
Fults Salt Grass	0	98	85	0.10	70 (2)	-
Kentucky Bluegrass	-	97	80	0.30	247 (7)	5/
Lespedeza, Korean	20	92	84	0.50	211 (6)	3/
Oats	-	92	88	0.50	70 (2)	4/
Orchard Grass	-	90	78	1.50	175 (5)	4/
Redtop	-	90	78	1.80	175 (5)	4/
Ryegrass, Perennial, Annual	-	97	85	0.30	175 (5)	4/
Rye, Grain, Winter	-	92	83	0.50	70 (2)	4/
Rescue 911 Hard Fescue	0	97	82	0.10	105 (3)	-
Timothy	-	92	84	0.50	175 (5)	4/
Vetch, Crown	30	92	67	1.00	211 (6)	3/ & 6/
Vetch, Spring	30	92	88	1.00	70 (2)	4/
Vetch, Winter	15	92	83	1.00	105 (3)	4/
Wheat, hard Red Winter	-	92	89	0.50	70 (2)	4/

SELF-CONSOLIDATING CONCRETE FOR PRECAST PRODUCTS (BDE)

Effective: July 1, 2004

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. The design and testing of a self-consolidating concrete mixture shall be according to Section 1020 of the Standard Specifications except as modified herein.

Materials. Materials shall conform to the following requirements:

- (a) 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 flowable concrete that does not require mechanical vibration.

The high range water-reducing admixture shall comply with the requirements of AASHTO M 194, Type F.

The viscosity modifying admixture will be evaluated according to the test methods and mix design proportions referenced in AASHTO M 194, except the following physical requirements shall be met:

- (1) For initial and final set times, the allowable deviation of the test concrete from the reference concrete shall not be more than 1.0 hour earlier or 1.5 hours later.
 - (2) For compressive and flexural strengths, the test concrete shall be a minimum of 90 percent of the reference concrete at 3, 7 and 28 days.
 - (3) The length change of the test concrete shall be a maximum 135 percent of the reference concrete. However, if the length change of the reference concrete is less than 0.030 percent, the length change of the test concrete shall be a maximum 0.010 percentage units greater than the reference concrete.
 - (4) The relative durability factor of the test concrete shall be a minimum 80 percent.
- (b) Fine Aggregate. A fine aggregate used alone in the mix design shall not have an expansion greater than 0.30 percent per ASTM C 1260. For a blend of two or more fine aggregates, the resulting blend shall not have an expansion greater than 0.30 percent.

The aggregate blend expansion will be calculated as follows:

$$\text{Aggregate Blend Expansion} = (a/100 \times A) + (b/100 \times B) + (c/100 \times C) + \dots \text{etc.}$$

Where: a, b, c, ... = percent of aggregate blend
A, B, C, ... = aggregate expansion according to ASTM C 1260

Mix Design Criteria. The slump requirements of Article 1020.04 of the Standard Specifications shall not apply. In addition, the allowable coarse aggregate gradations shall be CA 11, CA 13, CA 14, CA 16, or a blend of these gradations. The fine aggregate proportion shall be a maximum 50 percent by mass (weight) of the total aggregate used.

Trail Batch. A minimum 1 cu m (1 cu yd) trial batch shall be produced. The mixture will be evaluated for air content, slump flow, visual stability index, compressive strength, passing ability, and static/dynamic segregation resistance.

The trial batch shall be scheduled and performed in the presence of the Engineer. Testing shall be performed per the Department's test method or as approved by the Engineer.

For the trial batch, the air content shall be within the top half of the allowable specification range. The slump flow range shall be 510 mm (20 in.) minimum to 710 mm (28 in.) maximum. The visual stability index shall be a maximum of 1. Strength shall be determined at 28 days. At the Contractor's option, strength may be determined for additional days.

Passing ability and static/dynamic segregation resistance shall be determined by tests selected by the Contractor and approved by the Engineer. The visual stability index shall not be used as the sole criteria for evaluating static segregation resistance.

After an acceptable mixture has been batched and tested, the mixture shall also be evaluated for robustness. Robustness shall be evaluated by varying the dosage of the self-consolidating admixture system and water separately. Additional trial batches may be necessary to accomplish this.

When necessary, the trial batches shall be disposed of according to Article 202.03 of the Standard Specifications.

Quality Control. Once testing is completed and acceptable results have been attained, production test frequencies and allowable test ranges for slump flow, visual stability index, passing ability, and static/dynamic segregation resistance shall be proposed. The production test frequencies and allowable test ranges will be approved by the Engineer.

The slump flow range shall be ± 50 mm (± 2 in.) of the target value, and within the overall range of 510 mm (20 in.) minimum to 710 mm (28 in.) maximum. The visual stability index shall be a maximum of 1. The approved test ranges for passing ability and static/dynamic segregation resistance will be based on recommended guidelines determined by the Engineer.

SHOULDER STABILIZATION AT GUARDRAIL (BDE)

Effective: January 1, 2005

Revise the last sentence of the second paragraph of Article 630.06 of the Standard Specifications to read:

“The void around each post shall be backfilled with earth or aggregate and capped with 75 mm (3 in.) of bituminous mixture or grout.”

Replace the last sentence of the third paragraph of Article 630.06 of the Standard Specifications with the following:

“Guardrail posts shall be driven through holes cored in the completed shoulder stabilization. The void around each post shall be backfilled with earth or aggregate and capped with 75 mm (3 in.) of bituminous mixture or grout.”

Add the following paragraph to the end of Article 630.06 of the Standard Specifications:

“When driving guardrail posts through existing shoulders, shoulder stabilization, or other paved areas, the posts shall be driven through cored holes. The void around each post shall be backfilled with earth or aggregate and capped with 75 mm (3 in.) of bituminous mixture or grout.”

STABILIZED SUBBASE AND BITUMINOUS SHOULDERS SUPERPAVE (BDE)

Effective: April 1, 2002

Revised: July 1, 2004

Description. This work shall consist of constructing stabilized subbase and bituminous shoulders Superpave according to Sections 312 and 482 respectively, of the Standard Specifications and the special provision, “Quality Control/Quality Assurance of Bituminous Concrete Mixtures” except as modified herein.

Revise Article 312.03(b) of the Standard Specifications to read:

“(b) RAP Material (Note 3)”

Revise Note 2 of Article 312.03 of the Standard Specifications to read:

“Note 2. Gradation CA 6, CA 10, or CA 12 shall be used.”

Revise Note 3 of Article 312.03 of the Standard Specifications to read:

"Note 3. RAP shall meet the requirements of the special provision "RAP for Use in Bituminous Concrete Mixtures". RAP containing steel slag shall be permitted for use in top-lift surface mixtures only."

Revise Note 4 of Article 312.03 of the Standard Specifications to read:

"Note 4. Unless otherwise specified on the plans, the bituminous material shall be performance graded asphalt cement, PG58-22. When more than 15 percent RAP is used, a softer PG binder may be required as determined by the Engineer."

Revise Article 312.06 of the Standard Specifications to read:

"312.06 Mixture Design. The Contractor shall submit mix designs for approval, for each required mixture. Mix designs shall be developed by Level III personnel who have completed the course, "Superpave Mix Design Upgrade". The mixtures shall be designed according to the respective Illinois Modified AASHTO references listed below:

- AASHTO MP 2 Standard Specification for Superpave Volumetric Mix Design
- AASHTO R 30 Standard Practice for Mixture Conditioning of Hot-Mix Asphalt (HMA)
- AASHTO PP 28 Standard Practice for Designing Superpave HMA
- AASHTO T 209 Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- AASHTO T 312 Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
- AASHTO T 308 Determining the Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method

(a) Job Mix Formula (JMF). The JMF shall be according to the following limits:

<u>Ingredient</u>	<u>Percent by Dry Weight</u>
Aggregate.....	94.0 to 96.0
Asphalt Cement.....	4.0 to 6.0*
Dust/AC Ratio	1.4

*Upper limit may be raised for the lower or top lifts if the Contractor elects to use a highly absorptive coarse and/or fine aggregate requiring more than six percent asphalt. The additional asphalt shall be furnished at no cost to the Department.

When RAP material is being used, the JMF shall be according to the following limits:

<u>Ingredient</u>	<u>Percent by Dry Weight</u>
Virgin Aggregate(s)	46.0 to 96.0
RAP Material(s) (Note 1)	0 to 50
Mineral Filler (if required)	0 to 5.0
Asphalt Cement.....	4.0 to 7.0
Dust/AC Ratio	1.4

Note 1. If specified on the plans, the maximum percentage of RAP shall be as specified therein.

It is recommended that the selected combined aggregate gradation not pass through the restricted zones specified in Illinois Modified AASHTO MP 2.

(b) Volumetric Requirements.

Design Compactive Effort	Design Air Voids Target (%)
$N_{DES} = 30$	2.0

(c) Determination of Need for Anti-Stripping Additive. The mixture designer shall determine if an additive is needed in the mix to prevent stripping. The determination will be made on the basis of tests performed according to Illinois Modified AASHTO T 283 using 4 in. Marshall bricks. To be considered acceptable by the Engineer as a mixture not susceptible to stripping, the ratio of conditioned to unconditioned split tensile strengths (TSR) shall be equal to or greater than 0.75. Mixtures, either with or without an additive, with TSR values less than 0.75 will be considered unacceptable.

If it is determined that an additive is required, the additive may be hydrated lime, slaked quicklime, or a liquid additive, at the Contractor's option. The liquid additive shall be selected from the Department's list of approved additives and may be limited to those which have exhibited satisfactory performance in similar mixes.

Dry hydrated lime shall be added at a rate of 1.0 to 1.5 percent by weight of total dry aggregate. Slurry shall be added in such quantity as to provide the required amount of hydrated lime solids by weight of total dry aggregate. The exact rate of application for all anti-stripping additives will be determined by the Engineer. The method of application shall be according to Article 406.12 of the Standard Specifications."

Revise Article 312.08 of the Standard Specifications to read:

"312.08 Mixture Production. When a hot-mix plant conforming to Article 1102.01 is used, the aggregate shall be dried and heated in the revolving dryer to a temperature of 120 °C (250 °F) to 175 °C (350 °F).

The aggregate and bituminous material used in the bituminous aggregate mixture shall be measured separately and accurately by weight or by volume. When the aggregate is in the mixer, the bituminous material shall be added and mixing continued for a minimum of 35 seconds and until a homogeneous mixture is produced in which all particles of the aggregate are coated. The mixing period, size of the batch and the production rate shall be approved by the Engineer.

The ingredients shall be heated and combined in such a manner as to produce a mixture which, when discharged from the mixer, shall be workable and vary not more 10 °C (20 °F) from the temperature set by the Engineer.

When RAP material(s) is used in the bituminous aggregate mixture, the virgin aggregate(s) shall be dried and heated in the dryer to a temperature that will produce the specified resultant mix temperature when combined with the RAP material.

The heated virgin aggregates and mineral filler shall be combined with RAP material in such a manner as to produce a bituminous mixture which when discharged from the mixer shall not vary more than 15 °C (30 °F) from the temperature set by the Engineer. The combined ingredients shall be mixed for a minimum of 35 seconds and until a homogeneous mixture as to composition and temperature is obtained. The total mixing time shall be a minimum of 45 seconds consisting of dry and wet mixing. Variation in wet and dry mixing times may be permitted, depending on the moisture content and amount of salvaged material used. The mix temperature shall not exceed 175 °C (350 °F). Wide variations in the mixture temperature will be cause for rejection of the mix.

- (a) Personnel. The QC Manager and Level I Technician shall have successfully completed the Department's "Superpave Field Control Course".
- (b) Required Tests. Testing for stabilized subbase and bituminous shoulders shall be conducted to control the production of the bituminous mixture using the test methods identified and performed at a frequency not less than indicated in the following table.

Parameter	Frequency of Tests Non-Class I Mixtures	Test Method
Aggregate Gradation Hot bins for batch and continuous plants. Individual cold-feeds or combined belt-feed for drier-drum plants. (% passing sieves: 12.5 mm (1/2 In.), 4.75 mm (No. 4), 75 µm (No. 200))	1 gradation per day of production. The first day of production shall be washed ignition oven test on the mix. Thereafter, the testing shall alternate between dry gradation and washed ignition oven test on the mix. The dry gradation and the washed ignition oven test results shall be plotted on the same control chart.	Illinois Procedure (See Manual of Test Procedures for Materials).
Asphalt Content by ignition oven (Note 1.)	1 per day	Illinois-Modified AASHTO T 308

Air Voids		
Bulk Specific Gravity of Gyratory Sample	1 per day	Illinois-Modified AASHTO T 312
Maximum Specific Gravity of Mixture	1 per day	Illinois-Modified AASHTO T 209

Note 1. The Engineer may waive the ignition oven requirement for AC content if the aggregates to be used are known to have ignition AC content calibration factors which exceed 1.5 percent. If the ignition oven requirement is waived, other Department approved methods shall be used to determine the AC content.

During production, the ratio of minus 75 µm (#200) sieve material to total asphalt cement shall be not less than 0.6 nor more than 1.6, and the moisture content of the mixture at discharge from the mixer shall not exceed 0.5 percent. If at any time the ratio of minus 75 µm (#200) material to asphalt or moisture content of the mixture falls outside the stated limits, production of the mix shall cease. The cause shall be determined and corrective action satisfactory to the Engineer shall be initiated prior to resumption of production.

During production, mixture containing an anti-stripping additive will be tested by the Engineer for stripping according to Illinois Modified AASHTO T 283. If the mixture fails to meet the TSR criteria for acceptance, no further mixture will be accepted until the Contractor takes such action as is necessary to furnish a mixture meeting the criteria.

- (c) Control Charts/Limits. Control charts/limits shall be according to QC/QA requirements for Non-Class I Mixtures except air voids shall be plotted on the control charts within the following control limits:

Air Void Control Limits	
Mixture	Individual Test
Shoulders	± 1.2 %
Others	± 1.2 %"

Replace the first paragraph of Article 312.10 of the Standard Specifications with the following:

“312.10 Placing and Compacting. After the subgrade has been compacted and is acceptable to the Engineer, the bituminous aggregate mixture shall be spread upon it with a mechanical spreader. The maximum compacted thickness of each lift shall be 150 mm (6 in.) provided the required density is obtained. The minimum compacted thickness of each lift shall be according to the following table:

Nominal Maximum Aggregate Size of Mixture	Minimum Compacted Lift Thickness
CA 12 – 12.5 mm (1/2 in.)	38 mm (1 1/2 in.)
CA 10 - 19 mm (3/4 in.)	57 mm (2 1/4 in.)
CA 6 – 25 mm (1 in.)	76 mm (3 in.)

The surface of each lift shall be clean and dry before succeeding lifts are placed.”

Revise Article 482.02 of the Standard Specifications to read:

“**482.02 Materials.** Materials shall meet the requirements of Article 312.03. For the top lift, the aggregate used shall meet the gradation requirements for a CA 10 or CA 12. Blending of aggregates to meet these gradation requirements will be permitted.”

Revise the first paragraph of Article 482.04 of the Standard Specifications to read:

“**482.04 General.** For pavement and shoulder resurfacing projects, Superpave binder and surface course mixtures may be used in lieu of bituminous aggregate mixture for the resurfacing of shoulders, at the option of the Contractor, or shall be used when specified on the plans.”

Revise Article 482.04(c) of the Standard Specifications to read:

“(c) Mixture Production312.08”

Revise Article 482.05 of the Standard Specifications to read:

“**482.05 Composition of Bituminous Aggregate Mixture.** The composition of the mixture shall be according to Article 312.06, except that the amount of asphalt cement used in the top lift shall be increased up to 0.5 percent more than that required in the lower lifts. For resurfacing projects when the Superpave binder and surface course mixtures option is used, the asphalt cement used in the top lift shall not be increased. Superpave mixtures used on the top lift of such shoulders shall meet the gradation requirements of the special provision “Superpave Bituminous Concrete Mixtures”.

For shoulder and strip construction, the composition of the Superpave binder and surface course shall be the same as that specified for the mainline pavement.”

In the following locations of Section 482 of the Standard Specifications, change “Class I” to “Superpave”:

- the second paragraph of Article 482.04
- the first sentence of the second paragraph of Article 482.06
- the first sentence of the fourth paragraph of Article 482.06
- the second sentence of the fourth paragraph of Article 482.06
- the first sentence of the third paragraph of Article 482.08(b)

Revise the first paragraph of Article 482.06 of the Standard Specifications to read:

“**482.06 Placing and Compacting.** This work shall be according to Article 312.10. The mechanical spreader for the top lift of shoulders shall meet the requirements of Article 1102.03 when the shoulder width is 3 m (10 ft) or greater.”

Revise Article 482.09 of the Standard Specifications to read:

"482.09 Basis of Payment. When bituminous shoulders are constructed along the edges of the completed pavement structure, this work will be paid for at the contract unit price per square meter (square yard) for BITUMINOUS SHOULDERS SUPERPAVE of the thickness specified. The specified thickness shall be the thickness shown on the plans at the edge of the pavement.

On pavement and shoulder resurfacing projects, the shoulder resurfacing will be paid for at the contract unit price per metric ton (ton) for BITUMINOUS SHOULDERS SUPERPAVE.

The construction of shoulder strips for resurfacing pavements will be paid according to the special provision, "Superpave Bituminous Concrete Mixtures".

SUBGRADE PREPARATION (BDE)

Effective: November 1, 2002

Revise the tenth paragraph of Article 301.03 of the Standard Specifications to read:

"Equipment of such weight, or used in such a way as to cause a rut in the finished subgrade of 13 mm (1/2 in.) or more in depth, shall be removed from the work or the rutting otherwise prevented."

SUPERPAVE BITUMINOUS CONCRETE MIXTURE IL-4.75 (BDE)

Effective: November 1, 2004

Description. This work shall consist of constructing bituminous concrete surface course or leveling binder with a Superpave, IL-4.75 mixture. Work shall be according to Section 406 of the Standard Specifications and the special provision "Quality Control/Quality Assurance of Bituminous Concrete Mixtures", except as modified herein.

Materials.

- (a) Fine Aggregate. The fine aggregate shall be at least 50 percent manufactured sand meeting FA 20 gradation. The manufactured sand shall be stone sand, slag sand, steel slag sand, or combinations thereof. When used as leveling binder, steel slag sand will not be permitted.

The fine aggregate quality shall be Class B. The total minus 75 μm (No. 200) material in the mixture shall be free from organic impurities.

- (b) Reclaimed Asphalt Pavement (RAP). RAP will not be permitted.
- (c) Bituminous Material. The asphalt cement (AC) shall conform to Article 1009.05 of the Standard Specifications for SBS PG76-28 or SBR PG76-28, except the elastic recovery shall be a minimum of 80.

The AC shall be shipped, maintained, and stored at the mix plant according to the manufacturer's requirements. It shall be placed in an empty tank and not blended with other asphalt cements.

- (d) Mineral Filler. Mineral filler shall conform to the requirements of Article 1011.01 of the Standard Specifications, except it shall not be collected dust.

Laboratory Equipment.

- (a) Superpave Gyratory Compactor. The Superpave gyratory compactor (SGC) shall be used for all laboratory mixture compaction.
- (b) Ignition Oven. The ignition oven shall be used for determination of AC content. The ignition oven shall also be used to recover aggregates for all required washed gradations.

The Engineer may waive the ignition oven requirement for AC content if the aggregates to be used are known to have ignition AC content calibration factors, which exceed 1.5 percent. If the calibration factor exceeds 1.5 percent other IDOT approved methods shall be utilized for determination of AC content.

Mixture Design. The Contractor shall submit mix designs for approval, for each required mixture. Mix designs shall be developed by Level III personnel who have successfully completed the course, "Superpave Mix Design Upgrade". Articles 406.10 and 406.13 of the Standard Specifications shall not apply. The mixtures shall be designed according to the respective Illinois Modified AASHTO references listed below.

AASHTO MP 2	Standard Specification for Superpave Volumetric Mix Design
AASHTO PP 2	Standard Practice for Short and Long Term Aging of Hot Mix Asphalt (HMA)
AASHTO PP 19	Standard Practice for Volumetric Analysis of Compacted Hot Mix Asphalt (HMA)
AASHTO PP 28	Standard Practice for Designing Superpave HMA
AASHTO T 209	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
AASHTO T 305	Standard Method of Test for Determination of Draindown Characteristics in Uncompacted Asphalt Mixtures.
AASHTO T 308	Determining the Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method
AASHTO T 312	Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor

- (a) Mixture Composition. The job mix formula (JMF) shall conform to the following:

Sieve	Percent Passing
12.5 mm (1/2 in.)	100
9.5 mm (3/8 in.)	100
4.75 mm (No. 4)	90-100
2.36 mm (No. 8)	70-90
1.18 mm (No. 16)	50-65
600 μm (No. 30)	35-55
300 μm (No. 50)	15-30
150 μm (No. 100)	10-18
75 μm (No. 200)	8-10
AC Content	8% to 10%

(b) Volumetric Requirements.

Volumetric Parameter	Requirement
Design Air Voids	2.5 % at Ndesign 50
Voids in the Mineral Aggregate (VMA)	19.0% minimum
Voids Filled with Asphalt (VFA)	87-95%
Maximum Draindown	0.3%

(c) Determination of Need for Anti-Stripping Additive. The mixture designer shall determine if an additive is needed in the mix to prevent stripping. The determination shall be made on the basis of tests performed according to Illinois Modified T 283. To be considered acceptable by the Engineer as a mixture not susceptible to stripping, the ratio of conditioned to unconditioned split tensile strengths (TSRs) shall be equal to or greater than 0.75 for 4 in. specimens or 0.85 for 6 in. specimens. Mixtures having TSRs less than these, either with or without an additive, will be considered unacceptable.

When it is determined that an additive is required, the additive may be hydrated lime, slaked quicklime, or a liquid additive, at the Contractor's option. The liquid additive shall be selected from the Department's list of approved additives and may be limited to those, which have exhibited satisfactory performance in similar mixes.

Dry hydrated lime shall be added at a rate of 1.0 to 1.5 percent by weight of total dry aggregate. Slurry shall be added in such quantity as to provide the required amount of hydrated lime solids by weight of total dry aggregate. The exact rate of application for all anti-stripping additives will be determined by the Engineer. The method of application shall be according to Article 406.12 of the Standard Specifications.

Mixture Production. Plant modifications may be required to accommodate the addition of higher percentages of mineral filler as required by the JMF.

During production, mineral filler shall not be stored in the same silo as collected dust. This may require the wasting of any previously collected baghouse fines prior to production of the IL-4.75 mixture. Only dust collected during the production of IL-4.75 may be returned directly to the IL-4.75 mixture. Any additional minus 75 μm (No. 200) material needed to produce the IL-4.75 shall be mineral filler.

The mixture shall be produced within the temperature range recommended by the asphalt cement producer; but not less than 155 °C (310 °F).

The amount of moisture remaining in the finished mixture shall be less than 0.3 percent based on the weight of the test sample after drying.

Mixtures containing steel slag sand or aggregate having absorptions ≥ 2.5 percent shall have a silo storage plus haul time of not less than 1.5 hours.

Control Charts/Limits. Control charts/limits and testing frequency shall be according to QC/QA requirements for Class I mixtures except as follows:

Parameter	Individual Test	Moving Average
% Passing		
1.18 mm (No. 16)	$\pm 4\%$	$\pm 3\%$
75 μm mm (No. 200)	$\pm 1.0\%$	$\pm 0.8\%$
Asphalt Content	$\pm 0.2\%$	$\pm 0.1\%$
Air Voids	$\pm 1.0\%$ (of design)	$\pm 0.8\%$ (of design)
Density	93.5 - 97.4%	

CONSTRUCTION REQUIREMENTS

Placement. The mixture shall be placed on a dry, clean surface when the air temperature in the shade is 10 °C (50 °F) or above. The mixture temperature shall be 155 °C (310 °F) or above and shall be measured in the truck just prior to placement.

When used as leveling binder, the mixture shall be overlaid within five days of being placed.

Lift Thickness.

- (a) Surface Course. The minimum and maximum compacted lift thickness for the IL-4.75 mixture shall be 19 mm (3/4 in.) and 32 mm (1 1/4 in.) respectively.
- (b) Leveling Binder. Density requirements for IL-4.75 mixture shall apply when the nominal , compacted thickness is 19 mm (3/4 in.) or greater.

Compaction. The compaction operation shall start immediately after the mixture has been placed. The Contractor shall provide a minimum of two steel-wheeled tandem rollers for breakdown (T_B) and one finish steel-wheeled roller (T_F) meeting the requirements of Article 406.16(a) and 1101.01(e) of the Standard Specifications except the minimum compression for all of the rollers shall be 49 N/mm (280 lb/in.) of roller width. Pneumatic-tired and vibratory rollers will not be permitted.

Basis of Payment. This work will be paid for at the contract unit price per metric ton (ton) for POLYMERIZED LEVELING BINDER (MACHINE METHOD), SUPERPAVE, IL-4.75, N50; and POLYMERIZED BITUMINOUS CONCRETE SURFACE COURSE, SUPERPAVE, IL-4.75, N50.

SUPERPAVE BITUMINOUS CONCRETE MIXTURES (BDE)

Effective: January 1, 2000

Revised: April 1, 2004

Description. This work shall consist of designing, producing and constructing Superpave bituminous concrete mixtures using Illinois Modified Strategic Highway Research Program (SHRP) Superpave criteria. This work shall be according to Sections 406 and 407 of the Standard Specifications and the special provision, "Quality Control/Quality Assurance of Bituminous Concrete Mixtures", except as follows.

Materials.

- (a) Fine Aggregate Blend Requirement. The Contractor may be required to provide FA 20 manufactured sand to meet the design requirements. For mixtures with $N_{design} \geq 90$, at least 50 percent of the required fine aggregate fraction shall consist of either stone sand, slag sand, or steel slag sand meeting the FA/FM 20 gradation.
- (b) Reclaimed Asphalt Pavement (RAP). If the Contractor is allowed to use more than 15 percent RAP, as specified in the plans, a softer performance-graded binder may be required as determined by the Engineer.

RAP shall meet the requirements of the special provision, "RAP for Use in Bituminous Concrete Mixtures".

RAP will not be permitted in mixtures containing polymer modifiers.

RAP containing steel slag will be permitted for use in top-lift surface mixtures only.

- (c) Bituminous Material. The asphalt cement (AC) shall be performance-graded (PG) or polymer modified performance-graded (SBS-PG or SBR-PG) meeting the requirements of Article 1009.05 of the Standard Specifications for the grade specified on the plans.

The following additional guidelines shall be used if a polymer modified asphalt is specified:

- (1) The polymer modified asphalt cement shall be shipped, maintained, and stored at the mix plant according to the manufacturer's requirements. Polymer modified asphalt cement shall be placed in an empty tank and shall not be blended with other asphalt cements.
- (2) The mixture shall be designed using a mixing temperature of 163 ± 3 °C (325 ± 5 °F) and a gyratory compaction temperature of 152 ± 3 °C (305 ± 5 °F).

- (3) Pneumatic-tired rollers will not be allowed unless otherwise specified by the Engineer. A vibratory roller meeting the requirements of Article 406.16 of the Standard Specifications shall be required in the absence of the pneumatic-tired roller.

Laboratory Equipment.

- (a) Superpave Gyratory Compactor. The superpave gyratory compactor (SGC) shall be used for all QC/QA testing.
- (b) Ignition Oven. The ignition oven shall be used to determine the AC content. The ignition oven shall also be used to recover aggregates for all required washed gradations.

The Engineer may waive the ignition oven requirement for AC content if the aggregates to be used are known to have ignition AC content calibration factors which exceed 1.5 percent. If the ignition oven requirement is waived, other Department approved methods shall be used to determine the AC content.

Mixture Design. The Contractor shall submit mix designs, for approval, for each required mixture. Mix designs shall be developed by Level III personnel who have successfully completed the course, "Superpave Mix Design Upgrade". Articles 406.10 and 406.13 of the Standard Specifications shall not apply. The mixtures shall be designed according to the respective Illinois Modified AASHTO references listed below.

AASHTO MP 2	Standard Specification for Superpave Volumetric Mix Design
AASHTO R 30	Standard Practice for Mixture Conditioning of Hot-Mix Asphalt (HMA)
AASHTO PP 28	Standard Practice for Designing Superpave HMA
AASHTO T 209	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
AASHTO T 312	Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
AASHTO T 308	Determining the Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method

- (a) Mixture Composition. The ingredients of the bituminous mixture shall be combined in such proportions as to produce a mixture conforming to the composition limits by weight. The gradation mixture specified on the plans shall produce a mixture falling within the limits specified in Table 1.

TABLE 1. MIXTURE COMPOSITION (% PASSING) ^{1/}								
Sieve Size	IL-25.0 mm		IL-19.0 mm		IL-12.5 mm ^{4/}		IL-9.5 mm ^{4/}	
	min	max	min	max	Min	max	min	max
37.5 mm (1 1/2 in.)		100						
25 mm (1 in.)	90	100		100				
19 mm (3/4 in.)		90	82	100		100		
12.5 mm (1/2 in.)	45	75	50	85	90	100		100
9.5 mm (3/8 in.)						89	90	100
4.75 mm (#4)	24	42 ^{2/}	24	50 ^{2/}	28	65	28	65
2.36 mm (#8)	16	31	20	36	28	48 ^{3/}	28	48 ^{3/}
1.18 mm (#16)	10	22	10	25	10	32	10	32
600 μm (#30)								
300 μm (#50)	4	12	4	12	4	15	4	15
150 μm (#100)	3	9	3	9	3	10	3	10
75 μm (#200)	3	6	3	6	4	6	4	6

- 1/ Based on percent of total aggregate weight.
- 2/ The mixture composition shall not exceed 40 percent passing the 4.75 mm (#4) sieve for binder courses with Ndesign ≥ 90.
- 3/ The mixture composition shall not exceed 40 percent passing the 2.36 mm (#8) sieve for surface courses with Ndesign ≥ 90.
- 4/ The mixture composition for surface courses shall be according to IL-12.5 mm or IL-9.5 mm, unless otherwise specified by the Engineer.

One of the above gradations shall be used for leveling binder as specified in the plans and according to Article 406.04 of the Standard Specifications.

It is recommended that the selected combined aggregate gradation not pass through the restricted zones specified in Illinois Modified AASHTO MP 2.

- (b) Dust/AC Ratio for Superpave. The ratio of material passing the 75 μm (#200) sieve to total asphalt cement shall not exceed 1.0 for mixture design (based on total weight of mixture).
- (c) Volumetric Requirements. The target value for the air voids of the hot mix asphalt (HMA) shall be 4.0 percent at the design number of gyrations. The VMA and VFA of the HMA design shall be based on the nominal maximum size of the aggregate in the mix and shall conform to the requirements listed in Table 2.

TABLE 2. VOLUMETRIC REQUIREMENTS					
Ndesign	Voids in the Mineral Aggregate (VMA), % minimum				Voids Filled with Asphalt (VFA), %
	IL-25.0	IL-19.0	IL-12.5	IL-9.5	
50	12.0	13.0	14.0	15	65 - 78
70					65 - 75
90					
105					

- (d) Determination of Need for Anti-Stripping Additive. The mixture designer shall determine if an additive is needed in the mix to prevent stripping. The determination will be made on the basis of tests performed according to Illinois Modified T 283 using 4 in. Marshall bricks. To be considered acceptable by the Department as a mixture not susceptible to stripping, the ratio of conditioned to unconditioned split tensile strengths (TSRs) shall be equal to or greater than 0.75. Mixtures, either with or without an additive, with TSRs less than 0.75 will be considered unacceptable.

If it is determined that an additive is required, the additive may be hydrated lime, slaked quicklime, or a liquid additive, at the Contractor's option. The liquid additive shall be selected from the Department's list of approved additives and may be limited to those which have exhibited satisfactory performance in similar mixes.

Dry hydrated lime shall be added at a rate of 1.0 to 1.5 percent by weight of total dry aggregate. Slurry shall be added in such quantity as to provide the required amount of hydrated lime solids by weight of total dry aggregate. The exact rate of application for all anti-stripping additives will be determined by the Department. The method of application shall be according to Article 406.12 of the Standard Specifications.

Personnel. The QC Manager and Level I Technician shall have successfully completed the Department's "Superpave Field Control Course".

Required Plant Tests. Testing shall be conducted to control the production of the bituminous mixture. The Contractor shall use the test methods identified to perform the following mixture tests at a frequency not less than that indicated in Table 3.

TABLE 3. REQUIRED PLANT TESTS for SUPERPAVE

Parameter		Frequency of Tests	Test Method
Aggregate Gradation Hot bins for batch and continuous plants Individual cold-feeds or combined belt-feed for drier drum plants. (% passing sieves: 12.5 mm (1/2 in.), 4.75 mm (No. 4), 2.36 mm (No. 8), 600 µm (No. 30), 75 µm (No. 200))		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 afternoon if dry gradation is conducted in the morning or vice versa). NOTE. The order in which the above tests are conducted shall alternate from the previous production day (example: a dry gradation conducted in the morning will be conducted in the afternoon on the next production day and so forth). The dry gradation and washed ignition oven test results shall be plotted on the same control chart.	Illinois Procedure (See Manual of Test Procedures for Materials).
Asphalt Content by Ignition Oven (Note 1.)		1 per half day of production	Illinois Modified AASHTO T 308
Air Voids	Bulk Specific Gravity of Gyratory Sample	1 per half day of production for first 2 days and 1 per day thereafter (first sample of the day)	Illinois Modified AASHTO T 312
	Maximum Specific Gravity of Mixture		Illinois Modified AASHTO T 209

Note 1. The Engineer may waive the ignition oven requirement for AC content if the aggregates to be used are known to have ignition AC content calibration factors which exceed 1.5 percent. If the ignition oven requirement is waived, other Department approved methods shall be used to determine the AC content.

During production, the ratio of minus 75 µm (#200) sieve material to total asphalt cement shall be not less than 0.6 nor more than 1.2 and the moisture content of the mixture at discharge from the mixer shall not exceed 0.5 percent. If at any time the ratio of minus 75 µm (#200) material to asphalt or moisture content of the mixture falls outside the stated limits, production of the mix shall cease. The cause shall be determined and corrective action satisfactory to the Engineer shall be initiated prior to resuming production.

During production, mixtures containing an anti-stripping additive will be tested by the Department for stripping according to Illinois Modified T 283. If the mixture fails to meet the TSR criteria for acceptance, no further mixture will be accepted until the Contractor takes such action as is necessary to furnish a mixture meeting the criteria.

Construction Requirements

Lift Thickness.

- (a) Binder and Surface Courses. The minimum compacted lift thickness for constructing bituminous concrete binder and surface courses shall be according to Table 4:

TABLE 4 – MINIMUM COMPACTED LIFT THICKNESS	
Mixture	Thickness, mm (in.)
IL-9.5	32 (1 1/4)
IL-12.5	38 (1 1/2)
IL-19.0	57 (2 1/4)
IL-25.0	76 (3)

- (b) Leveling Binder. Mixtures used for leveling binder shall be as follows:

TABLE 5 – LEVELING BINDER	
Nominal, Compacted, Leveling Binder Thickness, mm (in.)	Mixture
≤ 32 (1 1/4)	IL-9.5
32 (1 1/4) to 50 (2)	IL 9.5 or IL-12.5

Density requirements shall apply for leveling binder when the nominal, compacted thickness is 32 mm (1 1/4 in.) or greater for IL-9.5 mixtures and 38 mm (1 1/2 in.) or greater for IL-12.5 mixtures.

- (c) Full-Depth Pavement. The compacted thickness of the initial lift of binder course shall be 100 mm (4 in.). The compacted thickness of succeeding lifts shall meet the minimums specified in Table 4 but not exceed 100 mm (4 in.).

If a vibratory roller is used for breakdown, the compacted thickness of the binder lifts, excluding the top lift, may be increased to 150 mm (6 in.) provided the required density is obtained.

- (d) Bituminous Patching. The minimum compacted lift thickness for constructing bituminous patches shall be according to Table 4.

Control Charts/Limits. Control charts/limits shall be according to QC/QA Class I requirements, except density shall be plotted on the control charts within the following control limits:

TABLE 6. DENSITY CONTROL LIMITS		
Mixture	Parameter	Individual Test
12.5 mm / 9.5 mm	Ndesign ≥ 90	92.0 – 96.0%
12.5 mm / 9.5 mm	Ndesign < 90	92.5 – 97.4%
19.0 mm / 25.0 mm	Ndesign ≥ 90	93.0 – 96.0%
19.0 mm / 25.0 mm	Ndesign < 90	93.0 – 97.4%

Basis of Payment. On resurfacing projects, this work will be paid for at the contract unit price per metric ton (ton) for BITUMINOUS CONCRETE SURFACE COURSE, SUPERPAVE, of the friction aggregate mixture and Ndesign specified, LEVELING BINDER (HAND METHOD), SUPERPAVE, of the Ndesign specified, LEVELING BINDER (MACHINE METHOD), SUPERPAVE, of the Ndesign specified, and BITUMINOUS CONCRETE BINDER COURSE, SUPERPAVE, of the mixture composition and Ndesign specified.

On resurfacing projects in which polymer modifiers are required, this work will be paid for at the contract unit price per metric ton (ton) for POLYMERIZED BITUMINOUS CONCRETE SURFACE COURSE, SUPERPAVE, of the friction aggregate mixture and Ndesign specified, POLYMERIZED LEVELING BINDER (HAND METHOD), SUPERPAVE, of the Ndesign specified, POLYMERIZED LEVELING BINDER (MACHINE METHOD), SUPERPAVE, of the Ndesign specified, and POLYMERIZED BITUMINOUS CONCRETE BINDER COURSE, SUPERPAVE, of the mixture composition and Ndesign specified.

On full-depth pavement projects, this work will be paid for at the contract unit price per square meter (square yard) for BITUMINOUS CONCRETE PAVEMENT, (FULL-DEPTH), SUPERPAVE, of the thickness specified.

On projects where widening is constructed and the entire pavement is then resurfaced, the binder for the widening will be paid for at the contract unit price per square meter (square yard) for BITUMINOUS CONCRETE BINDER COURSE, SUPERPAVE, of the mixture composition, Ndesign, and thickness specified. The surface and binder used to resurface the entire pavement will be paid for according to the paragraphs above for resurfacing projects.

SURFACE TESTING OF PAVEMENTS (BDE)

Effective: April 1, 2002

Revised: July 1, 2004

Bituminous Concrete Overlays

Revise Article 406.03(k) of the Standard Specifications to read:

“(k) Pavement Surface Test Equipment 1101.10”

Revise Article 406.21 of the Standard Specifications to read:

“406.21 Surface Tests. The finished surface of the pavement shall be tested for smoothness within 24 hours and before the pavement is opened to traffic. All objects and debris shall be removed from the pavement surface prior to testing. Testing shall be performed in the presence of the Engineer.

(a) Test Sections/Equipment.

(1) High-Speed Mainline Pavement. High-speed mainline pavement shall consist of pavements, ramps and loops with a posted speed greater than 75 km/hr (45 mph). These sections shall be tested using a California Profilograph or an approved equivalent.

(2) Low-Speed Mainline Pavement. Low-speed mainline pavement shall consist of pavements, ramps and loops with a posted speed of 75 km/hr (45 mph) or less. These sections shall be tested using a California Profilograph or an approved equivalent.

(3) Miscellaneous Pavement. Miscellaneous pavement shall consist of:

- a. pavement on horizontal curves with a centerline radius of curvature of less than or equal to 300 m (1000 ft) and pavement within the superelevation transition of such curves;
- b. the first or last 4.5 m (15 ft) of a pavement section where the Contractor is not responsible for the adjoining surface;
- c. intersections;
- d. variable width pavements;
- e. side street returns;
- f. crossovers;
- g. connector pavement from mainline pavement expansion joint to the bridge approach pavement;
- h. bridge approach pavement; and
- i. other miscellaneous pavement surfaces (i.e. a turn lane) as determined by the Engineer.

Miscellaneous pavement shall be tested using a 5 m (16 ft) straightedge set to a 10 mm (3/8 in.) tolerance.

- (b) Lots/Sublots. Mainline pavement test sections will be divided into lots and sublots.
- (1) Lots. A lot will be defined as a continuous strip of pavement 1600 m (1 mile) long and one lane wide. When the length of a continuous strip of pavement is less than 1600 m (1 mile), that pavement will be included in an adjacent lot. Structures will be omitted when measuring pavement length.
 - (2) Sublots. Lots will be divided into 160 m (0.1 mile) sublots. A partial subplot resulting from an interruption in the pavement will be subject to the same evaluation as a whole subplot.
- (c) Testing Procedure. One wheel track shall be tested per lane. Testing shall be performed 1 m (3 ft) from and parallel to the edge of the lane away from traffic. A guide shall be used to maintain the proper distance.

The profile trace generated shall have stationing indicated every 150 m (500 ft) at a minimum. Both ends of the profile trace shall be labeled with the following information: contract number, beginning and ending stationing, which direction is up on the trace, which direction the profilograph was pushed, and the profilograph operator name(s). The top portion of the Department supplied form, "Profilograph Report of Pavement Smoothness" shall be completed and secured around the trace roll.

Although surface testing of intermediate lifts will not be required, they may be performed at the Contractor's option. When this option is chosen, the testing shall be performed and the profile traces shall be generated as described above.

The Engineer may perform his/her own testing at any time for monitoring and comparison purposes.

- (d) Trace Reduction and Bump Locating Procedure. All traces shall be reduced. Traces produced by a mechanical recorder shall be reduced using an electronic scanner and computer software. This software shall calculate the profile index of each subplot in mm/km (in./mile) and indicate any high points (bumps) in excess of 8 mm (0.30 in.) with a line intersecting the profile on the printout. Computerized recorders shall provide the same information.

The profile index of each track, average profile index of each subplot, average profile index of the lot and locations of bumps shall be recorded on the form.

All traces and reports shall be provided to the Engineer for the project file.

The Engineer will use the results of the testing to evaluate paving methods and equipment. If the average profile index of a lot exceeds 635 mm/km (40.0 in./mile) for high-speed mainline pavement or 1025 mm/km (65.0 in./mile) for low-speed mainline pavement, the paving operation will be suspended until corrective action is taken by the Contractor.

- (e) Corrective Work. All bumps in excess of 8 mm (0.30 in.) in a length of 8 m (25 ft) or less shall be corrected. If the bump is greater than 13 mm (0.50 in.), the pavement shall be removed and replaced to the satisfaction of the Engineer at the Contractor's expense. The minimum length of pavement to be removed shall be 900 mm (3 ft).
- (1) High-Speed Mainline Pavement. Any subplot having a profile index within the range of, greater than 475 (30.0) to 635 (40.0) mm/km (in./mile) including bumps, shall be corrected to reduce the profile index to 475 mm/km (30.0 in./mile) or less on each trace. Any subplot having a profile index greater than 635 mm/km (40.0 in./mile) including bumps, shall be corrected to reduce the profile index to 475 mm/km (30.0 in./mile) or less on each trace, or replaced at the Contractor's option.
- (2) Low-Speed Mainline Pavement. Any subplot having a profile index within the range of, greater than 710 (45.0) to 1025 (65.0) mm/km (in./mile) including bumps, shall be corrected to reduce the profile index to 710 mm/km (45.0 in./mile) or less on each trace. Any subplot having a profile index greater than 1025 mm/km (65.0 in./mile) including bumps, shall be corrected to reduce the profile index to 710 mm/km (45.0 in./mile) or less on each trace, or replaced at the Contractor's option.
- (3) Miscellaneous Pavement. Surface variations which exceed the 10 mm (3/8 in.) tolerance will be marked by the Engineer and shall be corrected by the Contractor.

Corrective work shall be completed using either an approved grinding device consisting of multiple saws or by removing and replacing the pavement. Corrective work shall be applied to the full lane width. When completed, the corrected area shall have uniform texture and appearance, with the beginning and ending of the corrected area squared normal to the centerline of the paved surface.

Upon completion of the corrective work, the surface of the subplot(s) shall be retested. The Contractor shall furnish the profilograph tracing(s) and the completed form(s) to the Engineer within two working days after corrections are made. If the profile index and/or bumps still do not meet the requirements, additional corrective work shall be performed.

Corrective work shall be at the Contractor's expense.

- (f) Smoothness Assessments. Assessments will be paid to or deducted from the Contractor for each subplot of mainline pavement, per the Smoothness Assessment Schedule. Assessments will be based on the average profile index of each subplot prior to performing any corrective work unless the Contractor has chosen to remove and replace the subplot. For sublots that are replaced, assessments will be based on the profile index determined after replacement.

Assessments will not be paid or deducted until all other contract requirements for the pavement are satisfied. Pavement that is corrected or replaced for reasons other than smoothness, shall be retested as stated herein.

SMOOTHNESS ASSESSMENT SCHEDULE (Bituminous Concrete Overlays)		
High-Speed Mainline Pavement Average Profile Index mm/km (in./mile)	Low-Speed Mainline Pavement Average Profile Index mm/km (in./mile)	Assessment per subplot
95 (6.0) or less	240 (15.0) or less	+\$150.00
>95 (6.0) to 160 (10.0)	>240 (15.0) to 400 (25.0)	+\$80.00
>160 (10.0) to 475 (30.0)	>400 (25.0) to 710 (45.0)	+\$0.00
>475 (30.0) to 635 (40.0)	>710 (45.0) to 1025 (65.0)	+\$0.00
Greater than 635 (40.0)	Greater than 1025 (65.0)	-\$300.00

Smoothness assessments will not be applied to miscellaneous pavement sections.”

Bituminous Concrete Pavement (Full-Depth)

Revise Article 407.09 of the Standard Specifications to read:

“**407.09 Surface Tests.** The finished surface of the pavement shall be tested for smoothness according to Article 406.21 except as follows:

Two wheel tracks shall be tested per lane. Testing shall be performed 1 m (3 ft) from and parallel to each lane edge.”

SMOOTHNESS ASSESSMENT SCHEDULE (Full-Depth Bituminous)		
High-Speed Mainline Pavement Average Profile Index mm/km (in./mile)	Low-Speed Mainline Pavement Average Profile Index mm/km (in./mile)	Assessment per subplot
95 (6.0) or less		+\$800.00
>95 (6.0) to 175 (11.0)	240 (15.0) or less	+\$550.00
>175 (11.0) to 270 (17.0)	>240 (15.0) to 400 (25.0)	+\$350.00
>270 (17.0) to 475 (30.0)	>400 (25.0) to 710 (45.0)	+\$0.00
>475 (30.0) to 635 (40.0)	>710 (45.0) to 1025 (65.0)	+\$0.00
Greater than 635 (40.0)	Greater than 1025 (65.0)	-\$500.00

Delete the fourth paragraph of Article 407.13 of the Standard Specifications.

Portland Cement Concrete Pavement

Revise Article 420.12 of the Standard Specifications to read:

“**420.12 Surface Tests.** The finished surface of the pavement shall be tested for smoothness according to Article 406.21 except as follows:

Two wheel tracks shall be tested per lane. Testing shall be performed 1 m (3 ft) from and parallel to each lane edge.

Membrane curing damaged during testing shall be repaired as directed by the Engineer at the Contractor's expense.

No further texturing for skid resistance will be required for areas corrected by grinding. Protective coat shall be reapplied to ground areas according to Article 420.21 at the Contractor's expense."

For pavement that is corrected by removal and replacement, the minimum length to be removed shall meet the requirements of either Class A or Class B patching.

SMOOTHNESS ASSESSMENT SCHEDULE (PCC)		
High-Speed Mainline Pavement Average Profile Index mm/km (in./mile)	Low-Speed Mainline Pavement Average Profile Index mm/km (in./mile)	Assessment per subplot
95 (6.0) or less		+\$1200.00
>95 (6.0) to 175 (11.0)	240 (15.0) or less	+\$950.00
>175 (11.0) to 270 (17.0)	>240 (15.0) to 400 (25.0)	+\$600.00
>270 (17.0) to 475 (30.0)	>400 (25.0) to 710 (45.0)	+\$0.00
>475 (30.0) to 635 (40.0)	>710 (45.0) to 1025 (65.0)	+\$0.00
Greater than 635 (40.0)	Greater than 1025 (65.0)	-\$750.00

Delete the sixth paragraph of Article 420.23 of the Standard Specifications.

Testing Equipment

Revise Article 1101.10 of the Standard Specifications to read:

"1101.10 Pavement Surface Test Equipment. Required surface testing and analysis equipment and their jobsite transportation shall be provided by the Contractor.

- (a) 5 m (16 ft) Straightedge. The 5 m (16 ft) straightedge shall consist of a metal I-beam mounted between two wheels spaced 5 m (16 ft) between the axles. Scratcher bolts which can be easily and accurately adjusted, shall be set at the 1/4, 1/2, and 3/4 points between the axles. A handle suitable for pushing and guiding shall be attached to the straightedge. The straightedge shall meet the approval of the Engineer.
- (b) California Profilograph. The California Profilograph or approved equivalent shall consist of a frame 8 m (25 ft) in length supported upon multiple wheels at either end. The profile shall be recorded from the vertical movement of a wheel attached to the frame at mid point. All traces from pavement sections tested with a California Profilograph or approved equivalent shall be recorded on paper with scales of 300:1 longitudinally and

1:1 vertically. Data filters for an automated California Profilograph shall be set according to the parameters outlined in California Test 526, except the blanking band shall be set to 0.0 mm (0.00 in.).

- (1) Calibration. The Contractor shall demonstrate to the Engineer that the testing equipment has proper tire pressure inflation, trueness of tire travel, and is calibrated for vertical displacement and horizontal distance. This calibration shall consist of the following:
 - a. A 150 to 300 m (500 to 1000 ft) long calibration test section shall be located on the project. This test section should be relatively straight and flat. The profilograph shall be calibrated for longitudinal distance on this test section to the satisfaction of the Engineer.
 - b. Longitudinal calibration consists of pushing, at walking speed (approximately 5 km/hr (3 mph)), the profilograph over the pre-measured test section and determining the chart scale factor. To calculate the chart scale factor, divide the pre-measured test distance, in millimeters (inches), by the length of the profile trace from this test section, in millimeters (inches). This factor should be 300 ± 0.5 . If the profilograph produces charts with a different scale factor, adjustment of the profilograph shall be made to bring the scale factor to the tolerance specified above.
 - c. Vertical calibration consists of placing the center recording wheel of the profilograph on a base plate and recording the base elevation. Two plates, 13 mm (0.5 in.) thick each, are added under the center wheel, one at a time, and the change in elevation noted. The two plates are removed, one at a time, and the change in elevation noted. Each step in the process shall show a change in height of $13 \text{ mm} \pm 1.0 \text{ mm}$ ($0.5 \text{ in.} \pm 0.01 \text{ in.}$). If the profilograph produces results not conforming to the above limits, it shall be adjusted to the tolerance specified.
 - d. The automatic trace reduction capability of a machine so equipped shall be checked by comparing the machine's results to the results obtained through manual trace reduction using California Test 526 with a 0.0 mm (0.00 in.) blanking band. The comparison shall be made with the trace obtained on the pre-measured test section. The results of the comparison shall not differ by more than 30 mm/km (2.0 in./mile).
 - e. All calibration traces and calculations shall be submitted to the Engineer for the project file.

The Engineer may retest the pavement at any time to verify the accuracy of the equipment.

- (2) Trace Analysis. The Contractor shall reduce/evaluate these traces using a 0.0 mm (0.00 in.) blanking band and determine a profile index in mm/km (in./mile) for each section of finished pavement surface. If the Contractor's profilograph is equipped with a computerized recorder, the trace produced will be evaluated without further reduction. If the profilograph has a mechanical recorder, the Contractor shall provide

an electronic scanner, a computer, and software to reduce the trace. All analysis equipment (electronic scanner, computerized recorder, etc.) shall be able to accept 0.0 mm (0.00 in.) for the blanking band.”

SUSPENSION OF SLIPFORMED PARAPETS (BDE)

Effective: June 11, 2004

The slipforming option, as stated in Article 503.17(e)(1) of the Standard Specifications will not be allowed on this project.

TEMPORARY CONCRETE BARRIER (BDE)

Effective: October 1, 2002

Revised: November 1, 2003

Revise Section 704 of the Standard Specifications to read:

“SECTION 704. TEMPORARY CONCRETE BARRIER

704.01 Description. This work shall consist of furnishing, placing, maintaining, relocating and removing precast concrete barrier at temporary locations as shown on the plans or as directed by the Engineer.

704.02 Materials. Materials shall meet the requirements of the following Articles of Section 1000 - Materials:

Item	Article/Section
(a) Portland Cement Concrete.....	1020
(b) Reinforcement Bars (Note 1)	1006.10(a)(b)
(c) Connecting Pins and Anchoring Pins.....	1006.09
(d) Connecting Loop Bars (Note 2)	
(e) Rapid Set Mortar (Note 3)	

Note 1. Reinforcement bars shall be Grade 400 (Grade 60).

Note 2. Connecting loop bars shall be smooth bars conforming to the requirements of ASTM A 36.

Note 3. Rapid set materials shall be obtained from the Department’s approved list of Packaged, Dry, Rapid Hardening Cementitious Materials for Concrete Repairs. For a rapid set mortar mixture, one part packaged rapid set cement shall be combined with two parts fine aggregate, by volume or a packaged rapid set mortar shall be used. Mixing of the rapid set mortar shall be according to the manufacturer’s instructions.

CONSTRUCTION REQUIREMENTS

704.03 General. Precast concrete barrier produced after October 1, 2002 shall meet National Cooperative Highway Research Program (NCHRP) Report 350, Category 3, Test Level 3 requirements and have the F shape. Precast concrete barrier shall be constructed according to the Bureau of Materials and Physical Research's Policy Memorandum "Quality Control/Quality Assurance Program for Precast Concrete Products", applicable portions of Sections 504 and 1020, and to the details shown on the plans.

Precast units shall not be removed from the casting beds until a flexural strength of 2,000 kPa (300 psi) or a compressive strength of 10,000 kPa (1400 psi) is attained. When the concrete has attained a compressive strength according to Article 1020.04, and not prior to four days after casting, the units may be loaded, shipped and used.

704.04 Installation. F shape barrier units shall be seated on bare, clean pavement or paved shoulder and pinned together in a smooth, continuous line at the exact locations provided by the Engineer. The barrier unit at each end of the installation shall be secured to the pavement or paved shoulder using six anchoring pins and protected with an impact attenuator as shown on the plans.

F shape and New Jersey shape barrier units shall not be mixed in the same run.

Barrier units or attachments damaged during transportation or handling, or by traffic during the life of the installation, shall be repaired or replaced by the Contractor at his/her expense. The Engineer will be the sole judge in determining which units or attachments require repair or replacement.

The temporary barriers shall be removed when no longer required by the contract. After removal, all anchoring holes in the pavement or paved shoulder shall be filled with a rapid set mortar. Only enough water to permit placement and consolidation by rodding shall be used and the material shall be struck-off flush.

704.05 New Jersey Shape Barrier. New Jersey shape barrier produced prior to October 1, 2002 according to earlier Department standards, may be used until January 1, 2008.

Barrier units or attachments damaged during transportation or handling, or by traffic during the life of the installation, shall be repaired or replaced by the Contractor at his/her expense. The Engineer will be the sole judge in determining which units or attachments require repair or replacement.

F shape and New Jersey shape barrier units shall not be mixed in the same run.

The barrier unit at each end of the installation shall be secured to the pavement or paved shoulder using six dowel bars and protected with an impact attenuator as shown on the plans.

The temporary barriers shall be removed when no longer required by the contract. After removal, all anchoring holes in the pavement or paved shoulder shall be filled with a rapid set mortar. Only enough water to permit placement and consolidation by rodding shall be used and the material shall be struck-off flush.

704.06 Method of Measurement. Temporary concrete barrier will be measured for payment in meters (feet) in place along the centerline of the barrier. When temporary concrete barrier is relocated within the limits of the jobsite, the relocated barrier will be measured for payment in meters (feet) in place along the centerline of the barrier.

704.07 Basis of Payment. When the Contractor furnishes the barrier units, this work will be paid for at the contract unit price per meter (foot) for TEMPORARY CONCRETE BARRIER or RELOCATE TEMPORARY CONCRETE BARRIER.

When the Department furnishes the barrier units, this work will be paid for at the contract unit price per meter (foot) for TEMPORARY CONCRETE BARRIER, STATE OWNED or RELOCATE TEMPORARY CONCRETE BARRIER, STATE OWNED.

| Impact attenuators will be paid for separately.”

TRAFFIC BARRIER TERMINALS (BDE)

Effective: January 1, 2003

Revise Article 631.05 of the Standard Specifications to read:

“631.05 Traffic Barrier Terminal, Type 5 and Type 5A. The face of the guardrail shall be installed flush with the face of the bridge rail or parapet.”

Revise Article 631.06 of the Standard Specifications to read:

“631.06 Traffic Barrier Terminal, Type 6. When attaching the end shoe to concrete constructed with forms and with a thickness of 300 mm (12 in.) or less, the holes may be formed, core drilled or an approved 20 mm (3/4 in.) cast-in-place insert may be used.

When attaching the end shoe to concrete constructed with forms and with a thickness greater than 300 mm (12 in.), an approved M20 (3/4 in.) bolt with an approved expansion device may be used in lieu of formed or core drilled holes.

When attaching the end shoe to concrete constructed by slipforming, the holes shall be core drilled.

The tapered, parapet, wood block out shall be used on all appurtenances with a sloped face.

When no bridge approach curb is present, Type B concrete curb shall be constructed as shown on the plans according to Section 606.”

Revise Article 631.07 of the Standard Specifications to read:

“631.07 Traffic Barrier Terminal, Type 6B. Attachment of the end shoe to concrete shall be according to Article 631.06 except the tapered, parapet, wood block out will not be required.”

Delete the third and fourth paragraphs of Article 631.11 of the Standard Specifications.

Add the following paragraph to the end of Article 631.11 of the Standard Specifications:

“Construction of the Type B concrete curb for TRAFFIC BARRIER TERMINAL, TYPE 6 will be paid for according to Article 606.14.”

TRAFFIC CONTROL DEFICIENCY DEDUCTION (BDE)

Effective: April 1, 1992

Revised: January 1, 2005

To ensure a prompt response to incidents involving the integrity of work zone traffic control, the Contractor shall provide a telephone number where a responsible individual can be contacted 24 hours-a-day.

When the Engineer is notified, or determines a traffic control deficiency exists, he/she 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 12 hours based upon the urgency of the situation and the nature of the deficiency. The Engineer shall be the sole judge.

A deficiency may be any lack of repair, maintenance, or non-compliance with the traffic control plan. A deficiency may also be applied to situations where corrective action is not an option such as the use of non-certified flaggers for short term operations; working with lane closures beyond the time allowed in the contract; or failure to perform required contract obligations such as traffic control surveillance.

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 \$1,000 or 0.05 percent of the awarded contract value, whichever is greater. For those deficiencies where corrective action was not an option this monetary deduction will be immediate.

In addition, if the Contractor fails to respond, the Engineer may correct the deficiency and the cost thereof will be deducted from monies due or which may become due the Contractor. This corrective action will in no way relieve the Contractor of his/her contractual requirements or responsibilities.

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 6. In the event the contractor subcontracts a portion of the contract work, he shall

determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within the reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to the Illinois Department of Transportation for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g. by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Illinois Department of Transportation and the Federal Highway Administration. The Illinois Department of Transportation and the Federal Highway Administration shall approve a program, if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved by not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather 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.

TRANSIENT VOLTAGE SURGE SUPPRESSION (BDE)

Effective: August 1, 2003

Revise the first paragraph of Article 1074.03(a)(4) of the Standard Specifications to read:

“(4) Transient Voltage Surge Suppression. The cabinet shall be provided with transient voltage surge suppression. Transient surge suppression unit leads shall be kept as short as possible and ground shall be made directly to the cabinet wall or ground plate as near as possible to the object being grounded. All transient surge suppression units shall be tested and certified as meeting this specification by an independent testing laboratory. One copy of each of the full testing report shall be submitted to the Engineer.”

Revise Article 1074.03(a)(4)a. of the Standard Specifications to read:

- “a. Surge Suppressor. The suppressor protecting the solid state controller, conflict monitor, and detection equipment shall consist of two stages: stage one which shall include a controller cabinet AC power protection assembly and stage two which shall include AC circuit protection.

The design of the stage one suppressor shall be modular and it shall be installed in such a way that it may be removed and replaced with the intersection under power and in flashing operation. It shall have a permanently mounted and wired base and a removable circuit package. The stage one suppressor shall have two LED failure indicators for power ‘on’ and suppression ‘failure’ and shall meet the following properties:

Stage One Suppressor	
Properties	Criteria
“Plug-in” suppression module	12 pin connector assembly
Clamp voltage	250 V at 20,000 A typical
Response time	Less than 5 nanoseconds
Maximum continuous service current	15 A at 120 VAC 60 Hz
High frequency noise attenuation	At least 50 dB at 100,000 Hz
Operating temperature	-40 °C (-40 °F) to 85 °C (185 °F)

If the controller assembly includes a system telemetry module or remote intersection monitor, the status of the stage one suppressor shall be continuously and remotely monitored by an appropriate alarm circuit.

The stage two, high speed, solid state, transient suppressor shall protect the system from transient over voltage without affecting power at the load. It shall suppress transients of either polarity and from either direction (source or load). The suppressor shall have a visual “on” indicator lamp when the unit is operating normally. It shall also have a UL plastic enclosure, a four position terminal strip for power connection, and it shall utilize silicon avalanche diode technology. The stage two suppressor shall meet the following properties:

Stage Two Suppressor	
Properties	Criteria
Nominal service voltage	120 V at 50/60 Hz
Maximum voltage protection level	±330 V
Minimum voltage protection level	±220 V ±5%
Minimum surge current rating	700 A
Stand by power	Less than 0.5 Watts
Hot to neutral leakage current at 120 V RMS	Less than 5µA
Maximum response time	5 nanoseconds
Operating and Storage temperature	-20 °C (-4 °F) to 50 °C (122 °F)”

TRUCK BED RELEASE AGENT (BDE)

Effective: April 1, 2004

Add the following sentence after the third sentence of the first paragraph of Article 406.14 of the Standard Specifications.

“In addition to the release agent, the Contractor may use a light scatter of manufactured sand (FA 20 or FA 21) evenly distributed over the bed of the vehicle.”

WEIGHT CONTROL DEFICIENCY DEDUCTION

Effective: April 1, 2001

Revised: August 1, 2002

The Contractor shall provide accurate weights of materials delivered to the contract for incorporation into the work (whether temporary or permanent) and for which the basis of payment is by weight. These weights shall be documented on delivery tickets which shall identify the source of the material, type of material, the date and time the material was loaded, the contract number, the net weight, the tare weight when applicable and the identification of the transporting vehicle. For aggregates, the Contractor shall have the driver of the vehicle furnish or establish an acceptable alternative to provide the contract number and a copy of the material order to the source for each load. The source is defined as that facility that produces the final material product that is to be incorporated into the contract pay items.

The Department will conduct random, independent vehicle weight checks for material sources according to the procedures outlined in the Documentation Section Policy Statement of the Department’s Construction Manual and hereby incorporated by reference. The results of the

independent weight checks shall be applicable to all contracts containing this Special Provision. Should the vehicle weight check for a source result in the net weight of material on the vehicle exceeding the net weight of material shown on the delivery ticket by 0.50% (0.70% for aggregates) or more, the Engineer will document the independent vehicle weight check and immediately furnish a copy of the results to the Contractor. No adjustment in pay quantity will be made. Should the vehicle weight check for a source result in the net weight of material shown on the delivery ticket exceeding the net weight of material on the vehicle by 0.50% (0.70% for aggregates) or more, the Engineer will document the independent vehicle weight check and immediately furnish a copy of the results to the Contractor. The Engineer will adjust the net weight shown on the delivery ticket to the checked delivered net weight as determined by the independent vehicle weight check.

The Engineer will also adjust the method of measurement for all contracts for subsequent deliveries of all materials from the source based on the independent weight check. The net weight of all materials delivered to all contracts containing this Special Provision from this source, for which the basis of payment is by weight, will be adjusted by applying a correction factor "A" as determined by the following formula:

$$A = 1.0 - \left(\frac{B - C}{B} \right); \text{ Where } A \leq 1.0; \left(\frac{B - C}{C} \right) > 0.50\% \text{ (0.70\% for aggregates)}$$

Where A = Adjustment factor
B = Net weight shown on delivery ticket
C = Net weight determined from independent weight check

The adjustment factor will be applied as follows:

$$\text{Adjusted Net Weight} = A \times \text{Delivery Ticket Net Weight}$$

The adjustment factor will be imposed until the cause of the deficient weight is identified and corrected by the Contractor to the satisfaction of the Engineer. If the cause of the deficient weight is not identified and corrected within seven (7) calendar days, the source shall cease delivery of all materials to all contracts containing this Special Provision for which the basis of payment is by weight.

Should the Contractor elect to challenge the results of the independent weight check, the Engineer will continue to document the weight of material for which the adjustment factor would be applied. However, provided the Contractor furnishes the Engineer with written documentation that the source scale has been calibrated within seven (7) calendar days after the date of the independent weight check, adjustments in the weight of material paid for will not be applied unless the scale calibration demonstrates that the source scale was not within the specified Department of Agriculture tolerance.

At the Contractor's option, the vehicle may be weighed on a second independent Department of Agriculture certified scale to verify the accuracy of the scale used for the independent weight check.

WORK ZONE PUBLIC INFORMATION SIGNS (BDE)

Effective: September 1, 2002

Revised: January 1, 2005

Description. This work shall consist of furnishing, erecting, maintaining, and removing work zone public information signs.

Camera-ready artwork for the signs will be provided to sign manufacturing companies upon request by contacting the Central Bureau of Operations at 217-782-2076. The sign number is W21-1116-6048.

Freeways/Expressways. These signs are required on freeways and expressways. The signs shall be erected as shown on Highway Standard 701400 and according to Article 702.05(a) of the Standard Specifications.

All Other Routes. These signs shall be used on other routes when specified on the plans. They shall be erected in pairs midway between the first and second warning signs.

Basis of Payment. This work will not be paid for separately but shall be considered as included in the cost of the Standard.

WORK ZONE SPEED LIMIT SIGNS (BDE)

Effective: April 2, 2004

Revised: April 15, 2004

Delete Article 702.05(c).

Revise Article 702.05(d) to read:

“(d) Work Zone Speed Limit Signs. Work zone speed limit sign assemblies shall be provided and located as shown on the plans. Two additional assemblies shall be placed 150 m (500 ft) beyond the last entrance ramp for each interchange. The individual signs that make up an assembly may be combined on a single panel. The sheeting for the signs shall be reflective and conform to the requirements of Article 1084.02.

All permanent “SPEED LIMIT” signs located within the work zone shall be removed or covered. This work shall be coordinated with the lane closure(s) by promptly establishing a reduced posted speed zone when the lane closure(s) are put into effect and promptly reinstating the posted speed zone when the lane closure(s) are removed.

The work zone speed limit signs and end work zone speed limit signs shown in advance of and at the end of the lane closure(s) shall be used for the entire duration of the closure(s).

The work zone speed limit signs shown within the lane closure(s) shall only be used when workers are present in the closed lane adjacent to traffic; at all other times, the signs shall be promptly removed or covered. The sign assemblies shown within the lane closure(s) will not be required when the worker(s) are located behind a concrete barrier wall.

WORK ZONE TRAFFIC CONTROL DEVICES (BDE)

Effective: January 1, 2003

Revised: November 1, 2004

Add the following to Article 702.01 of the Standard Specifications:

“All devices and combinations of devices shall meet the requirements of the National Cooperative Highway Research Program (NCHRP) Report 350 for their respective categories. The categories are as follows:

Category 1 includes small, lightweight, channelizing and delineating devices that have been in common use for many years and are known to be crashworthy by crash testing of similar devices or years of demonstrable safe performance. These include cones, tubular markers, flexible delineators and plastic drums with no attachments. Category 1 devices shall be crash tested and accepted or may be self-certified by the manufacturer.

Category 2 includes devices that are not expected to produce significant vehicular velocity change but may otherwise be hazardous. These include drums and vertical panels with lights, barricades and portable sign supports. Category 2 devices shall be crash tested and accepted for Test Level 3.

Category 3 includes devices that are expected to cause significant velocity changes or other potentially harmful reactions to impacting vehicles. These include crash cushions, truck mounted attenuators and other devices not meeting the definitions of Category 1 or 2. Category 3 devices shall be crash tested and accepted for either Test Level 3 or the test level specified.

Category 4 includes portable or trailer-mounted devices such as arrow boards, changeable message signs, temporary traffic signals and area lighting supports. Currently, there is no implementation date set for this category and it is exempt from the NCHRP 350 compliance requirement.

The Contractor shall provide a manufacturer's self-certification letter for each Category 1 device and an FHWA acceptance letter for each Category 2 and Category 3 device used on the contract. The letters shall state the device meets the NCHRP 350 requirements for its respective category and test level, and shall include a detail drawing of the device.”

Delete the third, fourth and fifth paragraphs of Article 702.03(b) of the Standard Specifications.

Delete the third sentence of the first paragraph of Article 702.03(c) of the Standard Specifications.

Revise the first sentence of the first paragraph of Article 702.03(e) of the Standard Specifications to read:

“Drums shall be nonmetallic and have alternating reflectorized Type AA or Type AP fluorescent orange and reflectorized white horizontal, circumferential stripes.”

Add the following to Article 702.03 of the Standard Specifications:

“(h) Vertical Barricades. Vertical barricades may be used in lieu of cones, drums or Type II barricades to channelize traffic.”

Delete the fourth paragraph of Article 702.05(a) of the Standard Specifications.

Revise the sixth paragraph of Article 702.05(a) of the Standard Specifications to read:

“When the work operations exceed four days, all signs shall be post mounted unless the signs are located on the pavement or define a moving or intermittent operation. When approved by the Engineer, a temporary sign stand may be used to support a sign at 1.2 m (5 ft) minimum where posts are impractical. Longitudinal dimensions shown on the plans for the placement of signs may be increased up to 30 m (100 ft) to avoid obstacles, hazards or to improve sight distance, when approved by the Engineer. “ROAD CONSTRUCTION AHEAD” signs will also be required on side roads located within the limits of the mainline “ROAD CONSTRUCTION AHEAD” signs.”

Delete all references to “Type 1A barricades” and “wing barricades” throughout Section 702 of the Standard Specifications.

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.

STEEL COST ADJUSTMENT (BDE)

Effective: April 2, 2004

Revised: July 1, 2004

Description. At the bidder’s option, a steel cost adjustment will be made to provide additional compensation to the Contractor or a credit to the Department for fluctuations in steel prices. The bidder must indicate on the attached form whether or not steel cost adjustments will be part of this contract. This attached form shall be submitted with the bid. Failure to submit the form shall make this contract exempt of steel cost adjustments.

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), frames and grates, and other miscellaneous items will be subject to a steel cost adjustment when the pay item 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) Evidence that increased or decreased steel costs have been passed on to the Contractor.
- (b) The dates and quantity of steel, in kg (lb), shipped from the mill to the fabricator.
- (c) The quantity of steel, in kg (lb), 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 kg (lb)
D = price factor, in dollars per kg (lb)

$$D = CBP_M - CBP_L$$

Where: CBP_M = The average of the Consumer Buying Price indices for Shredded Auto Scrap (Chicago) and No. 1 Heavy Melt (Chicago) as published by the American Metal Market (AMM) for the day the steel is shipped from the mill. The indices will be converted from dollars per ton to dollars per kg (lb).

CBP_L = The average of the Consumer Buying Price indices for Shredded Auto Scrap (Chicago) and No. 1 Heavy Melt (Chicago) as published by the AMM for the day the contract is let. The indices will be converted from dollars per ton to dollars per kg (lb).

The unit masses (weights) 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 CBP_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 CBP_L and CBP_M in excess of five percent, as calculated by:

$$\text{Percent Difference} = \{(CBP_L - CBP_M) \div CBP_L\} \times 100$$

Steel cost adjustments will be calculated by the Engineer and will be paid or deducted when all other contract requirements for the steel items 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.

Attachment

Item	Unit Mass (Weight)
Metal Piling (excluding temporary sheet piling)	
Furnishing Metal Pile Shells 305 mm (12 in.), 3.80 mm (0.179 in.) wall thickness)	34 kg/m (23 lb/ft)
Furnishing Metal Pile Shells 305 mm (12 in.), 6.35 mm (0.250 in.) wall thickness)	48 kg/m (32 lb/ft)
Furnishing Metal Pile Shells 356 mm (14 in.), 6.35 mm (0.250 in.) wall thickness)	55 kg/m (37 lb/ft)
Other piling	See plans
Structural Steel	See plans for weights
Reinforcing Steel	See plans for weights
Dowel Bars and Tie Bars	3 kg (6 lb) each
Mesh Reinforcement	310 kg/sq m (63 lb/100 sq ft)
Guardrail	
Steel Plate Beam Guardrail, Type A w/steel posts	30 kg/m (20 lb/ft)
Steel Plate Beam Guardrail, Type B w/steel posts	45 kg/m (30 lb/ft)
Steel Plate Beam Guardrail, Types A and B w/wood posts	12 kg/m (8 lb/ft)
Steel Plate Beam Guardrail, Type 2	140 kg (305 lb) each
Steel Plate Beam Guardrail, Type 6	570 kg (1260 lb) each
Traffic Barrier Terminal, Type 1 Special (Tangent)	330 kg (730 lb) each
Traffic Barrier Terminal, Type 1 Special (Flared)	185 kg (410 lb) each
Steel Traffic Signal and Light Poles, Towers and Mast Arms	
Traffic Signal Post	16 kg/m (11 lb/ft)
Light Pole, Tenon Mount and Twin Mount, 9 m – 12 m (30 - 40 ft)	21 kg/m (14 lb/ft)
Light Pole, Tenon Mount and Twin Mount, 13.5 m – 16.5 m (45 - 55 ft)	31 kg/m (21 lb/ft)
Light Pole w/Mast Arm, 9 m – 15.2 m (30 - 50 ft)	19 kg/m (13 lb/ft)
Light Pole w/Mast Arm, 16.5 m – 18 m (55 - 60 ft)	28 kg/m (19 lb/ft)
Light Tower w/Luminaire Mount, 24 m – 33.5 m (80 - 110 ft)	46 kg/m (31 lb/ft)
Light Tower w/Luminaire Mount, 36.5 m – 42.5 m (120 - 140 ft)	97 kg/m (65 lb/ft)
Light Tower w/Luminaire Mount, 45.5 m – 48.5 m (150 - 160 ft)	119 kg/m (80 lb/ft)
Metal Railings (excluding wire fence)	
Steel Railing, Type SM	95 kg/m (64 lb/ft)
Steel Railing, Type S-1	58 kg/m (39 lb/ft)
Steel Railing, Type T-1	79 kg/m (53 lb/ft)
Steel Bridge Rail	77 kg/m (52 lb/ft)
Frames and Grates	
Frame	115 kg (250 lb)
Lids and Grates	70 kg (150 lb)

RETURN WITH BID

**ILLINOIS DEPARTMENT
OF TRANSPORTATION**

**OPTION FOR
STEEL COST ADJUSTMENT**

The bidder shall submit this form with his/her bid. Failure to submit the form shall make this contract exempt of steel 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 plans?

Yes No

Signature: _____ **Date:** _____

**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

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 quailifiable 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.

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

listed on the wage determination unless the Administrator of the

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

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.

(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 a 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 (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 the submission of copies of payrolls by 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 work 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 contractor's 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.

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.

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

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.il.gov/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.il.gov/desenv/subsc.html>.

If you have any questions concerning the wage rates, please contact IDOT's Chief Contract Official at 217-782-7806.